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PRESEARCH

TRANSLATION AND INTERPRETING SUPPORT
FOR ARMY R&D ACTIVITIES

by

Robert V. Hubbard

30 April 1986

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> The findings and recommendations contained in this report do not represent the official position of the U.S. Army unless so designated by the Army.

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This report describes the methodology, findings, and recommendations of a study of the requirements, resources, and procedures of the Army R&D Community for translations and interpreting of foreign language information of scientific and technical interest. The study is based on survey of R&D technical libraries and foreign intelligence offices and interviews with many officials responsible for information support, translating, and interpreting. The report includes descriptions of the translating and interpreting processes and the organizations that do this work. The major finding of the study is that Army R&D management should assure adequate use of foreign technology in support of Army R&D by incorporating policy and responsibilities for transfer of foreign technology to the Army into the Army Scientific and Technical Information Program.

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ABSTRACT

This report describes the methodology and results of a study of
U.S. Army resources and procedures for translating and inter-
preting scientific and technical information from foreign
languages into English for use by Army research and development
(R&D) scientists and engineers. Translating and interpreting
are important steps in making foreign technology available to
the R&D Community. This study was sponsored by the Office of
the Deputy Chief of Staff for Technology Planning and Manage-
ment, Headquarters, U.S. Army Materiel Command and was completed
by Presearch Incorporated under Contract No. DAAD05-84-C-0189.

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PREFACE

A stated objective of the Commander, U.S. Army Materiel Command is to use foreign technology and equipment to help reduce the cost and time required to develop and field weapons and equipment. Attainment of this objective is impeded by the fact that much foreign technical literature and equipment documentation must be translated into English.

The U.S. Army has not established adequate policies, organizations, and procedures for the tasks of identifying, translating and interpreting, and disseminating the important technical information available in foreign languages. The Army R&D Community has largely left exploitation of foreign technical literature to the Intelligence Community, which is too small and too oriented on certain nations to be able to provide Army scientists and engineers with the detailed technology available from other technically advanced nations.

This situation causes U.S. duplication of foreign R&D, increased time and cost for U.S. R&D, lack of appreciation of foreign accomplishments, and inefficient communication with foreign military and technical establishments. The problems increase as Germany, France, Japan, the Soviet Union, Sweden and other countries rival U.S. technology. The Army cannot afford to assume that domestic technology will always provide the best materiel support for its units and troops.

To increase the effectiveness of its use of foreign technology, the U.S. Army should take the following actions:

- Establish policies and responsibilities for transfer of foreign technology to Army R&D in the Army Scientific and Technical Information Program

- Organize a Central Army Language Services Office to direct, coordinate, and participate in translating and interpreting activities for the Army

- Provide Army R&D technical libraries and intelligence and security offices (Foreign Intelligence Offices) with the guidance and resources needed to use and support existing DoD and Government translating and interpreting agencies effectively.

ACKNOWLEDGEMENT

This study could not have been completed without the interest
and cooperation of the many individuals who so willingly
discussed their concerns about improving translating and
interpreting support for the Army and the Government. Four
individuals in particular devoted much more time and interest to
the study effort than could have been expected. These
individuals are:

- Mr. Lester C. Bennefeld, Jr., Chief, Document Analysis
  Branch, U.S. Army Foreign Science and Technology
  Center

- Dr. James H. Canfield, Acting Chief, Information Ser-
  vices Division, U.S. Air Force Systems Command Foreign
  Technology Division

- Ms. Maureen E. Cote, Production Group, U.S. Foreign
  Broadcast Information Service

- Mr. Helmut R. Kerl, Chief, R&D Interpreting Office,
  U.S. Army Foreign Science and Technology Center

SUMMARY

PURPOSE AND OBJECTIVES

1.   This study report provides Army officials responsible for information support of Army research and development (R&D) activities with information needed for efficient and effective management and use of translating and interpreting resources available to the Army. These resources play an important role in making foreign science and technology (S&T) accessible to Army scientists and engineers. The objectives of the study were to:

    a. Estimate the demand for translating and interpreting support generated by Army R&D activities

    b. Identify and describe current resources and procedures for translating and interpreting support to the Army R&D Community

    c. Identify and describe problem areas in translating and interpreting service resources and procedures

    d. Develop recommendations for actions to improve translating and interpreting support to Army R&D activities with the end goal of facilitating Army use of S&T information available in foreign languages.

2.   The study was sponsored by the Army Principle Technical Information Officer, Office of the Deputy Chief of Staff for Technology Planning and Management, Headquarters, Army Materiel Command and performed by Presearch Incorporated under Contract Number DAAD05-84-C-0189.

SCOPE

3.   The study addressed requirements for translating and interpreting support for the Army R&D Community to include Army R&D laboratories and activities in the Office of the Chief of Engineers, Headquarters, Department of the Army; the Army Materiel Command; the Army Medical Research and Development Command; and the Army Research Institute for the Behavioral and Social Sciences.

METHODOLOGY

4.   Information on Army R&D requirements for translating and interpreting support, resources available, and use of those resources was collected through literature research, interviews,

and questionnaire survey. Officials of all the major translat-
ing and interpreting services in the Department of Defense
(DoD), Intelligence Community, and Department of State (DOS)
were interviewed. Questionnaires were sent to and received from
35 technical libraries and 22 Foreign Intelligence Offices in
the Army R&D Community. The collected data were analyzed to
derive the study findings and recommendations. About six man-
months of professional effort were involved.

FINDINGS

Demand for Translating and Interpreting Support

5.   **Translating Support.** The total Army R&D demand for trans-
lating support was about 6 million words per year in the
1984/1985 timeframe. In addition to these 6 million words per
year required by the R&D organizations, an additional 12 to 13
million words of translation were requested by U.S. Army Foreign
Science and Technology Center (FSTC) intelligence analysts,
HQDA, TRADOC, and other Army organizations that use the FSTC
Foreign Language Research Branch as a resource for translating
services. The principal languages required for R&D work are
German, French, and Russian, with occasional requirements in 15
to 20 other languages. Requirements for Japanese translation
are increasing rapidly.

6.   The current R&D workload of 6 million words per year
equates to 10 to 12 man-years of translation support per year.
The total Army load of 20 million words equates to 30 to 40 man-
years of translation support per year.

7.   **Interpreting Support.** Army R&D organizations require from
550 to 600 man-days per year of conference interpreting support.
Assuming two days of administration and travel are required for
each day of that interpreting, the annual workload equates to
seven to eight man-years of effort per year. Most of this work
is required for international conferences related to projects
such as the Multiple Launch Racket System and Test Standardiza-
tion. The principal languages required are German and French.

Resources and Procedures

8.   **Translating Support.** Translating resources available to
R&D organizations include the FSTC Foreign Language Research
Branch, the Redstone Scientific Information Center (RSIC) Trans-
lation Branch, and commercial translation contractors. Of the 6
million words of R&D translations per year, about 3.2 million
are sent directly to contractors, 1.1 million are done by RSIC,
and 1.7 million are sent to FSTC through the FIOs. FSTC normal-
ly uses contractors to translate documents sent in by the FIOs

but occasionally sends some documents to the U.S. Joint Publications Research Service for translation.

9.   Army R&D organizations pay varying rates for contract translations, depending on the language and technical content of the document to be translated. The average rate paid appears to be about $35 per 1,000 words. Current commercial rates for highly technical work in languages such as Russian or Japanese may run as high as $100 per 1,000 words. Requirements to accept low bids for translation work are often reported to impinge on the quality of the translations received.

10.   A very rough estimate of the total cost of translating support for Army R&D per year, including Government and contractor personnel, is $450,000 to $500,000. An estimate of the total cost required to meet the estimated total Army demand of 20 million words per year is approximately $1.6 million per year.

11.   **Interpreting Support**. About 30% of the Army's requirements for interpreting are provided by the Army R&D Interpreting Office. The other 70% are met by the DOS Office of Language Services. The estimated current annual cost to the Army of interpreting support for R&D work is approximately $325,000.

Problem Areas

12.   Translating and interpreting support for Army R&D activities is inadequate to support the Army's need to exploit foreign technology. About 15% of the stated requirements for translation were not met in 1985; many translations required months to prepare; the translations are often of uncertain quality; procedures, policy, and guidance for translation support are not spelled out; the organizations that manage and provide translating and interpreting support are understaffed; and the Army lacks overall policy for the management of language services.

13.   These findings are not surprising given the small amount of money expended on translating and interpreting. In 1985 the Army spent less than $1,000,000 to obtain translating and interpreting support for R&D. This is a miniscule amount of money compared to expenditures on major development projects, several of which cost billions of dollars. The potential savings by obtaining significant new information from just one foreign language source could pay for the entire Army translating and interpreting budget for several year.

RECOMMENDATIONS

14.   The major recommendations derived from the study findings are listed below.   The Army shall:

- Incorporate policy and responsibilities for use of foreign technical information into its Scientific and Technical Information Program

- Reduce its reliance on intelligence organizations for exploitation of foreign technical literature; the intelligence agencies do not have the resources to meet all R&D requirements for technology

- Provide incentive for scientists and engineers attain and maintain language skills useful in their work

- Establish a Central Army Language Services Management Office, responsible to HQDA, which will assess requirements, provide resources, and disseminate information for translating and interpreting services

- Increase the number of its personnel dedicated to translating and interpreting; the current FSTC Foreign Language Research Branch and R&D Interpreting Office are both seriously understaffed

- Provide guidance to organizations that contract for translations; technical libraries have not been told how to procure, handle, and distribute translations

- Make better use of existing Government resources for registration, storage, and retrieval of foreign technical information; only one-third of the Army R&D installations have on-line access to the Defense Intelligence Open Source data base which contains references to over 5 million foreign technical articles

- Identify in-house personnel with language capabilities to screen documents before they are submitted for translation

- Establish a system for prioritizing and reporting the status of requests for translation of foreign language documents

- Establish a means to assess and control translation quality.

PRESEARCH INCORPORATED

TABLE OF CONTENTS

PRESEARCH INCORPORATED

TABLE OF CONTENTS (Cont)

TABLE OF CONTENTS (Cont)

PRESEARCH INCORPORATED

TABLE OF CONTENTS (Cont)

TABLE OF CONTENTS (Cont)

LIST OF ILLUSTRATIONS

ORGANIZATIONAL ACRONYMS

Throughout this report mention is made of Government organizations. For ease of reference, acronyms are often used in place of their full names. The acronyms for the organizations mentioned are presented below. A complete list of acronyms used in the text is contained in Appendix A:

Organization Name	Acronym
Aberdeen Proving Ground	APG
Aeroflight Dynamics Directorate	ADD
Aeromedical Research Laboratory	ARL
(Air Force Systems Command) Foreign Technology Division	FTD
Armament, Munitions and Chemical Command	AMCCOM
Armament Research & Development Center	ARDC
Armed Forces Medical Intelligence Center	AFMIC
(Army) Foreign Science and Technology Center	FSTC
Army Intelligence Agency	AIA
(Army) Intelligence and Threat Analysis Center	ITAC
Army Material Technology Laboratory	AMTL
Army Materiel Command	AMC
Army Medical Research and Development Command	AMRDC
(Army) Missile and Space Intelligence Center	MSIC
Army Missile Laboratory	AML
Army Research Institute for the Behavioral and Social Sciences	ARI
Army Research Office	ARO

Organization Name	Acronym
(Army) Training and Doctrine Command	TRADOC
Atmospheric Sciences Laboratory	ASL
Aviation Applied Technology Directorate	ATD
Aviation Engineering Flight Activity	AEFA
Aviation Propulsion Directorate	APD
Aviation R&T Activity	ARTA
Aviation Systems Command (AMC)	AVSCOM
Ballistic Research Laboratory	BRL
Belvoir R&D Center	BRDC
Benet Weapons Laboratory	BWL
Chemical Research & Development Center	CRDC
Chief of Engineers	COE
Cold Regions Research & Engineering Laboratory	CRREL
Cold Regions Test Center	CRTC
Combat Surveillance and Target Acquisition Laboratory	CSTAL
Communications Electronics Command (AMC)	CECOM
Consolidated Translation Survey	CTS
Construction Engineering Research Laboratory	CRRL
Defense Intelligence Agency	DIA
Defense Mapping Agency	DMA
Defense Technical Information Center	DTIC
Department of Defense	DOD
Department of Energy	DOE
Department of State	DOS

Organization Name	Acronym
Department of the Army	DA
Electronic Proving Ground	EPC
Electronic Warfare Laboratory	EWL
Electronics Research and Development Command	ERADCOM
Electronics Technology and Devices Laboratory	ETDL
Fire Control and Small Caliber Weapon Systems Laboratory	FCSCWSL
Foreign Broadcast Information Service	FBIS
Harry Diamond Laboratories	HDL
Headquarters, Department of the Army	HQDA
Human Engineering Laboratory	HEL
Intelligence Community Staff	IC Staff
Jefferson Proving Ground	JPG
Joint Publications Research Service	JPRS
Laboratory Command (AMC)	LABCOM
Large Caliber Weapon Systems Laboratory	LCWSL
Letterman Army Institute of Research	LAIR
Library of Congress Federal Research Division	LOC FRD
Materials & Mechanics Research Center	MMRC
Medical Bioengineering R&D Laboratory	MBRDL
Medical Research and Development Command	MED R&D CMND
Medical Research Institute of Chemical Defense	MRICD
Medical Research Institute of Infectious Diseases	MRIID
Missile Command (AMC)	MICOM

Organization Name	Acronym
Natick R&D Center	NRDC
National Aeronautics and Space Agency	NASA
National Security Agency	NSA
National Technical Information Service	NTIS
Naval Intelligence Support Center	NISC
Night-Vision and Electro-Optics Laboratory	NVEOL
Office of the Surgeon General	OTSG
Redstone Scientific Information Center (AMC)	RSIC
Signals Warfare Laboratory	SWL
Tank-Automotive Command	TACOM
Tank-Automotive Laboratory	TAL
Test and Evaluation Command (AMC)	TECOM
Troop Support Command	TROSCOM
Tropic Test Center	TTC
U.S. Air Force Systems Command Foreign Technology Division	FTD
Vulnerability Analysis Laboratory	VAL
Walter Reed Army Institute of Research	WRAIR
Waterways Experimental Station	WES
White Sands Missile Range	WSMR

I. INTRODUCTION

PURPOSE OF THE STUDY

1.1 This study provides Army officials responsible for information support of Army materiel research and development (R&D) with information needed for efficient and effective management and use of translating and interpretating resources available to the Army. These resources play an important role in making foreign science and technology accessible to Army scientists and engineers. The specific objectives of the study are:

- To identify and describe available resources and current procedures for translating and interpreting foreign language information containing scientific and technical (S&T) data of interest to Army R&D organizations

- To estimate the demand for translating and interpreting support by Army Materiel Command (AMC) R&D activities

- To identify and describe problem areas in the translating and interpreting support process

- To develop recommendations for improvement in translating and interpreting support procedures and resources for consideration by the Commanding General, AMC.

STUDY SPONSORSHIP AND ADMINISTRATION

1.2   The study was sponsored by the Office of the Deputy Chief
of Staff (ODCS) for Technology Planning and Development, Head-
quarters, AMC. The AMC officials concerned with the study are
the following:

- **Study Sponsor:** Mr. E. J. Kolb, Principal Army Tech-
  nical Information Officer, ODCS for Technology
  Planning and Development (AMCLD), Headquarters AMC
  (HQAMC), (202) 274-8671

- **Contracting Officer's Representative:** Mr. Richard V.
  Miles, ODCS for Intelligence (AMCMI), HQAMC, (202)
  274-5745

- **Contracting Officer's Technical Representative:**
  Mr. H. R. Kerl, Chief, R&D Interpreting Office, Infor-
  mation Services Division (AIAST-IM-IS4), U.S. Army
  Foreign Science and Technology Center (FSTC), (804)
  296-5171, Extension 487.

1.3   The study was performed by Presearch Incorporated of
Fairfax, Virginia under Contract No. DAAD05-84-C-0189.

ORGANIZATION OF THE STUDY REPORT

1.4   The main body of this report contains ten sections.

a.   The first three sections explain the study purpose,
      the problem, and the methodology used to collect data
      and develop recommendations.

2

b. Section IV describes the Army R&D organizations and their information support resources.

c. Section V discusses interpreting support for international conferences which the Army sponsors and/or in which it participates, including interpreting as a profession, sources of interpreting support, the magnitude of Army requirements for conference interpretation, and problem areas. It concludes with recommendations for the improvement of interpreting support to Army conferences.

d. Sections VI through VIII discuss S&T translation as a profession, translation resources and procedures in the R&D community, and the magnitude of Army R&D requirements for translation support. Section IX describes problem areas in translation support for Army R&D activities and recommends possible solutions.

e. Section X concludes the report.

1.5   The main body of the report is supplemented by seven appendices. These appendices contain a list of acronyms used in this report, the bibliography, copies of survey questionnaires sent to Army R&D organizations, a list of individuals interviewed, and information of historical interest.

DEFINITIONS

1.6   The terms _translating_ and _interpreting_ are frequently used throughout this study report. _Translating_ is the process of converting information _written_ in one language to _writing_ in

3

another language. Interpreting is the process of orally re-
stating information spoken in one language in another language.

1.7   Organizations that provide translation and interpreting
support to the Army provide several different types of services,
to include:

   a.   Demand Translating. Demand translations are initiated
         by the customer; the Army "customer" requests that a
         supporting organization translate a foreign language
         document provided by the Army.

   b.   Initiative Translations. Initiative translations are
         provided when a language services organization identi-
         fies a document for translation, translates it, and
         makes it available to those who may find the product
         useful. Translations are provided in regularly pub-
         lished documents distributed to R&D technical
         libraries and intelligence offices supporting R&D
         commands, centers, and laboratories (not all documents
         go to all libraries and intelligence offices).

   c.   Registration of Translations. A translation registry
         automated or manual citations for documents that are
         known to have been translated. These citations
         identify and describe the document, allowing an indi-
         vidual to determine whether a particular foreign
         language article or book has been translated into
         English. A registry may not retain copies of the
         actual translations.

   d.   Storage and Distribution of Translations. A transla-
         tion repository maintains actual copies of translated

4

documents. The repository makes these copies available to authorized customers.

SCOPE OF THE STUDY

1.8   Approximately six professional man-months of effort were devoted to this study.

1.9   The study focused on translating and interpreting support for AMC R&D activities; it did not directly address support for intelligence analysis, combat development, or other non-R&D purposes.

1.10   The study primarily considered U.S. Government translating and interpreting resources either controlled by or available to the Army; a detailed investigation of foreign and private sector *translation resources was not possible under the level of effort* provided by the contract.

1.11   The study considered both demand and initiative translations.

ACRONYMS AND TERMS

1.12   Acronyms used in this study are spelled out the first time they appear in the text. A list of organizational acronyms is provided at the beginning of this report, immediately before Section I. Appendix A contains a consolidated list of all acronyms used and their meanings. Terms are explained as they appear in the text.

REFERENCES

1.13 Appendix B lists and describes the principal references consulted during the study effort. References are identified in the text or in footnotes throughout the report.

II. DISCUSSION OF THE PROBLEM

STATEMENT OF THE PROBLEM

2.1   The Army does not provide adequate translation and inter-
preting support to its materiel research, development, and
acquisition (RDA) activities. The time required to obtain new
translations is very often excessive; the availability of exist-
ing translations is not always recorded; and acquisition of
existing translations is frequently difficult or impossible.
These situations frequently discourage Army scientists and
engineers from requesting, obtaining and considering foreign
technology of potential use to Army RDA. Failure to consider
foreign S&T information results in Army duplication of foreign
research and development, which increases the cost of U.S. pro-
jects and the amount of time required to field weapons and
equipment.

2.2   Army lack of adequate translating and interpreting capa-
bility also inhibits communication with allies and participation
in mutually advantageous joint development efforts and delays
the use of weapons and equipment procured from foreign countries
if the technical documentation is not in English.

FACTS BEARING ON THE PROBLEM

Increasing Volume of Foreign S&T Literature

2.3   The rate of S&T progress throughout the world is increas-
ing each year. Much of this progress is being made by countries
that do not document or discuss all their work in English. An
indication of the magnitude of the literature can be inferred

from the following figures. The five military service S&T intelligence production agencies (as of 15 March 1985) subscribed to a total of 4,304 foreign serial (regularly published) journals. Of these, 1,405 were regularly reviewed for article citations to be entered into the Defense Intelligence Central Information Reference and Control (CIRC) on-line data base operated by the U.S. Air Force Foreign Technology Division (FTD). Of the 1,405 journals reviewed, only about 250 are published in English. [1] These figures do not include the large number of books and one-time publications that are published each year. The CIRC data base currently contains citations for some 5 million open source S&T articles and books, most of which have not been translated into English. Potential requirements for translation are immense.

Limited Capability of Available Language Services Support Resources

2.4 Since most U.S. scientists and engineers involved in Army RDA have little or no capability to read foreign languages, the vast and growing repository of foreign S&T literature must be made available in English if it is to be useful. The process to achieve this includes obtaining documents and screening them for potentially useful information, preparing bibliographic data and abstracts, translating the materiel (either on an initiative or demand basis), and distributing the translations to the scientists and engineers who need them. An adjunct of the process is the maintenance of data bases in which the bibliographic information can be stored and retrieved.

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[1] Foreign Technology Division, Foreign Publication Subscription Master List, FTD-RSL-Z-356-85, 15 March 1985, and CIRC Open Literature Exploitation List, FTD-RSL-Z-355-85, 15 March 1985.

2.5   The language capabilities maintained by the Army, other
DOD elements, and other U.S. agencies are at best marginally
adequate for the task and are largely oriented toward support of
intelligence production organizations. These intelligence
organizations are invaluable middlemen for transmitting informa-
tion on foreign technology to the R&D community. However, the
Intelligence Community will not be able to meet most of the R&D
community requirements for foreign S&T information for several
reasons.

- First, some estimates suggest that there is only about
  one S&T intelligence analyst for every 200 scientists
  and engineers involved in military R&D. [2] There is
  simply too much going on in the R&D world for the In-
  telligence Community to keep up with

- Second, the focus of the Intelligence organizations,
  by necessity, is on S&T developments by potential
  adversaries. Intelligence resources available to
  assess technology in friendly and non-aligned nations
  such as Japan, Germany, France, Sweden, Israel, and
  several other technologically advanced nations have
  historically been very limited

- Third, processing of information by the Intelligence
  Community takes time. Months or even years may pass

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[2]   This ratio is derived from figures contained in two publica-
tions: (1) DCI Scientific and Technical Intelligence Com-
munity, The Processing of Overtly Collected Scientific and
Technical Intelligence Information (U), STIC 83-004, October
1983, SECRET, and (2) King Research Associates, Incorpo-
rated, The Use and Value of Defense Technical Information
Center Products and Services, June 1983.

from the time information first appears in a foreign
language publication until it is analyzed and pub-
lished by an intelligence organization

- Fourth, dissemination of information from intelligence
organizations is often restricted by security require-
ments. If open source information is used in a
classified publication, it may never reach an engineer
who could use it, either because the document is not
given wide enough distribution or because the poten-
tial user does not have the necessary clearance. 3/

2.6   The Intelligence Community's ability to provide foreign
S&T information to the military R&D Community is supplemented by
other Government and private sector translation and interpreta-
tion resources, such as technical libraries, professional
societies, and language services contractors. However, Army R&D
management at the Headquarters, Department of the Army (HQDA)
level and in the major R&D commands has not come to grips with
the management of language services support for the Army
materiel research, development, and acquisition process. The
issue has been left largely to the Intelligence Community,
which, because of the size of the job and other priorities,
cannot meet RDA requirements. To a large extent, individual
Army RDA organizations are left on their own to exploit foreign
technology as best they can.

3/   A 1983 survey of the use of intelligence information by Army
R&D work units and project managers documented this occur-
rence. See Presearch Incorporated, Analysis of the Use of
Foreign Intelligence by Research and Development Activities
of the U.S. Army Materiel Development and Readiness Command,
Technical Report No. 613, Arlington, VA, August 1983.

The Army Scientific and Technical Information Program

2.7   The efficiency and effectiveness of the Army materiel R&D process are highly dependent on the quality and completeness of the scientific and technical (S&T) information available to and used by Army scientists and engineers (S&Es). The management and provision of such information is of direct concern to the Army S&T Information Program (STIP) described in Army Regulation (AR) 70-45 dated 1 January 1984, which implements Department of Defense (DOD) Directive 3200.12, DOD Scientific and Technical Information Program (included as Appendix A to AR 70-45).

2.8   One of the two primary objectives of the STIP is "Adaptation and evaluation of better ways of communicating and transferring technical information." This objective includes the increased effectiveness of (inter alia)..." (3) Information processing and accessing (from direct and remote sources)" and "(4) Publications, symposia, conferences, and meetings; documentation and communication of results of these entities will include proceedings, papers, reports, and monographs." [4] Yet, in spite of the importance of interpreting and translating to the process of international communication, neither is mentioned in AR 70-45. DOD Dir 3200.12 does charge the Under Secretary of Defense for Research and Engineering to coordinate with "the Defense Intelligence Agency (DIA) and other federal intelligence activities to effect transmittal of relevant information and translations derived from technical intelligence activities to the DTIC (Defense Technical Information Center) and appropriate IACs (Information Analysis Centers), in accordance with current

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[4]   AR 70-45, Scientific and Technical Information Program, p. 1.

11

dissemination and release procedures." [5/] DOD Dir 3200.12 makes no mention at all of interpreting. It is not surprising that without DOD or Army-level policy for language services in support of STIP objectives, that management and allocation of resources to these services are not emphasized in the RDA Community.

EFFECTS OF THE PROBLEM

On Army R&D

2.9   Inadequate transfer of foreign technology to Army R&D activities has several negative effects, which are often unquantifiable because the potential benefit of the foreign technology is never recognized. The major potential problem is duplication of effort. There is no need for Army R&D personnel to reinvent *something that has already been developed elsewhere.* Duplication of effort is costly and time-consuming and delays delivery of new weapons and equipment to the Army's tactical and strategic forces. Inadequate information exchange on foreign technology also limits the scope of U.S. research based on foreign initiatives. Although foreign initiatives may not be adopted, they may still provide useful background information and intellectual stimulation. Knowledge of foreign S&T initiatives also enhances the credibility of U.S. scientists in the international arena and avoids the "it's no good if not invented here" syndrome.

[5/]   DOD Directive 3200.12, Enclosure 2, Section C, paragraph 1m.

On Acquisition

2.10 The Army Materiel Command is striving to reduce the cost of materiel acquisition and the time required to get equipment to the forces in the field by buying off-the-shelf materiel. These items are being procured from other nations as well as from the domestic market. Examples include the Roland missile system, largely developed by Germany and France, and the German 120mm tank gun. An item currently under consideration is the German CL289 reconnaissance drone. Other procurements have involved Spain, France, and Israel, and other nations.

2.11 The acquisition of these systems involves international negotiations, as described in paragraphs 2.11 through 2.14, and the procurement of the technical documentation for the systems. Far too often, the U.S. Army failed to foresee that this documentation would be delivered in a language other than English, and its capability to translate these technical documents has been very limited. For example, the Roland missile system was delivered with French and German documentation that required months to translate, leaving many U.S. engineers largely idle. [6] A 1985 example is that a U.S. Army arsenal acquired caseless ammunition data, 12 linear feet of untranslated German-language documents in spite of the fact that the R&D interpeting office advised that the data should be requested in English.

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[6] Interview, Mr. Theodore Woerner, Translation Branch, Redstone Scientific Information Center, 5 December 1984.

[7] Interview, Mr. Lester Bennefeld, Chief, Foreign Language Research Branch, U.S. Army Foreign Science and Technology Center, 6 August 1985.

On Negotiations With Allies

2.12 Several of the U.S. Army's major materiel development and acquisition initiatives, such as the Multiple-Launch Rocket System (MLRS), are being conducted in cooperation with European allies, most notably Germany and France. Such projects require close and effective coordination with the foreign countries involved. Typically, numerous conferences, working groups, and staff meetings are held.

2.13 Fortunately, Germany and France emphasize the teaching of English in their schools, much more so than the U.S. emphasizes instruction in German and French. For this reason, many of their representatives to conferences speak some English. But in spite of reasonable knowledge of conversational English, the ability of many foreign individuals to understand spoken English in a technical conference environment is often limited. Unfortunately, this limitation is not always recognized by Americans.

2.14 As pointed out in Section V of this report, the Army has very limited inhouse capability to support such international conferences. The Army has one German/English interpreter and two French/English interpreters. These Army interpreters are supplemented by State Department in-house or contract interpreters. The potential demand for interpretation at conferences, however, far exceeds available resources. The State Department Director of Language Services, who has frequent contact with the Army R&D Interpreting Office, estimates that the Army could use 10 interpreters and still not satisfy all its requirements. He also stated that Government-wide requirements for State Department interpreter support are increasing

rapidly and noted that it would be helpful if the Army could provide more of its own interpreting support. [8/]

Summary

2.15 The effects of inadequate support are difficult to measure, but are nonetheless real. Effective communication at international conferences is a must. Without it, the risk of misunderstanding with resultant delays, cost, and hard feelings, increases dramatically.

2.16 These examples suggest the cost and delay that inadequate planning for and use of language services is causing the Army. The remainder of this study report elaborates on Army organization for translation and interpretation support for R&D, identifies problem areas in more detail, and develops recommendations for actions the Army can take to reduce the extent of the problem.

[8/] Interviews, Mr. Harry Obst, Director, Office of Language Services, U.S. Department of State, 12 and 28 August 1985.

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III. STUDY METHODOLOGY AND EXECUTION

APPROACH

3.1   The objectives of the study were to:

a.   Estimate the demand for translating and interpreting support generated by AMC R&D activities

b.   Identify and describe current resources and procedures for translating and interpreting support to the Army R&D Community

c.   Identify and describe problem areas in translating and interpreting service resources and procedures

d.   Report findings and develop recommendations for improvements in language support to Army R&D for consideration by Headquarters, AMC and other concerned Army managers.

3.2   To attain these objectives, three basic tasks had to be completed: data collection, data analysis, and report preparation. The scope of each of these tasks was determined by the availability of contract resources.

3.3   Data collection was the basic task most constrained by the available time and money for the study. The Army R&D Community includes some 35 laboratories and R&D centers and 60 to 70 project/product management offices located throughout the United

States. 9/ It was not feasible to collect data by visiting
these organizations to conduct interviews and obtain statistics.
Therefore, it was decided to collect data on the demand for and
use of translating and interpreting services by surveying the
supporting organizations that provide these services. There are
three types of such supporting organizations: technical
libraries, foreign intelligence offices (FIOs), 10/ and language
services organizations.

a. There are approximately 40 technical libraries that
    support Army R&D organizations. These libraries are
    assigned at various levels in the R&D organizational
    hierarchy; some are at command level, some are at R&D
    Center level, and many are organic to the individual
    laboratories. Many of these libraries obtain new
    translations for their patrons by contracting the work
    out; most maintain foreign S&T literature in their
    holdings, usually both in foreign languages and in
    English translations. One technical library, the
    Redstone Scientific Information Center (RSIC), has its
    own 6-member translation staff.

b. The FIOs are also found at command, center, and labo-
    ratory level. There are over 20 supporting the R&D

9/ Section IV provides more information about the Army R&D
    Community.

10/ At the time the study began many of the AMC commands and
    laboratories had FIOs that acted as points of contact for
    the R&D agencies with the intelligence agencies. These
    offices are now reorganized as intelligence and security
    offices; however, standard names for them have not been
    established to date. For convenience, these offices are
    referred to as FIOs in this report.

activities of the Army Materiel Command. Among many other duties, the FIOs accept requests for new translations and forward these request to the FSTC for translation by the FSTC Foreign Language Research Branch. Many FIOs also have on-line access to the foreign open source S&T literature data base maintained by the Foreign Technology Division (FTD) of the Air Force Systems Command and can search this data base on behalf of their customers. Some FIOs review and disseminate to their customers the translations produced by various Government agencies on an initiative basis.

c. The language services organizations are those agencies that actually prepare translations or provide interpreters for the Army R&D Community. The Army's inhouse assets are the FSTC Foreign Language Research Branch and the RSIC Translation Branch. There are a variety of other Government organizations that provide language services to the Army R&D Community. Principal examples are the Department of State (DOS) Language Services Office, the Joint Publications Research Service (JPRS), the National Security Agency (NSA), the Air Force FTD, and the Naval Intelligence Support Center (NSIC). Such organizations usually rely on contractors to do much of their work.

3.4 Because of the large number of technical libraries and FIOs supporting the Army R&D Community, it was necessary to use questionnaires to survey them. Different questionnaires were used for the technical libraries and the FIOs since their

missions and functions are different. In many cases, the questionnaires were followed up with telephone calls to elicit additional information. Appendix C contains the questionnaire sent to the technical libraries; Appendix D includes the questionnaire sent to the FIOs.

3.5   The language services organizations were almost all visited at least once to interview their officials and to obtain statistics on the demand for their services from Army R&D organizations and to investigate the extent to which they produce translations of foreign language S&T literature on an initiative basis. Several organizations not visited were contacted by telephone. Appendix E contains a list of the agencies visited and individuals interviewed.

STUDY TASKS

3.6   The three basic tasks--data collection, data analysis, and documentation--were split out into a total of eight study tasks, which are listed below. Once the detailed planning was done and the study plan published, the research and analysis tasks were carried out concurrently. [11]/

- Task 1, Detailed Task Planning and Scheduling

- Task 2, Conduct Initial Research at Army Staff, AMC, and FSTC

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[11]/ A more detailed description of the study methodology is contained in the study plan published by Presearch Incorporated on 17 June 1985.

- Task 3, Study FIO Role and Participation in Translation Support

- Task 4, Investigate R&D Laboratories and Project Manager Requirements and Resources for Translation

- Task 5, Identify and Investigate Government Translation and Interpretation Resources Available to the Army Materiel Command

- Task 6, Identify and Assess Selected Private Sector Translation and Interpretation Resources

- Task 7, Prepare Draft Report and Coordinate for Comments

- Task 8, Prepare Final Study Report.

STUDY EXECUTION

3.7   The study was conducted essentially as planned. The questionnaire surveys of the technical libraries and the FIOs were administered during August, September, and October 1985. Follow-up telephone calls were required in some cases to ensure that the questionnaires were completed and returned. The overall cooperation and timeliness of response of libraries and FIOs were excellent. The visits to the various language services organizations were conducted throughout most of 1985. All the officials contacted were interested in the study, most cooperative, and very informative. The high level of interest in the study indicates a strong awareness of the difficulties in providing language services support to Army R&D and other Government organizations and a general desire to do whatever is

possible to improve the situation. Table 3.1 lists the technical libraries, FIOs, and language services organizations contacted during the study. In some cases, the names may have been altered by the AMC reorganization effective 1 October 1985. The names used in the lists reflect the latest versions to the extent known as of the date this report was prepared. The organization of the R&D activities, the libraries, and FIOs is described in Section IV.

3.8   The Army R&D technical libraries returned a total of 35 questionnaires. The AMC FIOs returned 22 questionnaires. The data from the questionnaires were tabulated manually. Interviews centered on identifying the mission and function of the organization being investigated, the extent to which Army R&D agencies use the organization, procedures for obtaining its support, and the views of its representatives about strengths and weaknesses of the language services as they relate to Army R&D. The data were then analyzed and this study report was prepared.

TABLE 3.1

ORGANIZATIONS CONTACTED DURING THE STUDY RESEARCH

Technical Libraries Surveyed	FIOs Surveyed	Language Services Organizations Interviewed
Army Armament R&D Center[1/]	Army Armament R&D Center[1/]	Document Analysis Branch; Library Services Branch;
Benet Weapons Laboratory[2/]	Benet Weapons Laboratory[2/]	Army R&D Interpreting Office; Army Foreign Science and
Army Chemical R&D Center	Army Chemical R&D Center	Technology Center
HQ, U.S. Army Aviation Systems Command	HQ, U.S. Army Aviation Systems Command	Army R&D Interpreting Office
Aviation Research and Technology Activity	Aviation Research and Technology Activity	Translation Branch, Redstone Scientific Information Center
Aviation Applied Technology Directorate 3/	Army Aviation Engineering Flight Activity	Information Services and Technical Translation Divisions, U.S. Air Force Foreign Technology Division
Aviation Propulsion Directorate 3/	HQ, U.S. Army Communications-Electronics Command	Translation Division, Naval Intelligence Support Center
Aerostructures Directorate 3/, 4/	HQ, U.S. Army Laboratory Command	Joint Publications Research Service 9/
HQ, U.S. Army Communications-Electronics Command	Army Materials Technology Laboratory	Consolidated Translation Survey[9/]
U.S. Army Electronics R&D Command Technical Support Activity 5/	Ballistic Research Laboratory	Foreign Broadcast Information Service
U.S. Army Research Office	Human Engineering Laboratory Liaison Office 6/	Office of Language Services, Department of State
Army Materials Technology Laboratory	Signals Warfare Laboratory	Translation Section, Technical Library, Defense Mapping Agency Aerospace Center
Ballistic Research Laboratory	HQ, U.S. Army Missile Command	National Security Agency
Human Engineering Laboratory	HQ, U.S. Army Tank-Automotive Command	Armed Forces Medical Intelligence Center
Harry Diamond Laboratories/ Headquarters, Laboratory Command	Belvoir R&D Center[7/]	National Technical Information Center
Signals Warfare Laboratory	Natick R&D Center	Defense Technical Information Center
Army Missile Laboratory (Redstone Scientific Information Center)	HQ, U.S. Army Test and Evaluation Command 8/	Office of the Assistant Chief of Staff for Intelligence, HQ,
HQ, U.S. Army Tank-Automotive Command	Electronic Proving Ground 4/	Department of the Army 9/
	Dugway Proving Ground	Enlisted Language Branch, U.S. Army Military Personnel Center

TABLE 3.1 (Cont)

Technical Libraries Surveyed	FIOs Surveyed	Language Services Organizations Interviewed
Belvoir R&D Center[7/]	White Sands Missile Range	Overt Information Processing Action Group, U.S. Intelligence Community
Natick R&D Center	Yuma Proving Ground	Staff
Dugway Proving Ground	Army Materiel Systems Analysis Agency	The American Association of Language Specialists
Jefferson Proving Ground	Office of Missile Elec-	The National Translation Center
Tropic Test Center .	tronic Warfare	(University of Chicago)
White Sands Missile Range		
HQ, U.S. Army Medical R&D Command		
Aeromedical Research Laboratory		
Lettermen Army Institute of Research		
Medical Bioengineering Laboratory		
Army Medical Research Insti- tute of Chemical Defense		
Army Medical Research Insti- tute of Infectious Diseases		
Walter Reed Army Institute of Research		
Army Construction Engineering Research Laboratory		
Army Engineering Topographic Laboratories		
Waterways Experiment Station		
U.S. Army Research Institute for the Behavioral and Social Sciences		

1/ Includes the Large Caliber Weapon Systems Laboratory and the Fire Control and Small Caliber
Weapon Systems Laboratory.

2/ Subordinate to the Large Caliber Weapons Systems Laboratory.

3/ Subordinate to the Aviation Research and Technology Activity.

4/ Did not respond to survey.

5/ When AMC reorganized, this activity became part of the Communications-Electronics Command.
Previously, it had been part of the Electronics R&D Command.

6/ Performs FIO function for the Human Engineering Laboratory.

7/ This FIO also supports the Night Vision and Electro-Optics Laboratory.

8/ This FIO also serves as a library for certain technical documents required by HQ, Test and
Evaluation Command.

9/ This organization is subordinate to the Foreign Broadcast Information Service.

IV. ARMY R&D ACTIVITIES AND THEIR INFORMATION
SUPPORT ORGANIZATIONS

INTRODUCTION

4.1   This section briefly describes the organization of the
Army R&D Community, its information requirements, and its infor-
mation and intelligence support activities. This information
provides a frame of reference for the remaining sections in this
report, which deal specifically with interpreting and translat-
ing support for the Army R&D Community.

ORGANIZATION

4.2   HQDA provides Army-level staff supervision and guidance
for the organization and operation of the Army R&D organiza-
tions. Primary functions of the Army Staff in regard to R&D
include the establishment of priorities for development projects
and the allocation of fiscal and personnel resources to support
those projects. The overall priorities are established by the
Office of the Deputy Chief of Staff for Operations and Plans
(ODCSOPS) in coordination with the other Army Staff agencies and
subject to the approval of the Army Chief of Staff. The other
Army Staff Agencies that are very much concerned with Army R&D
include the Office of the Deputy Chief of Staff for Research,
Development, and Acquisition (ODCSRDA), the Office of the Deputy
Chief of Staff for Personnel (ODCSPER), the Chief of Engineers
(COE), and the Office of the Surgeon General (OTSG).

4.3   ODCSRDA provides staff guidance for R&D matters to the
Army Materiel Command, which is an organization of almost
120,000 military and civilian personnel spread in some 95 loca-
tions throughout the U.S. and overseas locations, and which is

25

responsible for almost half of the annual budget for the entire Army. AMC includes eight subordinate commands that have significant R&D responsibilities. Some 20 R&D centers, activities, and laboratories are assigned to these commands. At any one time, AMC also has in progress some 65 to 75 development projects that are being carried out under the direction of project managers (PMs). A few of the most important high budget project managers report directly to HQAMC; most of the PMs report to the commanding generals of the AMC subordinate commands. Also reporting directly to HQAMC is the Army Materiel Systems Analysis Agency (AMSAA), which conducts studies and analyses in support of all AMC R&D activities.

4.4   ODCSPER provides staff guidance to the Army Research Institute for the Behavioral and Social Sciences (ARI). This institute studies all aspects of human factors affecting the Army's capability to carry out its mission, and is categorized as a member of the Army R&D Community.

4.5   The OCOE supervises four R&D laboratories whose work directly supports the mission of the OCOE. There is no intermediate headquarters between these laboratories and the OCOE.

4.6   The Surgeon General's Office provides Army Staff guidance to the U.S. Army Medical Research and Development Command (AMRDC). AMRDC includes nine laboratories and institutes that perform R&D work related to medicine and dentistry.

4.7   Figure 4.1 shows the organization of the Army R&D Community as of 1 October 1985, which was the day the latest reorganization of AMC became effective. Project management offices are not shown in the figure. The principal organizations affected by the reorganization are the Laboratory

SECRETARY OF THE ARMY

- **CHIEF OF STAFF**
- **ASST. SEC. FOR RD&A**

Under CHIEF OF STAFF:
- **DCS RDA**
  - **HQ. ARMY MATERIEL COMMAND**
    - **AMMCOM**
      - Chemical R&D Center
      - Armament R&D Center
        - Fire Control and Small Caliber Weapon Systems Lab.
        - Large Caliber Weapon Systems Lab. (Includes Benet Weapons Lab.)
- **DCS PERSONNEL**
  - Army Research Institute for the Behavioral and Social Sciences
- **SURGEON GENERAL**
  - **HQ. MEDICAL R&D COMMAND**
    - Aeromedical Research Lab.
    - Institute of Dental Research
    - Institute of Surgical Research
    - Letterman Army Institute of Research
    - Medical Bioengineering R&D Lab.
    - Medical Research Institute of Chemical Defense
    - Medical Research Institute of Environmental Medicine
    - Medical Research Institute of Infectious Diseases
    - Walter Reed Army Institute of Research
- **CHIEF OF ENGINEERS**
  - Cold Regions Research Engineering Lab.
  - Construction Engineering Research Lab.
  - Engineer Topographic Laboratories
  - Waterways Experiment Station

AVSCOM
- Avionics R&D Activity
- Aviation Engineering Flight Activity
- Aviation Research and Technology Labs.
  - Aeromechanics Act.
  - Applied Technology Act.
  - Propulsion Act.
  - Structures Act.

CECOM
- CECOM R&D Center
- Combat Surveillance and Target Acquisition Lab.
- Electronic Warfare Lab.
- Night-Vision and Electro-Optics Lab.
- Signals Warfare Lab.

LABCOM
- Materials & Mechanics Research Center
- Ballistic Research Lab.
- Human Engineering Lab.
- Harry Diamond Labs.
- Electronics Technology and Devices Lab.
- Atmospheric Sciences Lab.
- Vulnerability Analysis Lab.
- Army Research Office

MICOM
- Army Missile Lab.

TACOM
- Tank Automotive Lab.

TROSCOM
- Belvoir R&D Center
- Natick R&D Center

FIGURE 4.1

Army R&D Community Organization (Less Project Managers)

Command (LABCOM) and the Communications-Electronics Command (CECOM). LABCOM replaced the old Electronics R&D Command and assumed supervision of four laboratories that had previously reported directly to HQAMC and several of the other laboratories that had previously been under the Electronics R&D Command. Four of the laboratories previously under the Electronics R&D Command were transferred to CECOM. The AMC reorganization also resulted in some name changes for individual R&D activities, most noticeably in the Aviation Systems Command (AVSCOM). Those organizations affected by the AMC reorganization are indicated in italics in the figure.

4.8   The surveys of the R&D technical libraries and the FIOs covered the translation and interpreting requirements of all the R&D centers, laboratories, and institutes shown in Figure 4.1 with the exception of those not supported by their own R&D libraries or FIOs: the Institutes of Surgical and Dental Research, the Aviation Development and Test Activity, and the Cold Regions Test Center. Review of records maintained by the FSTC Foreign Language Research Branch, the Army R&D Interpreting Office, and the DOS Office of Language Services indicated that none of these organizations submitted a request for translation or interpreting during calendar year 1984. Although they may possibly acquire translations through local contracts, it appears probable that their requirements are not large enough to affect the overall Army R&D demand for language services significantly.

4.9   All R&D activities need access to a wide range of S&T information to support their activities. Individually, each laboratory requires information relevant to the particular programs and functions supported by the laboratory's principal

mission. The primary programs and S&T areas of interest dic-
tating the specific information requirements of many of the
laboratories included in the study are summarized in Table 4.1.

4.10 As suggested by the table, the information needs of the
Army's R&D activities are quite extensive. To support these
needs, the laboratories rely on a variety of information re-
sources, such as automated on-line data bases, proceedings from
technical conferences and symposia, technical reports, and S&T
books and journals.

4.11 The table also infers the complexity of providing trans-
lation and interpreting support to the Army R&D Community. The
interests of the R&D world encompass many complex technologies,
most of which have their own technical vocabulary. In many in-
stances, finding a language-qualified person who is also knowl-
edgeable of the technical vocabularies used in foreign language
literature or speech can be very difficult. Many translations
are done by persons of normally adequate fluency who are not
technically qualified.

INFORMATION SUPPORT ORGANIZATIONS

4.12 There are two types of information support organizations
in the Army R&D Community that have the primary mission of pro-
viding S&T information to the scientists and engineers. The
first type of organization, the technical library, is found
throughout the community. Technical libraries may be found at
R&D command, center, laboratory, or activity level. Many
libraries support more than one laboratory and several support
one or more PMs. The other type of organization, the FIO, is
found throughout AMC and at three AMRDC institutes. The

TABLE 4.1

AREAS OF SPECIALIZATION OF SELECTED R&D LABORATORIES INCLUDED

Laboratory	S&T Area of Specialization
Army Research Office	Chemical-biological, physics, engineering, mathematics, geosciences, metallurgy-materials, electronics
Ballistic Research Lab	Ballistic, charged particle beam, and liquid propulsion technologies
Human Engineering Lab	Human factors engineering including automation, artificial intelligence, and robotics
Materials and Mechanics Research Center	Materials, solid mechanics, & materials testing technology
Chemical Research and Development Center	Neuro-biochemical research; life-cycle engineering for chemical weapons and chemical biological defense; smoke/obscurant technology
Fire Control and Small Caliber Weapons Systems Lab	Fire control and weapons systems technology, ammunition and auxiliary items through 40 mm. caliber
Large Caliber Weapons System Lab	Weapons systems, guns, ammunition larger than 40 mm for tanks, artillery, mortar, and recoilless guns
Applied Technology Lab	Aircraft weaponization and mission support technology
Aviation Engineering Flight Activity	Airworthiness and aircraft performance testing
Aviation R&T Labs	Aeronautical research
Communications-Electronics Command R&D Center	Tactical command, control and communication, military computer equipment and systems and computer software
Atmospheric Sciences Lab	Atmospheric sciences including atmospheric sensing/effects and meteorological technology
Combat Surveillance and Target Acquisition Lab	Radiological systems and radar technology
Electronics Technology and Devices Lab	Electronics technology
Electronics Warfare Lab	Electronic counter-countermeasures technology
Harry Diamond Labs	Electronic fuzes, nuclear weapons effects, and radar technology

TABLE 4.1 (Cont)

Laboratory	S&T Area of Specialization
Night-Vision and Electro-Optics Lab	Electro-optics, lasers, visionics, and infrared technology
Army Missile Lab	Missile technology
Tank-Automotive Lab	Tank-automotive weapons and equipment systems technology
Belvoir R&D Center	Mobility/counter-mobility research and engineering
Natick R&D Center	Aero-mechanical engineering, tool engineering, individual protection, and science and advanced technology
Cold Regions Research and Engineering Lab	Winter and arctic cold conditions research and engineering
Research Institute for the Behaviorial and Social Sciences	Manpower, personnel, training and system research
Aeromedical Research Lab	Life sciences research on effects of aviation, combat vehicles, and combat weapons systems
Letterman Army Institute of Research	Medical research in physiology and other clinical areas
Medical Bioengineering R&D Lab	Medical research on dental materiel, pest management materiel, delivery systems for insecticide, and soldier occupational hazards
Medical Research Institute of Chemical Defense	Basic and medical research on chemical warfare agents, antidote drugs, and pretreatment
Medical Research Institute of Infectious Diseases	Medical research on pathogenesis, diagnosis, prophylaxis, treatment and epidemiology of naturally occuring infectious diseases
Walter Reed Army Institute of Research	Medical research in drug development, neuropsy, general and preventive medicine

1/ Information on the individual laboratories S&T areas of specialization was taken from Headquarters, U.S. Army Materiel Development and Readiness Command, Department of Defense In-House RDT&E Activities: Management Analysis Report, Alexandria, VA, 30 October 1983.

FIOs are to be found at command, center, laboratory, or activity level and may support several laboratories and PMs.

Technical Libraries

4.13 The primary functions of the technical library are to acquire, store, and disseminate S&T information used and produced by the R&D organization(s) it supports. Libraries maintain conventional repositories of paper and microfiche documents; most have remote computer terminals that allow them to access one or more of several on-line government and commercial information systems. These on-line systems allow the library staff to search large bibliographic data bases on behalf of their patrons and order needed documents. Another important resource for the technical libraries is the inter-library loan system, which allows any one library to tap into the resources of literally hundreds of libraries in the U.S. and foreign countries.

4.14 One of the automated information systems of particular importance to the technical libraries is the Defense R&D On-Line System (DROLS), which permits the libraries to search several data bases maintained by the Defense Technical Information Center (DTIC). One of these DTIC data bases, the Technical Reports (TR) Data Base, is of particular interest as a source of translations. The TR Data Base contains well over 50,000 references to translations of foreign S&T literature. Using DROLS to access the TR Data Base, librarians can locate and retrieve bibliographies and abstracts for relevant documents. The full text of these documents can then be ordered in paper or microfiche copies from DTIC. The DTIC is an extremely important resource for translations of foreign technical literature. It is a place where libraries can go to determine whether there is

an existing translation of a document and readily obtain the full text of the document.

4.15 Many of the R&D technical libraries accept requests from their patrons to have foreign language articles and books trans-lated. These libraries then arrange to have a commercial trans-lation company prepare the required translation. The systems for obtaining contract translations varies somewhat from library to library. Some contract for each translation individually; some arrange to have a blanket purchase order set up to be used as necessary. At some locations, the organization or project that requested the translation must pay for it; at others the translation is paid for out of the library budget.

Foreign Intelligence Offices

4.16 The FIOs provide an intelligence information support for the Army R&D organizations that compliments the services pro-vided by the technical libraries. The FIOs identify the intel-ligence requirements of the projects and work units they support, obtain the products of intelligence agencies that meet these requirements, and disseminate the required information to the requestors. In cases where the needed intelligence has not been produced, the FIOs can create intelligence production re-quirements for the intelligence production agencies. Some FIOs also maintain limited intelligence libraries. Most operate remote terminals for the DoD Intelligence Information Support System Central Information Reference and Control (CIRC) On-Line System maintained by the Air Force FTD at Wright-Patterson Air Force Base. The CIRC system contains references to over five million foreign articles and books, as well as a translation registry and the full text of many intelligence reports.

4.17 Those FIOs with access to CIRC are able to search CIRC for references to foreign literature on behalf of their customers. The customers can then review the bibliographies obtained from CIRC and select specific entries for which they would like to order the entire document. If the document is not locally available, the FIO may ask FSTC to check for a translation. If there is an existing translation, the FSTC library will obtain a copy and send it to the requesting FIO. If an existing translation cannot be found, the FIO may request the FSTC Foreign Language Research Branch to have a translation prepared. On many occasions the FIO will send a foreign language document directly to FSTC for translation. Until recently, in most cases, FSTC prepared translations at no cost to the requesting R&D organization.

4.18 More information on the functions and procedures of the FIOs is contained in the FIO Handbook. 12/ Although the FIO Handbook does not describe procedures for the FIOs in the security area, a mission acquired since the AMC reorganization--it does go into detail in Section VI on the procedures for obtaining information and translation support from FSTC.

Language Support Capabilities of Libraries and FIOs

4.19 Questionnaires were sent to 36 R&D technical libraries and 23 R&D FIOs located at 33 different installations. These libraries and FIOs provide information support to 8 R&D commands (not including HQAMC), 38 R&D centers and laboratories, the Army Test and Evaluation Command (TECOM), the 8 TECOM proving grounds

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12/ HQ, USADARCOM, Foreign Intelligence Office Handbook, 29 January 1982 (Revised 1983), UNCLASSIFIED.

and test centers, and approximately 45 PMs assigned to the 7 AMC R&D commands. [13/] The libraries and FIOs surveyed are listed in Table 4.2. The table also shows their locations, whether or not they process requests for translations of foreign language documents, and whether or not they have CIRC and DROLS remote terminals.

Translation Processing

4.20 Of the 34 technical libraries that responded to the survey, [14/] 23 process requests for contract translations. Of the 21 AMC libraries, 12 process requests for translation. Of these 12 AMC libraries that contract for translations, 10 are collocated with FIOs that can also obtain translations. The major reason that these libraries contract for translations even though the FIOs could request translations from FSTC at no cost is that the FIOs cannot obtain translations from FSTC in time to meet the R&D requirements. Of the 13 non-AMC libraries, 11 contract for translations. None of these non-AMC libraries are collocated with FIOs that process requests for translations. One library, the CRREL, reported that, in the past, it had tried to use FSTC for translations but was told by the Office of the Assistant Chief of Staff (OACSI), HQDA, that it would have to

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[13/] The number of PMs changes occasionally as new projects are begun and old ones move into the operational portion of their life cycle.

[14/] Two AMC libraries, White Sands Missile Range and the Aeroflight Dynamics Directorate, did not return questionnaires. Also, in Table 4.2 the two HQCECOM libraries to which questionnaires were sent are counted as one library. Although both returned questionnaires, only one of them provides technical information support to the R&D activities located at Fort Monmouth.

TABLE 4.2
ARMY R&D LIBRARIES AND FIOS AND THEIR RESOURCES
FOR TRANSLATION SUPPORT

Army R&D Technical Libraries and FIOs	Location	Process Requests for Translation? (Yes/No)	Library Has DROLS Terminal? (Yes/No)	FIO CIRC Terminal	R&D Activities Supported
Army Materiel Command					
AMCCOM:					
ARDC Library	Dover, NJ	Yes	Yes	-	LCWSL, FC & SCWSL, PMs
ARDC FIO	Dover, NJ	Yes	--	Dial-up	LCWSL, FC & SCWSL, PMs
Benet WL Library	Watervliet, NY	Yes	Yes	-	BWL
Benet WL FIO	Watervliet, NY	Yes	--	None	BWL
CRDC Library	Edgewood, MD	Yes	Yes	-	CRDC, PM
CRDC FIO	Edgewood, MD	Yes	--	Dial-up[1]	CRDC, PM
AVSCOM:					
HQAVSCOM Library	St. Louis, MO	No	Yes	--	HQAVSCOM, PMs
HQAVSCOM FIO	St. Louis, MO	Yes	--	Dial-up	HQAVSCOM, PMs
ARTA Library	Moffett Field, CA	No	Yes	-	All ARTA Directorates
ARTA FIO	Moffett Field, CA	Yes	--	None	All ARTA Directorates
ATD Library	Ft. Eustis, VA	No	Yes	-	ATD
ADD Library	Langley Field, VA	No response	Yes	-	ADD
APD Library	Cleveland, OH	Yes	Yes	-	APD
AEFA FIO	Edwards AFB, CA	No	--	None	AEFA
CECOM:					
HQCECOM Library[2]	Ft. Monmouth, NJ	No	Yes	--	HQCECOM, CECOM R&D Center, CSTAL, DWL, ETDA, PMs
HQCECOM FIO	Ft. Monmouth NJ	Yes	--	On-line, Secure	HQCECOM, CECOM R&D Center, CSTAL, EWL, ETDA, PMs
SWL Library	Warrenton, VA	No	Yes	--	SWL
SWL FIO	Warrenton, VA	No	-	None	SWL
LABCOM:					
HQLABCOM Library	Adelphi, MD	Yes	Yes	--	HQLABCOM, HDL
HQLABCOM FIO	Adelphi, MD	Yes	-	On-line, Secure	HQLABCOM, HDL
AMTL Library	Watertown, MA	Yes	Yes	--	AMTL
AMTL FIO	Watertown, MA	Yes	--	None	AMTL
BRL Library	Aberdeen PG, MD	No	Yes	-	BRL, AMSAA, PMs
BRL FIO	Aberdeen PG, MD	Yes	--	On-line, Secure	BRL
HEL Library	Aberdeen PG, MD	Yes	Yes	-	HEL
HEL FIO	Charlottesville, VA	Yes	--	On-line, Secure	HEL
VAL FIO	White Sands, NM	Yes	-	On-line, Secure	OMEW, ASL
ARO Library	Research Triangle Park, NC	No	Yes	None	ARO
MICOM:					13 PMs
HQMICOM FIO	Redstone Arsenal, AL	Yes	--	On-line, Secure	HQMICOM, AML, PMs
RSIC (AML Library)	Redstone Arsenal, AL	Yes	Yes	--	HQMICOM, AML, PMs
MSIC Library 3/	Redstone Arsenal, AL	Yes	Yes	On-line, Secure	HQMICOM, AML, PMs
TACOM:					
HQTACOM Library	Warren, MI	No	Yes	-	HQTACOM, TAL, PMs
HQTACOM FIO	Warren, MI	Yes	--	On-line, Secure	HQTACOM, TAL, PMs
TROSCOM					
BRDC Library	Ft. Belvoir, VA	Yes	Yes	--	BRDC, NVEOL
BRDC FIO	Ft. Belvoir, VA	Yes	--	Dial-up	BRDC, NVEOL
NRDC Library	Natick, MA	Yes	Yes	--	NRDC
NRDC FIO	Natick, MA	Yes	--	None	NRDC
TECOM:					
HQTECOM FIO[4]	Aberdeen PG, MD	Yes	Yes	On-line, Secure	HQTECOM, APG, CRTC
Dugway PG Library	Dugway, UT	Yes	Yes	-	DPG
Dugway PG FIO	Cugway, UT	Yes	--	Dial-up	DPG
Electronics PG FIO	Ft. Huachuca, AZ	No response	Yes 5/	(NR)	EPG

TABLE 4.2 (Cont)

Army R&D Technical Libraries and FIOs	Location	Process Requests for Translation? (Yes/No)	Library Has DROLS Terminal? (Yes/No)	FIO CIRC Terminal	R&D Activities Supported
Jefferson PG Library	Madison, IN	No	No	-	JPG
Tropic Test Center Library	Fort Clayton, Panama	Yes	Yes	--	TTC
WSMR Library	White Sands, NM	No response	Yes	-	WSMR, ASL
WSMR FIO	White Sands, NM	No	-	On-line, Secure	WSMR
Yuma PG FIO	Yuma, AZ	No	--	None	YPG
AMSAA:					
AMSAA FIO	Aberdeen PG, MD	Yes	Yes[6]	None[7]	AMSAA
ODCSPER					
ARI Library	Alexandria, VA	No	Yes	Yes	ARI
AMRDC					
HQ AMRDC Tech Inf Off	Ft. Detrick, MD	Yes	Yes[8]	--	HQ AMRDC, MBRDL, MRIID
AMRL Library	Ft. Rucker, AL	Yes	Yes	--	AMRL
LAIR Library	San Francisco, CA	Yes	Yes	--	LAIR
LAIR FIO 9/	San Francisco, CA	No	--	None	LAIR
MBRDL Library	Ft. Detrick, MD	Yes	No 10/	--	MBRDL
MRICD Library	Edgewood, MD	Yes	Yes	-	MRICD
MRICD FIO 9/	Edgewood, MD	No	-	None	MRICD
MRIID Library	Ft. Detrick, MD	Yes	No 10/	-	MRIID
WRAIR Library	Washington, DC	Yes	No	-	WRAIR
WRAIR FIO 9/	Washington, DC	No	-	None	WRAIR
AFMIC 11/	Ft. Detrick, MD	Yes	Yes	On-line, Secure	All Defense Medical R&D Agencies
COE					
CERL Library	Champaign, IL	Yes	Yes	--	CERL
CRREL Library	Hanover, NH	Yes	No	-	CRREL
ETL Library	Fort Belvoir, VA	No	Yes	-	ETL
WES Library	Vicksburg, MI	Yes	Yes	-	WES

1/ CRDC FIO has access to BRL on-line, secure CIRC terminal located at APG.

2/ Includes former ERDSA Library.

3/ MSIC is an element of the Army Intelligence Agency. Provides classified CIRC support to MICOM FIO and AML.

4/ TECOM FIO also provides limited library service to HQTECOM, APG, and other TECOM activities.

5/ Ft. Huachuca Technical Reference Division has a DROLS terminal.

6/ AMSAA has a DROLS terminal in its plans/programs/budget office.

7/ AMSAA FIO has access to BRL on-line secure CIRC terminal collocated at APG.

8/ HQAMRDC Tech Info Office provides DROLS service to MBRDL and MRIID, which are also located at Ft. Detrick.

9/ Information about AMRDC FIOs was obtained from HQAMRDC.

10/ Receives DROLS service from HQAMRDC.

11/ AFMIC is a DoD Intelligence Agency; could provide CIRC support to Ft. Detrick R&D activities.

fund the translations. CRREL decided that it would continue to contract directly for translation services.

4.21 Of 23 FIOs surveyed, 22 returned completed questionnaires. (All FIOs surveyed were in AMC.) Of these 22, 18 process requests for translations. Six of these FIOs reported that they sometimes refer customers' requests for translations to the technical library collocated with the FIO. If the customer can pay for the translation, he will receive more timely support by having the library contract for translation services.

4.22 The list of organizations in Table 4.2 includes two intelligence agencies that are collocated with Army R&D activities: the Missile and Space Intelligence Center (MSIC) at Redstone Arsenal, collocated with the Army Missile Laboratory, RSIC, and the Missile Command (MICOM) FIO; and the Armed Forces Medical Intelligence Center (AFMIC), at Fort Detrick Maryland, collocated with HQAMRDC and two AMRDC laboratories. Both MSIC and AFMIC process requests for translation primarily from their own intelligence analysts.

4.23 Availability of DROLS Terminals. Of the 36 libraries surveyed, 31 have DROLS remote terminals. With one exception, those libraries that do not have their own DROLS terminals have access to one elsewhere at their installation. The exception is CRREL at Hanover, NH, which reported obtaining DROLS support through the Office of the Chief of Engineers. DROLS terminals are also available at the Test and Evaluation Command (TECOM) FIO--which maintains some library functions for HQTECOM, MSIC, AFMIC, FSTC, NVEOL, and the headquarters of the Electronic

Proving Grounds at Fort Huachuca, AZ. The widespread availability of DROLS terminals indicates that the translations in the DTIC TR Data Base should be readily identifiable and retrievable for scientists and engineers throughout the Army R&D Community.

4.24 Availability of CIRC Terminals. The distribution of CIRC remote terminals is much more limited than that of DROLS terminals. Fourteen of the AMC FIOs have their own CIRC remote terminals. HQAMC, AFMIC, MSIC, and FSTC also have CIRC terminals. There are CIRC terminals located at only 11 of the installations where Army R&D activities are located. (There are three in the Aberdeen/Edgewood area.) Seven of the AMC FIOs without CIRC terminals are able to request CIRC searches off-line, but this requires much more time than on-line searches.

4.25 The limited availability of CIRC terminals suggests that Army R&D use of the CIRC foreign S&T open source data base and the CIRC translation registry is less widespread than would be desirable and that the R&D agencies, at least at those locations without terminals, are probably not aware of useful foreign technology and may be duplicating translations already available.

4.26 The resources available to the Army for translating support and translations, to include the DTIC TR Data Base and the CIRC System, are described in more detail in Section VII. Problem areas in translation support for Army R&D are discussed in Section IX.

4.27 Interpreting. None of the FIOs and libraries that returned questionnaires regularly process requests for interpreting, and only one indicated that it had done so in the past. It appears that R&D activities that require interpreting support

request such support directly from the Army R&D Interpreting Office located with FSTC in Charlottesville, Virginia or from the Department of State (DOS), or make their own arrangements. Section V discusses interpreting in support of Army R&D in detail.

V. INTERPRETING SUPPORT FOR ARMY R&D

GENERAL

5.1   This section discusses linguistic interpreting support for
Army R&D activities. The topics discussed include:

- The profession of conference interpretation

- Individual qualifications required for military con-
  ference interpreters

- Sources of conference interpreters

- Sources of interpreting support for the Army

- Army requirements for interpreting support

- Problem areas.

THE PROFESSION OF CONFERENCE INTERPRETATION

5.2   An interpreter is "a person who translates orally between
parties conversing in different languages." 15/ A conference
interpreter is a person who interprets at more or less formal
meetings which include participants who do not speak the same
language or who do not speak a common language fluently enough
to communicate effectively. Conference interpretation is

15/ Webster's Ninth New Collegiate Dictionary, Merriam-Webster,
    Inc., Springfield, MA, 1983, p. 633.

generally considered to demand the highest level of skill of any situation requiring an interpreter. Conferences generally involve a number of people, subjects may be very technical, and there is pressure to conduct the proceedings as rapidly and efficiently as possible. The conference interpreter has little or no chance to think about or rephrase statements.

5.3 There are two types of interpretation that may be used at conferences. The first type is called simultaneous interpretation; the other is consecutive interpretation.

a. Simultaneous interpretation involves listening to a speaker and interpreting his words to another language at the same time. This capability is developed only with extensive training and practice. It requires extremely high fluency in the languages used and knowledge of the subject matter being discussed.

b. Consecutive interpretation involves listening to the speaker and then translating his or her words while the speaker pauses. Consecutive interpretation also requires a very high level of fluency to ensure that accurate renditions of the speaker's words are made. Consecutive interpretation, however, permits the interpreter a bit more time to search for proper and accurate wording.

5.4 The advantages of simultaneous interpreting are that it saves time and minimizes interference with the proceedings by the interpretation process. The disadvantages are that competent simultaneous interpreters are difficult to find, especially when highly technical subject matter is involved, and that the risk of misinterpretation is somewhat greater. In simultaneous

interpreting, the interpreter must react automatically, having virtually no chance to pause to search for words with the exact shade of meaning required. Consecutive interpreting provides the interpreter more time to formulate accurate renditions of the speaker's words and does not require the interpreter to listen and talk at the same time. The disadvantages of consecutive interpreting are that it tends to disrupt the natural delivery of a speaker and at least doubles the amount of time required to deliver a speech or conduct a meeting. Since simultaneous interpreting was first used at the Nuermberg Trials after World War II, it has become increasingly popular with diplomats, military personnel, scientists, and others involved in international meetings.

QUALIFICATIONS REQUIRED FOR MILITARY CONFERENCE INTERPRETERS

5.5   Interpreting technical information from one spoken language to another is a difficult and specialized process. To be a competent interpreter at conferences involving military S&T subjects, an individual must have many qualifications.

   a.   The interpreter must have native or near native
        fluency in the languages he or she is interpreting.
        This fluency must include an understanding of
        colloquial speech, the ability to recognize nuances of
        meaning, and an appreciation of the cultural back-
        ground associated with the language. The interpreter
        must be able to speak the language lucidly to be
        readily understandable to the audience.

   b.   The interpreter must be sufficiently versed in the
        technology being discussed to be able to interpret
        technical terms accurately. Fluency in a language

43

does not automatically include the ability to inter-
pret or to understand scientific information.

c. The interpreter must be able to focus his or her
    attention completely on the task at hand, often for
    hours at a time, sometimes under distracting circum-
    stances. At many high level meetings, the cost of
    inaccurate interpretation may be very high or, at
    least, be embarrassing. The interpreter must be able
    to endure a level of stress equated by some to that
    faced by air traffic controllers.

d. In more sophisticated interpretation environments the
    interpreter must be capable of setting up and
    operating electronic equipment used to support the
    interpreting effort.

e. The interpreter must possess the appropriate security
    clearance to have access to the information being
    discussed.

f. The interpreter should be familiar with the project
    being discussed and the participants in the meeting.
    Each R&D project tends to develop its own jargon, and
    those involved with the project have their own points
    of view and interests, which must be communicated
    accurately.

g. The interpreter should be familiar with the military
    culture environment of all participants, to include
    terms, ranks, senior-subordinate relationships, etc.

SOURCES OF CONFERENCE INTERPRETERS

5.6   Once a person has attained interpreter-level fluency, he
or she must still acquire working knowledge of military tech-
nology to be fully effective. Given the literally hundreds of
areas of Army S&T interest, this is a never-ending process. The
interpreter must also stay abreast of developments in his or her
languages that affect terminology. No interpreter can function
well without allocating adequate time for study and research.

5.7   The supply of qualified conference interpreters available
to the U.S. Government is quite limited, especially when the
size of the country's population is considered. The principal
Government employer of interpreters, on either a direct-hire or
contract basis, is the Department of State (DOS). Many of the
interpreters working for the DOS are natives of foreign
countries who have become U.S. residents and attained a high
degree of English fluency. Some of these are graduates of Euro-
pean universities that offer training in interpreting; others
have developed their skills over the years through on-the-job
training.

5.8   Relatively few U.S. universities and colleges offer
advanced training in interpreting. The only school known to
confer a master's degree in interpreting/translation with a
specialty in conference interpretation is the Monterey Institute
of International Studies (Monterey, California). Languages
include German, French, Russian, and Spanish. The Institute
awards this degree to only three or four people each year.
Another university that prepares students for conference
interpretation is Georgetown University (Washington, DC).
Georgetown offers a one-year program that results in a
certificate for those who successfully complete the

45

work. Most students admitted to the certificate program have
already earned their bachelor's degrees; all have been tested to
ensure they have a high level of fluency before beginning the
course of study. In 1985 nine of twelve students successfully
earned conference interpreting certificates. Languages offered
include French, German, Spanish, Portuguese, and Italian. A new
option, Japanese, has recently been added. Other universities
that offer advanced education in interpretation include the
University of Massachusetts, Florida International University,
and the University of Delaware. The Sorbonne in Paris, France,
is considered by some to be the premier school for conference
level interpreters.

5.9   Another possible source of conference interpreters is the
pool of language-trained personnel in the Army active or reserve
forces. Although no information collected during this study
confirmed that Army linguists are being used as conference
interpreters, some commands may happen to have a person assigned
who is fluent enough to act as an interpreter for informal con-
ferences. These people, if there are any, are not identified
and available for Army-level requirements. Given the high level
of skill required for conference interpreters, it is unlikely
that many such individuals exist. The language training pro-
vided to Army personnel by the Defense Language Institute
Foreign Language Center in Monterey, California, does not
develop this level of fluency nor does it teach sophisticated
interpreting techniques. Army officers are expected to attain a
conversational fluency. Enlisted personnel are channeled into
one of two military occupational specialties for linguists,
voice interceptor or interrogator. Neither officers nor
enlisted personnel can expect to be placed in assignments where

they acquire the technical knowledge and language skills
required for conference interpreting. [16]/

SOURCES OF INTERPRETATION SUPPORT FOR THE ARMY

5.10   Army agencies and organizations requiring interpretation
support have three options for obtaining that support.   The
first is to contact the Army R&D Interpreting Office, an AMC
element currently co-located with the Army Foreign Science and
Technology Center in Charlottesville, Virginia.   The second
option is to use the Office of Language Services of the Depart-
ment of State in Washington, DC.   The third option is to use
whatever resources may be procured locally, either in-house per-
sonnel, language services contractors, or nearby universities.
The R&D commands and laboratories rarely procure interpreting
services locally.

The Army R&D Interpreting Office

5.11   In June 1979 Headquarters, AMC, recognized its need for
professional interpreting support at international conferences
by assigning three R&D interpreter spaces to FSTC. [17]/   The idea
was to provide a cadre of civilian conference interpreters for
R&D meetings with NATO countries sponsored by Department of the
Army (DA), AMC, and TRADOC.   The chief of the R&D Interpreting

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[16]/ Army language training is discussed further in Sections VI
and IX in regard to translation support for Army R&D work.

[17]/ In 1979, what is now the Army Materiel Command was known as
the Army Materiel Development and Readiness Command
(DARCOM); FSTC was one of its subordinate organizations.   In
1984 DARCOM was renamed AMC.   In 1985 FSTC was removed from
AMC and incorporated into the newly formed Army Intelligence
Agency (AIA), which reports directly to HQDA.

Office, rated as a GS-13, as a German/English interpreter. The other two positions are currently held by GS-11 French/English interpreters. Current demand for German/English interpretation far exceeds the capabilities of the office to provide the service. Demand for French/English interpretation is growing rapidly as the availability of the two French/English interpreters (who joined the office in late 1984) becomes known.

5.12 The R&D Interpreting Office does not have an administrative person to handle its arrangements for training, travel, and scheduling or to maintain its records. These administrative matters must be handled by the interpreters. This reduces the amount of time they have available for study and preparation for conferences.

5.13 Salaries and administrative cost of the R&D Interpreting Office are paid for by AMC. The cost of interpreters' travel and per diem is paid for by user agencies. The interpreters do not receive extra pay for travel on weekends or holidays.

4.14 The collocation of the R&D Interpreting Office with the FSTC greatly facilitates the interpreters' preparation for their assignments. The intelligence analyst staff at FSTC maintains expertise in almost all scientific and technical areas of interest to the Army and is available for consultation with the interpreters. FSTC also has its own Foreign Language Research Office, which provides translation support for FSTC, AMC, and other Army customers. The R&D Interpreting Office personnel are able to consult with the FSTC translators to identify the most accurate translation of technical terms.

5.15 In 1985, the Army removed FSTC from AMC and made it one of three intelligence production centers in a newly created Army

Intelligence Agency. The R&D Interpreting Office remains an AMC asset; however, it may be moved to another location. As of the date of this writing, no decision has been made.

Department of State Office of Language Services

5.16 The DOS Office of Language Services provides interpreting and translating support to the DOS, the White House, and--on a reimburseable basis--to other elements of the U.S. Government to include the DOD and the Services. Appendix F to this report contains a brief history of the Office of Language Services prepared by the DOS.

5.17 The DOS Office of Language Services is 85% concerned with interpretation. It employs over 20 full-time interpreters and maintains contractual relationships with over 1,200 individual free-lance interpreters. DOS administers, trains, and tests all interpreters on its staff, both in-house and contractual. As required, DOS obtains security clearances for its interpreters. Dealing directly with individual interpreters gives DOS a great deal of flexibility to respond to requests for assistance. Normally, 3 days' lead time is sufficient for it to meet an assignment. The cost of a fully qualified conference interpreter (simultaneous translation) to the customer is $275 per day plus expenses. The cost of a seminar interpreter (largely consecutive translation) is $215 per day plus expenses. The State Department bills customers for interpreter travel on weekends and holidays as well as for time spent during the normal work week. According to a knowledgeable State Department source, a competent conference-level free-lance interpreter can expect to make from $25,000 to $35,000 per year based on current demand. The amount also varies with experience, the language provided, and the technical competence of the interpreter.

5.18 The Director of the Office of Language Services estimates that, on the average, about 3 days of study and preparation are required for each day that an interpreter actually spends in meetings providing interpreting services. These 3 days include time for language study, travel, briefings about and preparation for specific conference topics, analysis, and documentation of terminology.

Other Interpreting Resources

5.19 Other potential resources for conference interpreting available to the Army include the Navy Intelligence Support Center, language service companies, language-qualified in-house personnel, and faculty and students at local universities.

5.20 The Naval Intelligence Support Center at Suitland, Maryland, maintains a translation branch similar to the one at the Army FSTC. The chief of this branch will occasionally make one or two of his translators available for interpretation assignments. He reported that the Army has not requested interpreting support from NISC.

5.21 A number of language services companies can provide interpreters; however, no Army R&D activity surveyed reported having contracted locally for interpreting support. According to the Chief of the DOS Language Services Office, contracting companies may offer lower rates than State, but private firms cannot provide the quality assurance and security clearances available from DOS.

5.22 Many R&D and test activities employ language qualified people who can converse with foreign visitors. Examples are the Cold Regions Research and Engineering Laboratory, which has several fluent Russian speakers, and the U.S. Army Tropic Test Center in Panama, which has many Spanish speakers on its staff. The extent to which such language-qualified personnel are available throughout the Army R&D Community is unknown, but it is suspected to be quite limited. The capabilities of such individuals to provide competent interpreting support is probably also quite limited, given the extremely high degree of language skill and training required to become proficient at simultaneous or consecutive technical interpreting.

5.23 University faculty members and students may occasionally be available for limited interpreting support. Some R&D laboratories have reported using local academic personnel for help with translation; none reported using them for interpretation. The problems with their use include lack of familiarity with military and technical subjects, lack of security clearances, and limited availability.

5.24 As far as could be determined during the study, the U.S. Government maintains no organizations that provide conference interpreting support other than the DOS Office of Language Services and the Army R&D Interpreting Office. Even the U.S. Air Force Systems Command Foreign Technology Division, which provides extensive human and machine-assisted translation services to the Air Force, the Defense Intelligence Agency (DIA), the Intelligence Community, and other Services, does not provide interpreting support.

ARMY REQUIREMENTS FOR INTERPRETING SUPPORT

Army Participation in International Conferences

5.25 The establishment by AMC of an R&D Interpreting Office was due to AMC involvement with several European nations in ground force materiel research, development, testing, and acquisition. This involvement requires frequent meetings, both in the U.S. and overseas, with government and industry officials from the Federal Republic of Germany, France, and Italy. Also, HQDA, AMC, and TRADOC have conducted staff talks with the Germans, French, Brazilians, and Chinese. Many of these meetings involve important policy decisions and/or highly technical matters. In most cases it cannot be assumed that all the participants have sufficient command of the languages involved to deal with these matters effectively and accurately, and interpreters are required. Although Germany and other nations provide inter-preters, especially in Europe, it is in the U.S.' interest to have its own interpreters present, both from the standpoint of assuming its share of the burden in conducting the meetings and ensuring that substantive matters are properly communicated and understood from the U.S. point of view.

Procedures for Requesting Support

5.26 Army organizations and project managers needing inter-preting support for international meetings usually contact the Army R&D Interpreting Office to request assistance, but they are not required by any Army directive to do so. In either case the requesting organization must provide the funds to cover the costs incurred by the supporting organization. If the Army R&D Interpreting Office cannot meet a request, either because of other commitments or because it has no capability for the

required language, it will refer the request to DOS. If more
than two languages are spoken at the same conference, the Army
and DOS may team up to provide interpreting support. On
occasion, when DOS has been unable to provide an additional
German/English interpreter as requested, the Army R&D
Interpreting Office has arranged for help from German resources,
such as the German Military Representative for the U.S.A. and
Canada and the German Liaison Office at AMC Headquarters.

Magnitude of Requirements for Conference Interpretation

5.27 The Army R&D Interpreting Office and the DOS Office of
Language Services have provided statistics on the support they
provided to the Army during the period 1 January 1984 through
30 June 1985. Since no office at the HQDA or major command
level maintains central records for interpreting support, these
statistics are the only available indication of the extent of
Army demand for such assistance. Table 5.1 summarizes the
information obtained from DOS and the R&D Interpreting Office.

5.28 Support by the State Department. DOS statistics identify
the conference sponsor, the activity supported, the dates of
support, and the amount billed to the customer. Their records
show that State billed the Army $230,997 during the 18-month
period. Of this amount, $164,006 (71%) was billed to the
Multiple Launch Rocket System for support of numerous meetings
in Alabama, Texas, and California. The various MLRS meetings
required German/English, French/English, and Italian/English
interpreting support. An MLRS representative expressed satis-
faction with the support provided by DOS, stating that the
interpreters were well-qualified and that there was continuity
in the assignment of interpreters to the project's conferences.
The remaining $66,991 billed to the Army for DOS interpreting

TABLE 5.1

ARMY R&D CONFERENCES REQUIRING INTERPRETATION SUPPORT
(1 JANUARY 1984 THROUGH 30 JUNE 1985)

Conference Topic	Number of Conferences[1]	Conference Location(s)[2]
Multiple Launch Rocket System	15	Alabama (9) Texas (4) Florida (1) Oklahoma (1)
Fire Control Systems and Standardization	5	Texas (1) Arizona (1) New Mexico (2) Germany (1)
M-1 Tank	2	Germany (2)
ADLER/TACFIRE	6	Germany (4) Oklahoma (1) Virginia (1)
Combat Rifle Program	3	Germany (2) Maryland (1)
Tank Main Armament Systems and Test Procedures	8	Germany (4) New Jersey (2) Maryland (2)
Large Caliber Weapons Standardization	2	Arizona (1) Germany (1)
Reconnaissance Materiel Concepts	2	Maryland (2)
Chemical Warfare/CBR	3	Maryland (3)
US/FRG Maintenance Working Group	2	Maryland (2)
US/FRG Supply and Transportation Working Group	1	Virginia (1)
US/French Antitank Weapons Group	2	Virginia (1) Alabama (1)
Combat System Vulnerability	1	Maryland (1)
Parachute Surgical Unit (French)	2	Maryland (1) North Carolina (1)
US/FRG Armaments Working Group	1	Maryland (1)
US/FRG R&D Conferences	3	Washington (1) Arizona (1) Virginia (1)

[1] The estimated total number of interpreter man-days used at these conferences is about 850.

[2] The numbers in parentheses show the number of meetings that occurred at the listed locations.

support was for meetings and conferences hosted by various
TRADOC, AMC, and Army Medical R&D Command elements in the U.S.

5.29 Although DOS did not provide the number of man-days of
interpreter support it provided to the Army during the 18-month
period, it can be estimated. The total cost of DOS interpreting
services for the Army for this period was about $231,000. The
Director of the Office of Language Services states that the
total cost of a conference interpreter is about $375 per day
when per diem and travel are included. Dividing $231,000 by
$375 per day suggests that the Army used approximately 615 man-
days of support by DOS interpreters in 18 months. The languages
most commonly provided were German and French; there were some
requirements for Italian, Portuguese, and Chinese.

5.30 Support from the Army R&D Interpreting Office. During the
same 18-month period, the single German/English interpreter at
the Army R&D Interpreting Office provided approximately 230 days
of interpreting support to a variety of R&D activities. Of
these 230 days, about 120 were provided in Germany, with the
interpreter spending anywhere from 3 to 24 days in Germany at
one time. The remaining 110 days were provided at a variety of
locations in the continental U.S.

5.31 The two French interpreters in the Army R&D Interpreting
Office have been available for assignment only since January
1985. Working as a pair, they have provided support to HQAMC;
the Chemical R&D Center; the Antitank Working Group sponsored by
the HQDA Office of the Deputy Chief of Staff for Research,
Development, and Acquisition; and TRADOC/French staff talks, for
a total of about 30 days of support. The demand for the French
interpreters is increasing as their availability becomes known
to Army organizations.

Comparison of State and Army Interpreting Support Services

5.32 Although a detailed comparison of the cost and effectiveness of interpreting support from State and the Army R&D Interpreting Office is beyond the scope of this study and much of the data collected from DOS and the Army is not directly comparable, several generalizations are ventured. These generalizations address the two issues of cost and effectiveness.

5.33 Cost. From the point of view of the overall Army budget, with no other consideration other than dollars expended, obtaining interpreting support through the DOS from free-lance interpreters at a daily rate may be cheaper than retaining full-time Army employees at the GS-11 to 13 paygrade level, at least for languages other than French and German. Unless the Army requires about 150 man-days per year of interpretation in a particular language, the cost of retaining a GS-11 full-time employee interpreter is probably more expensive than hiring a DOS contract interpreter on an "as-required" basis. [18] When a DOS interpreter is used, the Army is billed only for the days of service provided; DOS bears the cost of testing, training, and administration (to include obtaining security clearances) for its free-lance interpreter personnel.

5.34 From the point of view of an individual Army activity, such as a project manager's office, it is much cheaper to obtain interpreting support from the Army R&D Interpreting Office because the cost of the interpreters' salaries and support is subsidized by the AMC R&D budget and is not charged to the project.

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[18] The total cost to the Army of employing a mid-level GS-11 is estimated at $41,000 per year. A mid-level GS-13 costs about $60,000 per year.

The sponsoring activity pays only the cost of transportation, per diem, and incidental expenses, which would be much less than the $375 per day paid for DOS interpreters. Thus, the answer to the question, "Are State interpreters cheaper than Army inter- preters?" depends on who is asking the question and what the Army's total requirements are for the language concerned.

5.35 Effectiveness. Given that Army activities generate suffi- cient demand for interpretation in a particular language to warrant considering hiring full-time interpreters--as they do for German and French--the advantages and disadvantages of using DOS or Army interpreters can be compared using factors other than cost. These factors include responsiveness to Army requirements, familiarity with the Army environment, familiarity with the military environment in Germany or in French-speaking countries, security clearances, and knowledge about specific research, development, test, and evaluation project technology and personnel. Table 5.2 lists these considerations and compares the use of DOS and Army interpreters in the light of each one. It suggests that use of Army interpreters is generally preferable to use of DOS interpreters, even though the DOS employs and provides only the most highly qualified interpreters available.

5.36 A final consideration, which favors the maintenance of at least some in-house Army interpreters, is the matter of Army prestige. The German and French armies both place great importance on language services and maintain relatively large staffs of interpreters and translators. In the past, these foreign interpreters have been called on in situations which should have been handled by U.S. Army resources or at least U.S. Government resources. Although such help has been provided several times, use of foreign interpreters for U.S.-sponsored

TABLE 5.2
COMPARATIVE EFFECTIVENESS OF USING ARMY AND DOS INTERPRETERS[1]

Point of Comparison	Army Interpreters (AIs)	State Interpreters (SIs)
Availability	Directly available for Army requirements	Will meet Army requirements on an "as available" basis
Familiarity with Army environment	Spend full-time in Army environment	Have limited exposure to Army environment
Familiarity with foreign counterpart military environment	Have guidance and time to study foreign military environment; will frequently be involved with foreign military in conferences	May have limited requirement to study foreign military environment; will have limited opportunity to be involved with foreign military personnel
Security clearance	Security clearance administered by Army; all AIs can be cleared to required level	Available SIs may not have required level of clearance
Continuity of assignment to specific types of conferences	AIs are generally available for repeated use with specific projects; can learn to know specific technology and people	Continuity of assignment subject to State requirements; may have little time to study specific technology and learn about personnel [2]

[1] This table addresses use of German/English and French/English interpreters. At the present time neither the Army R&D Interpreting Office nor the State Department have received enough requests for other language interpreters to justify the Army hiring full-time employees to interpret other languages.

[2] As noted in the text, the MLRS project reports that the State Department has provided continuity of assignment for interpreters supporting MLRS.

meetings may be seen as an admission that the U.S. Army does not recognize the importance of high quality interpretation or is not willing to carry its share of the load in conducting international conferences and working groups.

PROBLEM AREAS

5.37 As in any area of endeavor, those responsible for the provision of interpreting support for the Army's international meetings and conferences are faced with several problems of varying magnitude. Such problems may be categorized as those which the Army can correct and those for which solutions are not readily apparent. The latter category of problems can be considered accepted as "facts of life" that must be dealt with rather than solved.

Interpretation Facts of Life

5.38 **Number of Languages to be Interpreted**. Many languages are spoken by foreign military personnel with whom the Army deals. Fortunately, the number to be interpreted for Army R&D activities is much smaller and includes German, French, and Italian. Although requirements for interpretation of other languages may increase, it appears that for the immediate future the Army would be able to satisfy most of its conference interpreting requirements by maintaining an in-house German and French conference interpreting capability and relying on the State Department to interpret other languages. An alternative would be for the Army to establish its own pool of contract interpreters. This would require the allocation of resources to administer the testing, training, and assignment of interpreters--functions which State is already managing.

5.39 **Number of S&T Areas of Interest.** Although military inter-
national R&D conferences tend to center on weapons and equipment
systems, the number of technologies incorporated into these
systems and their components is immense. Presentations and dis-
cussions at conferences may involve many different technologies
related to one specific project. It is unlikely that most con-
ference interpreters will have the detailed technical back-
ground--in two languages--to facilitate their interpretation of
these subjects. It is very important that an interpreter
assigned to a technical conference is provided time to prepare
by studying the subjects to be discussed and reviewing
terminology. As an interpreter gains experience and has the
opportunity to work at several conferences related to a par-
ticular R&D project, his or her technical expertise will
increase.

5.40 **Scarcity of Qualified Conference Interpreters.** The com-
bination of qualifications required for a proficient military
R&D conference interpreter makes it probable that highly quali-
fied individuals will be difficult to locate. This is
especially true in light of the generally low level of emphasis
American society places on development of foreign language
skills, the de-emphasis on language training for science and
engineering students in universities, and the modest financial
rewards for the grueling effort that must be devoted to
preparation for and conduct of conference interpreting.
Although the Army may be able to locate, recruit, and train
talented linguists, it is doubtful that the Army can have much
influence on the linguistic isolation of most Americans.

5.41 Lack of Conference Interpreting Support by Intelligence Agencies. Later in this report more will be said about Intelligence Community (IC) support of language services for the R&D world. It is germane to note that S&T intelligence analysts derive very little of their information directly from the spoken word. No U.S. S&T intelligence agency is known to have conference interpreters qualified for S&T work and employed primarily for that duty. Since a large proportion of U.S. Government interest in language services resides in the IC organizations, IC neglect of R&D interpreting requirements appears to have been reflected in the level of resources allocated by the Government to this field of activity.

Interpretation Problems with Possible Solutions

5.42 Lack of HQDA- and MACOM-Level Management of Interpretation Services. Two facts emphasize Army lack of high level attention to the need for R&D conference interpreting. First, the Army Regulation (AR) assigning responsibilities and providing guidance for the Army Scientific and Technical Information Program makes no mention of interpreting in support of Army scientists and engineers, [19] probably because the DoD directive for the STIP does not mention interpretation. [20] Given the fact that U.S. scientists and engineers gain a large amount of information from international conferences and that many program managers hold frequent conferences with Allied forces, the lack

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[19] AR 70-45, Scientific and Technical Information Program, 1 January 1984.

[20] DoD Directive 3200.12, Scientific and Technical Information Program, 15 February 1983.

of recognition for conference interpretation in the DoD and Army
STIPs suggests that the importance of accurate and professional
conference interpretation has not been recognized by either DoD
or Army management. Second, there is no official Army point of
contact for the provision and administration of interpreting
services. Although the Army R&D Interpreting Office has been a
de facto point of contact for those who know of its existence,
there is no requirement for all Army organizations requiring
interpreting support to go through that office, nor is the
office staffed to handle the potential volume of requests that
would result if it were designated as Army conference interpre-
tation manager.

5.43 The Army should recognize the importance of effective com-
munication at international conferences and the need for
linguistic support of various R&D components by professional
interpreters and translators. The first step would be to revise
AR 70-45 to include appropriate references and directives for
linguistic support. The present R&D interpreting function
should be improved and possibly be combined with a centralized
translation service for maximum benefit to the Army. The Army
can sponsor a staffing study [21]/ to determine the relative cost
of retaining in-house interpreters compared to use of contrac-
tors. This information, coupled with assessment of current and
potential requirements for interpretation services and estab-
lishment of Army priorities for effective international communi-
cation with its major allies, would underlie future decisions
for allocation of resources to the interpretation function.

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[21]/ Procedures are provided in AR 5-20, Commercial Activities,
currently under revision.

5.44 **Lack of Definition of the Mission of the R&D Interpreting Office.** Although AMC has recognized a requirement to provide interpreters for R&D conferences, AMC has not provided a charter or specific guidance to the chief of the R&D Interpreting Office. The activities of the office have largely been defined and managed by the chief, who fortunately has a broad perspective of Army requirements and missions and an understanding of the importance of effective communication among U.S. military officials and their foreign counterparts. He also understands that visitors from foreign countries frequently have a good comprehension of English, and he is well aware of the low regard many foreign officials have for Americans who can communicate only in English. Given these attributes and perspectives, the current R&D Interpreting Office chief has filled a large gap by not only providing interpreting services but by promoting them and acting as a point of contact for the Army to obtain interpreting support from the State Department. Although these activities are highly commendable, no one at AMC or other headquarters appears to have thought out and defined the mission of the R&D Interpreting Office, in spite of frequent requests for such guidance from the office chief himself.

5.45 It appears that the most appropriate DA Staff Agency to define the mission of the Army R&D Interpreting Office is ODCSRDA, which should coordinate the action with ODCSOPS and OACSI, both of which have responsibilities for the Defense Language Program that are described in AR 350-20, <u>Management of the Defense Language Program</u>.

5.46 **Understaffing of the R&D Interpreting Office.** The R&D Interpreting Office does not have the personnel required to maintain its present workload. The assignment of two French interpreters to the office appears appropriate to meet most

French requirements for the near term, even though these re-
quirements are increasing as the availability of the French
interpreters becomes known. The assignment of only one German
interpreter, who is also the office chief, is inadequate to meet
current requirements. According to DOS guidelines for the
amount of time required for study and preparation for assign-
ments, the German interpreter met requirements extensive enough
for over two full-time interpreters, plus managing much of the
office administration. In regard to office administration, re-
view of the administrative requirements of the Army R&D Inter-
preting Office suggests that there is sufficient current and
potential work to merit the assignment of a full-time secre-
tary/office manager, preferably a person who can read French and
German and prepare correspondence in those languages. Unless
these personnel requirements are met in the near future, support
provided by the office to the Army will probably diminish. It
is very doubtful that any future office chief/interpreter will
be able to carry the interpretation and administrative load
presently handled by the incumbent. The present office chief
has been able to manage the workload only because he has over 20
years experience, which reduces the time he needs for study and
conference preparation, is highly motivated, and has great
stamina.

5.47 HQAMC, if not HQDA, should investigate the feasibility of
assigning two additional personnel spaces to the R&D
Interpreting Office. The first priority would be for an
additional German/English conference interpreter; the second
priority would be for an administrative person. Justification
for such personnel increases was sent to HQAMC in the past by
the R&D Interpreting Office Chief.

5.48 **Army Dependency on State Department Interpreting Support.**
The State Department supports the Army on an "as available"
basis and, although an excellent working relationship exists
between its Office of Language Services and the Army R&D
Interpreting Office, State has not always been able to provide
support when requested by the Army. Meanwhile, Government-wide
requirements for State interpretation support are increasing.
In the future it is probable that the Army may not receive the
same level of State support that it has received in the past.
In an interview, the Director of the State Language Services
Office stated that it would help his office if the Army could
handle more of its interpreting requirements on its own.

5.49 The Army can reduce its dependence on State interpreters.
One or both of two courses of action could be followed. First,
the addition of another German interpreter to the staff of the
Army R&D Interpreting Office (as suggested in paragraph 5.46)
would enable that office to carry more of the Army load.
Second, the Army could establish a point of contact for
obtaining its own free-lance interpreter support. This point of
contact office would assume responsibility for testing,
training, clearing, and scheduling free-lance interpreters to
support the Army. A pool of interpreters could be established
from those who have worked for the Army in the past and by
contacting organizations, such as the American Association of
Language Specialists (TAALS) [22/]--and universities, that train
interpreters. The Army R&D Interpreting Office would be a
logical candidate to assume Army management of free-lance inter-
preters. To accomplish this mission, it would require addi-
tional administrative personnel and authority to obligate funds

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[22/] The American Association of Language Specialists, Suite 9,
1000 Connecticut Avenue, Washington, DC 20026.

for contract support. A key point in contracting for language services is that the Army should not be required to accept the low bidder. The Army needs the highest quality of interpretation it can obtain. Economizing on contractor rates may be a disaster if inaccurate interpretation causes misunderstanding between the U.S. and its allies.

5.50 Lack of Interpreting and Translation Support Integration. The Army R&D Interpreting Office to date has been collocated with the Foreign Language Research (translation) Branch of the Army FSTC at Charlottesville, Virginia. This collocation of the interpreting and translating functions has allowed very constructive consultation among their language specialists.

5.51 Now that FSTC has become part of the Army Intelligence Agency, it appears likely that the Army R&D Interpreting Office (which remains under AMC control) and the FSTC Foreign Language Research Branch will be both functionally and physically separated. The Interpreting Office is scheduled to move from Charlottesville, in the future. Its staff will retain their R&D conference support mission (probably) but will lose its capability to confer with FSTC translators.

5.52 It appears that there is clearly a need for the Army to improve its organization for linguistic support of its R&D (and other) components. This section of the study report has made a case for improved interpretation support. The following sections examine the situation in the translation arena and develop recommendations for integrating interpretation and translating functions to improve language services support to the Army R&D Community.

VI. SCIENTIFIC AND TECHNICAL TRANSLATION

GENERAL

6.1   This section discusses various aspects of S&T translating in support of Army R&D activities. This information is presented to provide a common understanding of the translating process so as to place later discussion of translation sources, demand, and problems in context. The topics covered in this section include:

- Definition and description of the translating process

- Types of translating

- Qualifications for S&T translators

- Support resources needed by S&T translators

- Training for S&T translators.

6.2   Although the information in this section has been obtained from a number of knowledgeable sources, the study report, Russian Translation Quality in the Intelligence Community, by Maureen E. Cote of the Foreign Broadcast Information Service has been of particular value. [23] Even though this study specifically addresses translating Russian, it contains much information relevant to translating any language.

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[23] Cote, Maureen D., Russian Translation Quality in the Intelligence Community, (unpublished manuscript), SECRET, to be published in 1986 by the Center for Studies in Intelligence.

THE TRANSLATING PROCESS

Definition

6.3   For the purpose of this study, translating is defined as the process of converting written information from one language to writing in another language.

Description

6.4   Translating may be categorized according to the type of material that is translated. The American Translator's Association (ATA) [24] makes a distinction between literary and non-literary translating. Literary translating involves translating of general literature such as novels, essays, poetry, etc., which requires the translator to have a command of the nuances of a language and its cultural context. Non-literary translating, such as economic, political, military, and S&T subjects requires command of the language, its technical vocabularies, and a knowledge of the manner in which the technical vocabularies are used in the context of their parent language. Translating accurately and effectively is much more than a word-for-word substitution process. The translator must recognize the intended meaning in the original language and then express that meaning in the target language. This often involves using terms much different than those in the original language. For example, the Russian words that literally mean "radio-thermal" translate into English as "infrared."

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[24] American Translators' Association, 109 Croton Avenue, Ossining, New York 10562.

6.5   There are different levels of translating. The translator may simply scan a journal article to be able to tell someone else what the article is generally about (this is called "gisting"); the translator may create an abstract of the document; or the translator may produce a complete rendition of the original article in a new language. From gisting to full translation encompasses a continuum of translating effort.

6.6   Translating, from the Army R&D point of view, usually requires taking information in a foreign language and reproducing that information in English; however, this is not always true. Occasionally, Army R&D activities that are working in cooperation with foreign scientists and engineers must translate correspondence, speeches, and reports, into the appropriate foreign languages. This requires a much greater proficiency in the language than a knowledge for translating from a source language into English.

TYPES OF TRANSLATING

6.7   The advent of computers has brought some changes to the process of translating information from one language to another. There are now three types of translating: human translation, machine (computer)-assisted translation, and machine translation.

Human Translation

6.8   Human translation is the traditional process requiring a translator to sit down with the text of a document and convert that document to another language. In this process, most translators will at least occasionally require printed or automated reference materials, and they may need to consult with other

translators. Most translators still rely primarily on printed and microfiche dictionaries and glossaries; however, more and more automated glossaries and other translation aids are being marketed for use with small computers. Several very sophisticated initiatives in automated glossaries exist in Europe and Canada, and increasing interest in such translation aids is being shown in the U.S.

Machine-Assisted Translation

6.9 Machine-assisted translation (MAT) involves the use of a computer to make the initial translation of a document from one language to another before it is "post-edited" by a human translator. The original text of the document is converted to machine-readable form and fed into a computer. Using very sophisticated programs that analyze the syntax and the vocabulary used in the original language, the computer produces an English (or other) language version that may be displayed on a terminal video display screen or printed out. The computer must not only "decode" the original language; it must also "encode" the material in something close to understandable English.

6.10 The language decoding and encoding processes are extremely complex, and it is impossible to program a computer to recognize and process the virtually infinite variations that may occur in a language. For these reasons the product of machine-translation usually contains a number of mistranslations, awkward statements, and inaccuracies. In MAT a human translator reviews the computer output, normally at a display terminal, and corrects the errors the output contains. This process requires less "human" time than does the production of an entirely human translation.

Machine Translation

6.11 Machine translation (MT) uses the same computer resources as MAT. In MT, however, the "raw" output of the computer becomes the product. The computer printout, of course, may have to be merged with copies of the illustrations, if any, that appear in the original document.

6.12 MT products vary in readability and usefulness, depending on several factors to include the adequacy of the computerized glossaries available for the subject discussed in the original document, the complexity of the syntax of the languages involved, and the degree of development of the software prepared to manage the vocabulary and syntax. Assessments of the usefulness of unedited machine translations vary widely, depending on the point of view of the critic. It appears fair to say that most machine translations will at least provide the reader with a general idea of the content of the document. This may be enough for the reader to decide whether the document's subject matter warrants the cost of having a human translator review and refine the translation.

6.13 Several countries are making significant efforts to develop MT for various language pairs. Most efforts seem to be directed toward the translating of S&T material in recognition of the immense task that international transfer of technology entails. In the U.S. Government, there is currently significant interest in Russian/English, French/English, German/English, Spanish/English, and Japanese/English MT. The status of MT is described in more detail in Section VII of this report.

Measurement of Translation Work

6.14 The product of the translating process is usually measured in the number of words translated, the basic unit being a thousand words in the target language. Knowledgeable experts estimate that a professional translator can produce from 1,000 to 4,000 words per day, depending on the language and the subject matter. Costs are also expressed in thousands of words. Translating costs as paid by U.S. Government agencies may vary from under $20 per 1,000 words to over $70 per 1,000 words. Costs vary with the language to be translated, the subject matter of the document, the organization paying the cost, and the availability of translators. Translators with technical knowledge in certain S&T areas and in less common languages command higher reimbursement. Translation costs paid by the U.S. Government are low compared to those paid by some other governments or private industry, where fees of $100 per 1,000 words or higher are common. The government's ability to pay affects the quality of translation support it receives, both from government employees and contractors. Economizing on translation fees may result in inaccurate and misleading translations. For important documents, such as international agreements or standards and documents containing valuable technology, unwillingness to pay competitive rates may be very expensive in the long run.

QUALIFICATIONS FOR S&T TRANSLATORS

6.15 To produce quality work for Army R&D activities, a translator should have several qualifications.

    a. **Command of English.** No matter how proficient the translator is in a foreign language, his or her value

is limited if he or she cannot write organized, fluent, and correct English. The S&T translator should also have an understanding of the English technical vocabulary for the S&T and military areas of interest represented in the documents to be translated.

b. **Technical Knowledge.** The more the translator understands the subject technology the more accurate and useful the translation will be to the U.S. scientist or engineer who reads it.

c. **Command of Foreign Language and Culture.** The translator must have excellent reading comprehension of the foreign language concerned and an understanding of the cultural effects on uses of the language.

d. **Professional Pride in the Product.** It is most important that the translator be willing to take the time to prepare the most accurate translation possible and to stand behind the quality of his or her work. Given the low level of translation quality control available through most of the Government, the translator must set and adhere to high personal standards.

e. **Eligibility for Security Clearance.** Some of the work for the Army R&D Community will involve classified information. A translator who can be cleared may be assigned a greater variety of work than an uncleared individual.

SUPPORT RESOURCES NEEDED BY S&T TRANSLATORS

6.16 Translators, especially those working in specialized fields of interest, should not operate in a vacuum. They need access to various resources if they are to be able to produce the best possible work. These resources include general and technical dictionaries and glossaries, contact with other translators for their languages and S&T areas, and contact with scientists and engineers in their S&T areas.

    a. **Dictionaries and Glossaries.** Translators need adequate reference materials. Although excellent general dictionaries are available for most languages of S&T interest, the availability of comprehensive technical glossaries is much less satisfactory. The result is lack of standardization of technical terminology. Two translators working independently on the same document may produce quite different translations if they do not have the same reference materials.

    b. **Contact with Other Translators.** S&T translators need the synergistic effect of working with others in the same field. Working in isolation may tend to reduce the quality of a translator's work as he or she is forced to make independent decisions about use of terms, context, and conventions.

    c. **Contact with S&T Experts.** Most translators are not experts in the S&T work they translate. If they were, they might be scientists or engineers instead of translators. It is very helpful to a translator if he or she can consult with a technical expert to ensure that the translation is accurate and uses English

terms familiar to the customer. It would be very
helpful to most translators if they could have contact
with technical experts of the foreign country con-
cerned to explain usages and concepts as they are ex-
pressed in the foreign language.

TRAINING FOR S&T TRANSLATORS

6.17 A person with reasonable speaking and/or reading compe-
tence in a foreign language may not have the qualifications and
knowledge required to be an effective S&T translator. To be a
good S&T translator, an individual needs both academic or on-
the-job training and experience. Unfortunately for the Army,
the language courses offered in most of the U.S. colleges and
universities and at the Defense Language Institute Foreign
Language Center (DLIFLC) do not produce qualified S&T
translators.

6.18 The ATA Translation Studies Committee conducted a survey
during 1981 through 1983 of all U.S. colleges and universities
known to have translating or interpreting courses. Of the some
240 institutions that responded, very few provide training in
non-literary translation oriented toward technical areas. The
output of these schools is further narrowed by the large
emphasis on several mainstream languages and the limited number
that train students in other technically important languages
such as Swedish, Japanese, Chinese, and the Eastern European
languages.

6.19 The DLIFLC trains its officer and enlisted students to
have basic conversational and reading fluency in a wide variety

of languages; it does not attempt to produce S&T transla-
tors. 25/ The number of potentially capable technical transla-
tors in the active or reserve Army is further narrowed by the
general lack of opportunity for Army linguists to develop S&T
translation skills. Most units or activities that have Army
linguists do not provide them with opportunity to develop S&T
translation skill. Both the FSTC and RSIC translation branch
chiefs have note that when they have military people assigned to
their offices, it takes at least a year for the translator to
become productive. 26/ The new personnel need to learn both
language and technology. Probably the most capable military S&T
translators are employed at the National Security Agency, which
provides fairly extensive training to its linguists. Even at
NSA, only a few military personnel are used primarily as S&T
translators.

6.20 Assuming that an individual has a basic fluency in a
language and wants to become an S&T translator, the initiative
to learn technologies and develop specialized capabilities
appears to rest largely with the individual and the relatively
small number of Government people available to bring along new
translators in the S&T fields. For some people, however, who
must keep producing their 2,000 or 3,000 words per day to make a
modest living, taking time out to do research and develop their
expertise in tecnical specialties may seems a luxury.

25/ References for Army language training include AR 350-20,
Management of the Defense Language Program (currently in
revision, expected to be published in early 1986), and AR
611-6, Army Linguist Management, 16 October 1985.

26/ The FSTC Foreign Language Research Branch has no uniformed
Army translators authorized but has provided on-the-job
training to enlisted linguists from Active Army units for
periods up to a year. The RSIC Translation Branch has four
positions for active Army translators. The RSIC positions
are the only known personnel spaces for active duty S&T
translators in the Army R&D Community.

6.21 It would appear that the U.S. Government would have an interest in helping to develop qualified S&T translators, but the trend for the past decade has been for the Government to rely more and more on the use of translation contractors. This shifts the responsibility for training off the Government's shoulders, but it also suggests that the Government should be able to assure that the translations it is getting are of adequate quality. The capability for translation quality control exists only to a very limited extent, given the limited number of government employees qualified to review contract translations and the very large amount of translating that must be done.

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VII. TRANSLATION SERVICES, ORGANIZATIONS, AND PROCEDURES

GENERAL

7.1   This section contains background information about trans-
lating services, organizations and procedures. It provides a
frame of reference for subsequent discussion of problem areas in
translating support for Army R&D activities. The first subsec-
tion describes the types of services that organizations involved
with translating and translations provide. The second subsec-
tion identifies and discusses Government organizations that pro-
vide these services. (One private section organization of par-
ticular importance is included. The scope of the study did not
permit detailed investigation of private sector information
services and translating contractors.) The third subsection
describes the procedures used by Army R&D Community technical
libraries and FIOs to obtain copies of translations and request
translating services.

7.2   The information in this section has been derived from a
questionnaire survey of the Army R&D technical libraries and
FIOs, interview of officials of most of the organizations de-
scribed, and from the publication DIRECTORY: Information Re-
sources Based on Foreign Media and Publications, prepared for
the Director of Central Intelligence by the HUMINT Committee of
the Intelligence Community Staff. [27]/

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[27]/ Director of Central Intelligence, DIRECTORY: Information
Resources Based on Foreign Media and Publications, DCIC
10006-85, July 1985, For Official Use Only, with Annex, DCIC
10007-85, July 1985, SECRET. Although this directory was
prepared to meet intelligence analyst interest in foreign,
open source information, it is available to U.S. Government
organizations.

TYPES OF TRANSLATION SERVICES

7.3   Organizations involved with translating and translations provide one or more of the following services:

- Identifying, locating, and obtaining foreign language documents

- Processing of requests for translations

- Producing translations

- Registering translations

- Storing translations

- Distributing translations.

Identifying, Locating, and Obtaining Foreign Language Documents

7.4   These services are the conventional research and document handling functions of the library. Although many scientists and engineers obtain foreign language documents from their own personal sources, library information specialists often find references to foreign literature in the course of meeting their patrons' requests for information. Such references may be to documents held by the library or which are obtainable from other libraries and information services.

Processing Requests for Translation

7.5   Once a foreign language document has been obtained, two decisions should be made before a new translation is initiated.

First, it must be decided that the document merits translation. Second, it should be determined that a new translation is required. Once the decision has been made to request a new translation, it may be obtained from supporting Government agencies or by contracting directly with a commercial organization.

Preparing Translations

7.6   Organizations that prepare translations do so on either an initiative or a demand basis. Initiative translating is based on general requirements inherent in the mission and functions of the translating organization. Demand translating is done to meet a specific request from a customer.

Registering Translations

7.7   This service involves documenting the existence of a translation of a foreign language document and keeping this information available to those who need it. This is usually done by entering data such as document title, author, date of publication, publisher, etc. in an automated data base. Organizations that maintain translation registries do not always retain copies of the actual translation.

Storing Translations

7.8   This service involves storing the full text of a translation in a central repository available to a user population. Translations are usually stored as paper or microfiche documents.

Distributing Translations

7.9   Distribution of translations to potential users may be limited or widespread, depending on the policies of the organization that prepared or initiated the translation. Some translations are disseminated widely throughout the Government; others are sent only to the individual who requested the work.

TRANSLATION ORGANIZATIONS

R&D Libraries and FIOs

7.10   Libraries and FIOs help scientists and engineers to identify, locate, and obtain documented technical information to include literature in foreign languages. Of the organizations contacted during this study, 23 of 34 libraries and 18 of 22 FIOs process requests for translations on behalf of their patrons (see Table 4.2 on page 37).

7.11   Libraries and FIOs distribute new translations to the patrons who request them, but not all libraries and FIOs store copies of the translations or make secondary distribution. A reason that some FIOs do not store copies of translations or provide copies to their local technical library is that most of the new translations received by the FIOs are prepared by FSTC. FSTC automatically provides copies of all open source translations to the DTIC Technical Reports Collection, where they can be located and retrieved by DTIC users. It was found that the storing and secondary distribution of new translations by technical libraries was less thorough. Of the 23 libraries that contract for translations, only 13 retain copies in their files, only 4 send copies to DTIC, and only 2 register translations

with the Consolidated Translation Survey (CTS) (see paragraph
7.45). This means that many translations contracted for by
libraries are not available to anyone but the original requestor
of the translation. Some libraries reported that they did not
distribute copies to DTIC because they were concerned about
copyright limitations and some reported that they had never been
required to send copies to DTIC. These problems are discussed
further in Section IX.

Army Foreign Science and Technology Center

7.12 Two branches of the FSTC Information Services Division
provide the translation support services listed in paragraph
7.3, the Library Services Branch and the Foreign Language Re-
search Branch. These branches exist primarily to support FSTC
intelligence analysts, but they also support external organiza-
tions. The FIOs in the Army Materiel Command R&D organizations
are major outside customers.

7.13 **Library Services Branch**. This FSTC branch stores many of
the translations produced by the military S&T intelligence
agencies and the National Security Agency and serves as a
registry for these documents. The FSTC Library staff use
external translation registries to identify existing transla-
tions and frequently obtain copies from other libraries and in-
formation services. If the FSTC library has a translation in
its own holdings, it may be able to respond to a request for it
in 1 or 2 days, depending on its current workload. If the
library must obtain the translation from an external source, the
response time may typically be from 2 to 6 weeks. If the
library cannot locate an existing translation for a document, it
will turn the document over to the Foreign Language Research
Branch for translating.

7.14 **Foreign Language Research Branch**. This branch has positions for 10 full-time, in-house civilian translators. The current staff of 9 translators prepares translations in Russian, German, French, Chinese, Arabic, and a few other languages. The FSTC translators are used to meet high priority and/or highly classified translating requirements from FSTC analysts and to spot check translations prepared by FSTC contractors. About 90% of the annual output of the Foreign Language Research Branch is prepared by contractors. Some requests for translations that cannot otherwise be filled are sent to the Joint Publications Research Service for translation (see paragraph 7.39). Normally, about 20% of the branch's requests for translations are from outside agencies. Of these external requests, about 50 to 60% (1.5 million words per year) are from Army R&D agencies.

7.15 Prior to 1 October 1985, FSTC was an AMC organization. On 1 October 1985, FSTC became part of the Army Intelligence Agency (AIA). Now that FSTC is an AIA resource, FSTC will assume the translating load previously carried by the Army Intelligence and Threat Analysis Center (ITAC), which is also part of AIA. FSTC also expects to provide more translating support to HQDA, HQTRADOC, and other external organizations. [28/] To meet this increased workload, the Foreign Language Research Branch budget has been increased, but as of January 1986 the number of in-house translator positions remains at 10. It appears that in the future non-AIA customers will be required to reimburse FSTC for the cost of translations.

[28/] FSTC statistics for October-December 1985 confirm this expectation. A significant increase occurred in the number of translation requests from AIA and HQDA.

7.16 FSTC translations are registered with the Consolidated Translation Survey (CTS) and the CIRC Translation Index. Standard distribution for FSTC translations includes libraries at CIA, DIA, MSIC, NISC, FTD, and DTIC. FSTC distributes its own and FTD translations to various Army R&D laboratories based on the laboratories' statements of interest.

7.17 The Foreign Language Research Branch produces cover-to-cover translations of four Soviet periodicals, of which <u>Technology and Armament</u> is the most relevant to the R&D Community.

The Redstone Scientific Information Center

7.18 The RSIC, which is part of the Army Missile Laboratory (AML), supports the AML, NASA, and project managers at Redstone Arsenal, Alabama. RSIC is unique in the Army R&D Community in that it is the only R&D technical library that has its own translation branch. The translation branch has 2 civilian and 4 military translators. The four military translator positions at RSIC are the only known active duty full-time S&T translator spaces in the Army. The RSIC Translation Branch translates German, French, and Russian documents in response to requirements from AML, PM, and NASA scientists and engineers. The translation branch does most of its work (1.2 million words in CY1985) in-house; but does send some of its work to JPRS (about 274,000 words in CY1985). RSIC does not produce any regular publications containing translations of foreign language periodicals. Translations prepared by the RSIC Translation Branch are retained in the RSIC document collection; however, as of October 1985, RSIC was not submitting its translations to the DTIC technical reports collection, nor were its translations registered with CTS or CIRC.

7.19 Some of the AMC project managers at Redstone are involved in international efforts and occasionally request the RSIC Translation Branch to translate memoranda of understanding, vu-graphs, and briefings from English to German as well as from German to English.

7.20 There are two organizations at Redstone in addition to RSIC that process requests for translating support. These are the MICOM FIO and the MSIC library, both of which forward requests for translating support to FSTC. The FIO serves the project managers and AML; the MSIC library serves primarily its own intelligence analysts.

The Air Force Systems Command Foreign Technology Division

7.21 FTD is the Air Force equivalent of FSTC. FTD analyzes foreign S&T information from both intelligence and open sources and produces technical intelligence to meet Air Force requirements. To help support this mission, the FTD Directorate of Data Services includes an information services division and a translation division that process requests for translation, prepare translations, and distribute copies of FTD-produced translations. FTD generates about 18 million words of translation per year. Copies of all FTD translations are registered with the CTS and sent to the DTIC Technical Reports Collection. All FTD translations are referenced in the CIRC on-line translation index (XLAX). FTD prepares a daily compendium of Soviet newspaper articles called the Soviet News Abstracts Publication (SNAP) that includes frequent references to Soviet S&T and R&D activities and personalities.

7.22 FTD is an important translation resource for the Army as well as the Air Force. FTD is the executive agent for the DOD S&T Intelligence Information Services Program (STIISP) under

tasking mangaged by the DIA S&T Intelligence Directorate. FTD operates three translation services of interest to the Army: (1) the CIRC Open Source Data Base, (2) the CIRC Translation Index (XLAX), and (3) a machine translation system. Each of these activities is described in the following paragraphs.

7.23 **CIRC Open Source Data Base**. The CIRC Open Source Data Base contains about 5 million references to three broad categories of foreign open literature: civil and military S&T, with geographic coverage of the USSR, Eastern Europe, and China; military equipment information with worldwide coverage; and R&D management information from the USSR and China. About 1,400 periodicals are regularly screened for content pertinent to STIISP requirements. Processing includes the preparation of bibliographic references and abstracts for entry in CIRC; it does not include translation of the text of referenced articles and books. About 300,000 references per year are added to the CIRC Open Source Data Base. The data base may be accessed and searched by users who have dedicated or dial-up terminals for the CIRC On-Line System. (Fourteen AMC FIOs have CIRC terminals, as do FSTC, MSIC, and AFMIC.) CIRC informs those users who have submitted standing requests (CIRC profiles) for information of new inputs of interest each time the data base is updated. The originals of many documents referenced in CIRC are stored at the Foreign Science Library in Columbus, Ohio.

7.24 **CIRC Translations Index**. XLAX identifies translations into English of S&T information in support of DoD S&T libraries. It contains worldwide geographic coverage. Approximately 400,000 references to translations are on-line in XLAX; about 1,400 are added each month. XLAX listings include identification of the original language source, the author(s), the producer of the translation, and the producer's identification of

the translation. No abstract is provided nor is text included. XLAX is available to users through their CIRC remote terminals. The data base may be searched using the original language reference and author(s) names, transliterated. Successful retrieval will display on-line the producing agency and the producer's identification of the translation. FTD is incorporating information from the CTS Data Base in XLAX, so CTS information will be available to CIRC users in 1986.

7.25 **Machine Translation.** The enormous amount of S&T information published in foreign languages has spurred DoD and Intelligence Community interest in use of computers to assist in translating this information into English. The potential translating load is far too great for the available supply of human translators. In view of this, DoD has chartered FTD to develop and operate a machine translation (MT) system to use for translating long documents. At present, FTD machine translation is operational for Russian and French, and a German system is in development. In the past year the Intelligence Community Staff has directed FTD to develop of a Japanese MT capability.[29/]

7.26 The most time-consuming part of MT is converting the hardcopy text to machine-readable form. There are two methods in current use for doing this. The first is having data entry personnel at computer terminals key the foreign language characters

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[29/] Interesting background on the importance of Japanese technology and U.S. efforts in machine translation of Japanese can be found in the testimony of George W. Rogers, Vice-Chairman, Information Handling Committee, Intelligence Community Staff, and others before the House of Representatives Committee on Science and Technology on June 26 and 27, 1986.

into the on-line system. At present FTD uses about 15 full-time
civilian employees for this work. This work requires the data
entry person to learn the foreign language characters (for
example, the Russian Cyrillic alphabet) and become proficient
with the use of the terminal keyboard, which is quite different
than an English language keyboard. Once these skills are
developed, the rote keying of foreign language characters into
the computer becomes very tedious. The second method of con-
verting hardcopy text to machine readable form is through use of
an optical character reader (OCR). The OCR is most useful for
long documents that have good quality, consistent characters in
their text. When beginning a new document, the OCR operator
must ensure that the OCR is properly reading the text, which it
scans line by line. Once the OCR has been adjusted to read the
characters accurately, the source document is fed through the
OCR page by page with the OCR operator standing by to make cor-
rections when errors occur. FTD has found that the OCR is
useful for scanning about one-third of the Russian language
documents sent to FTD for translating. The OCR is not efficient
for short documents (the OCR must be adjusted for each one) and
the quality of Russian printing is often too inconsistent to
permit use of the OCR.

7.28 Once the text of a document has been converted to machine-
readable form, MT translation becomes very effective. The FTD
computer can translate about 10,000 sentences in 45 minutes
(clock time). The machine output is reviewed on-line by FTD
translators who correct errors in the raw machine output. The
translated text is then printed out. The figures, tables, and
illustrations from the original document are copied and "cut and
pasted" into the layout for reproduction of the translations,
and the translation is reproduced.

7.29 FTD is willing to provide MT support to the Army; however, FTD does not have adequate resources to convert the text of hardcopy Army documents to machine-readable form for translation, and the Army must supply machine-readable text to FTD. So far, the Army has not come up with a means to do this although FSTC would like to use FTD MT to augment its translation resources. If this is arranged, the Army would be able to provide funds for the FTD contractor to convert the text of Army foreign language documents to machine-readable form.

7.30 There is considerable discussion in the Intelligence and R&D Communities about the value of machine-produced translations. Some people criticize the quality of machine translations, noting that the content is often awkwardly stated and that some words and phrases may not be translated accurately. (These criticisms are especially applicable to unedited machine translations.) Other people note the immense volume of S&T literature to be translated and believe that a machine translation is better than no translation, even if the machine translation serves only to alert the reader to the general content of the translated document.

Naval Intelligence Support Center

7.31 The NISC Translation Branch produces approximately 7 million words per year of S&T translations for the Navy. These translations are registered with the CTS and sent to DTIC. About 25% of the translations are produced by the in-house staff of 15 translators; the rest are prepared by contractors. The NISC translation branch has in-house capability in 17 languages. NISC produces five monthly publications based on translation of foreign literature: NAVSCAN (Foreign Naval Literature Survey), WESTFLEETS (Western Naval Digest), EASTFLEETS (Eastern Naval

Digest), SOVIET NAVAL DIGEST, and SOVIET SHIPBUILDING. These
publications are for Government use only. Some of the Army R&D
laboratories receive one or more of the NISC publications.

Armed Forced Medical Intelligence Center

7.32 AFMIC, formerly the Army Medical Intelligence Information
Agency (MIIA), [30]/ analyzes all-source information about foreign
S&T related to medical interest. AFMIC does not maintain an in-
house translation staff but does contract for about 600 transla-
tions per year of unclassified medical journal articles through
the HQAMRDC Acquisition Division (contracting office). FSTC
translates AFMIC classified documents at direct cost. These
translations are requested by AFMIC analysts, who frequently are
responding to requests from the medical laboratories and
institutes. AFMIC translations are registered with CTS and the
CIRC Translation Index and copies are sent to DTIC.

Defense Technical Information Center

7.33 The DTIC Technical Reports Data Base and microfiche col-
lection (previously introduced in paragraph 4.14) are a very
important registry and repository of translated S&T literature.
As of October 1985 over 53,000 translations were referenced in
the Technical Reports Data Base. Full text copies of these
translations are included in the technical reports microfiche
collection. The DTIC Technical Reports Data Base and microfiche
collection are the only information resources commonly available

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[30]/ AFMIC is now a DOD organization; however, its collocation
with HQAMRDC and two Army medical laboratories at Fort
Detrick does facilitate its responsiveness to AMRDC requests
for analytical support.

throughout the Army R&D Community that provide "one-stop" shopping for translations; that is, the existence of the translation can be ascertained and a copy can be obtained at the same location.

7.34 The DTIC Technical Reports Data Base is also quite valuable because translations are indexed and abstracted in the same manner as other technical reports. While other translation registries, such as XLAX and CTS, provide only very limited information about a document (author, date of publication, source journal or title, etc.) and can only be retrieved by that information, a DTIC technical report citation includes much more information about the referenced document to include descriptive terms and an abstract. This means that a researcher looking for particular technical information is quite likely to be able to find pertinent translations based on their substantive content.

7.35 Many organizations submit translations to DTIC. A sample of the latest 1,000 translations submitted to DTIC prior to 5 July 1985 showed that these documents had come from about 65 different sources. By far the largest contributors of translations, however, are the military S&T intelligence agencies, FTD, FSTC, NISC, and AFMIC. Of the sample of 1,000 translations, 707 had been submitted by these four agencies. Other information obtained from DTIC suggests that 80 to 90% of the total number of translations in the DTIC Technical Reports Collection were provided by the S&T intelligence agencies. [31]

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[31] More information on DTIC can be found in DTIC, Handbook for Users of the Defense Technical Information Center, DLAH 4185.8, Cameron Station, Alexandria, Virginia 22304-6145, December 1985, UNCLASSIFIED.

Defense Mapping Agency Aerospace Center

7.36 The Technical Library of the DMAAC has a 5-member transla-
tion section, all civilian, that supports DMAAC's requirements
for translation of foreign language documents. The five trans-
lators provide capability in several languages. About 25 to 30%
of the translating work sent to the section is passed on to con-
tractors. DMAAC is a user of CTS services and reports its
translations to the CTS for registry. It also supplies copies
of its work to DTIC.

National Security Agency

7.37 NSA maintains a small translations branch that prepares
translations of S&T literature in selected fields of interest.
The lists of NSA translations, classified CONFIDENTIAL, are
supplied to the military S&T intelligence agencies, which may
release NSA translations to R&D agencies with the prior approval
of NSA. FSTC routinely checks NSA translation lists when
looking for existing translations and sometimes provides NSA
translations to Army R&D FIOs.

Foreign Broadcast Information Service

7.38 The FBIS, a part of the CIA, serves the CIA and the entire
Government by monitoring foreign radio and TV broadcasts and
publications for items of political, economic, social, military,
and S&T interest. The FBIS translates and publishes abstracts,
extracts, and full text renditions of selected broadcasts and
articles. Broadcasts are reported in the FBIS Daily Report,
which is issued Monday through Friday in eight geographical
volumes, both in paper and microfiche form. Although broadcasts
are occasionally useful for their S&T content, more useful tech-
nical information is obtained through review, translation, and

publication of articles by the Joint Publications Research
Service (JPRS), a subordinate element of the FBIS. The FBIS and
JPRS publications are distributed throughout the Government.
FBIS also maintains the Consolidated Translation Survey, a
translation registry, and provides some support and guidance for
both Government and contract translators. The following para-
graphs discuss the JPRS, CTS, and FBIS translating support acti-
vities in more detail.

7.39 **U.S. Joint Publications Research Service.** JPRS, a sub-
ordinate element of the FBIS, produces both initiative and
demand translations. About 95% of the JPRS work is done in re-
sponse to requirements from FBIS analysts; the other 5% is done
on a reimbursable basis for external agencies. Three Army
agencies known to request JPRS for translating assistance are
the FSTC Foreign Language Research Branch, the RSIC Translation
Branch, and the Waterways Experiment Station (WES).

7.40 JPRS translations are published in a series of 53 serial
reports, which appear at intervals from almost daily to bi-
monthly, depending on the subject. Table 7.1 lists the titles
of the JPRS serial publications. Of these publications 20 are
directly concerned with S&T. S&T summaries are published for
China, Japan, Eastern Europe, Western Europe, and the Soviet
Union. The list in Table 7.1 reflects the JPRS emphasis on
Soviet technology. The serial reports are distributed to DoD
organizations by DIA. There is no automated index to the con-
tent of the JPRS Serial Reports, although work is in progress in
this area. A private company, Bell and Howell, publishes
TRANSDEX, which is a "key word" catalog to the JPRS reports.

TABLE 7.1

LIST OF JPRS SERIAL PUBLICATIONS

WORLDWIDE
Worldwide Report: Epidemiology
Worldwide Report: Narcotics and Dangerous Drugs
Worldwide Report: Nuclear Development and Proliferation
Worldwide Report: Telecommunications Policy, Research and
  Development
Worldwide Report: Terrorism

AFRICA
SubSaharan Africa Report

ASIA
Japan Report
Japan Report: Science and Technology
Korean Affairs Report
Mongolia Report
Southeast Asia Report

CHINA
China Report: Agriculture
China Report: Economic Affairs
China Report: Political, Sociological and Military Affairs
China Report: Plant and Installation Data
China Report: RED FLAG
China Report: Science and Technology

EASTERN EUROPE
East Europe Report: Economic and Industrial Affairs
East Europe Report: Political, Sociological and Military Affairs
East Europe Report: Science and Technology

LATIN AMERICA
Latin America Report

NEAR EAST, SOUTH ASIA
Near East/South Asia Report

USSR
USSR Report: Military Affairs
USSR Report: Political and Sociological Affairs
USSR Report: Problems of the Far East
USSR Report: Sociological Studies
USSR Report: Translations from KOMMUNIST
USSR Report: USA: Economics, Politics, Ideology
USSR Report: Agriculture
USSR Report: Construction and Related Industries
USSR Report: Consumer Goods and Domestic Trade
USSR Report: Economic Affairs
USSR Report: Energy
USSR Report: Human Resources
USSR Report: International Economic Relations
USSR Report: Machine Tools and Metalworking Equipment
USSR Report: Transportation
USSR Report: World Economy and International Relations
USSR Report: Chemistry
USSR Report: Cybernetics, Computers and Automation
  Technology
USSR Report: Earth Sciences
USSR Report: Electronics and Electrical Engineering
USSR Report: Engineering and Equipment
USSR Report: Life Sciences: Biomedical and Behavioral Sciences
USSR Report: Materials Science and Metallurgy
USSR Report: Meteorology and Hydrology
USSR Report: Physics and Mathematics
USSR Report: Science and Technology Policy
USSR Report: Space
USSR Report: Space Biology and Aerospace Medicine

WESTERN EUROPE
West Europe Report
West Europe Report: Science and Technology

FOREIGN PRESS NOTE

95

7.41 As of March 1985 the following Army R&D organizations were on the distribution list for one or more of the JPRS serial publications: AVSCOM, ARRADCOM, BRL, CECOM, CRDC, ERADCOM (now LABCOM), NRDL, SWL, VAL, Dugway PG, Electronic PG, and Yuma PG. FSTC and MSIC receive most of the serial titles.

7.42 The JPRS prepares translations for requestors such as FSTC, RSIC, and WES on an "as available" basis. JPRS has occasionally been unable to provide translating support requested by FSTC. This has usually been for high technology documents in languages such as Chinese and Russian for which qualified S&T translators are in short supply. In CY1985, FSTC requested JPRS to translate about 950,000 words of foreign literature; JPRS actually completed about 700,000 words of translation for FSTC in that year. RSIC's requests for JPRS support in CY1985 totalled about 274,000 words.

7.43 The JPRS has a full-time staff of about 200 linguists who are primarily concerned with the supervision and quality control of work sent out to approximately 1,300 freelance translators who prepare translations for JPRS. Each freelance translator is on an individual contract with JPRS, which permits JPRS to monitor the efficiency and quality of each translator. The JPRS in-house and contract staff prepares translations in about 80 languages. The Chief of JPRS reports that it is particularly difficult to find qualified S&T translators for Chinese, Japanese, and Russian.

7.44 In addition to preparing translations, JPRS also produces reference aids for translators. These reference aids include dictionaries and glossaries for specific areas of interest, lists of abbreviations and acronyms, guides to place names, and directories of publications. JPRS also distributes a handbook for contract translators.

7.45 **Consolidated Translation Survey.** The CTS maintained by FBIS is an index to documents that have been translated into English from foreign publications. Its automated files are a systematic and comprehensive means available throughout the U.S. Government to ensure that translations done by one agency are not duplicated by another at a later date. The CTS provides bibliographic citations; it does not make the actual translation available; rather, it refers the requestor to the office that produced the translation. In 1985 FBIS and FTD arranged to have the CTS operated on-line in CIRC as a part of the CIRC Translation Index. This capability should be operational in 1986 and will permit Army R&D agencies with CIRC terminals to have on-line access to the CTS records.

7.46 The CTS files date from 1949 and contain more than 2 million entries. Only unclassified translations are referenced. Documents are indexed by the author's or editor's name and the source (the transliterated title of the original document). The CTS file contains references to translations produced by more than 60 U.S. Government organizations, commercial translating houses, and Australian, British, and Canadian governmental or quasi-governmental agencies. Agencies sponsoring translations are requested to check with CTS before beginning a translation to determine if there is an existing translation, and to notify CTS when a translation is in-process and when a translation has been completed.

7.47 **Support to Translators.** The FBIS is assuming a more central role in the U.S. Intelligence Community effort to use foreign literature more effectively by improving translating services. Part of this effort includes making reference materials available to translators. FBIS has long been involved with production of glossaries and dictionaries. A new FBIS

initiative is the publication of a terminology newsletter, No
Uncertain Terms, for U.S. Government translators and con-
tractors. This newsletter contains short articles about termi-
nology in the many languages of interest to the FBIS and advises
translators of new reference aids that FBIS is publishing.

National Technical Information Service

7.48 The NTIS, an element of the U.S. Department of Commerce,
makes technical information produced in the U.S. and in many
foreign countries available to the U.S. Government and public.
NTIS acquires generally unpublished foreign technology and tech-
nical reports, makes the acquisition of such documents known in
its weekly Foreign Technology Abstract Newsletter, and sells
copies of reports to NTIS customers. The Foreign Technology
Abstract Newsletter provides English-language bibliographic in-
formation and abstracts for each NTIS foreign-language acquisi-
tion. NTIS normally does not have stock English language trans-
lations. Foreign technical reports may also be searched for and
ordered from the NTIS bibliographic data base which is available
on-line through several commercial information services. The
NTIS data base contains over 400,000 refrences to foreign tech-
nology reports as well as references to domestic S&T literature.

7.49 NTIS hopes by April 1986 to establish an on-line connec-
tion to the data base of the Japan Information Center of Science
and Technology (JICST) and to be able to provide English cita-
tions for the entries in this data base. This work is part of
the on-going NTIS International Technology Acquisition Program,
through which NTIS regularly acquires S&T documents from over 40
countries.

7.50 NTIS maintains The World Transindex Data Base. This data
base contains 140,000 citations to translations from East

European and Asiatic languages into Western languages from 1978 to the present. Another NTIS resource for translators is the Multilingual Aeronautical Dictionary that contains aeronautical terms in 10 languages.

7.51 NTIS has sponsored a few translations but does not have a charter to be a translating agency. NTIS is, however, quite interested in the use of machine translation and is involved with other U.S. Government agencies in exploring its applications.

Library of Congress, Federal Research Division

7.52 The Federal Research Division (FRD) performs foreign language and international research and analysis for Executive Branch departments and agencies, to include the military services, primarily through exploitation of the Library of Congress collections. FRD customers transfer funds to support work and task FRD annually to provide reference works and narrative studies. FRD produces abstracts, extracts, and full translations of documents in over 30 languages, with the most common languages being Russian, the East European languages, and Chinese. FRD translation work is registered with the CTS.

Department of State Office of Language Services

7.53 Although the DOS Office of Language Services is primarily used by the Army for interpreting service (see Section V, paragraphs 5.16 through 5.18), it also provides translating services. It has about 25 in-house translators and a staff of 200 contracted freelance translators. The DOS will provide translating service for the Army on a reimbursable basis; however, the Army has made very little use of DOS for translating.

99

The principal Army user has been the Office of the Secretary of the Army, which occasionally requests that speeches and correspondence be translated.

Department of Energy Office of Scientific and Technical Information

7.54 The DOE Office of Scientific and Technical Information (OSTI) operates and maintains the Energy Data Base (EDB). This data base contains all DOE technical reports and worldwide energy-related S&T information, to include several hundred Soviet energy and engineering journals. It is a reference data base that contains bibliographic information and abstracts for cited publications. The EDB is available on-line through commercial information systems and the DOE/RECON System. Magnetic tape copies of the EDB can be leased from NTIS. OSTI also manage translations central for DOE components and contractors, obtaining translations of foreign language documents on request. Completed translations are registered with the National Translations Center (see paragraph 7.57).

NASA S&T Information Branch

7.55 The NASA S&T Information Branch arranges for contract translation of about 6 million words per year of Russian text and also some German, French, Japanese, and other language materials. Items are selected by NASA researchers. Translations are registered with CTS when completed. A copy of each completed translation is kept at the NASA S&T Information Facility. Translations are entered in the NASA data base as technical memoranda, although most translations are not formally published. Government agencies may obtain on-line access to the

NASA data base through either dedicated terminals or dial-up terminals. Four of the Army's aviation R&T activities collocated with NASA space centers have local access to the NASA data base.

National Institutes of Health

7.56 The NIH Library has a small translation unit with capability in six languages (including Russian, German, French, Serbo-Croatian, Spanish, and Italian), and it has additional work done by contractors. The Translation Unit produces about 650,000 words of translation per year in-house and contracts for another 120,000 words. Completed NIH translations are registered with the National Translations Center.

National Translations Center

7.57 The NTC is a private, not-for-profit organization affiliated with the John Crerar Library at the University of Chicago. It serves as a registry and repository for English translations of foreign S&T literature accomplished in the U.S. or other English-speaking countries. The NTC has information on over 1 million translations and has accumulated copies of over 350,000 translations. The NTC's principal product is the Translations Register-Index, a monthly publication announcing new translations accessioned to the NTC data base. The NTC also has a cumulative index of translations for 1953-1966 and a just-completed cumulative index for 1967-1984. On-line access to the 1967-1984 data base is available through DOE/RECON. Off-line access is available by contacting the NTC directly for searches or specific publications.

7.58 Contributors to the NTC translation collection include a variety of U.S. Government organizations; those of particular interest from the Army R&D point of view are NASA, DOE, NIH, and the U.S. Army CRDC.

TRANSLATION PROCEDURES

7.59 This subsection describes procedures used by Army R&D organizations for the procurement and distribution of translations of foreign language S&T literature. Topics covered include sources of foreign language documents, checking for existing translations, use of supporting Government resources, contracting for translations, translating quality control, disposition of translations, and use of Government publications containing translations.

Obtaining Foreign Language Documents

7.60 Army scientists and engineers obtain foreign language documents and references to them from a variety of sources. Very often the documents or references were obtained for the patron by his technical library, either from the library's own holdings or from information services such as the interlibrary loan system or automated systems such as DIALOG, ORBIT, and BRS. Other sources of documents brought to libraries and FIOs for translation are scientific seminars and conferences. Patrons often bring in documents that have been passed on by fellow scientists or engineers. The FIOs are frequently requested to translate foreign language enclosures to intelligence reports

and documents that accompany foreign materiel. Searches of the
CIRC open source data base result in many requests for
documents, which in many cases have not been previously trans-
lated. Another source of foreign language technical literature
is the National Technical Information Service, which publishes a
biweekly digest of new foreign accessions to the NTIS
collection.

7.61 Once scientists and engineers have obtained a foreign
language document or a reference to one, they must decide
whether or not a translation would be worthwhile. Translation
is a costly process and should be done only if there is proba-
bility that the information in a document will be useful. The
most effective way of doing this is to have a language qualified
person scan the document's content and inform the prospective
reader about the subject matter. This is occasionally done at
some R&D organizations but depends largely on the random availa-
bility and willingness of language qualified people. Only 2 of
18 FIOs and 5 of 21 libraries have any systematic way of using
their foreign language qualified people to screen documents for
potential translation. More commonly, requests for translation
are based on review of bibliographic information and abstracts
or on inspection of the illustrations, tables, and equations
found in the document itself.

Checking for Existing Translations

7.62 The libraries and FIOs surveyed reported that in CY1984
they received over 1,300 requests for translations of foreign

language documents. $\underline{32}/$ About 70% of these requests were re-
ceived by the libraries and 30% by the FIOs. Once such requests
are received, the next step for almost all FIOs and libraries is
to determine if there is an existing translation for the foreign
language document concerned. (One FIO and three libraries re-
ported that they do not check for existing translations before
requesting a new one.)

7.63 Libraries and FIO check various resources to determine the
existence of translations as shown in Table 7.2. Those
libraries and FIOs that retain copies of translations first
check their own holdings. FIOs and libraries both use the DTIC
Technical Reports Data Base to an equal extent. The remaining
figures suggest, however, that FIOs are more likely to identify
the existence of translations than are the libraries, because
the FIOs have access to CIRC and can use the Translation Index
data base. The FIOs are more likely to check with their local
technical libraries than the libraries are to check with the
FIOs. Even if an FIO does not locate an existing translation,
it passes on a request for a new translation to FSTC, which will
make an extensive anti-duplication check before initiating a new
translation. A few libraries do make use of resources such as
NASA, NTIS, and the National Translations Center that are not
used by FIOs. Only four libraries and three FIOs use the
Consolidated Translation Survey.

$\underline{32}/$ The number of translation requests reported on the question-
naire is probably significantly understated, especially for
the FIOs, due to some ambiguity in the questionnaires. The
figure does give an indication, however, of the volume of
requests. A breakout of the number of requests by each R&D
organization is included in Section VIII.

TABLE 7.2
RESOURCES USED BY LIBRARIES AND FIOS
TO CHECK FOR EXISTING TRANSLATIONS

Number of respondents: R&D Technical Libraries--18

FIOs--17

Each respondent indicated all resources used.

Resource	Number of R&D Organizations Using Each Resource	
	Technical Libraries	FIOs
Library holdings	15	12
FIO files	3	13
Other libraries	4	0
DTIC Technical Reports Data Base	10	10
CIRC Translation Index (XLAX)	0	11
Consolidated Translation Survey	4	3
FSTC Library Services Branch	0	11
FSTC Foreign Language Research Branch	0	8
NASA	2	0
National Translations Center	5	0
National Technical Information Service	1	0

Use of Supporting Government Translating Resources

7.64 The FIOs typically ask FSTC to provide translating services. FSTC, in turn, uses either JPRS or contractors to produce translations. Only two of the 18 FIOs that process requests for translation obtain translations directly from contractors, and those two also send requests to FSTC. The other 16 FIOs all depend solely on FSTC for support. Of the 21 technical libraries that process requests for translation, 18 reported that they contract directly with translation firms, 5 reported that they purchase existing translations from organizations such as the National Translations Center, and 4 reported that they have some in-house capability to produce translations. The only significant library in-house translation resource is the Translation Branch of the Redstone Scientific Information Center. Three other libraries occasionally use language-qualified employees to do occasional short pieces. In CY1985 RSIC sent approximately 20% of its work to JPRS. The library at the Waterways Experiment Station also sends some translation work to JPRS.

7.65 Most of the FIOs reported that the production of translations requested from the FSTC Foreign Language Research Branch is very slow. Of those which estimated the times required to obtain translations from FSTC, the average estimate for a short document (less than 10 pages) was about 6 months. The average estimate for a long document (over 10 pages) was approximately one year.

Use of Contractors

7.66   The R&D technical libraries sent some 3 million words of foreign language documents to commercial contractors for translation in CY1984.   A wide range of rates were paid for this translation work; the average rate appears to be in the range of $30 to 35 per 1,000 words to be translated.   The total CY1984 bill, based on the figures reported by the libraries was in the vicinity of $125,000.   About half the libraries reported that the cost of translations came out of the library budget; the other half reported that the requesting R&D project had to provide the money for translations.

7.67   Most libraries use purchase orders to procure translating services.   Some libraries initiate a separate purchase order for each translation; others have been able to establish blanket purchase agreements or basic ordering agreements for translating services.   Blanket purchase agreements and ordering agreements reduce the amount of time required to initiate a new contract translation by 3 to 6 weeks.

7.68   Libraries report that commercial translation companies provide acceptable response time in preparing translations. Most of the documents sent for translation appear to be short, and the average turnaround time is 4 to 5 weeks.   Longer documents may take more time, of course.   The longest time reported for any commercial translation was 8 months.

Translation Quality Control

7.69   The libraries have virtually no means of ascertaining and controlling the quality of the translations they procure other than to ask the person who requested the translations to comment

on the product. These requestors can comment on the technical content and the quality of the English in the translation, but they are unable to determine the accuracy of the translation.

7.70 The quality of translations contracted for by FSTC is largely dependent on the capabilities of FSTC contractors. The FSTC Foreign Languages Research Branch staff is kept quite busy meeting the requests of FSTC analysts and administering contracts. They have little, if any, time to spot check or edit translations prepared by contractors. In contrast, JPRS has a large in-house staff of language qualified personnel who spend a significant amount of time reviewing translations prepared by the contractors. The JPRS practice of contracting with individuals rather than companies makes it more feasible for JPRS to identify and pass work to the best qualified contract translators. The translations prepared by RSIC are done largely in-house, and are subject to review by the branch chief. Those not done in-house are sent to JPRS.

Disposition of Translations

7.71 When a new translation is prepared, the FIO or library that sponsored the translation should ensure that the translation is registered and stored so that it may be available to others in the R&D Community. Normally, this happens with translations requested by the FIOs. Most FIOs retain copies of the translations in their files and often provide them to their local technical libraries. More importantly, FSTC, which prepares translations requested by the FIOs, registers its new translations with CTS and with the CIRC Translation Index and sends copies to DTIC for the Technical Reports collection and data base. These translations can then be located and retrieved throughout the R&D Community.

7.72 All libraries except one keep copies of the translations they sponsor in their own holdings, where they are available to local S&Es. Most libraries do not inform translation registries or DTIC about new translations. Only two libraries notify CTS of new translations. One library regularly sends copies of its translations to the NTC, and only one library reported that it regularly sends copies of translations to DTIC. Reasons for not sending copies of translations to DTIC varied. Ten libraries reported they have never been required to send copies to DTIC. Five stated they were unaware that DTIC collects translations of foreign language documents. A concern of 7 libraries was that many unauthorized translations are made of documents under copyright protection and these translations cannot be publically distributed. These libraries were unaware that DTIC routinely receives such "unauthorized" translations from FSTC, FTD, NISC, and AFMIC and restricts their use to U.S. Government agencies and individuals in consonance with U.S. Government policy. Some materials translated by the libraries are, of course, not suitable for the DTIC TR Data Base, such as data exchange agreements, correspondence, etc.

Use of Previously Translated Materials

7.73 As described earlier in this section, FSTC, FTD, NISC, JPRS, and other Government agencies prepare publications that contain translations of foreign technical literature. It appears that these publications are exploited to a moderate extent by the FIOs and to a much lesser extent by the technical libraries. The most commonly received publications are titles from the JPRS Serial Reports and the FTD Soviet News Abstracts Publication. The FIOs appear more interested in reviewing and disseminating these publications than the libraries and report a higher degree of interest in them by their customers. Twelve

FIOs receive JPRS reports and 9 receive SNAP. Only 6 of 33
libraries receive JPRS serial reports and 2 receive SNAP. The
libraries state their patrons show only moderate or less
interest in these publications.

VIII. ARMY R&D REQUIREMENTS FOR TRANSLATIONS

DISCUSSION

8.1 A principal objective of this study was to determine Army R&D requirements for translation of foreign language S&T documents. To achieve this objective, the two channels through which requests for translation are processed were investigated. These channels are the FIO/FSTC system and the R&D technical libraries.

8.2 Information about the FIO/FSTC channel was obtained from questionnaires completed by FIOs and by reviewing statistics provided by the FSTC Foreign Language Research and Library Services Branches. Information from the technical libraries was obtained by questionnaire. Many of the FIO and library questionnaires were followed up by telephone calls to the respondents.

8.3 Although the study methodology was reasonably successful in eliciting information about Army R&D demand for new translations of foreign language documents, the figures obtained probably understate the potential demand. First, it is probable that R&D demand for translations would increase significantly if U.S. scientists and engineers were more aware of the value of information contained in foreign language documents. Secondly, it is the opinion of many FIOs that the slow response by FSTC to requests for translation discourages some scientists and engineers from requesting translations. Unfortunately, the effect of these factors on the overall demand for translations of foreign literature is very difficult to quantify.

8.4   In spite of these factors, however, the figures obtained
from the FIOs, FSTC, and the R&D technical libraries do provide
an estimate of the actual Army R&D Community annual requirements
for translation, both in terms of the volume of information
translated and the languages that are being translated.

TRANSLATION PROCESSING BY TECHNICAL LIBRARIES

8.5   The technical libraries reported that in CY1984 they ob-
tained approximately 4.3 million words of translation for their
patrons. Of these 4.3 million words, 3.1 million were trans-
lated by commercial translation contractors hired directly by
the R&D libraries. The other 1.2 million words were translated
by the RSIC Translation Branch. (RSIC sent 91,000 of its 1.2
million words to JPRS for translation.) Table 8.1 shows the
amount and cost of translation work for which the libraries con-
tracted. The figures for a few of the libraries are estimates
based on partial information supplied by the library, but it
appears reasonable to accept the total figures as an indication
of the CY1984 translation effort.

8.6   Although the questionnaire sent to the R&D libraries did
not elicit the number of words translated in each foreign
language, it did ask the respondents to identify the languages
with which they were concerned. Table 8.2 lists the languages
and the number of libraries that reported requesting transla-
tions from each language. It is clear that the most commonly
translated languages are German, Russian, and French. Other
less frequently translated languages may be very important,
however. For example, translation of Serbo-Croatian and Hebrew
has been valuable for organizations involved in medical
research.

TABLE 8.1

TRANSLATION PROCESSING BY TECHNICAL LIBRARIES (CY1984)

Library	Requests for Translation Processed		Cost ($1,000s)
	Number of Requests	Number of Words (1,000s)	
AMC			
ARDC	10	24	$ 3.5
BWL	1/	1/	1/
CRDC	80	500	10.0
Belvoir R&DC	17	18	5.0
Natick R&DC	9	22	1.0
LABCOM (HDL)	5	50 (est)	1.5
HEL	43	262	6.5
MICOM (RSIC)2/3/	284	1,217	5.6
AVSCOM Propulsion Dir3/	120	929	33.0
AMRDC			
AMRDC HQ	15	160	1/
AMRL	2	2	0.6
LAIR	1/	1/	1/
MBRDL	1/	1/	1/
MRICD	124	370	12.4
MRIID	30	123	2.9
WRAIR	20	130	4.0
Engineer Laboratories			
CERL	5	5	1/
CRREL	19	150	4.5
WES	27	305	8.7
Total	810	4,267	$99.2

1/ Process translation requests but did not provide figures.

2/ RSIC supports Army Missile Lab. All RSIC translations are done in-house or sent to JPRS. Cost is for JPRS only.

3/ Library also supports NASA facility at the library's location.

TABLE 8.2
LANGUAGES FOR WHICH LIBRARIES REQUEST TRANSLATIONS

Language	Number of Libraries Requesting Translations from the Language (CY1984)
German	18
Russian	17
French	13
Japanese	8
Chinese	8
Other European Languages	11
Spanish	4
Other Asian Languages	4
Middle Eastern/African Languages	4

TRANSLATION PROCESSING BY THE FIOs AND FSTC

FIOs

8.7   The FIOs process requests for translations from the R&D scientists and engineers they support. If the FIO cannot locate an existing translation, it will send the requests on to FSTC. Normally, if the FIO actually has the document, it will send the document directly to the FSTC Foreign Language Research Branch. If the FIO has only a reference to the document, it will request the FSTC Library Services Branch to obtain the document and/or a translation of it.

8.8   The number of translation requests that are satisfied locally by FIOs was not specifically elicited by the study ques-tionnaire. The partial information available suggests that the FIOs may be able to satisfy 10 to 20% of the requirements for translations by finding existing translations themselves.

FSTC

8.9   Two branches of the FSTC Information Services Division process requests for translation from the FIOs, the Library Ser-vices Branch and the Foreign Language Research Branch.

8.10 **Library Services Branch.** In CY1984 the Library Services Branch received about 560 requests for translations of foreign language, open source S&T literature from the FIOs. Usually the FIOs provided FSTC with a reference to a document and asked FSTC to obtain a copy of a translation. Most of the references were obtained from the CIRC open source data base.

8.11 When the Library Services Branch receives such requests, it first checks to see if a translation is available in the library. If it is not, then the Branch will check with outside registries and libraries. If no existing translation can be found, the Branch will send the document to the Foreign Language Research Branch for translation.

8.12 Of the 560 requests for translations received in CY1984, FSTC was able to meet about 410 from in-house resources and 150 from external sources. Of the 410 in-house items, about 50 were sent to the Foreign Language Research Branch for translation. No information is available about the languages of the documents for which translation was requested.

8.13 The FSTC Library does not keep track of the number of foreign language enclosures to intelligence reports that are sent through them for translation.

Foreign Language Research Branch

8.14 In CY1985 [33/] the Foreign Language Branch received requests to translate about 14,200,000 words of foreign language documents. FSTC analysts accounted for about 66% of the total requests; external Army agencies, to include the Army R&D community initiated 34% of the requests. The R&D organizations

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[33/] Translation production statistics received from the FSTC Foreign Language Branch provided information for CY1985 rather than CY1984; however, the total workload for CY1985 approximated that for CY1984, so the CY1985 figures were accepted for this study as being representative of the annual Foreign Language Branch workload.

requested approximately 1,787,000 words of translation, which was about 12.5% of the total CY1985 FSTC translation workload. Table 8.3 lists the Army R&D organizations that submitted requests for translations in CY1985, the number of requests they submitted, the number of words for translation, and the average number of words per request. Almost all the requests were submitted by FIOs. There were several FIOs that did not submit a request for translation during CY1985 and are not included in the list. These FIOs do, however, occasionally request translations.

8.15 Of the total CY1985 workload of 14,200,000 words of translation, the Foreign Language Branch actually completed about 7,700,000 words, or about 54%. Of the work completed, about 11% was done in-house and 89% was done by commercial contractors working for FSTC or sent to the JPRS. It appears that the large amount of uncompleted work was sent to the commercial contractors used by FSTC. They completed only about 45% of the work sent to them. The JPRS, on the other hand, completed about 75% of the FSTC work referred to it.

8.16 Since FSTC production reports do not break down completed work by source of request, it is not possible to state the amount of R&D work that was not completed during CY1985. However, since all work from external requestors is sent to contractors or JPRS, it appears safe to assume that half (900,000 words) of the R&D requests sent in were completed. This situation appears to underlie the comments from the FIOs about the long time FSTC requires to respond to their requests for translation.

TABLE 8.3
ARMY R&D REQUESTS FOR TRANSLATION
SENT TO FSTC IN CY1985

Requesting Organization	No. of Requests	No. of Words	Avg. No. of Words Per Request
ARDC	38	355,000	9,400
BWL	3	44,000	14,700
CRDC	7	152,100	21,700
AVSCOM (HQS)	1	3,200	3,200
CECOM (HQS)	12	290,100	24,200
LABCOM (HQS)	0	0	0
AMTL	3	73,300	24,400
BRL	4	58,700	14,700
HEL	123	177,900	13,700
TACOM (HQS)	30	437,700	14,590
NRDC	17	126,800	7,500
TECOM	1	5,200	5,200
VAL	2	10,200	5,100
AAH PM	1	36,000	36,000
ARO	2	17,200	8,600
	133	1,786,700	13,400

Source: FSTC Foreign Language Branch Quarterly Production
          Reports for 2nd, 3rd, and 4th Quarter FY1985 and 1st
          Quarter 1986.

8.17 The intelligence orientation of FSTC analysts is reflected in the translation work done by the Foreign Language Research Branch. During CY1985 62.3% of the volume of translations completed by the branch was in the Russian language. This figure is almost 5 times more than the next most frequently translated language, German. The emphasis on Russian is understandable when it is remembered that two-thirds of the translation workload is generated within FSTC itself.

8.18 Table 8.4 shows the percent of translation work (measured in 1,000s of words) completed in each language during CY1985. The position of Spanish as the third language in terms of volume of words translated is not typical. It probably reflects U.S. military interest in Central America during 1985 and is not related to R&D requirements.

SUMMARY

8.19 The available statistics suggest that the annual demand for translations generated by the Army R&D Community is approximately 6 million words. Two-thirds of this demand is directed to commercial contractors and the RSIC Translation Branch; one-third is directed to FSTC, which in 1985 was able to complete about 55% of the requirements placed on it. If it is assumed that the average translator can produce about 2,000 words of quality translation per day, the Army R&D translation workload equates to about 3,000 man-days of work per year. If it is further assumed that the average full-time translator will translate 200 days per year, the R&D translation load is about 15 man-years annually. Since RSIC and FSTC have a total of 16 translator spaces authorized (with perhaps 13 or 14 normally filled), the R&D demand for translations theoretically could

TABLE 8.4

FSTC TRANSLATIONS COMPLETED IN CY1985 BY LANGUAGE

Language	Translation Workload
Russian	62.3
German	12.9
Spanish	11.2
French	2.8
Serbo-Croatian	3.0
Japanese	2.6
Swedish	1.7
Chinese	1.6
Korean	0.9
Polish	0.6
Italian	0.4
	100.0

NOTES: 1. This table includes all translation work done by FSTC in CY1985, not just the 1.7 million words done for R&D organizations.
2. Total volume of translations completed in CY1985 by FSTC Foreign Language Branch was approximately 7.7 million words.
3. FSTC completed 11% of work in-house; 89% was completed by contractors and JPRS.

consume all Army in-house translation resources. When the additional 13 million words per year of translation requirements sent to FSTC by non-R&D organizations is added to the R&D requirements, another 32 man-years of translation effort is needed. These figures infer that Army in-house translation resources can at best meet only 25 to 30% of the annual requirement for translation and that reliance on commercial contractors must continue. This estimate does not consider the expansion of requirements that would probably occur if translation support became more readily available, and scientists and engineers tried more diligently to exploit foreign technology.

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IX. PROBLEMS IN TRANSLATION SUPPORT FOR ARMY R&D

GENERAL

9.1   This section reviews problems in Army management and use of translation resources to support the information needs of its R&D scientists and engineers. Each problem is identified and discussed and actions that could be taken to reduce or eliminate the problem are suggested.

9.2   This information is presented for the use of Army managers who are responsible for information support for the Army R&D process. Effective information support for R&D scientists and engineers can significantly reduce the time and money required for development of the Army's weapons and equipment.

9.3   Although this section brings attention to problems in translation support for R&D, it is not intended to be critical of the many Army personnel who help to provide this support. These individuals are well aware of the situations described and have been very cooperative in bringing problems to the attention of this study effort. They have been trying to cope with and resolve translation support problems for years and see this study as a means of reporting situations that need to be improved if Army R&D efforts are to benefit from S&T information published in foreign languages.

9.4   This discussion of problems focuses on situations that the Army can do something about rather than general situations that the Army is largely unable to change, such as the enormous volume of foreign language S&T literature of potential value to Army R&D, the lack of language qualification of most Army R&D scientists and engineers, and the generally low emphasis

American colleges and universities place on languages for science and engineering students.

9.5 In the remainder of this section, problems in translation support for Army R&D are discussed under three topic headings: problems in policy, problems in management, and procedural problems.

PROBLEMS IN POLICY

Lack of Policy for Transfer of Foreign Technical Information to Army R&D

9.6 **Problem.** The Army and DoD Scientific and Technical Information Program policy documents (AR 70-45 and DoD Directive 3200.12) do not specifically recognize the importance of foreign technical information to the U.S. R&D process, and they do not establish policy and responsibilities for exploitation and management of foreign technical information. Foreign S&T information processing is passed off to intelligence organizations and the DoD S&T Intelligence Program. The S&T intelligence organizations are to submit translations of relevant technical documents to the DTIC technical reports collection. No mention is made of R&D requirements for translation of foreign language S&T documents or of means of satisfying those requirements.

9.7 **Discussion.** The lack of attention to management of foreign technical information in the Army STIP does not support the stated policy of the Army Materiel Command to use foreign technology, weapons, and equipment when it is in the interest of the Army to do so. If the U.S. Army is to reduce materiel cost and development time by use of foreign technology, it appears

that the STIP should include provisions for ensuring access to that technology.

9.8   **Recommendation**. The Army should revise AR 70-45 to incorporate policy and responsibilities for use of foreign technical information into the STIP. This revision should cover more than just translation and interpreting support. 34/ It should include recognition of R&D needs for foreign technology, development of policy for the use of foreign open source information, assignment of responsibilities for the acquisition and processing of that information and definition of information processing responsibilities of the R&D Community and the S&T intelligence agencies and the flow of information between them. Just as the R&D Community relies on the intelligence agencies for intelligence and threat information, the Intelligence Community should be able to rely on the R&D Community for open source S&T information.

9.9   Army revision of the STIP should be done by a working group chaired by the Deputy Assistant Secretary of the Army for Science and Technology. This group should include representatives of ODCSRDA, OACSI, HQAMC, HQLABCOM, HQAMRDC, OCOE, and the Army S&T intelligence agencies, FSTC and MSIC. A subcommittee of this working group should address the problems in translation and interpreting support. This subcommittee should include the chiefs of the Army R&D Interpreting Office, the FSTC Foreign Language Research Branch, and the RSIC Translation Branch, as well as selected representatives of Army R&D FIOs and technical libraries.

34/ See paragraph 5.42 for discussion of the STIP and inter-
    preting support.

Excessive Reliance on S&T Intelligence Organizations

9.10 **Problem.** The Army STIP is too dependent on S&T intelligence organizations for the processing and exploitation of foreign technical information. These agencies are not intended to and will never be capable of satisfying all R&D requirements for analysis and reporting of foreign technology.

9.11 **Discussion.** Much of the Army R&D Community reliance on the S&T intelligence agencies is overly optimistic for at least three reasons: the number of intelligence analysts available, the orientation of intelligence analysis and production, and the time required for intelligence processing.

9.12 The intelligence organizations in the Army and in DoD as a whole do not have the number of analysts required to cover thoroughly all the S&T fields that are of interest to the Army R&D Community. Within the Army, the total number of intelligence analysts in FSTC and MSIC is about 400 people. These 400 people theoretically support approximately 12,000 scientists and engineers in AMC, AMRDC, OCOE, and ARI, plus an unknown number of contractors, which is probably several times 12,000. It is unrealistic to expect that the small number of Army S&T intelligence analysts, even when backed by other Government agencies such as FTD, CIA, and DIA, will be able to provide detailed technical information required by thousands of scientists and engineers in hundreds of different fields of interest.

9.13 Compounding the limitations in exploitation of foreign technology caused by the relatively small size of the Army and national S&T intelligence resources is their orientation on potentially hostile countries. Intelligence agencies devote 80 to 90% of their effort trying to determine the potential threat

to U.S. forces and materiel posed by hostile nations. In many cases the actual technology incorporated into the threat is not as advanced as that found in the U.S. or other technologically advanced countries and is not useful as technology for U.S. Army materiel R&D. Intelligence resources for investigation and assessment of S&T in friendly or non-aligned nations such as Japan, France, Germany, Sweden, and others is quite limited.

9.14 Another factor affecting R&D use of foreign S&T information processed through the Intelligence Community is that the processing takes time that delays the availability of open source information to scientists and engineers. The publication of an intelligence report may occur months or even years after the S&T information it contains originally appeared in foreign language, open source documents. Furthermore, if intelligence reports contain classified information, their distribution may be limited and interested R&D personnel may not know of or have access to the document.

9.15 **Recommendation.** A mechanism to direct and coordinate the transfer of foreign technology to Army R&D purposes should be established during review of the STIP as recommended in paragraph 9.8 preceeding. The limitations on S&T intelligence agency capabilities to provide foreign S&T information for the Army R&D Community require R&D management to take the initiative in this area. R&D needs for foreign technical information are too large to leave to the Intelligence Community.

Lack of Emphasis on Attainment and Maintenance of Language Skills

9.16 **Problem.** The Army does not emphasize or reward the attainment and maintenance of language skills by R&D scientists

and engineers. The general lack of language capability in the R&D population inhibits Army capability to use S&T information contained in foreign language publications.

9.17 **Discussion.** During this study of translation support for Army R&D, no evidence was found that the Army encourages or rewards R&D personnel for language proficiency applicable to their work. Based on reports from the FIOs and technical libraries, it can be assumed that very few scientists and engineers in Army R&D organizations have a significant foreign language capability.

9.18 This general lack of language proficiency among R&D personnel greatly increases the requirement for translation support if useful foreign technology is to be identified and exploited. Even if translating support were available without constraint, it would be less efficient than the capability of a scientist or engineer to read information pertaining to his specialty in the foreign language it is published in. The individual can better interpret the significance of the content and understand technical matter than a translator and avoids the delay in information receipt caused by having to send the document to a translating organization.

9.19 **Recommendation.** Although it would be optimistic to expect large numbers of scientists and engineers to learn foreign languages, the Army should identify some way to reward those who do achieve the capability to read foreign technical literature pertaining to their S&T areas of interest. Such incentives could be identified during review of the STIP as proposed in paragraph 9.8 and then implemented through R&D management channels.

Summation of Policy Problems

9.20 The Army's lack of policy for exploitation of foreign technical information, overreliance on the Intelligence Community, and failure to emphasize language skills are evidence that HQDA and major R&D commands have not established the policy environment needed to foster more effective use of the S&T accomplishments of foreign nations to support materiel R&D. These factors underlie an apparent lack of central, high-level attention to the importance of providing information processing policy guidance for implementation by managers at all levels of the Army's R&D hierarchy.

PROBLEMS IN MANAGEMENT

Lack of Central Management of Language Service Support

9.21 **Problem. The Army does not centrally manage translation and interpreting support for R&D purposes.** [35] Given the lack of Army central policy for the use of foreign technology to support R&D scientists and engineers, this is not surprising. The FSTC Foreign Language Research Branch responds to translation requirements sent to it by R&D activities, but it does not direct, control, allocate resources, or otherwise manage overall language services support for the Army R&D Community. Any management of translation processing that does exist in the Army R&D Community is accomplished at the local level by FIOs (who send requests in to FSTC) and by technical libraries (which contract for translations or, in the case of RSIC, have their own translation staff).

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[35] Problems involving interpreting support were discussed in Section V of this study.

9.22 Discussion. The problems which derive from lack of central management of translation support for Army R&D scientists and engineers include: inconsistent procedures for use and payment of contractors; virtually non-existent quality control of translations; inadequate support for translators (especially contract translators) doing technical and military work; lack of coordination among translating organizations; probable duplication of translating effort; subordination of R&D requirements for translating support to intelligence priorities; and inconsistent registration, storage, and distribution of translations. All of these factors detract from Army ability to use foreign technology published in languages other than English. (These individual problem areas are discussed in more detail later in this section.)

9.23 At the Army Staff level there appears to be little attention given to the provision management of translation support for Army R&D activities. Responsibilities for the Army Language Program, as stated in AR 350-20, are largely assigned to OACSI, which has an understandable primary concern with management of language training and support for intelligence activities. Neither OACSI or AR 350-20 specifically address training for military or civilian personnel who will become S&T translators. A representative of OACSI does chair the Army Language Program Review Committee, which includes a representative of ODCSRDA.

9.24 The responsibility for management of translating support for Army R&D activities appears to be diffused among HQDA (OACSI, ODCSOPS, and ODCSRDA), HQ AMC, the R&D Commands and technical libraries, and the AIA and FSTC. No single office or individual has responsibility for determining requirements for translating support and for allocation of resources to meet those requirements.

9.25 **Recommendation.** Army revision of the STIP to establish
policy and responsibilities for translation and interpreting
support for R&D should include establishment of central staff
and operational management of language services. Such manage-
ment would direct and coordinate the use of language support
resources to the maximum advantage of the entire Army. The
needed management could be provided by establishing a central
Army Language Services Office which would report to the Army
Staff, possibly to the Director of the Army Staff or to the
Assistant Chief of Staff for Information Management. A possible
alternative would be to task the Army Intelligence Agency to
manage Army-wide translation and interpreting support. Whatever
the location of the Army Language Services Office, it should be
adequately staffed to accomplish the following duties:

- Monitor and assess Army demand for translation and
  interpreting support

- Establish procedures for Army-wide language service
  support

- Maintain an in-house capability to perform high
  priority translating and interpreting, administer Army
  contracting for language services, provide quality
  control (editing/review) of contract translations, and
  participate with other agencies in the development of
  technical glossaries for use throughout the U.S.

- Translate and review international agreements in which
  the Army is involved

- Provide advice to R&D technical libraries for exploitation of foreign open source literature

- Represent the Army in its dealing with other language services activities throughout DoD and the Government

- Ensure that S&T and other translations prepared by or for the Army are properly registered and stored so they may be available to users throughout the Army and DoD.

Inadequate Allocation of Resources to the FSTC Foreign Language Research Branch

9.26 **Problem.** The FSTC Foreign Language Research Branch does not have enough staff to meet current requirements fully, much less to meet expanding future requirements.

9.27 **Discussion.** The Foreign Language Branch of the FSTC Information Services Division is the closest organization the Army has to a central language services office. Since FSTC's incorporation into AIA, the Branch has become more intelligence oriented and has been assigned the translation load formerly carried by ITAC. It is receiving an increasing number of requests for translations sent in by HQDA, TRADOC, FORSCOM, and other organizations as well as the AMC FIOs. Many other R&D organizations that do not have FIOs are also potential customers for the Branch. This expansion of mission has already resulted in a significant increase in the Foreign Language Branch's workload, which in CY1985 was almost double the amount of work that the Branch could administer or perform. If the Foreign Language Research Branch meets total Army requirements for translation,

it should be able to produce (either in-house or through con-
tracts) at least 20 million words per year plus handle
requirements for verbal reviews of documents.

9.28 As of March 1986, no expansion of the Foreign Language
Research Branch staff was planned to meet the increased antici-
pated workload. Additional funds to pay for contract work had
been allocated, and the Branch expected to begin administering
non-AIA work on a reimbursable basis.

9.29 Additional funds for the Foreign Language Research Branch
to use for contract translations will help the Branch address
its expanded workload but will not solve other problems. The
Branch has very little capability under the present workload to
review contract translations for quality and accuracy. Expan-
sion of the workload will in effect place quality control in the
hands of the translation contractors. The number of people
available to administer contracts will remain constant. Respon-
siveness to R&D requests for translating support on a reimburs-
able basis may be handled with less priority than work funded by
AIA.

9.30 **Recommendation.** Whether or not the FSTC Foreign Language
Research Branch assumes a greater role in management of transla-
tion support for the entire Army, it appears AIA should increase
the Branch's staff to augment its capability to administer con-
tracts and provide for some degree of quality control. Such
increases should be based on the results of an "A-76 Study" as
designed by the Office of Management and Budget for assessing
performance of commercial activities. [36/] Such a study would

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[36/] See also AR5-20, Commercial Activities.

establish the actual and potential workload for the Foreign
Language Research Branch and the relative cost effectiveness of
using Government employees and contractors to accomplish the
translation mission.

Lack of Guidance for Technical Libraries

9.31 **Problem.** The R&D technical libraries that process re-
quests for translations receive little guidance on translation
resources and their use, contracting arrangements and pro-
cedures, selection of contractors, and disposition of transla-
tions. Each library has developed its own procedures and
resources.

9.32 **Discussion.** At least 23 libraries in the Army R&D Com-
munity obtain translations of foreign language documents for
their patrons. These libraries have become involved in this
work largely through default. Either no other office had the
function of obtaining translations and the libraries took on the
job, or other organizations (i.e., the FIOs) could not provide
responsive enough support to meet R&D requirements. In any
event, neither HQDA or the major R&D command headquarters appear
to have provided guidance or assistance to the technical
libraries in regard to translation activities.

9.33 **Recommendation.** The Army should provide guidance for
processing and disposition of translations to the R&D technical
libraries. This guidance could be provided by the Army R&D
Management Office, which is part of ODCS RDA, HQDA.

9.34 The Army R&D Management Office is an Army-level staff
organization that has a channel to all the Army

134

technical libraries. It should be possible for this office to investigate library activities in the translation area, find out requirements from DTIC, FTD, FBIS, and others for registration, storage, and distribution of translations, and prepare guidance and information for the libraries. Such action would ensure some standardization of procedures and more effective use of existing translations.

PROCEDURAL PROBLEMS

9.35 The preceeding paragraphs have addressed problems and possible improvements in policy formulation and guidance and in management of Army translation support for R&D activities. Whether or not these improvements are implemented there are a number of procedural problems that can be addressed on a case-by-case basis under the existing policy and management situation. These problems are identified and discussed in the following paragraphs.

Underutilization of the CIRC System

9.36 **Problem.** The Army R&D Community is not taking full advantage of the information available in the Defense Intelligence Central Information Reference and Control System Open Source Data Base and Translation Index. This situation leads to ignorance of potentially useful foreign technical information and possible duplication of effort in retranslating documents that have already been translated.

9.37 **Discussion.** Two-thirds of the Army R&D laboratories and activities do not have on-line access to CIRC through either their technical libraries or FIOs. Some technical libraries are unaware of CIRC's existence. Since the CIRC provides access to

a data base with references pertaining to over 5 million
foreign documents of military S&T interest and the Translation
Index contains reference to over 400,000 translations, [37]/ it is
clear that Army R&D scientists at many locations are not
obtaining optimal information support.

9.38 Although CIRC is primarily a Defense Intelligence Re-
source, a secondary objective of CIRC is to make foreign tech-
nology available throughout the Defense R&D community to include
government laboratories, supporting contractors, research
institutes, and academic institutions. Recent upgrading of
CIRC's capabilities by the Air Force Systems Command Foreign
Technology Division has made access to CIRC available to R&D
activities that want it. The open source data bases can be
accessed through either dedicated or dial-up terminals in an
unclassified environment. Access to CIRC does not need to be
restricted to secure terminals operated by FIOs since CIRC
terminals, like those for DTIC or other information systems, may
be located in technical libraries.

9.39 **Recommendation.** Army R&D activities that do not already
have on-line access to the CIRC System should obtain authoriza-
tion and equipment to do so. Information about CIRC can be
obtained by contacting the U.S. Air Force Foreign Technology
Division, Attn: NI, Wright-Patterson Air Force Base, Ohio
45433, telephone (513) 257-3538. Access to CIRC can be arranged
by contacting DIA, Attn: DT-3, Washington, DC 20301, telephone
(202) 373-4688.

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[37]/ The CIRC Translation Index will soon include 2 million
translation citations supplied by CTS.

Underutilization of the Consolidated Translation Survey

9.40 **Problem**. In 1985 many of the technical libraries sup-
porting R&D activities were unaware of the existence of the FBIS
CTS and its data base of 2 million citations for existing trans-
lations. This situation limited capability to determine the
existence of translations before initiating new work.

9.41 **Discussion**. The CTS registry of existing translations is
available to organizations throughout the Government. CTS will
check for existing translations in response to either telephonic
or written requests. Sometime in 1986 the CTS data base should
be available on-line as part of the CIRC Translation Index.

9.42 **Recommendation**. Libraries and FIOs processing requests
for translation should check with CTS before initiating new
translations. This can be done by contacting the Foreign Broad-
cast Information Service/CTS, P.O. Box 2604, Washington, DC
20013, telephone (703) 351-2567.

Underutilization of the National Translations Center

9.43 **Problem**. Some R&D libraries and FIOs are unaware of the
NTC and its collection of translations of foreign S&T
literature. This limits their capability to locate and obtain
translations in support of Army R&D.

9.44 **Discussion**. The NTC data base of references to about 1
million translations in over 40 languages and its collection of
translations is available to Army R&D libraries and FIOs. Its
acquisitions are publicized in its monthly Translations Regis-
ter-Index.

9.45 **Recommendation**. The libraries and FIOs should be made
aware of the NTC resources. The NTC can be contacted by writing
the National Translations Center, The John Crerar Library,
University of Chicago, 5730 South Ellis Avenue, Chicago,
Illinois 60637, telephone (312) 962-7060.

Failure to Register and Store Translations

9.46 **Problem**. **Technical libraries that obtain contract trans-
lations generally do not register their translations with CIRC,
NTC, or CTS and do not send copies to DTIC for the Technical
Reports Data Base and Collection.** This meant that in CY1984 an
estimated 500 to 600 translations prepared for individual Army
R&D organizations were not made available throughout the Defense
Community. It is highly probable the same situation occurred in
1985.

9.47 **Discussion**. The technical libraries have not received
guidance concerning registration and storage of the translations
they obtain from contractors. As a result there are varying
opinions about what should or should not be done, and most of
the contract translations obtained by the technical libraries
are not made available to other users to include the Intelli-
gence Community.

9.48 One of the "gray areas" in the minds of some librarians is
the legality of sending unauthorized translations of copyrighted
articles to DTIC. They have not been officially informed that
such unauthorized translations can be stored and distributed by
DTIC as long as distribution is restricted to the Government.
Another gray area is the general DTIC requirement to prepare and
attach a DD Form 1473 to each document submitted to the DTIC
Technical Reports Collection. Those libraries that contract for

large numbers of translations do not have the staff necessary to prepare these forms. They do not know that DTIC will accept the translations without the 1473s attached. DTIC would rather do this processing itself than not to have the document submitted to their collection.

9.49 **Recommendations.** The R&D technical libraries should be directed to:

    a.   Register translations with the CTS (FBIS, telephone (703) 351-2567)

    b.   Register translations with the CIRC Translation Index (FTD, Attn: NI, telephone (513) 257-3528; autovon 787-3528)

    c.   Submit two copies of translations to DTIC (Defense Technical Information Center, Attn: DTIC-FDAC, Cameron Station, Alexandria, VA 22304-6145, telephone (202) 274-7184). [37]/ The copies of translations should be marked with any applicable distribution limitations. [38]/

Inadequate Screening of Documents to be Translated

9.50 **Problem.** Most technical libraries and FIOs have very limited capability to screen foreign language documents to

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[37]/ More information is available in the DTIC Users Handbook published in December 1985.

[38]/ DoD Directive 5230.24 provides instructions concerning distribution limitations. Guidance on distribution limitations may be obtained from FSTC (804) 296-5171, autovon 274-7481.

determine if the information content merits expenditure of time and money on translation. Inability to screen documents causes two problems, unwarranted translation of documents that do not contain useful information (or translation of entire documents when only selected portions are useful) and failure to translate documents that do contain useful information.

9.51 **Discussion.** Translation resources are scarce and expensive and should be used efficiently. Screening of documents by language-qualified personnel helps to ensure that translation resources are properly used. Most libraries and FIOs have not established a systematic method of screening documents, and in-house language qualified people who could briefly review documents have not been identified. FSTC will screen documents, if requested, but this requires time to transmit the document to and from FSTC.

9.52 Since some R&D personnel are language-qualified, it would be easily feasible for each R&D laboratory to prepare a list identifying language-qualified personnel, the languages they know, and their areas of technical expertise. The FIOs and libraries could then consult the list to find personnel who may be able to look through documents and advise on their content. The lists should also be made available to HQAMRDC, OCOE, and HQAMC, which could then consolidate them and make the consolidated lists available to FIOs and technical libraries throughout the Army R&D Community. This procedure would greatly help in screening of foreign language documents for translation and cost very little in terms of the time of any one individual on the list.

9.53 **Recommendation.** HQAMC, HQAMRDC, and OCOE should direct their subordinate R&D activities to prepare and submit lists of language-qualified people assigned to those activities. These

lists would then be consolidated and provided to the R&D activities along with suggested procedures for use of language-qualified people to screen foreign language documents.

Lack of Information About Status of Translation Requests to FSTC

9.54 **Problem.** AMC FIOs are uninformed about the status of translation support they have requested. Specifically, they do not know the priority their work has in the overall workload of the FSTC Foreign Language Research Branch and they do not know when they can expect their requests to be fulfilled.

9.55 **Discussion.** Without information on the status of their translation requests or a way to influence the priority given their work by FSTC, the FIOs cannot be responsive to the R&D scientists and engineers who originally requested the translation work, particularly when requested translations may not be returned for over a year. The FIOs need to be able to look for alternative sources of translations if work by FSTC will take too long.

9.56 **Recommendation.** The FSTC Foreign Language Research Branch should prepare and distribute guidelines it uses for assignment of priorities to translation of documents sent in by the FIOs. FIOs should be notified when their request is received and told when the completed translation will be received.

Inadequate Translation Quality Control

9.57 **Problem.** R&D FIOs and libraries have very little means of assuring that translations received from contractors (either directly or through FSTC) are accurate.

9.58 **Discussion.** A major problem in translation of technical literature from a foreign language into English (or vice-versa) is that the person doing the translating is not familir with the technical content of the document being translated. Without guidance and editing, the translator may produce a product that is inaccurate and of limited or no use to the requestor. This situation is unlikely to change, because people who are trained scientists and engineers are unlikely to pursue translation work for a living. Translators often develop technical expertise only after years of working with documents pertaining to particular S&T areas of interest. Until they do, they need assistance and supervision to ensure their work is of adequate quality.

9.59 The Army itself has very limited means to provide assistance to translators or translation companies working on Army jobs. The FSTC Foreign Language Research Branch does not have the staff required to develop "Army" S&T glossaries and to review and edit contractor-produced translations. These tasks should become part of the mission of the recommended Army Language Management Office.

9.60 In the interim, FIOs and libraries will have to rely on customer comments to determine the usefulness of translations. The FSTC Foreign Language Research Branch could prepare a standard translation evaluation sheet for the recipient of a translation to complete and return to the pertinent library or FIO and to FSTC. These sheets would at least provide a record of the customer's view of a translation product. They would also provide a source of data about translation work done for the Army. These data would help establish the total demand for translation services.

9.61 **Recommendation.** The FSTC Foreign Language Research Branch should prepare a translation evaluation form to be used throughout the Army R&D Community to assess translation quality. This form should be forwarded through the the FIOs and libraries to the requestors of translations along with the translation itself. The requestor would complete the form and return it to the libraries, FIOs, and FSTC to provide a basis for evaluation of translation contractors and statistics on the demand for translation services.

Insufficient Distribution and Use of Existing Translation Publications

9.62 **Problem.** The Army R&D organizations do not take full advantage of translations of S&T literature available from JPRS, FTD, NISC, and other agencies. These translations contain potentially valuable information for Army scientists and engineers.

9.63 **Discussion.** Many R&D technical libraries and some FIOs do not receive copies of JPRS serial reports, the FTD Soviet Newspaper Abstract Publication, or other compendiums of translations published on a regular basis by U.S. Government agencies. These publications are valuable as sources of information foreign S&T initiatives and occasionally as sources of technology itself. It also appears that most of the libraries and FIOs that do receive some of these publications do not actively publicize and provide them to the R&D scientists and engineers at their locations.

9.64 **Recommendation.** The OCOE, AMC, and AMRDC should instruct their libraries and FIOs to review the lists of available publications and "subscribe" to those applicable to the R&D work

143

supported. The libraries and FIOs should take active measures to publicize these and other foreign literature resources to their scientists and engineers.

SUMMARY

9.65 This section has identified some of the procedural problems in current translation processing and made recommendations for actions to solve or reduce the problems. Although each of the problem described can be addressed individually by organizations now involved in translation processing with beneficial results for Army R&D, **the establishment of an Army Language Services Management Office to consider and improve Army translation management and performance in the context of the Scientific and Technical Information Program would avoid piecemeal approach to problems that have persisted for many years.**

9.66 It may be noted that use of machine translation has not been identified as a problem area. It is quite true that machine translations offer an approach to the translation of volumes of foreign literature much too extensive to be thoroughly exploited by human resources and that there are problems in the machine translation process, notably the conversion of hard copy text to machine readable form. These topics have not been addressed because the FSTC Foreign Language Research Branch is looking forward to using FTD machine translation capabilities when data entry problems are resolved. Currently, FTO is considering negotiating contracts for data entry for the machine translation process.

X. CONCLUSION

ATTAINMENT OF STUDY OBJECTIVES

10.1 The objectives of this study were to:

a. Estimate the demand for translating and interpreting support generated by Army R&D activities

b. Identify and describe current resources and procedures for translating and interpreting support to the Army R&D Community

c. Identify and describe problem areas in translating and interpreting service resources and procedures

d. Develop recommendations for actions to improve translating and interpreting support to Army R&D activities with the end goal of facilitating Army use of S&T information available in foreign languages.

10.2 Each of the study objectives has been attained. The results are summarized in the following paragraphs.

Demand for Translating and Interpreting Support

10.3 **Translating Support.** The total Army R&D demand for translating support was about 6 million words per year in the 1984/1985 timeframe. This estimate was established by investigating the information available from FSTC, the AMC FIOs, and the R&D technical libraries. In addition to these 6 million words per year required by the R&D organizations, an additional 12 to 13 million words of translation were requested by FSTC

intelligence analysts, HQDA, TRADOC, and other Army organiza-
tions that use the FSTC Foreign Language Research Branch as a
resource for translating services. Given the increasing use of
FSTC by other Army agencies, an estimate of at least 20 million
words for translating appears to be a reasonable estimate for
the 1986 requirement. The principal languages to be translated
for R&D work are German, French, and Russian, with at least
occasional requirements in 15 to 20 other languages.
Requirements for Japanese translation are increasing rapidly.

10.4   Assuming that a translator can produce 2,000 to 3,000
words of quality translation per day and works 230 days per
year, the current R&D workload of 6 million words per year
equates to 10 to 12 man-years of translation support per year.

10.5   **Interpreting Support**. Figures obtained from the Army R&D
Interpreting Office and the Department of State Office of
Language Services underlie an estimate that the Army R&D organi-
zations require from 550 to 600 man-days per year of conference
interpreting support. The principal languages to be interpreted
are German and French. Due to requirements for preparation,
travel, preparation of procedures, etc., one day of actual con-
ference interpreting work entails two to three days for prepara-
tion and administration. Assuming two of administration are
required for each day of actual interpretation, the annual
interpreting workload equates to seven to eight man-years of
effort. Most of this workload is required for interpreting at
international conferences related to development projects such
as the MLRS and test standardization.

Resources and Procedures

10.6   **Translating Support**. The translating resources available
to R&D organizations are the FSTC Foreign Language Research

Branch (which sends R&D documents to be translated to contrac-
tors or JPRS), the Redstone Scientific Information Center Trans-
lation Branch (which sends some documents to JPRS), and
commercial translation contractors. Of the 6 million words of
R&D work to be translated per year (judging from 1984 and 1985
statistics), about 3.2 million are sent directly to contractors,
1 1 million are done by RSIC, and 1.7 million are sent to FSTC
through the FIOs.

10.7 The FSTC Foreign Language Research Branch has positions
for 10 full-time translators on its staff. The RSIC Translation
Branch has positions for 6 full-time translators. Typically, at
least one or two positions are vacant at each agency.

10.8 FSTC in-house translators are used primarily to meet high
priority requirements for verbal and written translations from
FSTC intelligence analysts. All RSIC work is done by their in-
house staff except a small amount sent to JPRS. The FSTC trans-
lators have little time to review translations done by their
contractors.

10.9 Varying rates are paid to the many contract translation
companies, depending on the company and the language and
technical content of the document to be translated. The average
rate paid appears to be about $30 to $35 per 1,000 words. The
going rates for highly technical work in languages such as
Russian or Japanese may run as high as $100 per 1,000 words.
Often, local requirements to accept low bids for translation
work to impinge in the quality of the translations received.

10.10 A rough estimate of the total cost of translating support
for Army R&D per year, including Government and contractor
personnel, is $450,000 to $500,000. An estimate of the total
cost required to meet the estimated total Army demand of

20 million words per year, given the current number of in-house staff, is approximately $1.6 million per year.

10.11 **Interpreting Support**. About 30% of the Army's require-ments for interpreting are provided by the Army R&D Interpreting Office. The other 70% are met by the DOS Office of Language Services. U.S. Army R&D organizations using Army interpreters pay only for travel and per diem expenses. Army organizations using State Department conference interpreters (who are contractors) pay $275 per day plus expenses, per diem, and travel. The estimated total annual cost to the Army of interpreting support for R&D work is approximately $325,000, including both Army and DOS resources.

Problem Areas

10.12 **The study findings lead to the conclusion that translating and interpreting support for Army R&D activities are inadequate to support the army's need to exploit foreign technology. About 15% of the requirements for translation were not met in 1985; many translations required months to prepare; the translations are often of uncertain quality; procedures, policy, and guidance for translation support are not spelled out for technical libraries; the organizations that manage and provide translating and interpreting support are understaffed; and the Army lacks overall policy for the management of language services to support Army use of foreign technology and equipment.**

10.13 These findings are not surprising given the relatively small amount of money expended on translating and interpreting. In 1985 the Army probably spent less than $1,000,000 to obtain translating and interpreting support for R&D. This is a

miniscule amount of money compared to the expenditures on major
development projects, several of which have costs in the
billions of dollars. The money saved by obtaining new
information from just one foreign language source could pay for
the entire Army annual translating and interpreting budget for a
year several times over.

Recommendations

10.14 The major recommendations derived from the study findings
are listed below. These recommendations were identified and
discussed in detail in Section V--Interpreting Support for Army
R&D and Section IX--Problems in Translation Support for Army
R&D. The Army should:

- Incorporate policy and responsibilities for use of
  foreign technical information into its scientific and
  technical information program. This will require a
  thorough revision of AR 70-45.

- Reduce its reliance on intelligence organizations for
  exploitation of foreign technical literature. The
  intelligence agencies do not have the resources to
  meet all R&D requirements for technology.

- Provide incentive and reward for scientists and
  engineers who attain and maintain language skills
  useful in their work.

- Establish and staff an Army Language Services
  Management Office, responsible to HQDA, which will
  assess requirements, provide resources, and dis-
  seminate information for translating and interpreting
  services.

- Increase the number of its personnel dedicated to translating and interpreting; the current FSTC Foreign Language Research Branch and R&D Interpreting Office are both seriously understaffed.

- Provide guidance to organizations that contract for translations. Technical libraries have not been told how to procure, handle, and distribute translations.

- Make better use of existing Government resources for registration, storage, and retrieval of foreign technical information. For example, only one-third of the Army R&D installations have access to the Defense Intelligence Open Source data base which contains references to over 5 million foreign technical articles.

- Identify and use in-house personnel with language capabilities to screen documents before they are submitted for translation.

- Have a system for prioritizing and reporting the status of requests for translation of foreign language documents.

- Establish a means for quality control of translations.

EPILOG

10.15 The Army will always have problems in identifying, processing, and using technology described in foreign languages.

Evidence of the persistence of these problems is contained in a
1917 War Department Memorandum concerning organization of a
translation office (see Appendix G). Whatever the magnitude of
the problems involved, however, the Army cannot afford not to
allocate and manage resources to do the best job possible. The
cost to do otherwise, although unquantifiable, is too great.

APPENDIX A

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LIST OF ACRONYMS

ADD	Aeroflight Dynamics Directorate
AEFA	Aviation Engineering Flight Activity
AFMIC	Armed Forces Medical Intelligence Center
AIA	Army Intelligence Agency (parent organization of FSTC, ITAC, and MISC)
AMC	Army Materiel Command
AMCCOM	Armament, Munitions and Chemical Command
AML	Army Missile Laboratory
AMRDC	Army Medical Research and Development Command
AMSAA	Army Materiel Systems Analysis Agency
AMTL	Army Material Technology Laboratory
APD	Aviation Propulsion Directorate
APG	Aberdeen Proving Ground
AR	Army Regulation
ARDC	Armament Research & Development Center
ARI	Army Research Institute for the Behavioral and Social Sciences
ARL	Aeromedical Research Laboratory
ARO	Army Research Office
ARTA	Aviation R&T Activity
ASL	Atmospheric Sciences Laboratory
ATA	American Translator Association
ATD	Aviation Applied Technology Directorate
AVSCOM	Aviation Systems Command (AMC)
BRDC	Belvoir R&D Center
BRL	Ballistic Research Laboratory
BWL	Benet Weapons Laboratory
CECOM	Communications Electronics Command (AMC)
CIA	Central Intelligence Agency
CIRC	Central Information Reference and Control (On-Line System)
COE	Chief of Engineers
CRDC	Chemical Research & Development Center
CRREL	Cold Regions Research & Engineering Laboratory

CRRL	Construction Engineering Research Laboratory
CRTC	Cold Regions Test Center
CSTAL	Combat Surveillance and Target Acquisition Laboratory
CTS	Consolidated Translation Survey
DA	Department of the Army
DCI	Director of Central Intelligence
DIA	Defense Intelligence Agency
DLIFLC	Defense Language Institute Foreign Language Center
DMA	Defense Mapping Agency
DMAAC	Defense Mapping Agency Aerospace Center
DOD	Department of Defense
DOE	Department of Energy
DOS	Department of State
DROLS	Defense Research and Development On-Line System
DTIC	Defense Technical Information Center
EDB	Energy Data Base
EPC	Electronic Proving Ground
ERADCOM	Electronics Research and Development Command
ETDL	Electronics Technology and Devices Laboratory
EWL	Electronic Warfare Laboratory
FBIS	Foreign Broadcast Information Service
FCSCWSL	Fire Control and Small Caliber Weapon Systems Laboratory
FIO	Foreign Intelligence Office
FRD	Federal Research Division (of the Library of Congress)
FSTC	(Army) Foreign Science and Technology Center
FTD	U.S. Air Force Systems Command Foreign Technology Division
HDL	Harry Diamond Laboratories
HEL	Human Engineering Laboratory
HQ	Headquarters
HQDA	Headquarters, Department of the Army
HUMINT	Human Intelligence
IC Staff	Intelligence Community Staff

ITAC	U.S. Army Intelligence and Threat Analysis Center
JICST	Japan Information Center of Science and Technology
JPG	Jefferson Proving Ground
JPRS	Joint Publications Research Service
LABCOM	Laboratory Command (AMC)
LAIR	Letterman Army Institute of Research
LCWSL	Large Caliber Weapon Systems Laboratory
LOC	Library of Congress
LOG FRD	Library of Congress Federal Research Division
MAT	Machine-Assisted Translation
MBRDL	Medical Bioengineering R&D Laboratory
MED R&D CMND	Medical Research and Development Command
MICOM	Missile Command (AMC)
MIIA	(U.S. Army) Medical Intelligence Inforation Agency (former name of AFMIC)
MLRS	Multiple-Launch Rocket System
MMRC	Materials & Mechanics Research Center
MRDC	Natick R&D Center
MRICD	Medical Research Institute of Chemical Defense
MRIID	Medical Research Institute of Infectious Diseases
MSIC	(Army) Missile and Space Intelligence Center
MT	Machine Translation
NASA	National Aeronautics and Space Agency
NIH	National Institute of Health
NISC	Naval Intelligence Support Center
NSA	National Security Agency
NTC	National Translations Center (at University of Chicago John Crerar Library)
NTIS	National Technical Information Service
NVEOL	Night Vision and Electro-Optics Laboratory
OACSI	Office of the Assistant Chief of Staff for Intelligence (HQDA)
OCOE	Office of the Chief of Engineers (HQDA)

OCR	Optical Character Reader
ODCS	Office of the Deputy Chief of Staff
ODCSOPS	Office of Deputy Chief of Staff for Operations and Plans (HQDA)
ODCSPER	Office of the Deputy Chief of Staff for Personnel (HQDA)
ODCSRDA	Office of the Deputy Chief of Staff for Research, Development, and Acquisition (HQDA)
OSTI	Office of Scientific and Technical Information
OTSG	Office of the Surgeon General
R&D	Research and Development
RDA	Research, Development, and Acquisition
RSIC	Redstone Scientific Information Center (AMC)
S&Es	Scientists and Engineers
S&T	Scientific and Technical
SNAP	Soviet News Abstracts Publication
STIISP	Scientific and Technical Intelligence Information Support Program
STIP	Scientific and Technical Information Program
SWL	Signals Warfare Laboratory
TACOM	Tank-Automotive Command
TAL	Tank-Automotive Laboratory
TECOM	Test and Evaluation Command (AMC)
TMAS	Tank Main Armament System
TR	Technical Reports
TRADOC	(Army) Training and Doctrine Command
TROSCOM	Troop Support Command
TTC	Tropic Test Center
WES	Waterways Experimental Station
WRAIR	Walter Reed Army Institute of Research
WSMR	White Sands Missile Range
XLAX	Translations Index (in CIRC)

PRESEARCH INCORPORATED

APPENDIX B

BIBLIOGRAPHY

This bibliography provides references to the more significant
documents used during the study of translation and interpreting
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listed are unclassified unless otherwise noted.

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Arlington, Virginia, December 1980

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nology Acquisition Program, Springfield, VA, 1982

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APPENDIX C

TECHNICAL LIBRARY SURVEY QUESTIONNAIRE

C.1   This appendix contains the letter of transmittal for the questionnaire used to survey the technical libraries in the Army Research and Development Community. Enclosed with the letter is the questionnaire itself.

C.2   The letter explains the purpose of the translation study and requests the support of the technical libraries in completing the questionnaire and returning it to the contractor. The letter includes the survey distribution list.

C.3   The questionnaire includes 45 questions addressing library activities and procedures relevant to the processing of requests for translation of foreign language documents, obtaining the translations, and the distribution of the translations once they are received.

AMCLD   10 September 1985

SUBJECT: Investigation of Translation Support for Army RDTE Activities

SEE DISTRIBUTION

1.   The Office of the Deputy Chief of Staff for Technology Planning and Manage-
ment, Headquarters, AMC, is sponsoring a study of translation support for Army RDTE
activities. This study has the following purposes:

    a.   To assess the demand for translation of foreign language technical
       documents

    b.   To investigate translation resources available to the Army

    c.   To identify any areas in which this Headquarters can enhance
       translation support to facilitate more effective use of the
       technology contained in foreign technical literature.

2.   Because many of the technical libraries supporting Army RDTE organiza-
tions process requests from scientists and engineers for translation of for-
eign language documents, this office is requesting your support for the trans-
lation study. Specifically, we are asking you to complete the enclosed
questionnaire, which elicits information about the libraries' involvement in
translation processing and the resources and procedures being used. As you
may know, similar questionnaires have been sent to selected Foreign Intelli-
gence Offices in the Army Materiel Command. Please complete the questionaire
and mail it on or before 27 September 1985 to the study contractor:

                         Presearch Incorporated
                         Attn: Translation Study (ISD)
                         8500 Executive Park Avenue
                         Fairfax, Virginia 22031

3.   In an effort to minimize the time required to complete the question-
naire, most of the questions it contains have been put in "yes/no" or "multi-
ple choice" format. You are encouraged, however, to add whatever comments may
be necessary to portray the translation situation accurately as it exists at
your location.

AMCLD
SUBJECT: Investigation of Translation Support for Army RDTE Activities

4.   Three of the questions in the questionnaire concern use of the Consoli-
dated Translation Survey (CTS), which is a translation registry maintained by
the U.S. Foreign Boadcast Information Service (FBIS) in Rosslyn, Virginia.
The CTS is operated to support all U.S. Government organizations interested in
translations of foreign literature. Since some technical libraries may not be
familiar with the CTS, a one-page briefing sheet prepared by CTS is enclosed.

5.   Your assistance in completing the questionnaire will be much appre-
ciated. If you have any questions concerning the translation study, you may
call the undersigned at autovon 284-8671 or commercial (202) 274-8671. Any
questions about specific questionnaire items may be addressed to the study
principal investigator, Mr. Robert V. Hubbard, at (703) 876-6400.

6.   For your information, The Defense Technical Information Center (DTIC)
has invited Presearch Incorporated to brief its Users Conference on 25 October
about the inquiry of DTIC Users sponsored by this office earlier this year and
the findings of this translation study which pertain to the acquisition and
distribution of translations by DTIC. Many of the libraries to which this
letter is addressed contributed information to the Army DTIC Users Study, so
the DTIC Users Conference provides a unique opportunity for us to provide
feedback to the many technical library staff members who have contributed so
much to the two studies.

2 Encls   EDWARD J. KOLB
1. Translation Study   Principal Army Technical
    Questionnaire   Information Officer
2. CTS Briefing Sheet

AMCLD
SUBJECT: Investigation of Translation Support for Army RDTE Activities

DISTRIBUTION:

Dir, US Army Research Office, ATTN: AMXRO-IP, PO Box 12211, Research Triangle
  Park, NC 27709-2211
Dir, US Army Ballistic Research Laboratory, ATTN: AMXBR-OD-ST, Aberdeen Proving
  Ground, MD 21005-5066
Dir, US Army Human Engineering Laboratory, ATTN: AMXHE-ST-LIB, Aberdeen
  Proving Ground, MD 21005-5066
Dir, US Army Materials and Mechanics Research Center, ATTN: AMMRC-PL,
  Watertown, MA 02172-0001
Cdr, US Army Armament Research and Development Center, ATTN: SMCAR-TSS,
  Dover, NJ 07801-5001
Dir, Benet Weapons Laboratory, ATTN: SMCAR-LCB-TL, Watervliet Arsenal,
  Watervliet, NY 12189-5000
Cdr, US Army Chemical Research and Development Center, ATTN: SMCCR-SP-IL,
  Aberdeen Proving Ground, MD 21010
CG, US Army Aviation System Command; ATTN: AMSAV-STINFO, 4300 Goodfellow
  Blvd, St. Louis, MO 63120
Dir, US Army Aviation Research and Technology Laboratories, ATTN: SAVDL-POM,
  NASA-Ames Research Center, Moffett Field, CA 94035
Dir, Propulsion Laboratory, Lewis Research Center, ATTN: Technical Library,
  Cleveland, OH 44135
Technical Library, Mail Stop 185, NASA-LRC, Hampton, VA 23665-5225
Dir, Applied Technology Laboratory, US Army R&T Laboratories, ATTN: SAVDL-
  ATL-TSC (Library), Fort Eustis, VA 23604-5577
Librarian, U.S. Army Aviation Technology Library, Bldg 5907,
  Fort Rucker, AL 36362
Cdr, US Army Communications and Electronics Command, ATTN: AMSEL-ME-PSL,
  Fort Monmouth, NJ 07703
Dir, Harry Diamond Laboratories, ATTN: DELHD-TA, 2800 Powder Mill Road,
  Adelphi, MD 20783
Cdr, US Army ERADCOM Technical Support Activity, ATTN: DELSD-L,
  Fort Monmouth, NJ 07703
CO/Dir, US Army Atmospheric Science Laboratory, ATTN: DELAS-AD-PD, White Sands
  Missile Range, NM 88002
Dir, U.S. Army Signals Warfare Laboratory, ATTN: DELSW-SO, Warrenton, VA 22186
CG, US Army Missile Command, ATTN: Redstone Scientific Information Center,
  AMSMI-RPR, Redstone Arsenal, AL 35898-5243
CG, US Army Tank Automotive Command, ATTN: AMSTA-TSL, Warren, MI 48090
Cdr, US Army Belvoir R&D Center, ATTN: STRBE-WC, Fort Belvoir, VA 22060-5606
Cdr, US Army Natick R&D Center, ATTN: STRNC-DT, Natick, MA 01760-5000
Cdr, US Army Dugway Proving Ground, ATTN: STEDP-SD-TA-F (Tech Library),
  Dugway, UT 84022
Cdr, US Army Jefferson Proving Ground, ATTN: STEJP-MS (Library), Madison, IN
  47250
Cdr, US Army Tropic Test Center, ATTN: STETC-MTD-O (Tech Info Spec),
  PO Drawer 942, Fort Clayton, APO Miami 34004
CG, White Sands Missile Range, ATTN: STEWS-TE-TL, White Sands Missile
  Range, NM 88002-5159

CONSOLIDATED TRANSLATION SURVEY

The FBIS-maintained Consolidated Translation Survey (CTS) is an index of items which have been translated into English from foreign publications. It is the only systematic means available to the U.S. Government to ensure that translations done by one agency are not duplicated by another at a later date, thereby saving the U.S. Government some $2 million annually in prevented duplications.

The CTS file dates from 1949 and contains more than 2 million entries. CTS includes records of only unclassified translations. Documents are indexed by:

1. Author's or editor's name and
2. Source--the transliterated title of the original document.

The CTS product is a bibliographic citation. CTS does not make the actual translation available to the requester but rather refers the requester to the office which produced the translation.

CTS can provide printouts by author and by source. Analysts and researchers can request printouts of the translated articles by a particular scientist or journalist or from a particular specialized journal or other publication. Such printouts can serve as an index to translated materials on a particular subject.

CTS includes data on items translated or in the process of translation by agencies throughout the U.S. Government, primarily those of the Intelligence Community. The CTS file contains references to translations produced by more than 60 U.S. Government organizations; commercial translating houses; and Australian, British, and Canadian governmental or quasi-official agencies.

CTS welcomes queries from all U.S. Government departments and agencies. Government agencies should call CTS:

1. To determine whether an item has been translated.
2. Before beginning to translate.
3. To advise that a translation is in process (CTS enters "in-process" translations in its files so other agencies will not need to undertake the same translation).
4. To advise that a translation has been completed.

Agencies can contact CTS by mail both to request a search of the data base and to inform CTS of the availability of a completed translation. Correspondence should be sent to Foreign Broadcast Information Service/CTS, P.O. Box 2604, Washington, D.C. 20013. Government agencies are also welcome to telephone CTS at 703-351-2567.

To arrange for a translation, contact Chief, Translation Services Staff at the same address; telephone number is 703-351-2979.

AMCLD

HQAMC TRANSLATION STUDY QUESTIONNAIRE
FOR TECHNICAL LIBRARIES

IDENTIFICATION OF TECHNICAL LIBRARY

Library Designation and Address: _____

_____

_____

_____

Please provide the following information:

Name of person who completed this
questionnaire: _____

Commercial telephone number at which
this person can be reached: _____

Principal R&D organizations _____
supported by this library: (Please
add any organizations the library _____
supports that have not been
identified) _____

_____

INSTRUCTIONS

This questionnaire asks 45 questions. Most questions require "yes/no" or
"multiple choice" answers. Some questions ask for specific figures; if the
exact figures are not readily available, please provide your best estimate.
Instructions for answering individual questions are included when needed for
clarity.

Space is provided at the end of the questionnaire for you to add comments rela-
tive to the use and provision of translations of foreign language S&T documents.
If you have specific comments pertaining to an individual question, please make
your comment on the page where that question appears.

Please mail the completed questionnaire to the study contractor no later than
27 September 1985. The address is:

Presearch Incorporated, Attn: Translation Study (ISD)
8500 Executive Park Avenue
Fairfax, VA 22031

QUESTIONS

Identification of Local Resources for Translation

1. Does your library process requests from its users for translation of foreign language documents?

   _____ Yes _____ No

2. Does any other organization at your location (for example, the Foreign Intelligence Office) process requests for translation of foreign language documents?

   _____ Yes _____ No

If your answer to Question No. 2 is "yes," please provide the organization's name and office symbol in the space below.

_____

3. Does your library refer requests for translation of foreign language documents to the other organization(s) (noted in the answer to Question No. 2) that process requests for translation? (Check the one most appropriate answer.)

   a. _____ Always

   b. _____ Sometimes

   c. _____ Never

   d. _____ Not applicable, no other organization at this location processes requests for translation

4. If your library does refer translation requests to other local organiza-
    tions, why? (Check all appropriate answers)

    a. _____ Other local organizations can obtain translations more quickly
               than the library

    b. _____ Other local organizations can obtain more accurate and useful
               translations than the library

    c. _____ The library does not process requests for translation

    d. _____ Other, please explain: _____

        _____

    e. _____ Not applicable; library does not refer requests for translations

IF YOUR LIBRARY DOES NOT PROCESS USER REQUESTS FOR TRANSLATION OF FOREIGN
LANGUAGE DOCUMENTS (I.E., YOU ANSWERED "NO" TO QUESTION NO. 1), DO NOT ANSWER
QUESTIONS 5 THROUGH 27. GO ON TO QUESTION NO. 28.

IF YOUR LIBRARY DOES PROCESS USER REQUESTS FOR TRANSLATION OF FOREIGN LANGUAGE
DOCUMENTS (I.E., YOU ANSWERED "YES" TO QUESTION NO. 1), PLEASE GO ON TO THE NEXT
QUESTION.

Initiation of Requirements for Translation

5. How do your library's users obtain the foreign language documents that they want to have translated? (Check all applicable items.)

   a. _____ From your library's holdings (books, serial publications, reports, etc.)

   b. _____ From the National Technical Information Service

   c. _____ From attendance at conferences, seminars, etc.

   d. _____ From advertising brochures

   e. _____ From other scientists and engineers

   f. _____ From materials obtained for them by your library using information resources such as interlibrary loan service, commercial and Government information services, etc.

   g. _____ From other sources, please identify: _____

   _____

6. When a library user has obtained a foreign language document, how does he or she decide if a translation is required? (Check the two most applicable answers.)

   a. _____ Based on bibliographic information and abstracts describing the document

   b. _____ Based on review of the figures, tables, equations, etc. contained in the document

   c. _____ Based on review of the document by a language capable person

   d. _____ Based on recommendations by other scientists and engineers

   e. _____ Other basis; please identify: _____

   _____

7. Do the organizations your library supports or does the library itself have any systematic way of using language-qualified staff personnel to screen foreign language documents to determine if they merit translation?

   _____ Yes _____ No

cont.

Processing of Translation Requests

8. How many requests for document translations did your library receive and process during Calendar Year (CY) 1984?

    _____ (number of requests)

9. What languages were these documents written in? (Check all applicable entries. Circle the two most common languages.)

    a. _____ German

    b. _____ French

    c. _____ Japanese

    d. _____ Russian

    e. _____ Chinese

    f. _____ Spanish

    g. _____ Other European Languages

    h. _____ Other Asian Languages

    i. _____ Middle Eastern/African Languages

10. When you receive a request for translation of a foreign language document, do you check to see if there is an existing translation of that document?

    _____ Yes _____ No

11. If you check to see if there is an existing translation of a document, which of the following resources do you use? (Check all applicable responses.)

    a. _____ The holdings of your own library

    b. _____ Your local Foreign Intelligence Office

    c. _____ Other libraries

    d. _____ The Defense Technical Information Center (DTIC) Technical Reports Data Base

    e. _____ The Consolidated Translation Survey (CTS) operated by the U.S. Foreign Broadcast Information Service

    f. _____ Other; please describe: _____

    _____

    g. _____ Not applicable; library does not check for existing translations.

12. How does the library obtain the translations requested by its users? (Check all applicable responses; circle the most frequently used method.)

    a. _____ From its own holdings

    b. _____ From the DTIC Technical Reports collection

    c. _____ From other libraries

    d. _____ By purchasing existing translations from private sector translation companies such as the National Translation Center in Chicago

    e. _____ By having "in-house" translation staff translate the documents

    f. _____ By contracting to have the document translated

    g. _____ Other; please describe: _____

_____

13. During CY1984, how many foreign language documents did the library send to contractors for translation? (Provide number of documents or check "not applicable."

    _____ (number of documents)   OR   _____ Not applicable, no documents were sent to contractors for translation

THE NEXT 11 QUESTIONS PERTAIN TO USE OF CONTRACTORS TO TRANSLATE FOREIGN LANGUAGE DOCUMENTS. IF YOUR LIBRARY DOES NOT USE CONTRACTORS FOR TRANSLATIONS, PLEASE DO NOT ANSWER QUESTIONS 14 THROUGH 24. GO ON TO QUESTION NO. 25.

IF YOUR LIBRARY DOES USE CONTRACTORS FOR TRANSLATIONS, PLEASE GO ON TO QUESTION NO. 14.

14. To obtain translations, does the library contract with translation companies or with individuals?

    a. _____ Contract with translation companies

    b. _____ Contract directly with individual translators

    c. _____ Both a. and b. above

15. During CY1984, what was the approximate total number of words in the documents sent to contractors for translation? (Please estimate the number of words and note whether the number is based on English word count or foreign language word count.)

_____ (Estimated total number of words translated by contractors during CY 1984)

_____English word count   _____Foreign language word count

16. During CY1984, what was the approximate total amount of money spent on translations prepared by contractors?

$_____(Estimated total spent for contract translations)

17. When you have contractors prepare translations, who pays for the work?

a. _____ The work unit, project, or organization that requested the translation

b. _____ The Library

c. _____ Your parent headquarters

d. _____ Other; please identify: _____

_____

18. What types of contractual arrangements do you have with translation contractors? (Check all applicable spaces below.)

a. _____ Basic ordering agreement

b. _____ Individual contract for each translation

c. _____ Purchase order

d. _____ Other; please explain: _____

_____

19. Once it has been decided that translation of a foreign language document is required, how much time is required to process a contract/purchase order before the contractor can be told to begin work on the translation?

_____(estimated number of <u>weeks</u> required to process contract/purchase order)

20. Does your library notify the Consolidated Translation Survey when a contract translation is initiated?

_____Yes _____No

21. Does your library notify the Consolidated Translation Survey when a contract translation has been completed?

_____Yes _____No

22. When a contractor is preparing a translation for one of your library customers, is the translator able to consult directly with the customer about technical material in the document being translated?

_____Yes _____No

23. Please estimate the average response time that contractors require to meet your requests for translation of foreign language documents of the various lengths indicated below. (Please indicate number of weeks in the spaces below.)

   a.   1-5 page documents   _____ weeks

   b.   6-10 page documents   _____ weeks

   c.   11-100 page documents   _____ weeks

   d.   Over 100 page documents   _____ weeks

24. Do you have any means of ascertaining and controlling the quality of trans-
    lations you obtain from contractors?

    _____Yes _____No

    If "yes," what means do you have? (Check all applicable responses)

    a. _____ Review by in-house language qualified personnel

    b. _____ Comments from the individual who requested the translation

    c. _____ Other; please explain: _____

        _____

25. When your library has a translation prepared, does it retain a copy in the
    library?

    _____Yes _____No

26. When your library has a translation prepared, does it send a copy to DTIC?

    _____Yes _____No

27. If the library does not send copies of translations to DTIC, why not?
    (Check all applicable responses.)

    a. _____ The library has not been required to send copies of translations
              to DTIC

    b. _____ Unaware that DTIC collects translations of foreign language docu-
              ments

    c. _____ Translations are made from documents under copyright protection
              and should not be distributed

    d. _____ Other; please explain: _____

        _____

Use of Previously Translated Information

-28. Is your library on distribution for publications containing compendiums of foreign S&T literature already translated to English by Government organizations (for example: Joint Publications Research Service Serial Reports, FBIS Daily Reports, etc.)?

_____Yes_____No

IF YOU ANSWER "NO" TO QUESTION 28, DO NOT ANSWER QUESTIONS 29, 30, 31, AND 32. GO ON TO QUESTION 33.

29. Which of the following publications containing translations does your library receive? (Check applicable publications.)

a. _____ JPRS Serial Reports

b. _____ FBIS Daily Report

c. _____ Soviet New Abstracts Publications (SNAP--published by the USAF Foreign Technology Division)

d. _____ NAVSCAN, WESTFLEETS, SOVIET NAVAL DIGEST, or SOVIET SHIPBUILDING (published by the Naval Intelligence Support Center)

e. _____ Other translation compendiums produced by U.S. Government

agencies; please identify: _____

_____

30. Please estimate the interest that your customers show in the translation publications identified in the responses to Question No. 29. (Check the one most applicable answer. Space is provided for comment.)

a. _____ Strong interest

b. _____ Moderate interest

c. _____ Slight interest

d. _____ No interest

Comment: _____

_____

_____

31. Is your library on distribution for individual translations prepared by any of the following intelligence agencies? (Check those agencies from which translations are received.)

    a. _____ U.S. Army Foreign Science and Technology Center

    b. _____ U.S. Naval Intelligence Support Center

    c. _____ U.S. Air Force Foreign Technology Division

    d. _____ Armed Forces Medical Intelligence Center

    e. _____ Not applicable; library is not on distribution for individual translations from any of the above agencies.

32. How are the publications referenced in Questions No. 29 and 31 made available to potential users? (Check all applicable responses.)

    a. _____ Retained at library for reference

    b. _____ Announced in accession notifications

    c. _____ Placed in general distribution

    d. _____ Selectively disseminated based on users' areas of interest

    e. _____ Other; please describe: _____

    _____

    f. _____ Not applicable; referenced publications are not received by the library.

33. Does your library subscribe to any commercial "cover-to-cover" translations of foreign technical and scientific publications?

    _____ Yes _____ No

Use of Foreign Language Publications

34. Does your library keep foreign language documents in its holdings (books, journals, reports, etc.)?

    _____ Yes _____ No

35. How often do library users refer to these foreign language publications? (Check most appropriate answer.)

    a. _____ Frequently

    b. _____ Occasionally

    c. _____ Rarely

    d. _____ Not applicable; library does not retain foreign language publications

Translation from English to a Foreign Language

36. Does your library receive requests for translation of English language documents into a foreign language?

    _____ Yes _____ No

    If yes, what types of documents must be translated _____

    _____

37. If the answer to Question No. 36 is "yes," how many such requests did the library process in CY1984?

    _____ (number of requests)   OR   _____ Not applicable

Interpretation Support

38. How often is your library requested to arrange for interpreters to support conferences, seminars, working groups, etc., that will involve foreign personnel?

    a. _____ Frequently (4 or more times per year)

    b. _____ Occasionally (1 to 3 times per year)

    c. _____ Seldom (less than once per year)

    d. _____ Never

39. What resources and procedures does the library use to obtain interpreters?
(Please identify the agencies the library contacts to procure interpreters
and briefly describe the procedures used to obtain them. If the library is
not involved in obtaining interpretation support for its customers, leave
the answer space blank.)

_____

_____

_____

_____

_____

Opinion Survey

FROM THE STANDPOINT OF YOUR LIBRARY, HOW STRONGLY DO YOU AGREE OR DISAGREE WITH
THE FOLLOWING STATEMENTS? RATE YOUR OPINION BY USING A SCALE OF FROM "1" TO
"5," WITH 1=STRONGLY DISAGREE TO 5=STRONGLY AGREE. CIRCLE THE APPROPRIATE
NUMBER BELOW EACH QUESTION. SPACE IS PROVIDED FOR ANY COMMENTS YOU MAY HAVE.

40. R&D scientists and engineers generally make adequate use of S&T information
contained in open source foreign language literature.

(Disagree)   1   2   3   4   5   (Agree)

_____

_____

_____

IF YOUR LIBRARY DOES NOT PROCESS USER REQUESTS FOR TRANSLATION OF FOREIGN
DOCUMENTS (I.E., YOU ANSWERED "NO" TO QUESTION NO. 1), DO NOT COMPLETE THE REST
OF THIS QUESTIONNAIRE. STOP AT THIS POINT AND RETURN THE QUESTIONNAIRE TO THE
STUDY CONTRACTOR.

IF YOUR LIBRARY DOES PROCESS USER REQUESTS FOR TRANSLATION OF FOREIGN LANGUAGE
DOCUMENTS (I.E., YOU ANSWERED "YES" TO QUESTION NO. 1), PLEASE GO ON TO ANSWER
THE REMAINING QUESTIONS.

41. R&D scientists and engineers are aware of procedures and resources for obtaining translations of foreign language documents.

(Disagree)   1   2   3   4   5   (Agree)

_____

_____

_____

42. The amount of time it takes to obtain translations is a significant problem for the library and its customers.

(Disagree)   1   2   3   4   5   (Agree)

_____

_____

_____

43. The amount of time required to obtain translations discourages R&D personnel from requesting them.

(Disagree)   1   2   3   4   5   (Agree)

_____

_____

_____

44. The accuracy and clarity of the translations the library can obtain for its customers are adequate to meet their requirements.

(Disagree)   1   2   3   4   5   (Agree)

_____

_____

_____

45. Translations of foreign language S&T literature are a valuable source of information for R&D scientists and engineers.

(Disagree)   1   2   3   4   5   (Agree)

_____

_____

_____

Comment

PLEASE ADD ANY COMMENT YOU MAY HAVE CONCERNING R&D REQUIREMENTS FOR TRANSLATIONS, THE PROCESS OF OBTAINING TRANSLATIONS, OR THE VALUE OF TRANSLATIONS TO ARMY R&D.

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END OF QUESTIONNAIRE. THANK YOU FOR YOUR ASSISTANCE.

APPENDIX D

FOREIGN INTELLIGENCE OFFICE SURVEY QUESTIONNAIRE

D.1   This appendix contains the letter of transmittal for the questionnaire used to survey the Foreign Intelligence Offices in the Army Materiel Command that are concerned with research and development.   Enclosed with the letter is the questionnaire itself.

D.2   The letter explains the purpose of the translation study and requests the support of the Foreign Intelligence Offices in completing the questionnaire and returning it to the contractor. The letter includes the survey distribution list.

D.3   The questionnaire contains 40 questions addressing Foreign Intelligence Office activities and procedures pertaining to the processing of requests for translation of foreign language documents and distribution of the translations once they are received.

AMCMI   23 August 1985

SUBJECT: Investigation of Translation Support for AMC RDTE Activities

SEE DISTRIBUTION

1.   The Office of the Deputy Chief of Staff for Technology Planning and Manage-
ment, Headquarters, AMC, is sponsoring a study of translation support for Army
Materiel Command RDTE activities. The purposes of this study are to assess
AMC demand for translation of foreign language documents, investigate the transla-
tion resources available to AMC, identify any areas in which resources can be
used more effectively and efficiently, and develop recommendations for feasible
actions that may be taken to enhance translation support so that maximum use
may be made of foreign language technical literature as a source of technology.

2.   Because many of the FIOs provide their customers with references to foreign
technical literature and process requests for translation of that literature,
this office is interested in the HQAMC translation study and is requesting your
FIO to complete a questionnaire concerning its resources and procedures for
translation support of its customers.

3.   You will find that the enclosed questionnaire relies largely on "yes/no"
and "multiple choice" questions. You are encouraged, however, to add whatever
comments may be necessary to portray the translation situation accurately as
it exists at your location. Please complete the questionnaire and mail it on
or before 6 September 1985 to the study contractor:

                         Presearch Incorporated
                         Attn: Translation Study (ISD)
                         8500 Executive Park Avenue
                         Fairfax, Virginia 22031

4.   The information you provide will not be used to evaluate the FIOs or other
organizations. Its purpose is to obtain information needed to enhance the effec-
tiveness of the use of foreign language documents as a source of technology·
for our R&D efforts. Your assistance will be much appreciated. If you have
any question concerning the translation study, you may call the study principal
investigator, Mr. Robert V. Hubbard, at (703) 876-6400.

Encl

RICHARD V. MILES
Chief, Foreign Intelligence Requirements and
  Production Management Division
Deputy Chief of Staff for Intelligence

AMCMI

SUBJECT: Investigation of Translation Support for AMC RDTE Activities

DISTRIBUTION:
Cdr, US Army Armament Research and Development Center, ATTN: SMCAR-RAI,
   Dover, NJ 07801
Cdr, US Army Chemical Research and Development Center, ATTN: SMCCR-OPF,
   Aberdeen Proving Ground, MD 21010
Cdr, US Army Armament Research and Development Center, ATTN: AMSMC-RAI-W,
   Watervliet, NY 12189
Dir, Ballistic Research Laboratory, ATTN: AMXBR-FI, Aberdeen Proving
   Ground, MD 21005
Cdr, US Army Aviation Systems Command, 4300 Goodfellow Blvd., ATTN: AMSAV-NI
   St. Louis, MO 63120
Dir, US Army Research and Technology Labortories, ATTN: SAVDL-FIO, Ames
   Research Center, Moffett Field, CA 94035
Cdr, US Army Aviation Engineering Flight Activity, ATTN: SAVTE-P, Edwards
   AFB, CA 93523
Cdr, US Army Electronics Research and Development Command, ATTN: AMDEL-FI,
   2800 Powder Mill Road, Adelphi, MD 20783
Cdr, US Army Communications-Electronics Command, ATTN: AMSEL-FI,
   Ft Monmouth, NJ 07703
Dir, US Army Signals Warfare Laboratory, ATTN: DELSW-RI, Vint Hill Farms
   Station, Warrenton, VA 22186
Cdr, Office of Missile Electronic Warfare, US Army Electronic Warfare
   Laboratory, ATTN: DELEW-M-FM, White Sands Missile Range, NM 88002
Ch, HEL Liaison Office, ATTN: AMXHE-FI, 220 Seventh Street, NE,
   Charlottesville, VA 22901
Dir, US Army Materials and Mechanics Research Center, ATTN: AMXMR-PF,
   Watertown, MA 02172
Cdr, US Army Missile Command, ATTN: AMSMI-XF, Redstone Arsenal, AL 35898
Cdr, US Army Belvoir Research and Development Center, ATTN: STRBE-HRF,
   Ft. Belvoir, VA 22060
Cdr, US Army Natick Research and Development Center, ATTN: STRNC-AI,
   Natick, MA 01760
Cdr, US Army Tank-Automotive Command, ATTN: AMSTA-NF, Warren, MI 48090
Cdr, US Army Test and Evaluation Command, ATTN: AMSTE-TO-F, Aberdeen
   Proving Ground, MD 21005
Cdr, US Army Dugway Proving Ground, ATTN: STEDP-SD-TA-F, Dugway, UT 84022
Cdr, US Army Electronic Proving Ground, ATTN: STEEP-MM-IS, Ft. Huachuca,
   AZ 85613
Cdr, US Army White Sands Missile Range, ATTN: STEWS-TE-F, White Sands
   Missile Range, NM 88002
Cdr, US Army Yuma Proving Ground, ATTN: STEYP-FIO, Yuma, AZ 85365
Dir, US Army Materiel Systems Analysis Agency, ATTN: AMXSY-PF, Aberdeen PG,
   MD, 21005-5071

AMCLD

HQAMC TRANSLATION STUDY QUESTIONNAIRE
FOR FOREIGN INTELLIGENCE OFFICERS

IDENTIFICATION OF FOREIGN INTELLIGENCE OFFICE (FIO)

FIO Designation and Address: _____

_____

_____

_____

Please provide the following information:

Name of person who completed this
questionnaire: _____

Commercial telephone number at
which this person can be reached: _____

Principal R&D activities sup-
ported by this FIO: _____
(Please add any organizations
the FIO supports that have not _____
been identified)

_____

_____

INSTRUCTIONS

This questionnaire asks 40 questions. Most questions require "yes/no" or
"multiple choice" answers. Some questions ask for specific figures; if the
exact figures are not readily available, please provide your best estimate.
Instructions for answering the questions are provided with the questions as may
be needed for clarity.

Space is provided at the end of the questionnaire for you to add comments rela-
tive to the use and provision of translations of foreign language S&T documents.
If you have specific comments pertaining to an individual question, please make
your comment on the page where that question appears.

Please mail the completed questionnaire to the study contractor no later than
6 September 1985. The address is:

>   Presearch Incorporated, Attn: Translation Study (ISD)
>   8500 Executive Park Avenue
>   Fairfax, VA 22031

QUESTIONS

Identification of Local Resources for Translation

1. Does your FIO process requests from its customers for translation of foreign language documents?

   _____Yes   _____No

2. Does your FIO use the Central Information Reference and Control (CIRC) system data bases to obtain references to foreign S&T documents for your customers?

   _____Yes   _____No

3. If your FIO uses CIRC, what type of access to CIRC do you have? (Check as many responses as are applicable.)

   _____ On-line secure terminal

   _____ On-line unclassified terminal

   _____ Dial-up terminal

   _____ Off-line access (telephone, correspondance)

   _____ Not applicable; this FIO does not use CIRC.

4. Does any other organization at your location (e.g., the technical library) process requests for translation of foreign language documents?

   _____Yes   _____No

   If your answer to question No. 4 is "yes," please provide the organization(s)' name and office symbol in the space below.

   _____

5. Does your FIO refer requests for translation of foreign language documents to the other organizations at your location (listed in the answer to question No. 4) that process requests for translation? (Check the one most appropriate answer)

   a. _____ Always

   b. _____ Sometimes

   c. _____ Never

   d. _____ Not applicable, no other organizations at this location process requests for translation

6. If your FIO does refer translation requests to other local organizations,
   why?
   (Check all appropriate answers)

   a. _____ Local organizations can obtain translations more quickly than the
            FIO

   b. _____ Local organizations can obtain more accurate and useful
            translations than FIO

   c. _____ FIO does not process requests for translation

   d. _____ Other, please explain: _____

   _____

IF YOUR FIO DOES NOT PROCESS CUSTOMER REQUESTS FOR TRANSLATION OF FOREIGN
LANGUAGE DOCUMENTS (I.E., YOU ANSWERED "NO" TO QUESTION NO. 1), DO NOT COMPLETE
THE REST OF THIS QUESTIONNAIRE. STOP AT THIS POINT AND RETURN THE QUESTIONNAIRE
TO THE STUDY CONTRACTOR. IF YOU WANT TO MAKE COMMENTS CONCERNING TRANSLATION
SUPPORT FOR R&D ACTIVITIES, USE THE SPACE PROVIDED AT THE END OF THE
QUESTIONNAIRE.

IF YOUR FIO DOES PROCESS CUSTOMER REQUESTS FOR TRANSLATION OF FOREIGN LANGUAGE
DOCUMENTS (I.E., YOU ANSWERED "YES" TO QUESTION NO. 1), PLEASE GO ON TO ANSWER
THE REST OF THE QUESTIONS IN THIS QUESTIONNAIRE.

Initiation of Requirements for Translation

7. How do your FIO's customers identify and/or obtain the foreign language
    documents that they want to have translated?
    (Please check all applicable items)

    _____ From CIRC bibliographic listings

    _____ From the technical library at your location

    _____ From the National Technical Information Service

    _____ From enclosures to intelligence reports

    _____ From attendance at conferences, seminars, etc.

    _____ From documentation accompanying foreign materiel

    _____ From advertising brochures

    _____ From other scientists and engineers

    _____ From other sources; please identify: _____

    _____

8. When an FIO customer has identified a foreign language document that he/she
    wants and requests the FIO to procure it, how do you obtain it? (Check all
    applicable answers.)

    _____ Request from the Foreign Science and Technology Center (FSTC)

    _____ Request from the Foreign Science Library in Columbus, Ohio

    _____ Request from your local technical library

    _____ Request from other sources; please identify: _____

    _____

9. After a FIO customer has identified/obtained a foreign language document, how does he/she decide if a translation is needed?
   (Check the two most applicable answers.)

   _____ Based on bibliographic information and abstracts describing the document

   _____ Based on review of the figures, tables, equations, etc. contained in the document

   _____ Based on review of the document by a language capable person

   _____ Based on recommendations by other scientists and engineers

   _____ Other basis; please identify: _____

   _____

10. Do the organizations your FIO supports have any systematic way of using language-qualified staff personnel to screen foreign language documents to determine if they merit translation?

    _____ Yes   _____ No

    If "yes," please describe: _____

    _____

    _____

Processing of Translation Requests

11. How many requests for document translations did your FIO receive during calendar year (CY) 1984?

    _____ (number of requests)

12. How many of the translation requests received in CY84 were referred to other organizations at your location for processing?

    _____ (number of requests referred)

13. How many of the document translation requests received in CY84 were processed by your FIO?

    _____ (number of requests processed)

14. When your FIO processes a request for document translation, do you check to
    see if there is an existing translation before requesting that one be made?

    _____ Yes   _____ No

15. If you do check to see if there are existing translations of a document,
    which of the following resources do you use?
    (Check all applicable responses)

    _____ FIO files

    _____ Local technical library

    _____ Defense Technical Information Center (DTIC) Technical Reports Data
          Base

    _____ CIRC Translation Index (XLAX)

    _____ Consolidated Translation Survey (CTS)

    _____ FSTC Library Services Branch (AIAST-IS3)

    _____ FSTC Foreign Language Research Branch (AIAST-IS2)

    _____ Other; please identify: _____

    _____ Not applicable; FIO does not check for existing translations

16. Of the total number of requests that your FIO processed during CY84, in how
    many cases were the required document translations obtained by the FIO from
    FIO files, the technical library, DTIC, or other resources not including
    FSTC?

    _____ (Number of requests satisfied using resources other than FSTC)

    Please identify the resources you used: _____

    _____

17. How many requests for translation of documents were forwarded to FSTC during
    CY84?

    _____ (number of requests forwarded to FSTC)

18. Of your requests for translation sent to FSTC during CY84, how many times
    did you request the FSTC Library Services Branch (IS3) to obtain a specific
    document and have it translated?

    _____ (number of requests to IS3)

19. Of your requests for translation sent to FSTC during CY84, how many times did you send a document directly to the Foreign Language Research Branch (IS2) for translation?

    _____ (number of requests sent directly to IS2)

20. Please estimate the time that FSTC has required to translate foreign language documents of various lengths in response to your requests. (Please indicate number of weeks in the spaces below.)

    1-5 page documents   _____ weeks

    6-10 page documents   _____ weeks

    11-100 page documents   _____ weeks

    Over 100 pages   _____ weeks

21. Does your FIO retain file copies of translations that have been obtained for your customers?

    _____ Yes   _____ No

22. Does your FIO provide copies of translations obtained for your customers to your local technical library?

    _____ Yes   _____ No

Use of Translation Contractors

23. Does your FIO ever obtain document translation services directly from translation contractors?

    _____ Yes   _____ No

IF YOUR ANSWER TO QUESTION NO. 23 IS "NO," DO NOT ANSWER THE FOLLOWING 6 QUESTIONS; GO ON TO QUESTION NO. 30.

24. When you have contractors prepare translations, who supplies the funds to pay for the work?

    _____ The work unit, project, or organization that requested the translation

    _____ Funds come out of the FIO budget

    _____ Funds come out of the parent headquarters budget

    _____ Other; please identify: _____

    _____

25. What is the approximate range of rates paid for translation in dollars per 1,000 words? (Please fill in the spaces below.)

The rates for translation range from $ _____ to $ _____ per thousand words of translation.

26. What was the total amount spent for translations in CY1984.

$_____

27. How many documents were sent to contractors for translation in CY1984?

_____ (number of documents were sent to contractors for translation.)

28. Please estimate the response time that contractors have required to meet your requests for translation of foreign language documents of the various lengths indicated below.
(Please indicate number of weeks in the spaces below.)

a. 1-5 page documents   _____ weeks

b. 6-10 page documents   _____ weeks

c. 11-100 page documents   _____ weeks

d. Over 100 page documents   _____ weeks

29. What types of contractural arrangements do you have with translation contractors?
(Check all applicable spaces below.)

a. _____ Basic ordering agreement

b. _____ Individual contract for each translation

c. _____ Purchase order

d. _____ Other; please explain _____

_____

Use of Previously Translated Information

30. Does your FIO obtain copies of foreign S&T literature already translated to English by Government or private sector organizations (for example: Joint Publications Research Service Serial Reports, FBIS Daily Reports, commercial cover-to-cover translations, etc.)?

_____ Yes   _____ No

IF YOU ANSWER "NO" TO QUESTION 30, DO NOT ANSWER QUESTIONS 31, 32, AND 33. GO ON TO QUESTION 34.

31. Which of the following publications containing translations does your FIO receive? (Check applicable publications.)

a. _____ JPRS Serial Reports

b. _____ FBIS Daily Report

c. _____ Soviet New Abstracts Publications (SNAP--published by the USAF Foreign Technology Division)

d. _____ NAVSCAN (published by the Naval Intelligence Support Center)

e. _____ Others; Please identify: _____

_____

_____

32. How are these publications made available to potential users? (Check all applicable responses.)

a. _____ Retained at FIO for reference

b. _____ Placed in general distribution

c. _____ Selectively disseminated based on user's areas of interest

d. _____ Other; please describe: _____

_____

_____

33. Please estimate the interest that your customers show in the translation publications identified in the response to question No. 31. (Check the one most applicable answer. Space is provided for comment.)

a. _____ Strong interest

b. _____ Moderate interest

c. _____ Slight interest

d. _____ No interest

Comment: _____

_____

_____

Interpretation Support

34. How often is your FIO requested to arrange for interpreters to support conferences, seminars, working groups, etc., that will involve foreign personnel?

    a. _____ Frequently (4 or more times per year)

    b. _____ Occasionally (1 to 3 times per year)

    c. _____ Seldom (less than once per year)

    d. _____ Never

35. What resources and procedures does the FIO use to obtain interpreters? (Please identify the agencies the FIO contacts to procure interpreters and briefly describe the procedures used to obtain them. If the FIO is not involved in obtaining interpretation support for its customers, leave the answer space blank.)

    _____

    _____

    _____

    _____

    _____

Opinion Survey

FROM THE STANDPOINT OF YOUR FIO, HOW STRONGLY DO YOU AGREE OR DISAGREE WITH THE FOLLOWING STATEMENTS? RATE YOUR OPINION BY USING A SCALE OF FROM "1" TO "5," WITH 1=STRONGLY DISAGREE TO 5=STRONGLY AGREE. CIRCLE THE APPROPRIATE NUMBER BELOW EACH QUESTION. SPACE IS PROVIDED FOR ANY COMMENTS YOU MAY HAVE.

36. R&D scientists and engineers generally make adequate use of S&T information contained in open source foreign language literature.

    (Disagree)   1   2   3   4   5   (Agree)

    _____

    _____

    _____

37. R&D scientists and engineers are aware of procedures and resources for
obtaining translations of foreign language documents.

    (Disagree)   1   2   3   4   5 (Agree)

    _____

    _____

    _____

38. The amount of time it takes to obtain translations is a significant problem
for the FIO and its customers.

    (Disagree)   1   2   3   4   5 (Agree)

    _____

    _____

    _____

39. The amount of time required to obtain translations discourages R&D personnel
from requesting them.

    (Disagree)   1   2   3   4   5 (Agree)

    _____

    _____

    _____

40. The accuracy and clarity of the translations the FIO can obtain for its
customers are adequate to meet their requirements.

    (Disagree)   1   2   3   4   5 (Agree)

    _____

    _____

    _____

Comment

PLEASE ADD ANY COMMENT YOU MAY HAVE CONCERNING R&D REQUIREMENTS FOR
TRANSLATIONS, THE PROCESS OF OBTAINING TRANSLATIONS, OR THE VALUE OF
TRANSLATIONS TO ARMY R&D.

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END OF QUESTIONNAIRE: THANK YOU FOR YOUR ASSISTANCE.

APPENDIX E

LIST OF AGENCIES

E.1   This appendix contains a list of the agencies contacted
and officials interviewed during the course of the translation
study. All interviews were conducted in person unless otherwise
noted.

E.2   In addition to the agencies included in the list, numerous
other organizations were contacted by telephone in the course of
following up on questionnaires sent to the Army Technical
Libraries and the Army Materiel Command Foreign Intelligence
Offices. The names of these organizations are included in
Appendices C and D.

Organization	Individual Interviewed
The American Association of Language Specialists	Ms. Estelle Belisle, President
Armed Forces Medical Intelligence Center	Mr. Daniel W. McCallum, Jr., Chief of Information Services (telephone interview)
Defense Mapping Agency Aerospace Center	Mr. Ivo Mannarelli, Chief, Translation Section, Technical Library
Department of State	Mr. Harry Obst, Director, Office of Language Services
Electronic Warfare Associates, Incorporated	Mr. Phillip H. Parsons, Analyst
Foreign Broadcast Information Service	
Production Group	Mr. Richard Bender, Acting Chief
S&T Branch, Soviet Division	Mr. Allen Thompson, Chief
Translation Services Staff	Mrs. Zaida Thompson, Chief
Language Officer	Ms. Maureen E. Cote
Joint Publications Research Service	Mr. LeRoy F. Butkus, Chief Ms. Sandra Grahm, Deputy Chief
Georgetown University School of Languages and Linguistics, Division of Interpretation and Translation	Ms. Estelle Belisle, Acting Head
Headquarters, Department of the Army, Office of the Assistant Chief of Staff for Intelligence	Major James Cox, Language Program Officer
Headquarters, U.S. Army Materiel Command, Office of the Deputy Chief of Staff for Technology Planning and Management	Mr. Edward J. Kolb, Principal Army Technical Information Officer

Organization	Individual Interviewed
Headquarters, U.S. Army Medical Research and Development Command	Ms. Dixie C. Daymont, Information Services (telephone interview) Mr. Ronald Adams, Foreign Science Officer
Intelligence Community Staff	Mr. George L. Marling Mr. George W. Rogers, Jr.
National Technical Information Service	Mr. David Shonyo, Director, Office of International Affairs
National Translations Center, John Crerar Library, University of Chicago	Ms. Idiko D. Novak, Chief
Redstone Scientific Information Center, U.S. Army Missile Command	Mr. Theodore Woerner, Chief, Translation Branch
U.S. Air Force Systems Command Foreign Technology Division	
Directorate of Data Services	
Technical Translation Division	Mr. Dale Bostad
Information Services Division	Dr. James H. Canfield, Chief
Document Services Branch	Ms. Anita L. Miller, Chief
Operations Division	Mr. David Leasure
U.S. Army Foreign Science and Technology Center	
Information Services Division	
Foreign Language Research Branch	Mr. Lester C. Bennefeld, Jr., Chief
Library Services Branch	Ms. Angela Moon
R&D Interpreting Office	Mr. Helmut R. Kerl, Chief

Organization	Individual Interviewed
U.S. Army Military Personnel Center	
Enlisted Personnel Directorate	SFC William Bishop, Enlisted Language Branch
U.S. Army Missile and Space Intelligence Center	Marcile L. Bagley, Library Chief
U.S. Naval Intelligence Support Center	Mr. Arthur W. Holtz, Chief, Translation Division

PRESEARCH INCORPORATED

APPENDIX F

SUMMARY HISTORY OF LANGUAGE SERVICES
IN THE DEPARTMENT OF STATE

F.1   The enclosed history of language services in the Depart-
ment of State was provided by Mr. Harry Obst, Director of the
Office of Language Services. It is a chronology of the develop-
ment of the Language Services Office.

Summary History of Language Services in
the Department of State

Compiled from Department Documents on August 2, 1984

1781   Department of Foreign Affairs first organized. The
        extremely small staff included one French interpreter
        (John P. Tetend) and one French translator (Philip
        Freneau).

1786   A Spanish translator (Isaac Pinto) is added.

1788   First documented "contracting out" of translations
        which the staff could not handle for Spanish, Dutch
        and German at a rate of 2 shillings per 100 words.

1789   Department of State established with a staff of less
        than ten officers. Thomas Jefferson retains the
        language staff under the reorganization in 1790.

1833   Secretary McLane establishes the Bureau of Translating
        and Miscellaneous by Order on June 30. He defines its
        duties as follows:

        "The duties of this bureau will consist in translating
        all letters, papers and documents of every description
        whatsoever relating to the business and duties of the
        Department. The translation of every letter, paper or
        other document in a foreign language shall be made
        immediately after it is received at the Department, and
        the translation be filed in the proper bureau with the
        original, and file of papers to which it belongs."

        Between 1834 and 1853 librarian functions are added to
        the translating duties from time to time, then again
        abolished.

1855   A reorganization Act of March 3, 1855 abolishes all
        existing bureaus in the Department. A "Translations
        Office" is created.

1870   "Translation Bureau" re-established by Secretary
        Hamilton Fish.

1905   The Bureau's duties are redefined as follows:

"This Bureau translates official communications to the
Department in foreign languages, and letters and docu-
ments in foreign languages received at the White House.
The Bureau also does translations for several Executive
Departments, the District of Columbia, and Congress,
upon official requests."

1909   Secretary Philander C. Knox, in need of a new "Bureau
of Trade Relations", demotes the Bureau to "Office of
the Translator". It is put under the Chief Clerk and
appears on a 1910 organization chart at the very
bottom, next to "Stables", "Carpenters", "Mail Room".

1921   Office status is abolished. Now appears as a
"Translators' Section" under the Chief Clerk.

1928   "Translation Bureau" re-established on October 18 by
Departmental Order No. 455. New duties are added,
including the rendering of the language services at
international conferences and "the critical examina-
tion of drafts of foreign texts of bilingual or multi-
lingual treaties to which the United States is a party in
order to insure the closest possible adjustment to each
other of the foreign and English text".

1944   Name changed to "Central Translating Bureau".

1948   Staff reaches a peak of about 75 employees. Verbatim
Reporting is added as a new duty and a "Stenographic
Unit" established. A reorganization creates the
"Division of Language Services" under the Office of
Public Affairs, placed under Administration and later
Operations in the early 1950s, with the name changed
to "Language Services Division".

The Division establishes an Interpreting Branch and a
Translating Branch for the first time, as the volume
of interpreting has pulled almost even with trans-
lating.

1950s   Simultaneous interpreting, first used at the Nuremberg
and   Trials, becomes popular and spreads to the United
1960s   Nations and international conferences. As a result,
interpreting rather than translating becomes the
dominant function of the language services rendered by
the Division.

Because of the limited size of its interpreting staff, LS begins to require its high-level interpreters to be able to work as simultaneous <u>and</u> consecutive interpreters <u>from and into</u> the foreign languages (in major league baseball, this would be equivalent to requiring the best hitters to be able to switch to pitching or catching on a moment's notice). Other organizations, including the United Nations, continue to hire staff interpreters only for one specialty <u>or</u> the other and usually let them interpret only into their native language.

1970 to 1984
The workload of the Division keeps growing. In addition to the 20 staff interpreters, who handle the most difficult work, the LS roster of qualified contract interpreters reaches 1,000 and well surpasses that figure by 1984. As many as 200 may work at the same time. The importance of oriental languages keeps growing; two staff interpreters for Chinese are hired for the first time. USIA has become the biggest user of LS interpreters on a reimbursable basis. ACDA, the Department of Defense, DEA (formerly BNDD), Customs and Justice depend heavily on interpreting support from the Division in the United States and overseas. Occasionally different staff interpreters are working in Africa, Asia, Europe and North & South America on the same day.

The volume of the Translating Branch exceeds 3 million words a year in more than 60 languages, much more than the staff of about 20 translators can handle. Treaty comparisons and extradition requests become numerous. The contract roster grows to almost two hundred. Other agencies rely strongly on translating support, for instance Justice, Treasury, DEA, IRS, Commerce and Customs. Electronic word processors are used by most translators but machine translation is still unsuitable for even simple translations and cannot be employed.

The White House, now a big user, still gets all services (interpreting, translating, screening and summarizing over 30,000 pieces of foreign-language mail per year) for free.

(Written by Harry Obst with assistance from Ruth Cline)

APPENDIX G

1917 WAR DEPARTMENT MEMORANDUM CONCERNING
A CENTRAL TRANSLATION OFFICE

G.1 The enclosed correspondence is a retyped copy of a U.S. War Department Memorandum of 1917. The xerox copy of the original document, from which this copy was typed, was not of suitable quality for publication.

G.2 Even though this memorandum was prepared almost 70 years ago, much of its content is still relevant to the Army's requirements for translation of foreign language documents.

WAR COLLEGE DIVISION   WAR DEPARTMENT
                      OFFICE OF THE CHIEF OF STAFF
0148-8   WASHINGTON

                                September 24, 1917

MEMORANDUM FOR THE CHIEF OF STAFF:

     Subject: Necessity for a central translation office for all
               military translations

     1. <u>Present System</u>. At present translations are being made of important military documents and papers by several Bureaus of the War Department (Engineers, Ordance, Signal Corps, etc.) and by some service schools, as well as by the War College Division, General Staff.

     2. <u>Proposed System</u>. It is proposed that all translation of military documents be centralized in the Translation Office of the Military Intelligence Section, War College Division, General Staff.

     3. <u>Advantages of the Proposed System</u>.

     (a) Coordination of work. The proposed system would do away with much duplication of work now going on. The Intelligence Section of the War College Division has tried to keep in touch with the various Bureaus of the War Department of which are doing translation, in order to avoid duplication of the work. Although much duplication of work has been avoided in this way, it is impossible to prevent considerable duplication of work, even when the best cooperation is effected. Lists sent in by the Signal Corps, for instance, show the titles of publications being translated by them; but, unless a great deal of time is taken to see that the publication mentioned on the signal Corps list is exactly the same publication the War College is considering translating, and that the two publications bear the same date, a duplication of work results, or in some instances a later and improved pamphlet in the hands of the War College is not translated, while an older and less complete edition of the same publicatoin may be translated by the Signal Corps. A central office for translation would insure the complete checking of all work, and would also insure that no important publication which should be translated is overlooked.

     The Intelligence Section, under which the translation is done, would insure that all documents and publications coming from abroad, or which we can obtain from abroad through our military attaches, are properly examined and passed on with a view to translation. It should also be noted that the publication committee, which edits the translations for publication, is also under the Intelligence Section. Therefore, if all military translations were centralized under the Intelligence Section, War College Division, the whole important machinery for getting the latest and best information into the hands of our service would be centralized and controlled at one place.

     The Intelligence Section is in close touch with the American Expeditionary Forces, and with the American military attaches, abroad. It is the section best capable of handling the question of finding what is important in foreign publications, of getting those publications, of coordinating the work of translating those publications, of editing the publication with their illustrations, and eventually sending them forward for publication.

(b) Authority for translation. A central translation office will also tend to solve the question of whether or not a certain document need be translated and published. The document would come accompanied by a memorandum from the proper bureau of the War Department stating that it should be published, and if the publication is desired rushed or not. In case of a document originating in the War College, the central translation office, being in direct cooperation with the Bureau of the War Department, and in still more direct cooperation with the various committees of the General Staff in the War College, would have little difficulty in determining whether or not the documents should be translated and published.

(c) Drawings and photographs. As a great many of the publications from translations of foreign documents contain illustrations which must be retraced or photographed for printing, the map section and the photograph gallery of the Military Intelligence Section, War College Division, is best fitted to handle this work. The Translation Office in the Military Intelligence Section, War College Division, controls these two workshops, and it would also have access to the Engineer School printing establishment at Washington Barracks, which has already done some very important map work for the General Staff.

(d) Library. As the War College contains by far the best military library in Washington, as a library has to be constantly used to obtain the accurate translations of very important military documents, it is obvious that translators at the War College would have a great advantage over other translators who do not have access to this library.

4. **Present Status of the Translation Office of the Military Intelligence Section, War College Division.** This office now has fourteen translators, most of whom have had several months' training on military translation. Certain of these translators have specialized on different departments of the work, such as aviation, artillery, etc. It is proposed to continue this specialization. If all translation work were centralized, translators could specialize to a very large degree, could study up their specialty by access to the library of the War College, and could rapidly fit themselves for the great accuracy of translation demanded under present military conditions.

5. **Recommendation.** It is therefore recommended that the necessary instructions be issued that, in the future, all documents or publication in foreign languages which any Bureau of the War Department, or any of the service schools, desires to have translated for publication or distribution by mimeograph, be sent to the Military Intelligence Section, War College Division, for translation.

6. The Chief of Ordance, of Engineers, of Coast Artillery, the Quartermaster General and the Chief Signal Officer have been consulted in this matter, and concur in the above recommendation.

Memorandum for the Adjutant General of the Army herewith.

P D LOCHRIDGE

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Colonel, General Staff,
Acting Chief of War College Division

WAR DEPARTMENT
OFFICE OF THE CHIEF OF STAFF
WASHINGTON

September 25, 1917

MEMORANDUM FOR THE ADJUTANT GENERAL OF THE ARMY:

    Subject: Translation and publication or distribution of documents
              at War College.

    The Secretary of War directs that instructions be issued to all chiefs of
Bureaus of the War Department, and to the commandants of the Army Service Schools
at Fort Leavenworth, the Artillery School at Fort Monroe, the School of Fire for
Field Artillery and the School of Arms at Fort Sill, substantially as follows:

    Hereafter all documents in a foreign language coming into your hands which you
desire published or distributed by mimeograph for the information of the service or
a part of the service, will be sent to the Chief, Military Intelligence Section,
War College Division, General Staff, Washington, D.C., for translation with a view
to publication or distribution. Accompanying these documents will be memoranda
requesting their translation, recommending the disposition which should be made of
them after translation, and stating, when necessary, that the work should be rushed
or that certain marked parts of the document may be omitted in translation.

                        Major General,
                        Chief of Staff.

Copy for the Army War College:

September 28, 1917

From: The Adjutant General of the Army.

To: The Judge Advocate General.

Subject: Translation and publication or distribution of documents at
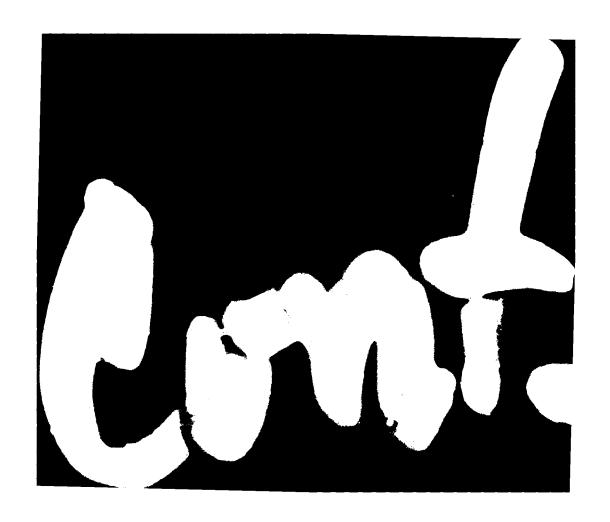   War College.

Hereafter all documents in a foreign language coming into your hands which you
desire published or distributed by mimeograph for the information of the service or
a part of the service. will be sent to the Chief, Military Intelligence Section,
War College Division, General Staff, Washington, D.C., for translation with a view
to publication or distribution. Accompanying these documents will be memoranda
requesting their translation, recommending the disposition which should be made of
them after translation, and stating, when necessary, that the work should be rushed
or that certain marked parts of the document may be omitted in translation.

By order of the Secretary of War:

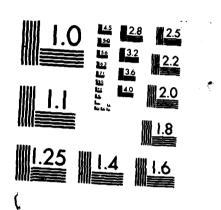Adjutant General.

Same letter sent to the following:
        Judge Advocate General
        Inspector General
        Quartermaster General
        Chief of Militia Bureau
        Surgeon General
        Chief Signal Officer
        Chief, Bureau of Insular Affairs
        Chief of Engineers
        Chief of Coast Artillery
        Chief of Ordnance

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MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

PRESEARCH INCORPORATED

SUMMARY

PURPOSE AND OBJECTIVES

1.   This study report provides Army officials responsible for information support of Army research and development (R&D) activities with information needed for efficient and effective management and use of translating and interpreting resources available to the Army. These resources play an important role in making foreign science and technology (S&T) accessible to Army scientists and engineers. The objectives of the study were to:

   a.   Estimate the demand for translating and interpreting support generated by Army R&D activities

   b.   Identify and describe current resources and procedures for translating and interpreting support to the Army R&D Community

   c.   Identify and describe problem areas in translating and interpreting service resources and procedures

   d.   Develop recommendations for actions to improve translating and interpreting support to Army R&D activities with the end goal of facilitating Army use of S&T information available in foreign languages.

2.   The study was sponsored by the Army Principal Technical Information Officer, Office of the Deputy Chief of Staff for Technology Planning and Management, Headquarters, Army Materiel Command and performed by Presearch Incorporated under Contract Number DAAD05-84-C-0189.

SCOPE

3.   The study addressed requirements for translating and interpreting support for the Army R&D Community to include Army R&D laboratories and activities in the Office of the Chief of Engineers, Headquarters, Department of the Army; the Army Materiel Command; the Army Medical Research and Development Command; and the Army Research Institute for the Behavioral and Social Sciences.

METHODOLOGY

4.   Information on Army R&D requirements for translating and interpreting support, resources available, and use of those resources was collected through literature research, interviews,

and questionnaire survey. Officials of all the major translat-
ing and interpreting services in the Department of Defense
(DoD), Intelligence Community, and Department of State (DOS)
were interviewed. Questionnaires were sent to and received from
35 technical libraries and 22 Foreign Intelligence Offices in
the Army R&D Community. The collected data were analyzed to
derive the study findings and recommendations. About six man-
months of professional effort were involved.

FINDINGS

Demand for Translating and Interpreting Support

5.   **Translating Support.** The total Army R&D demand for trans-
lating support was about 6 million words per year in the
1984/1985 timeframe. In addition to these 6 million words per
year required by the R&D organizations, an additional 12 to 13
million words of translation were requested by U.S. Army Foreign
Science and Technology Center (FSTC) intelligence analysts,
HQDA, TRADOC, and other Army organizations that use the FSTC
Document Analysis Branch as a resource for translating services.
The principal languages required for R&D work are German,
French, and Russian, with occasional requirements in 15 to 20
other languages. Requirements for Japanese translation are
increasing rapidly.

6.   The current R&D workload of 6 million words per year
equates to 10 to 12 man-years of translation support per year.
The total Army load of 20 million words equates to 30 to 40 man-
years of translation support per year.

7.   **Interpreting Support.** Army R&D organizations require from
550 to 600 man-days per year of conference interpreting support.
Assuming two days of administration and travel are required for
each day of that interpreting, the annual workload equates to
seven to eight man-years of effort per year. Most of this work
is required for international conferences related to projects
such as the Multiple Launch Rocket System and Test Standardiza-
tion. The principal languages required are German and French.

Resources and Procedures

8.   **Translating Support.** Translating resources available to
R&D organizations include the FSTC Foreign Language Research
Branch, the Redstone Scientific Information Center (RSIC) Trans-
lation Branch, and commercial translation contractors. Of the 6
million words of R&D translations per year, about 3.2 million
are sent directly to contractors, 1.1 million are done by RSIC,
and 1.7 million are sent to FSTC through the FIOs. FSTC normal-
ly uses contractors to translate documents sent in by the FIOs

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but occasionally sends some documents to the U.S. Joint Publications Research Service for translation.

9.   Army R&D organizations pay varying rates for contract translations, depending on the language and technical content of the document to be translated. The average rate paid appears to be about $35 per 1,000 words. Current commercial rates for highly technical work in languages such as Russian or Japanese may run as high as $100 per 1,000 words. Requirements to accept low bids for translation work are often reported to impinge on the quality of the translations received.

10.   A very rough estimate of the total cost of translating support for Army R&D per year, including Government and contractor personnel, is $450,000 to $500,000. An estimate of the total cost required to meet the estimated total Army demand of 20 million words per year is approximately $1.6 million per year.

11.   **Interpreting Support.** About 30% of the Army's requirements for interpreting are provided by the Army R&D Interpreting Office. The other 70% are met by the DOS Office of Language Services. The estimated current annual cost to the Army of interpreting support for R&D work is approximately $325,000.

Problem Areas

12.   Translating and interpreting support for Army R&D activities is inadequate to support the Army's need to exploit foreign technology. About 15% of the stated requirements for translation were not met in 1985; many translations required months to prepare; the translations are often of uncertain quality; procedures, policy, and guidance for translation support are not spelled out; the organizations that manage and provide translating and interpreting support are understaffed; and the Army lacks overall policy for the management of language services.

13.   These findings are not surprising given the small amount of money expended on translating and interpreting. In 1985 the Army spent less than $1,000,000 to obtain translating and interpreting support for R&D. This is a miniscule amount of money compared to expenditures on major development projects, several of which cost billions of dollars. The potential savings by obtaining significant new information from just one foreign language source could pay for the entire Army translating and interpreting budget for several years.

RECOMMENDATIONS

14. The major recommendations derived from the study findings are listed below. The Army should:

- Incorporate policy and responsibilities for use of foreign technical information into its Scientific and Technical Information Program

- Reduce its reliance on intelligence organizations for exploitation of foreign technical literature; the intelligence agencies do not have the resources to meet all R&D requirements for technology

- Provide incentive for scientists and engineers attain and maintain language skills useful in their work

- Establish a Central Army Language Services Management Office, responsible to HQDA, which will assess requirements, provide resources, and disseminate information for translating and interpreting services

- Increase the number of its personnel dedicated to translating and interpreting; the current FSTC Foreign Language Research Branch and R&D Interpreting Office are both seriously understaffed

- Provide guidance to organizations that contract for translations; technical libraries have not been told how to procure, handle, and distribute translations

- Make better use of existing Government resources for registration, storage, and retrieval of foreign technical information; only one-third of the Army R&D installations have on-line access to the Defense Intelligence Open Source data base which contains references to over 5 million foreign technical articles

- Identify in-house personnel with language capabilities to screen documents before they are submitted for translation

- Establish a system for prioritizing and reporting the status of requests for translation of foreign language documents

- Establish a means to assess and control translation quality.

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