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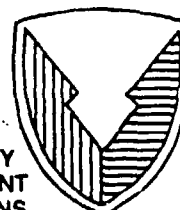
1987 ADVANCED PLANNING BRIEFING FOR INDUSTRY  
(APBI)

Compiled by Richard L. Dimmick  
Ronald P. Hinkle

ADVANCED SYSTEMS CONCEPTS DIRECTORATE

October 1987

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U.S. ARMY  
ARMAMENT  
MUNITIONS  
CHEMICAL COMMAND

Aberdeen Proving Ground, Maryland 21010-5423

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| 1a. REPORT SECURITY CLASSIFICATION<br><b>UNCLASSIFIED</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                    |                                                          | 1b. RESTRICTIVE MARKINGS                                                                            |                                                              |
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| 6c. ADDRESS (City, State, and ZIP Code)<br><b>Aberdeen Proving Ground, MD 21010-5423</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                    |                                                          | 7b. ADDRESS (City, State, and ZIP Code)                                                             |                                                              |
| 8a. NAME OF FUNDING / SPONSORING ORGANIZATION<br><b>CRDEC</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                    | 8b. OFFICE SYMBOL<br>(if applicable)<br><b>SMCCR-OPP</b> |                                                                                                     | 9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER              |
| 8c. ADDRESS (City, State, and ZIP Code)<br><b>Aberdeen Proving Ground, MD 21010-5423</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                    |                                                          | 10. SOURCE OF FUNDING NUMBERS                                                                       |                                                              |
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| 17. COSATI CODES                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                    |                                                          | 18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)                   |                                                              |
| FIELD<br><b>15</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | GROUP<br><b>02</b> | SUB-GROUP                                                | Unsolicited proposals, Chemical defense<br>Industrial liaison, NBC<br>(continued on reverse)        |                                                              |
| 19. ABSTRACT (Continue on reverse if necessary and identify by block number)<br>This publication is a compilation of the planned agenda and copies of the vugraphs to be presented at the 1987 Advanced Planning Briefing for Industry (APBI). The APBI is being held at the U.S. Army Chemical Research, Development and Engineering Center (CRDEC), Edgewood Area, Aberdeen Proving Ground, MD, on 7 and 21 October 1987. This briefing will cover specific aspects of the CRDEC programs and provide industry with mission-oriented scientific and technical information. (Keywords) |                    |                                                          |                                                                                                     |                                                              |
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|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                    |                                                          | 22c. OFFICE SYMBOL<br><b>SMCCR-SPS-T</b>                                                            |                                                              |

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All other editions are obsolete.

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18. Subject Terms (continued)

Smoke/obscuration,  
Decontamination,  
Reconnaissance, detection  
and identification,  
Collective protection,  
Individual protection,  
Computer-aided program management

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## PREFACE

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## Acknowledgments

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## 1987 ADVANCED PLANNING BRIEFING FOR INDUSTRY (APBI)

### 1. INTRODUCTION

A professional, active extramural relations program is a necessary part of the U.S. Army's research and development (R&D) program if the U.S. Army is to take maximum advantage of the rapidly expanding science and technology in the private sector. The U.S. Army recognizes that industry's and academia's access to advanced planning and requirements information as well as advice and guidance on doing business with the U.S. Army increases the effectiveness of bids and proposals, fosters competition, helps to surface scientific and technical developments, and increases the productivity of Independent R&D, all of which ultimately returns to the U.S. Army in the form of enhanced strength and effectiveness as a fighting force. It is therefore incumbent upon the U.S. Army Chemical Research, Development and Engineering Center (CRDEC) to make available the latest program information.

Current policy requires that every major subordinate command of the U.S. Army Materiel Command sponsor an APBI for each of its research, development, test, and evaluation (RDTE) projects. An APBI includes details on mid- and long-range RDTE plans and programs; background information on current related U.S. Army programs; and details on threat, deficiencies, and doctrine. APBIs are announced in the Commerce Business Daily. Direct invitations are sent to organizations on the CRDEC mailing list.

On 7 and 21 October 1987, CRDEC will conduct the seventh annual industry meeting for the purpose of detailing out-of-house opportunities for contractors with interest and expertise in the chemical defense and smoke/obscuration related technologies.

The intent of the meeting is to provide specific opportunities to consider in the area of competitive procurements and innovative ideas qualifying for unsolicited proposals and collaborative R&D efforts. The tone of the meeting is to be that of integrity and openness on the part of CRDEC. That tone is expected to be reciprocal in nature by the attendees from industry and academia.

A good cross-section of the research, development, and acquisition community are expected at this APBI. Based on APBIs conducted over the past 6 years by CRDEC, representatives from prime defense contractors, nonprofit institutions, small businesses, universities, subcontractors, parts suppliers, and consultants will attend.

CRDEC encourages participants in the 1987 APBI to contact the Technical Industrial Liaison Office (301-671-2031) with any administrative questions or suggestions to provide a better APBI next year.

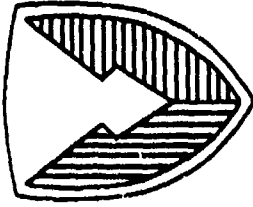
### 2. AGENDA AND PRESENTATIONS

The planned agenda and copies of vugraphs to be briefed follow.

**PROPOSED AGENDA  
ADVANCED PLANNING BRIEFING FOR INDUSTRY  
7 and 21 October 1987\***

|      |                                                     |                                     |
|------|-----------------------------------------------------|-------------------------------------|
| 0815 | Administrative Remarks                              | Mr. R. Dimmick                      |
| 0820 | Introduction and Overview                           | BG P. Hidalgo                       |
| 0840 | Air Force Programs in Chemical Defense              |                                     |
| 0925 | Navy Programs in Chemical Defense                   |                                     |
| 1010 | BREAK                                               |                                     |
| 1030 | Basic Research Opportunities                        | Dr. E. Poziomek                     |
| 1100 | Smoke Systems                                       | Mr. M. Erickson<br>(Mr. J. Green)   |
| 1130 | Collective Protection                               | Mr. J. D'Andrea                     |
| 1200 | LUNCH                                               |                                     |
| 1315 | Individual Protection                               | Mr. D. English<br>(Mr. T. Mitchell) |
| 1345 | Decontamination Systems                             | Mr. R. Bucci<br>(Mr. D. Behringer)  |
| 1405 | Standoff and Point Detectors                        | Dr. R. Mackay                       |
| 1425 | Detection Systems                                   | Mr. R. Vigus                        |
| 1440 | BREAK                                               |                                     |
| 1500 | Computer-Based Program Management<br>Control System | Dr. J. Carrico                      |
| 1515 | Contractor Mail                                     | Mr. J. Wood                         |
| 1525 | Value Engineering                                   | Mr. F. Kohut                        |
| 1535 | Industrial Liaison Programs                         | Mr. R. Dimmick                      |
| 1550 | Wrap-up and Final Remarks                           | Mr. J. Vervier                      |

\*Names in parentheses are those presenters who will speak on 21 October.



U.S. ARMY  
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# INTRODUCTION AND OVERVIEW

by

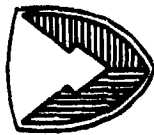
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**Commander**

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# CURRENT DOD POLICY

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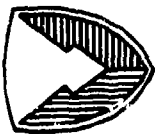


## CHEMICAL WARFARE/CHEMICAL-BIOLOGICAL DEFENSE PROGRAM

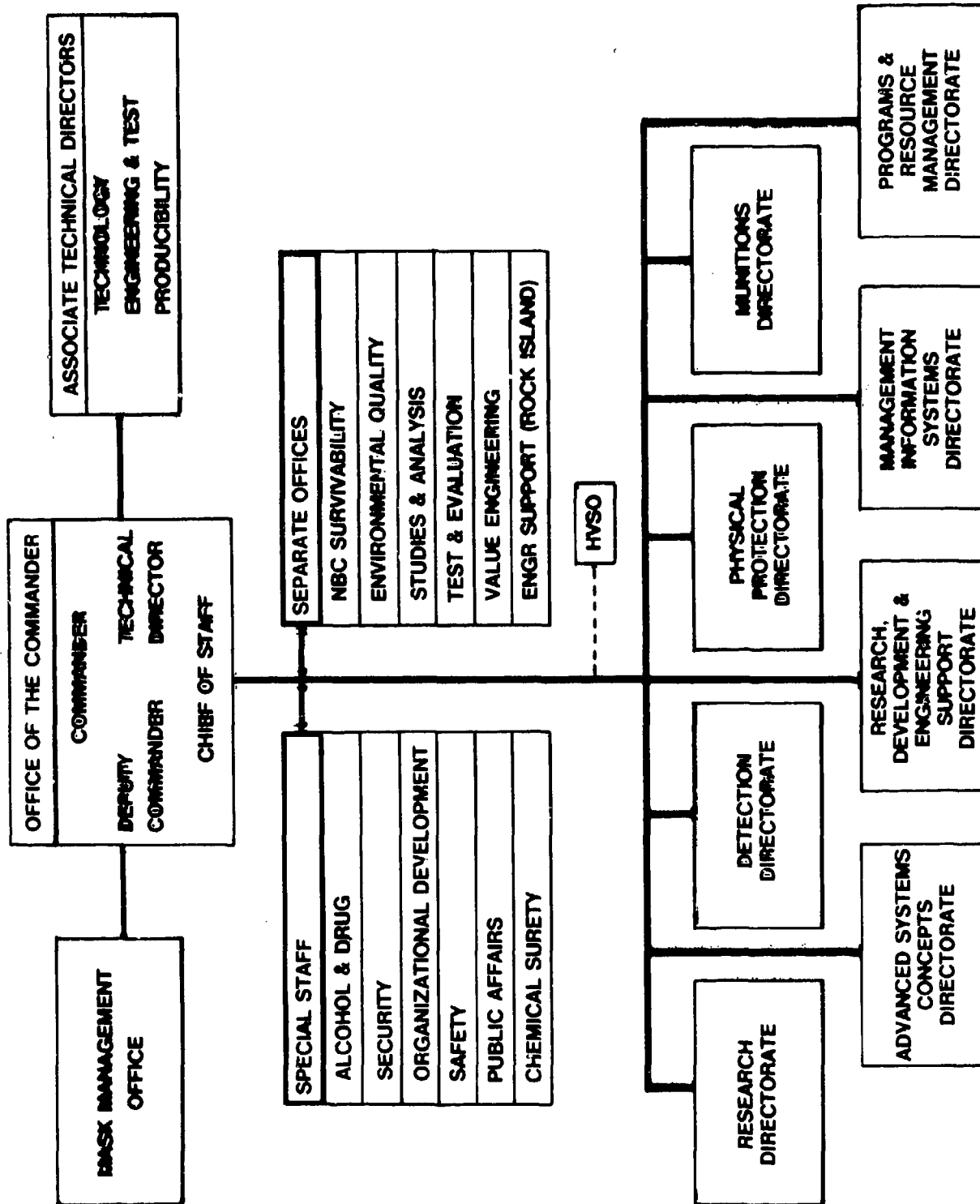
... TO PREVENT THE USE OF CHEMICALS, TOXINS AND BIOLOGICAL AGENTS AGAINST THE MEMBERS OF THE U.S. ARMED FORCES

- NO FIRST USE OF CHEMICAL WEAPONS
- NO USE OR POSSESSION OF BIOLOGICAL OR TOXIN WEAPONS
- MAINTAIN DETERRENT/RETALIATORY CHEMICAL WARFARE CAPABILITY
- MAINTAIN ADEQUATE DEFENSIVE POSTURE FOR CHEMICAL/ BIOLOGICAL WARFARE

# CRDEC MISSION

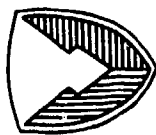


- RESEARCH, DEVELOPMENT AND ACQUISITION FOR . . .
  - CHEMICAL/BIOLOGICAL DEFENSIVE MATERIEL
  - RETALIATORY CHEMICAL MUNITIONS
  - SMOKE/OBSCURANT SYSTEMS
- LIFE CYCLE ENGINEERING SUPPORT OF ASSIGNED ITEMS
- U.S. LEAD LABORATORY FOR INTERNATIONAL RESEARCH, DEVELOPMENT AND STANDARDIZATION
- JOINT SERVICE R&D SUPPORT

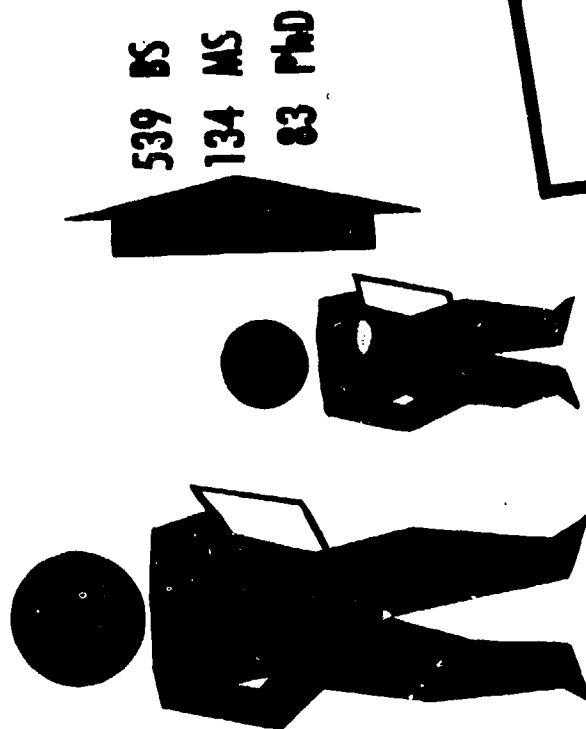


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# RESOURCES - PEOPLE



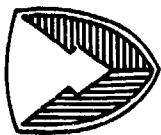
152 CHEMISTS  
 139 CHEMICAL ENGINEERS  
 82 PHYSICAL SCIENTISTS  
 92 MECHANICAL ENGINEERS  
 67 GENERAL ENGINEERS  
 23 PHYSICISTS  
 25 BIOLOGISTS  
 15 OPERATION RESEARCH  
 17 MATHEMATICIANS  
 15 ELECTRICAL ENGINEERS  
 3 PHYSIOLOGISTS  
 5 INDUSTRIAL ENGINEERS  
 5 PHARMACOLOGISTS



1428  
 TOTAL  
 1353 CIVILIAN  
 AND  
 75 MILITARY  
 670  
 SCIENTISTS  
 AND  
 ENGINEERS

- AVERAGE AGE - 40
- 323 NON-CRDEC PERSONNEL ON SITE

(A/O 30 JUL 87)  
 UU7 0178-01



# FY88 RESOURCES

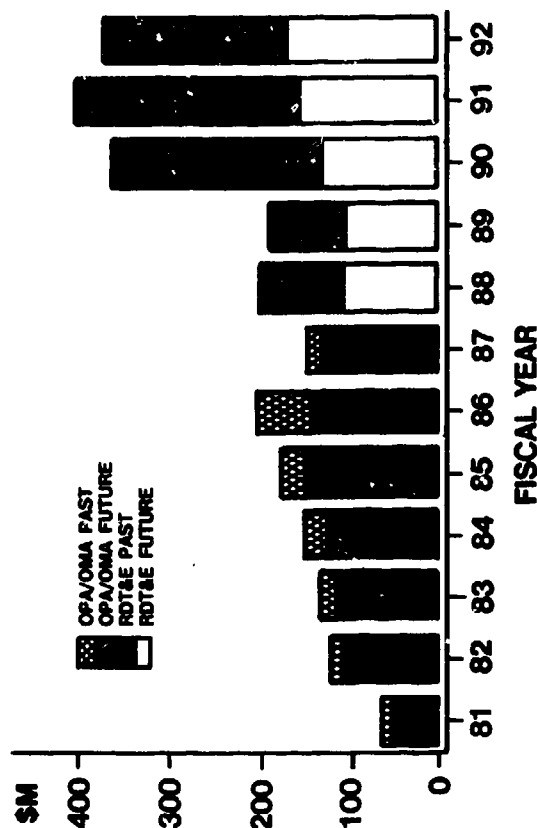
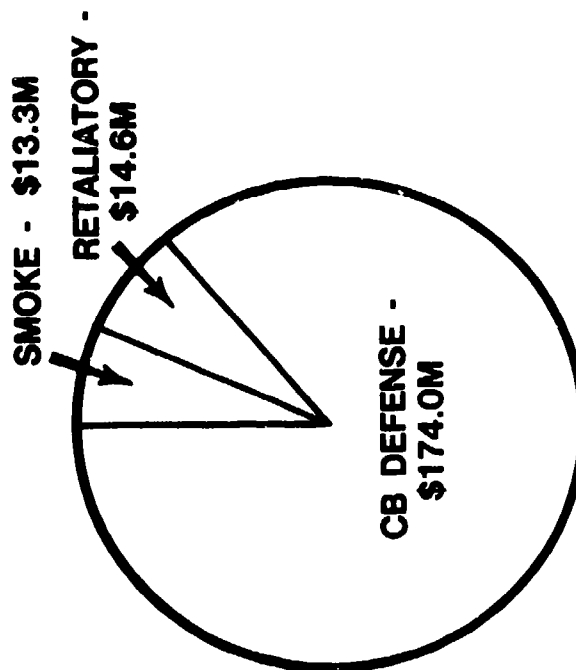
**TOTAL PROGRAM \$201.9 MILLION**

|                           |                          |
|---------------------------|--------------------------|
| <b>RDT&amp;E \$111.6M</b> | <b>IN-HOUSE \$ 77.8M</b> |
| <b>OPA \$ 81.6M</b>       | <b>CONTRACT \$110.0M</b> |
| <b>OMA \$ 8.7M</b>        | <b>OGA \$ 14.1M</b>      |

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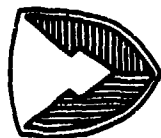
## FUNDING



A0332- UU7 1448 04

(A/O 31 JUL 87)

# PROGRAM AREAS



- DATA COLLECTION / SYSTEM SCIENCE
- THREAT AGENT CHEMISTRY
- INTEGRATION/ANALYSIS

- RECONNAISSANCE, DETECTION, IDENTIFICATION
- INDIVIDUAL PROTECTION
- COLLECTIVE PROTECTION
- DECONTAMINATION / CONTAMINATION AVOIDANCE

- CB ANTI-TERRORISM

- SMOKE/OBSCURANTS

- RETALIATORY CHEMICAL MUNITIONS

A0332- Y16 3639-01

# FY88 PROGRAM RESOURCE ALLOCATION



(\$000,000)

|                        | 6.1 | 6.2  | 6.3A | 6.3B | 6.4  | TOTAL | %     |
|------------------------|-----|------|------|------|------|-------|-------|
| THREAT AGENT CHEMISTRY |     | 1.4  |      |      |      | 1.4   | 1.7   |
| INTEGRATION/ANALYSIS   |     | 3.2  |      |      |      | 3.2   | 3.8   |
| RECON/DETECTION        | 1.5 | 10.9 | 3.6  | 6.0  | 13.5 | 35.5  | 42.7  |
| INDIVIDUAL PROTECTION  | .1  | 2.0  |      |      | 1.6  | 3.7   | 4.4   |
| COLLECTIVE PROTECTION  | .6  | 1.0  |      |      | 5.6  | 7.2   | 8.6   |
| DECONTAMINATION        | .7  | 2.2  |      | 3.0  | 1.0  | 6.9   | 8.3   |
| ANTITERRORISM          |     | .2   |      |      |      | .2    | .2    |
| RETALIATORY MUNITIONS  | .6  | 9.6  |      |      |      | 10.2  | 12.2  |
| SMOKE/OBSCURANTS       | 1.1 | 4.2  |      | 7.0  |      | 12.3  | 14.9  |
| DATA/SYSTEM SCIENCE    | .1  | 1.8  |      | .8   |      | 2.7   | 3.2   |
| TOTALS                 | 4.7 | 36.5 | 3.6  | 16.8 | 21.7 | 83.3  | 100.0 |

OVERHEAD & CUSTOMER MONEY NOT INCLUDED

(A/O 31 JUL 87)

AC332-UU7 6540-01

# NBC CONTAMINATION SURVIVABILITY

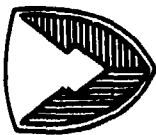


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- SURVIVAL OF CREW AND SYSTEM IN AN NBC CONTAMINATED ENVIRONMENT
- CONTAMINATION SURVIVABILITY:
  - DECONTAMINABILITY (HAZARD REDUCTION)
    - EQUIPMENT DESIGN
    - MATERIALS SELECTION
  - HARDNESS (RESISTANCE TO AGENT/DECONTAMINANT DAMAGE)
    - MATERIALS SELECTION
  - DESIGN TO ELIMINATE CONTAMINANT ENTRAPMENT
  - COMPATIBILITY (MINIMAL DEGRADATION IN MOPP)
    - COLLECTIVE PROTECTION
    - EQUIPMENT DESIGN

A0332- TT7 2760-02

# NBC CONTAMINATION SURVIVABILITY



- CRDEC'S TECHNICAL ASSISTANCE PROGRAM SUPPORTS ALL MATERIEL DEVELOPERS: RFPs, SSEBs, SOWs, SYSTEMS REV - ON-CALL HELP - SERVICE ADVERTISED IN CDD

ALSO, MATERIALS AND SIMULANTS DATA BASES, MODELS AND MODELS DEVELOPMENT

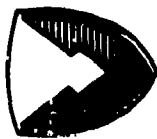
- NBC CONTAMINATION SURVIVABILITY: A HANDBOOK - DTIC NO B088033

- NBC MATERIALS HANDBOOK - DTIC NO. B079397

- GUIDELINES - DESIGN TO MINIMIZE CONTAMINATION AND TO FACILITATE DECONTAMINATION OF MILITARY VEHICLES AND OTHER EQUIPMENT: INTERIORS AND EXTERIORS

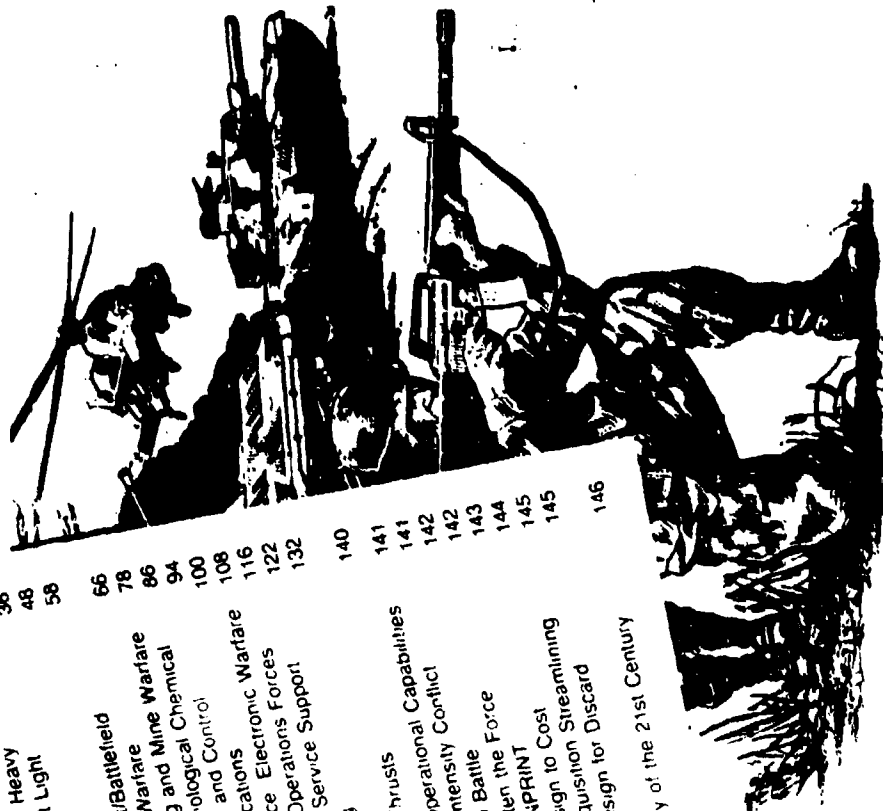
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# OVERVIEW OF ARMY RDA PROGRAM



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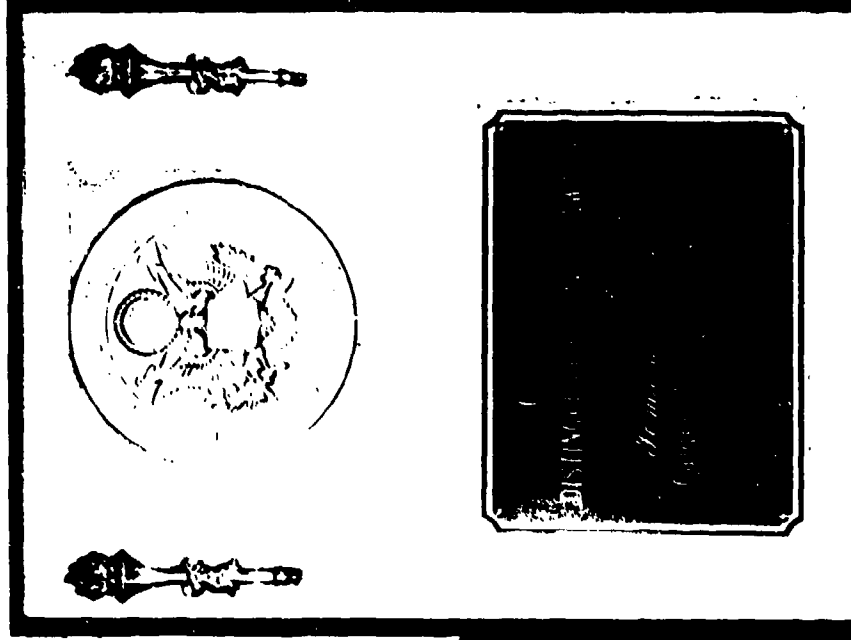
## PROVIDE ARMED FORCES WITH RESPONSIVE CBD/CW SYSTEMS

- EXPLOIT THE WORLDWIDE TECHNOLOGY BASE TO ACHIEVE SIGNIFICANT MATERIEL ADVANCES
- ADOPT A MATERIEL ACQUISITION STRATEGY WHICH FEATURES EARLY PLANNING AND ANALYSIS AND FIELDS INTEGRATED FAMILIES OF MATERIEL WHICH ARE READILY ADAPTABLE TO IMPROVEMENT AS TECHNOLOGY IMPROVES
- IMPLEMENT A COHERENT LONG RANGE PLAN TO ACHIEVE AND MAINTAIN MATERIEL SUPERIORITY
- MAXIMIZE WORKFORCE AND ORGANIZATIONAL EFFECTIVENESS
- BE AND BE PERCEIVED AS THE CENTER OF EXCELLENCE IN CBD/CW SCIENCE, TECHNOLOGY AND MATERIEL

# DISTINGUISHED SERVICE AWARDS

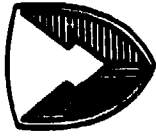


- TO PROMOTE AND REWARD STRONG COMMITMENT TO CRDEC'S MISSION
- OTHER GOVERNMENT AGENCIES, PRIVATE INDUSTRY, UNIVERSITIES ARE ELIGIBLE
- PLAQUE AND CITATION PRESENTED TO ORGANIZATION ON-SITE
- PERMANENT PLAQUE ON DISPLAY AT CRDEC



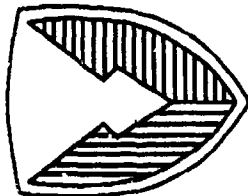
**2000 AWARD WINNERS**  
**3 PRIVATE COMPANIES**  
**2 UNIVERSITY PROFESSORS**

# BOTTOM LINE



- 0 FEMER FY88 NEW STARTS
- 0 FY89 NO BETTER THAN FY88
- 0 INCREASED COMPETITIVE ENVIRONMENT MAKES IR&D MORE CRITICAL
- 0 THERE ARE STILL OPPORTUNITIES

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CHEMICAL RD&E CENTER

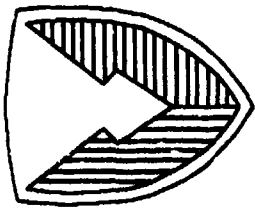
# AIR FORCE PROGRAMS IN CHEMICAL DEFENSE

AO332-C-G7226053

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THIS BRIEFING PACKAGE WAS DISTRIBUTED AT THE SEVENTH ANNUAL INDUSTRY MEETING.

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CHEMICAL COMMAND  
CHEMICAL RD&F CENTER

# NAVY PROGRAMS IN CHEMICAL DEFENSE

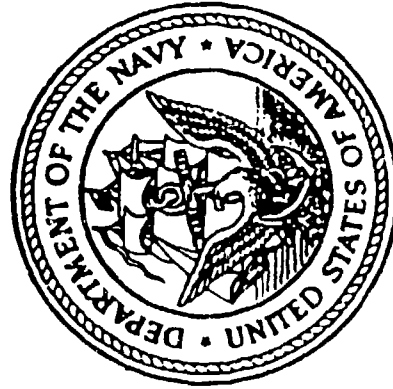
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Department of the Navy

**CONTRACTOR OPPORTUNITIES**

**CHEMICAL DEFENSE**

**RDT&E AND PRODUCTION**



**1987 ADVANCED PLANNING BRIEFING FOR INDUSTRY**

# **NAVY-CHEMICAL DEFENSE OPPORTUNITIES**

## **● INDIVIDUAL PROTECTION (6.3 AND 6.4)**

### **● ADVANCED PERMEABLE OVERGARMENT**

- UPGRADE CURRENT NAVY OVERGARMENT
- INCREASED FIRE PROTECTION, LIQUID/SOLID PROTECTION
- IMPROVED WEAR LIFE, REDUCED HEAT BURDEN
- DT GARMENTS CONTRACT FY 88, 89, < \$0.2M
- PRODUCTION POTENTIAL: 1M UNITS, FY 91, 92
- POC: NAVY CLOTHING AND TEXTILE RESEARCH FACILITY, MR. M. ROY (617) 651-4785  
NAVSEASYSKOM, WASHINGTON, DC, MR. P. JUNG (202) 692-1227

### **● RESPIRATORY PROTECTIVE EQUIPMENT**

- MCU-2/P MASKS VIA JOINT AIR FORCE PROCUREMENT
- PRODUCTION POTENTIAL: 250,000 THROUGH FY 90/91
- C2 CANISTERS, MCU-2/P MASK SUPPORT
- PRODUCTION POTENTIAL: 300,000 UNITS FOR SUPPLEMENTAL ISSUE
- POC: NAVSEASYSKOM, WASHINGTON, DC, MR. P. JUNG (202) 692-1227

# **NAVY-CHEMICAL DEFENSE OPPORTUNITIES**

## **● DETECTION AND WARNING (6.3 AND 6.4)**

### **● IMPROVED SHIPBOARD POINT DETECTOR SYSTEM**

- .. IMS TECHNOLOGY SENSOR, MULTI-AGENT CAPABILITY
- .. SHIPBOARD INTEGRATION, FIBER OPTICS
- .. DT PROTOTYPE CONTRACT FY 89, < \$1.0M
- .. PRODUCTION POTENTIAL: 500 SYSTEMS

### **● SHIPBOARD LIQUID AGENT DETECTION SYSTEM**

- .. AUTOMATIC, REMOTE DETECTION OF PERSISTENT CW AGENTS
- .. SENSOR TECHNOLOGY TO BE SELECTED IN-HOUSE FY 88, 89
- .. DT PROTOTYPE CONTRACT FY 90, < \$0.8M
- .. PRODUCTION POTENTIAL: > 300 SYSTEMS

32

### **● SHIPBOARD REMOTE DETECTION SYSTEM**

- .. CONCEPT, TECHNOLOGY SELECTION IN-HOUSE, FY 89, 90
- .. ADVANCED DEVELOPMENT PROTOTYPE CONTRACT, FY 90, < \$1.0M
- .. DT PROTOTYPE CONTRACT, FY 92, < \$1.5M
- .. PRODUCTION POTENTIAL: 50-75 SYSTEMS

- **POC:** NSWC, DAHLGREN, VA, MR. J. A. BYRNE, (703) 663-7641  
NAVSEASYS COM, WASHINGTON, DC, MR. W. NOYES, (202) 692-6064

# **NAVY-CHEMICAL DEFENSE OPPORTUNITIES**

## **● COLLECTIVE PROTECTION (6.3 AND 6.4)**

### **● M56 FILTER SETS**

- .. SHIPBOARD FULL-TIME COLLECTIVE PROTECTION SYSTEM, NEW CONSTRUCTION
- .. NAVY SURVIVABLE COLLECTIVE PROTECTION (SCPSN), SHORE BASES
- .. NAVY MODULAR COLLECTIVE PROTECTION, BACKFIT SELECTED AREAS
- .. PRODUCTION POTENTIAL: 10,000 UNITS THRU FY 93 (VIA ARMY PROCUREMENT)
- .. POC: NSWC, DAHLGREN, VA, MR. D. CRAIG (703) 663-7641
- NAVSEA, WASHINGTON, DC, MR. S. ENATSKY (202) 692-5487

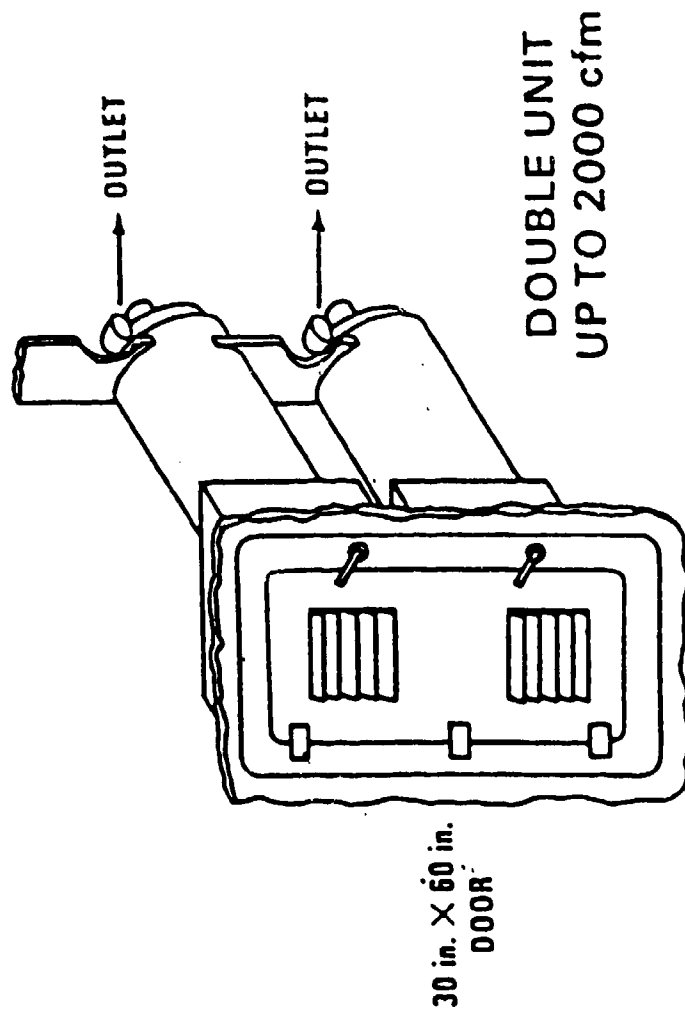
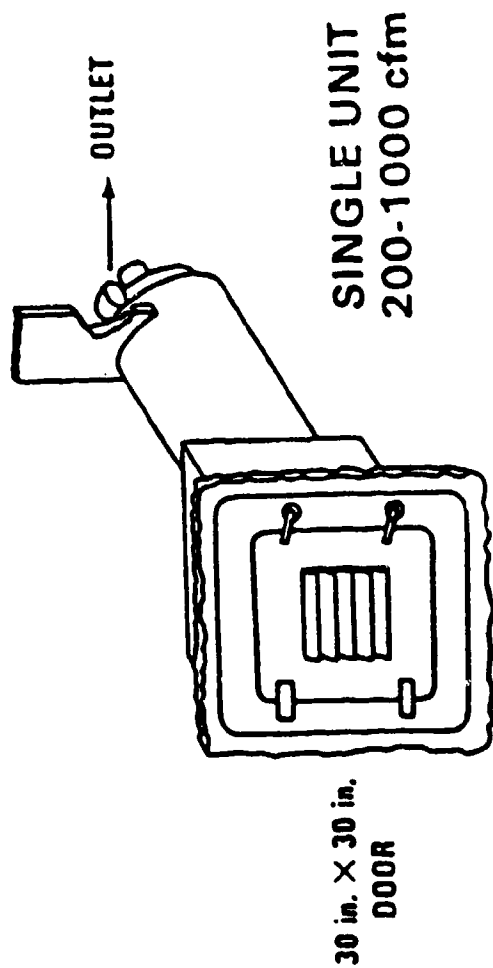
### **● MODULAR FILTER SYSTEM, SHIPBOARD SELECTED AREA CPS**

- .. 200-2000 CFM MODULAR DESIGN, M56 FILTER SET BASIC MODULE
- .. MIL-S-901C SHOCK QUALIFICATION ESSENTIAL
- .. DT PROTOTYPE CONTRACT, FY90, < \$300K
- .. PRODUCTION POTENTIAL: > 100 SYSTEMS, FY91-93
- .. POC: NSWC, DAHLGREN, VA, MR. D. CRAIG (703) 663-7641

### **● MACHINERY SPACE FILTRATION**

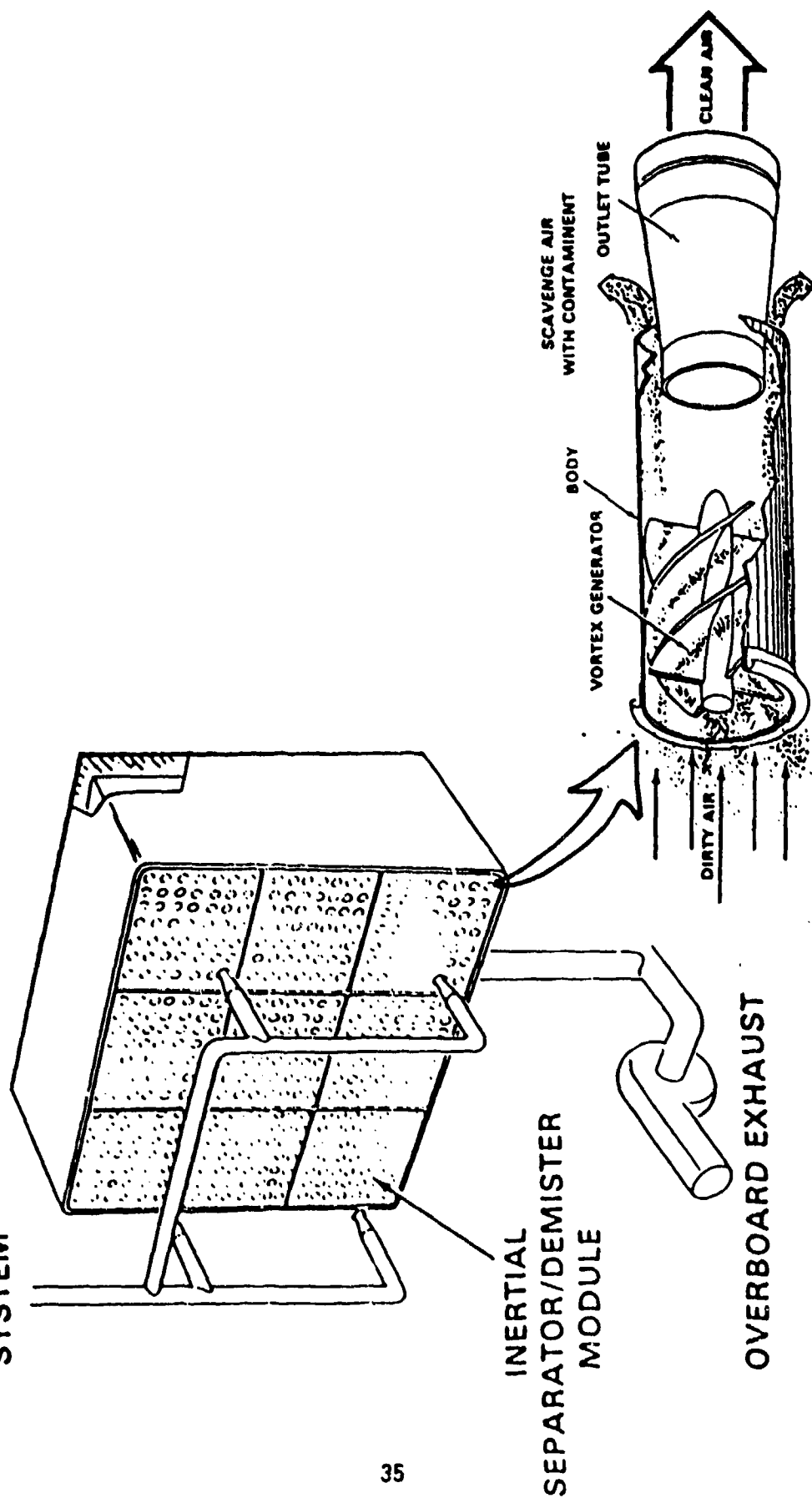
- .. INERTIAL SEPARATION TECHNOLOGY
- .. PARTICULATE REMOVAL, > 10 MICRON, 3000-20,000 CFM CAPACITY
- .. PRODUCTION CONTRACT, LEVEL II TDP, FY 90
- .. PRODUCTION POTENTIAL: 400 INSTALLATIONS THRU FY 95
- .. POC: DTNSRDC, ANNAPOLIS, MD, MR. T. WENZEL (301) 267-3346
- NAVSEA, WASHINGTON, DC, MR. G. GOLDBERG (202) 692-5487

# NAVY CBR (MODULAR) FILTER SYSTEM



# INERTIAL SEPARATOR CONFIGURATION

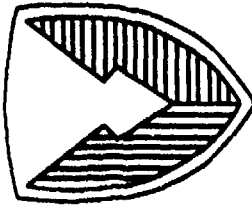
## DECONTAMINATION SYSTEM



# NAVY-CHEMICAL DEFENSE OPPORTUNITIES

## SUMMARY OF CONTRACTOR OPPORTUNITIES

| YEAR     | TITLE                                                                    | AMOUNT           | POINT OF CONTACT                |
|----------|--------------------------------------------------------------------------|------------------|---------------------------------|
| FY 88    | ADVANCED OVERGARMENTS (RDT&E)                                            | <\$200.0K        | M. ROY, NCTRF<br>(617) 651-4785 |
| FY 89-90 | MCU-2/P MASKS (PRODUCTION)<br>C2 CANISTERS (PRODUCTION)                  | \$33M<br><\$3.0M | PETER JUNG<br>(202) 692-1227    |
| FY 89    | IMPROVED POINT DETECTOR PROTOTYPE (RDT&E)                                | <\$1.0M          | J. A. BYRNE<br>(703) 663-7641   |
| FY 90    | SHIPBOARD LIQUID AGENT DETECTION SYSTEM (RDT&E)                          | <\$1.0M          | J. A. BYRNE<br>(703) 663-7641   |
| FY 90    | SHIPBOARD REMOTE DETECTION, ADVANCED DEVELOPMENT PROTOTYPE (RDT&E)       | <\$1.0M          | W. NOYES<br>(202) 692-6064      |
| FY 90    | SHIPBOARD MODULAR COLLECTIVE PROTECTION SYSTEM, ENGR DEV. MODELS (RDT&E) | \$300K           | D. CRAIG<br>(703) 663-7641      |
| FY 89-93 | STANDARD FILTER SETS, GAS AND PARTICULATE (PRODUCTION)                   | <\$6.0M          | D. CRAIG<br>(703) 663-7641      |



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# RESEARCH OPPORTUNITIES

by

**DR. EDWARD J. POZIOMEK**  
**Research Directorate**

SMCCR-RS  
AREA CODE (301) 671-3250  
AUTOVON (584) 3250

AO332-C-G7226052

# CRDEC RESEARCH



PHYSICS



CHEMICAL



TOXICOLOGY



BIOTECHNOLOGY



ANALYTICAL

A0332-5675-2-1-77

SMCCR Form 38, 1 April 1985

# ROLES OF RESEARCH



## DATA BASE

### PROVIDES:

- DATA
- METHODOLOGY DEVELOPMENT

## INNOVATION

### PROVIDES:

CREATION AND ADAPTATION  
OF NEW CONCEPTS

## SUPPORT

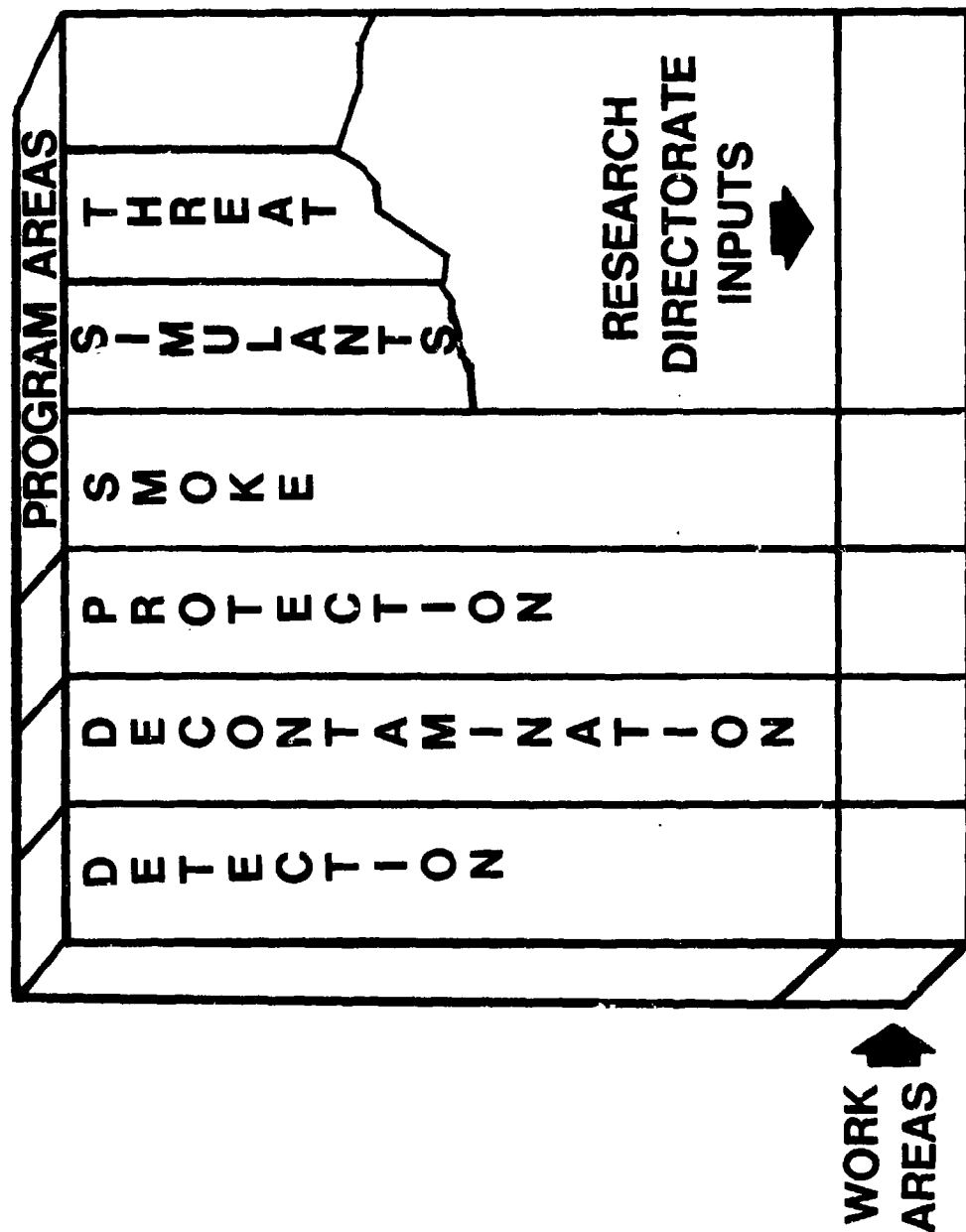
### PROVIDES:

- THE EXPERT
- TECHNICAL INFORMATION
- SERVICES
- DATA ANALYSIS

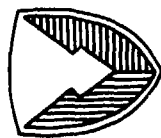


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# CRDEC MATRIX MANAGEMENT

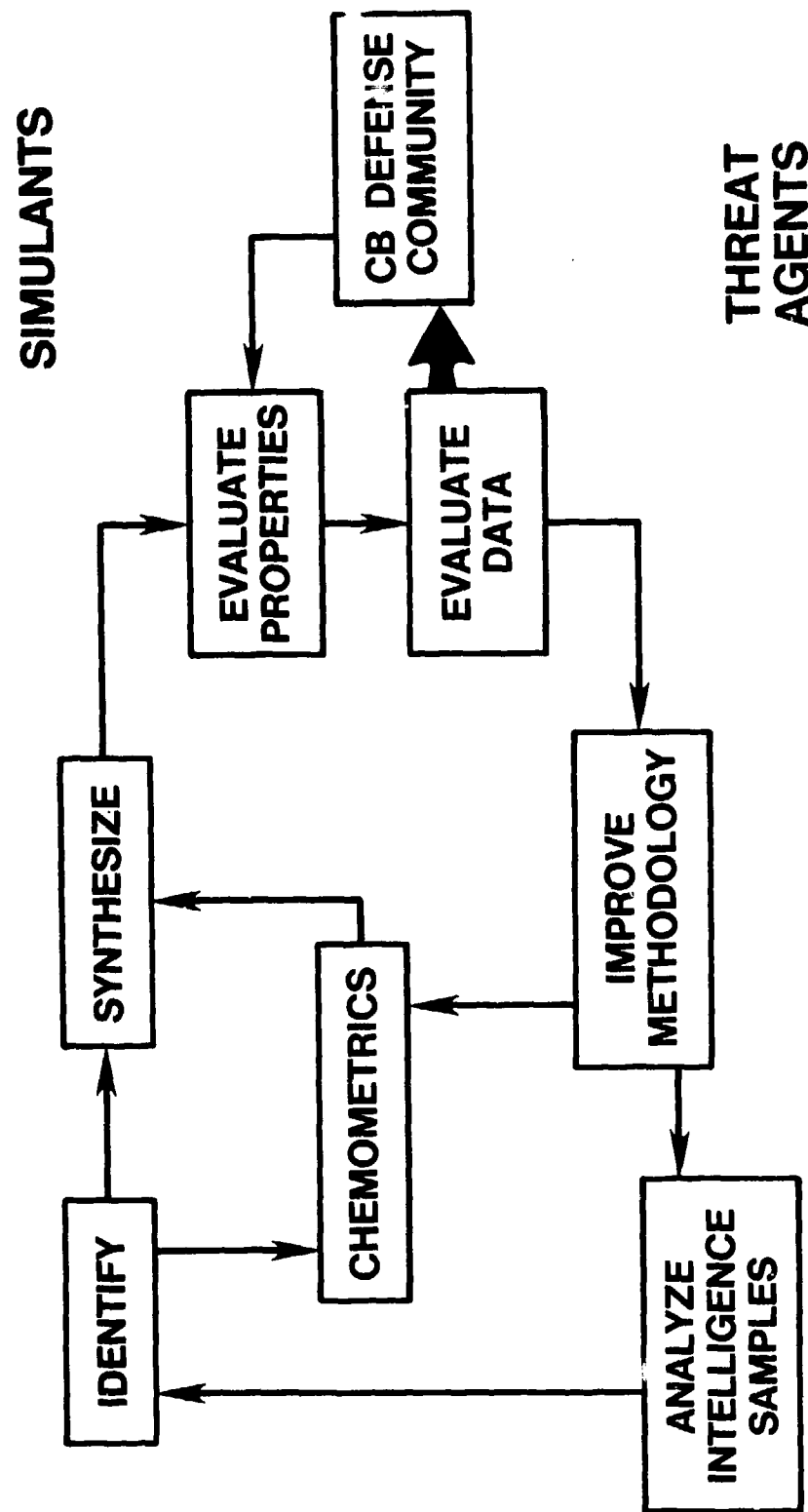


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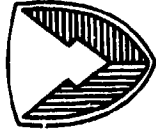
# THREAT AGENT AND SIMULANT TECHNOLOGY

## INFORMATION FLOW



A0332- M6 1038-01

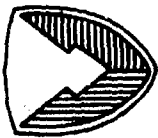
# EXTRAMURAL PROGRAM



## FY89 RESEARCH

- CONTINUED OPPORTUNITIES FOR COLLABORATION
- CONTINUED MECHANISMS FOR COMMUNICATION
  - CONFERENCES
  - WORKSHOPS
- CONTINUED POSSIBILITIES FOR ON-SITE CONTACT
  - PRESENTATION OF TECHNICAL SEMINARY
  - SABBATICALS
- FEW OPPORTUNITIES FOR GETTING NEW STARTS FUNDED

# EXTRAMURAL PROGRAM



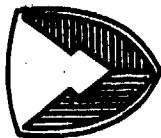
## POSSIBLE OPPORTUNITIES

- FUNDAMENTAL CHEMICAL-PHYSICAL PROPERTIES
- NBC SURVIVABILITY
  - COMPONENT TESTING
  - ASSESSMENT TECHNIQUES
- TEST TECHNOLOGY
  - AEROSOL INLET DESIGN
  - DROPLET FALLOUT SAMPLER
  - CHAMBER TECHNOLOGY
- ENVIRONMENTAL ASSESSMENTS
- NEW METHODOLOGIES FOR VISCOELASTICITY

AO332-VV7 2803-02

# OPPORTUNITIES ON-SITE

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## NATIONAL RESEARCH COUNCIL AWARDS

- ATMOSPHERIC PHYSICS
  - AEROSOLIZATION PROCESSES
- ORGANIC CHEMISTRY
  - POLYMER-SUPPORTED CATALYSIS
- PHYSICAL CHEMISTRY
  - INTERFACIAL ASPECTS OF CONTAMINATION CONTROL
- SURFACE AND COLLOID CHEMISTRY
  - MICROSENSORS
- FLUID MECHANICS
  - RHEOLOGICAL STUDIES OF FLUID BREAKUP

# **3R'S**

**REPLACEMENT - OF ANIMAL TESTING**

**REFINEMENT - OF INTACT AND ALTERNATIVE SYSTEMS**

**REDUCTION - IN NUMBER OF ANIMALS USED OR  
UTILIZATION OF ANIMALS LOWER ON  
EVOLUTIONARY SCALE**

A0332-

# ANIMAL TEST ALTERNATIVES



## COLLABORATIVE STUDY

- ROCKEFELLER UNIVERSITY/CRDC
- REDUCE NEED FOR DRAIZE TEST IN RABBITS (EYE IRRITANCY)
- DEVELOP CELL CULTURE TESTS AS SCREEN



A0332- R01361-07.02

# RESEARCH DIRECTORATE



**DIRECTOR** Dr. Edward J. Pozlomek (301) 671-3250  
**DEPUTY DIRECTOR** Dr. Richard R. Smardzewski (301) 671-4144

## DIVISION CHIEFS

**ANALYTICAL** Dr. Charles S. Harden (301) 671-2560  
**BIOTECHNOLOGY** Dr. F. Prescott Ward (301) 671-2586  
**CHEMICAL** Dr. Lynn Jarvis (301) 671-2719  
**PHYSICS** Mr. Arthur K. Stuenkel (301) 671-3619  
**TOXICOLOGY** Dr. Harry Salem (301) 671-3034

**BASIC RESEARCH**

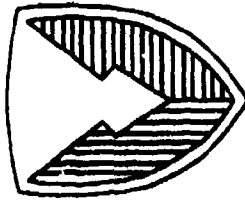
**SUPPORTING  
TECHNOLOGY**

**EARLY EXPLORATORY  
DEVELOPMENT**

A0332- A7 0105-02

SMCCR Form 38, 1 April 1966

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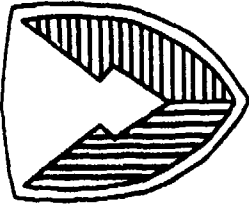
# **SMOKE SYSTEMS**

by

**MR. MERLIN L. ERICKSON**  
**Munitions Directorate**

SMCCR-MUS  
AREA CODE (301) 671-2922  
AUTOVON (584) 2922

AO332-C-G7226059



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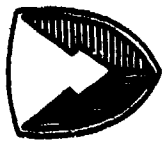
# SMOKE SYSTEMS

by

MR. JOHN J. GREEN  
Munitions Directorate

SMCCR-MUS-S  
AREA CODE (301) 671-3450  
AUTOVON (584) 3450

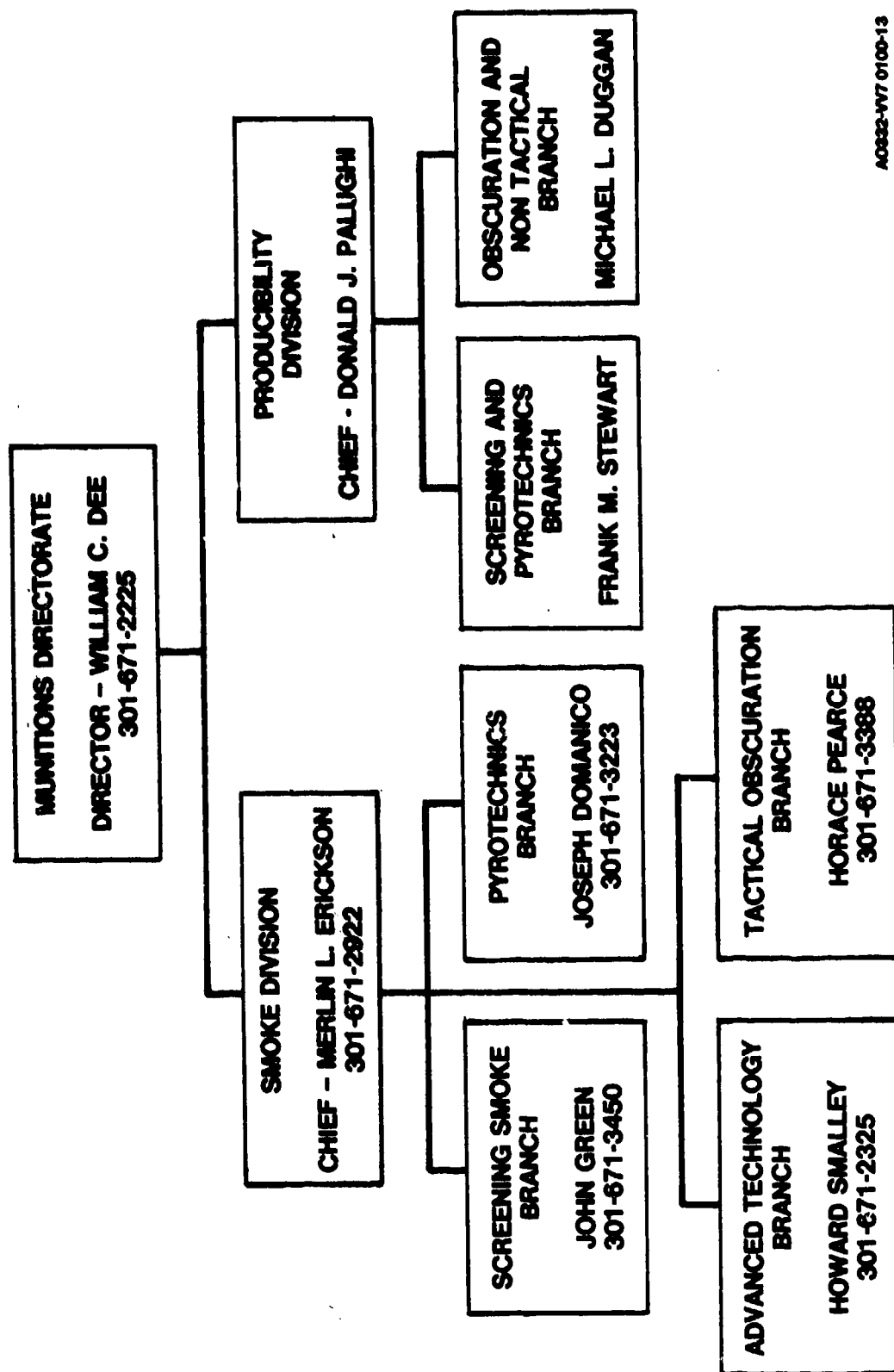
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# SMOKE SYSTEMS



# MUNITIONS DIRECTORATE



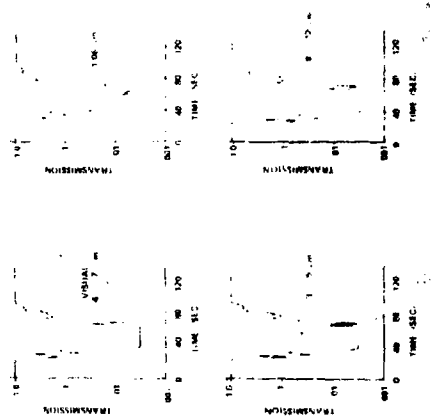
AO332-VV7 0100-13



# SMOKE AND OBSCURANTS

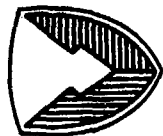


TRANSMISSION vs TIME  
DUGWAY PROVING GROUNDS



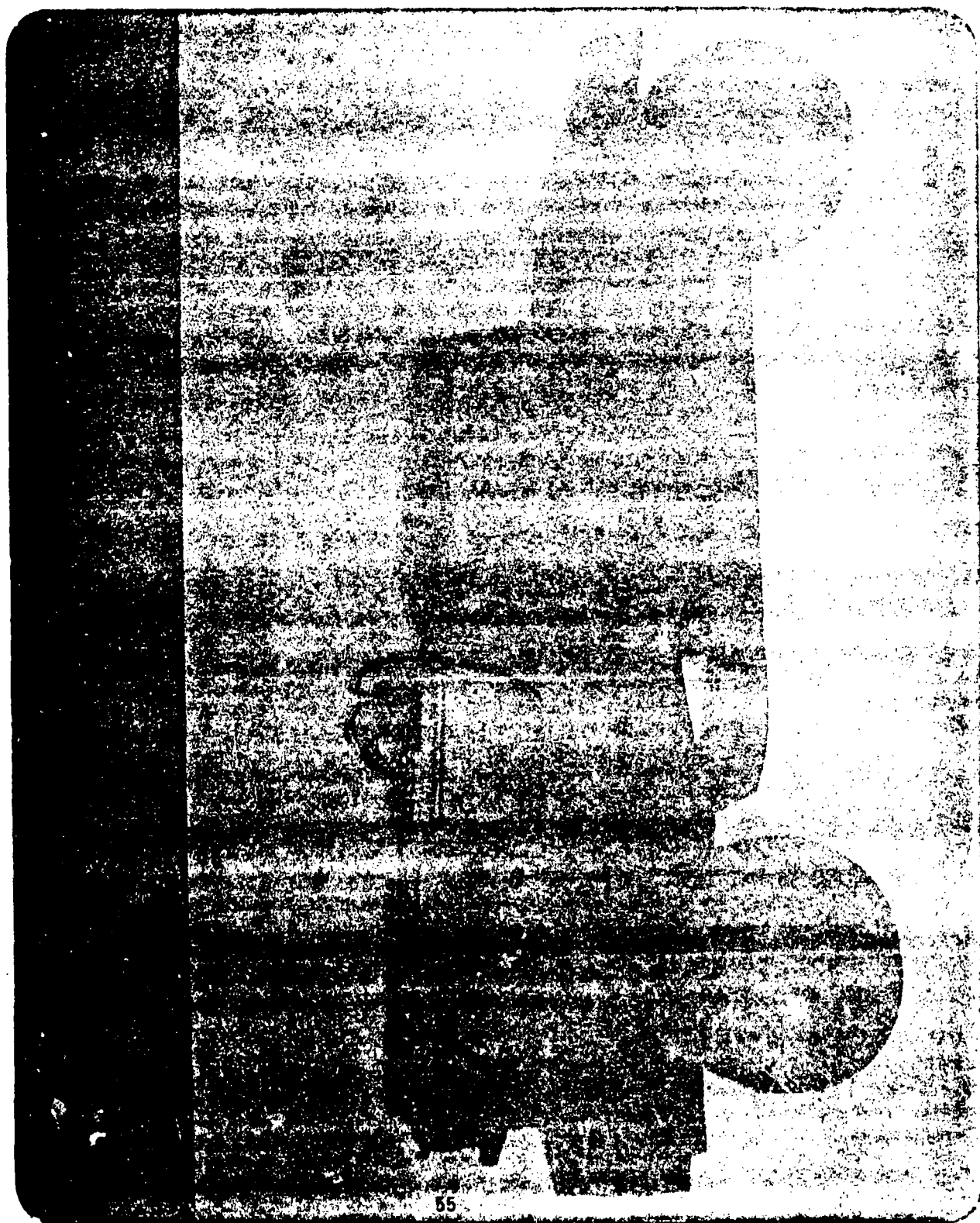
# TYPES OF SMOKE AND HARDWARE TYPES

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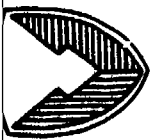


- SMOKE TYPES
  - VISUAL
  - IR ATTENUATING
  - MM DEFEATING
  - MULTISPECTRAL
- HARDWARE TYPES
  - GRENADES
  - ROCKET/MISSILE WARHEADS
  - ARTILLERY PROJECTILES
  - LARGE AREA SMOKE GENERATORS
  - SMOKE POTS
  - VEHICLE PROTECTION DEVICES
- SCOPE OF CRDEC EFFORT
  - RESEARCH THROUGH INITIAL PRODUCTION OF HARDWARE

A0332- A7 0100-14.01



# COMPETITIVE OPPORTUNITIES



## PRODUCT IMPROVEMENT OF M157 AND M3A4 SMOKE GENERATOR SYSTEM, AND VEHICLE ENGINE EXHAUST SMOKE SYSTEM

- COMPETITIVE CONTRACT TO RETROFIT THE ABOVE SMOKE SYSTEMS TO REPLACE FOG OIL WITH MORE READILY AVAILABLE SMOKE PRODUCING MATERIAL, i.e., DIESEL OR JP-8
  - MODIFY DESIGN
  - TEST DESIGN CHANGES
  - FABRICATE AND TEST FINAL PROTOTYPES
  - FINALIZE TDP
- CONTACT JOSEPH NOVAD 301 671-2863
- SOLICITATION PLANNED FOR FY88

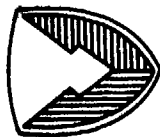
AO332-WW7 0100-04

**PRODUCT IMPROVEMENT OF  
M157 SMOKE GENERATOR SET (SGS)**

- **COMPETITIVE CONTRACT TO RETROFIT THE M157  
SGS TO USE DF2 AND JP-8 FUELS INSTEAD OF  
MOGAS (GASOLINE)**
  - **MODIFY DESIGN**
  - **TEST DESIGN CHANGES**
  - **FABRICATE AND TEST FINAL PROTOTYPES**
  - **FINALIZE TDP**
- **CONTACT JOSEPH NOVAD 301-671-2863**
- **SOLICITATION PLANNED FOR MAR 88**

A0332- W7 0100-01

# COMPETITIVE OPPORTUNITIES



## PRODUCT IMPROVEMENT OF M8 HC SMOKE GRENADE

- COMPETITIVE CONTRACT TO
  - INCORPORATE NEW HC REPLACEMENT MIX
  - MAKE REQUIRED DESIGN CHANGES
  - TEST DESIGN CHANGES
  - FABRICATE AND TEST FINAL PROTOTYPES
- CONTACT GERALD P. YOUNG 301-671-2863
- SOLICITATION DEC 88

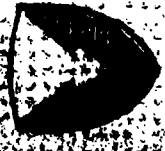
## PRODUCT IMPROVEMENT OF M4A2 HC FLOATING SMOKE POT

- COMPETITIVE CONTRACT TO
  - INCORPORATE NEW HC REPLACEMENT MIX
  - MAKE REQUIRED DESIGN CHANGES
  - TEST DESIGN CHANGES
  - FABRICATE AND TEST FINAL PROTOTYPES
- CONTACT GERALD P. YOUNG 301-671-2863
- SOLICITATION JUN 88

A0332- W7 0100-00

# COMBAT VEHICLE SYSTEMS

## DEFENSE



- IMPROVED SMOKE GRENADE LAUNCHER
- VEHICLE ENHANCED SMOKE SYSTEM
- CANOPY SMOKE
- VISIBLE - INFRARED - MILLIMETER



- M1 MAIN BATTLE TANK
- M2 INFANTRY FIGHTING VEHICLE
- M3 CAVALRY FIGHTING VEHICLE
- LIGHT ARMORED VEHICLE
- ARMORED FAMILY OF VEHICLES

A0332- A7001201

# COMPETITIVE OPPORTUNITIES

---



## COMBAT VEHICLE DEFENSIVE OBSCURATION SYSTEM (CVDOS)

- FULL SCALE DEVELOPMENT OF SMOKE GRENADE LAUNCHER, VEHICLE ENHANCED SMOKE SYSTEM, MILLIMETER WAVE GRENADE
  - COMPETITIVE CONTRACT TO -
    - FINALIZE DESIGN
    - PREPARE SOFTWARE
    - PRODUCT TEST PROTOTYPES
    - OPTION FOR LOW RATE INITIAL PRODUCTION
  - CONTACT WILLIAM ROUSE 301 671-3388
  - SOLICITATION PLANNED FOR FY89

**NEED LOW COST, SINGLE USE HARDWARE TO:**

- **CONVERT ENERGY FROM BURNING PYROTECHNIC MUNITIONS**
  - **DIRECT SMOKE HORIZONTALLY VS VERTICALLY**
  - **ENTRAIN AIR INTO WARM SMOKE TO COOL**
  - **SIGNIFICANTLY DILUTE CONCENTRATED SMOKE**
- **SUPPRESS FLAME/PILLARING FROM BURNING PHOSPHORUS MUNITION HARDWARE**

**INTERESTED IN BUYING DEMONSTRATION HARDWARE**

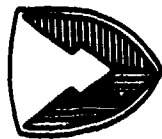
- **HIGH DILUTION, LOW COST, AIR DRIVEN EJECTORS**
- **METHOD TO PROJECT PARTICLES LONG DISTANCES**

**CONTACT Joe Domanico (301) 671-2180**

AO332-VV7 0100-11

# **MATERIAL AND HARDWARE AREAS OF INTEREST**

---



- **LOOKING FOR NEW TYPES OF SUBMICRON FILAMENTS**
  - **METALS**
  - **OTHER CONDUCTIVE MATERIALS**
  - **ABILITY TO CONTROL PROCESS TO CHANGE PHYSICAL PROPERTIES**
  - **100 POUND QUANTITIES NEEDED FOR EVALUATION**
  - **WORKING WITH 12 SOURCES NOW/DESIRE MORE**
  
- **LOOKING FOR METHODS TO CUT FILAMENTS > 5 MICRON DIAMETER AS SHORT AS 1 MILLIMETER LONG**

**CONTACT Gary Herman (301) 671-2325**

- INVESTIGATE THE RELIABILITY PROBLEM IN  
EXPLOSIVE TRAIN OF CANISTER FOR M825  
PROJECTILE

CONTACT WILLIAM SEMIATIN 301-671-3223

- FEASIBILITY STUDY ON USE OF SYNTHETIC FELT  
WEDGES IN CANISTER FOR M825 PROJECTILE

CONTACT WILLIAM SEMIATIN 301-671-3223

- LOW COST METHOD OF COMPACTING FLAKE  
PARTICLES FROM BULK DENSITY OF 15 LB/CU FT  
TO BULK DENSITY OF 60 LB/CU FT WITHOUT  
USING A WETTING AGENT

CONTACT MICHELLE WEBER 301-671-3388

# INNOVATIVE AREAS OF INTEREST

---



## GENERATION OF SCREENING AND ENERGY BEAM

### BLOCKING CANDIDATES SMOKE PARTICLES

- MICRON SIZE SCATTERING NONABSORBING UV - IR
- TEN MICRON EDGE TRANSPARENT CUBES
- CONDUCTIVE REFRACTORY PARTICLES
- LOW WORK FUNCTION CONDUCTIVE FLAKES
- DIALECTRIC REFRACTORY PARTICLES

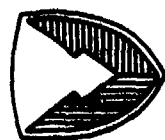
CONTACT ERICA RILEY 301-671-4294

## SMOKE CHAMBER POWDER DISSEMINATION DEVICES

- PNEUMATIC
- ELECTROSTATIC
- ACOUSTIC
- MECHANICAL
- FLASH VAPORIZATION OF SLURRIES

CONTACT BOB WRIGHT 301-671-4294

A0332-W7 0100-10



# AEROSOL MEASUREMENT OPPORTUNITIES

---

INSTRUMENTATION TO MEASURE AEROSOL ADSORPTION CROSS SECTION  
FROM ULTRAVIOLET THROUGH INFRARED (.2 TO 14 MICRONS) AND IN  
THE MICROWAVE REGION (3 - 300 GHZ)

- INTEGRATED DIFFERENTIAL SCATTER
- PHOTOACOUSTIC
- PHOTOTHERMAL DEFLECTION
- PHASE FLUCTUATION OPTICAL HETERODYNE
- PATH RADIANCE

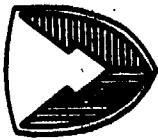
CONTACT JEFF KAGAN 301-671-2326

- INSTRUMENTATION FOR SMOKE CHARACTERIZATION
- MEASURE REAL-TIME AEROSOL MASS CONCENTRATION IN SMOKE CHAMBERS AND IN THE FIELD
  - MEASURE AERODYNAMIC SIZE DISTRIBUTION IN SMOKE CHAMBERS AND IN THE FIELD
  - COVER CONCENTRATION RANGE  $0.05-1\text{G/M}^3$  AND EQUIVALENT AERODYNAMIC DIAMETER RANGE 0.1 MICRON TO 50 MICRONS

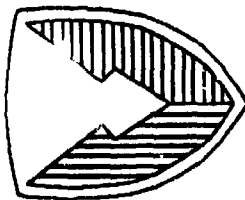
CONTACT ROBERT DOHERTY 301-671-2326

A0332- 07 0100-08

# TRACK RECORD FOR PROPOSALS



- QRI'S CONDUCTED HAVE RESULTED IN
  - LOW COST TURBINE SMOKE GENERATORS
  - CONVERSION OF DIESEL FUEL
  - MULTIPLE AWARDS
- ITEMS OFFERED 2-3 YEARS AGO INCORPORATED INTO CURRENT 6.3-6.4 DEVELOPMENTS
  - SUGGESTED APPROACH
    - CONTACT CRDEC PERSONNEL WITH IDEAS
    - RAPID RESPONSE INDICATING INTEREST/NOT
    - FIGURE OUT BEST APPROACH
      - PURCHASE ORDERS TO EVALUATE ITEMS
      - CONTRACTS TO MODIFY/IMPROVE ITEMS



U.S. ARMY  
ARMAMENTS  
MUNITIONS  
CHEMICAL COMMAND  
CHEMICAL ROLE CENTER

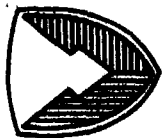
# COLLECTIVE PROTECTION

by

MR. JOSEPH A. D'ANDREA  
Physical Protection Directorate

SMCCR-PPC  
AREA CODE (301) 671-2732  
AUTOVON (584) 2732

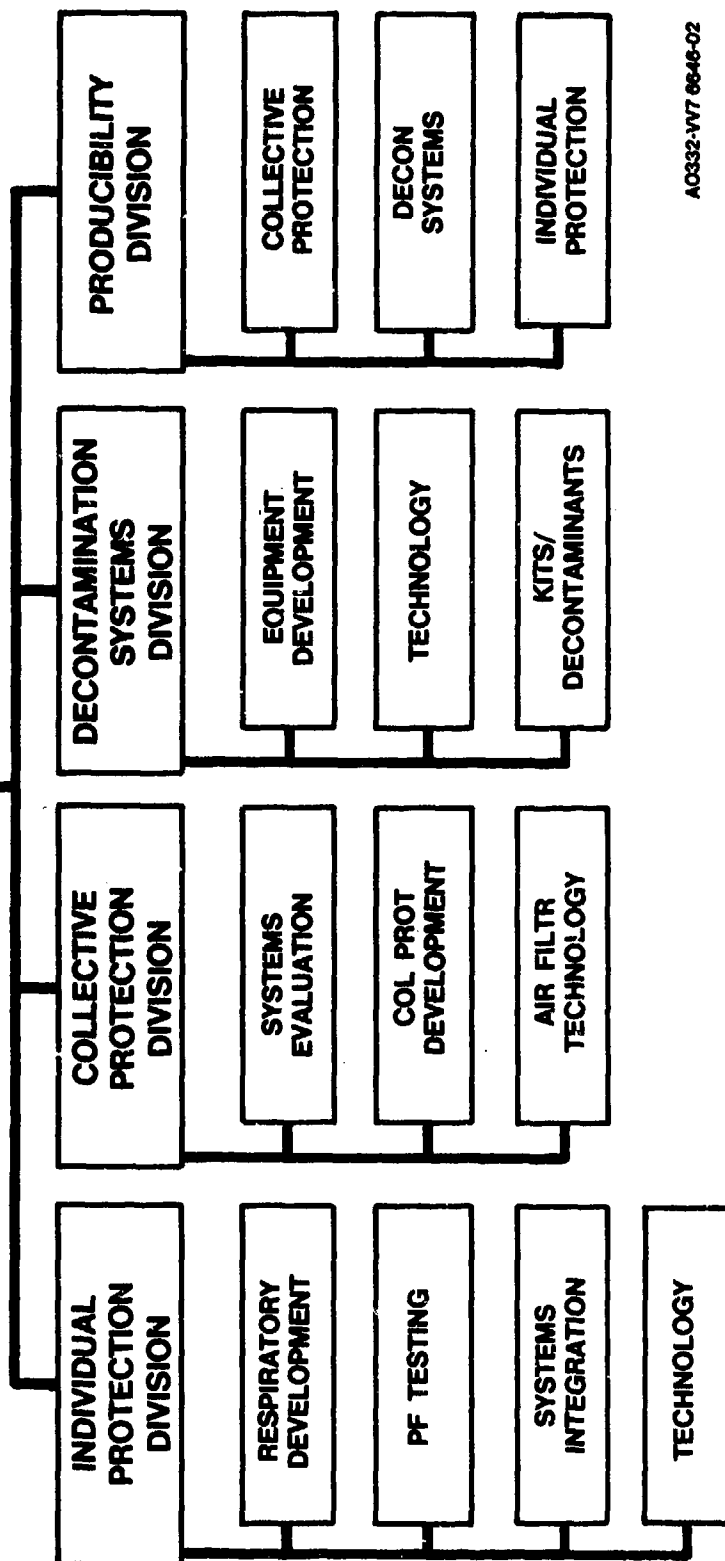
AO332-C-G7226066



# PHYSICAL PROTECTION

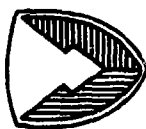
U.S. ARMY CHEMICAL RESEARCH, DEVELOPMENT  
AND ENGINEERING CENTER (CRDEC)

## PHYSICAL PROTECTION DIRECTORATE



AO332-VV7 8646-02

# COLLECTIVE PROTECTION



CHEMICAL RESEARCH, DEVELOPMENT AND  
ENGINEERING CENTER

PHYSICAL PROTECTION DIR  
Col. Gross  
(301) 671-3384

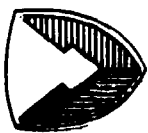
COLLECTIVE PROTECTION DIV  
Mr. D'Andrea  
(301) 671-2732

SYSTEMS EVALUATIONS  
Mr. Blewett  
(301) 671-4208

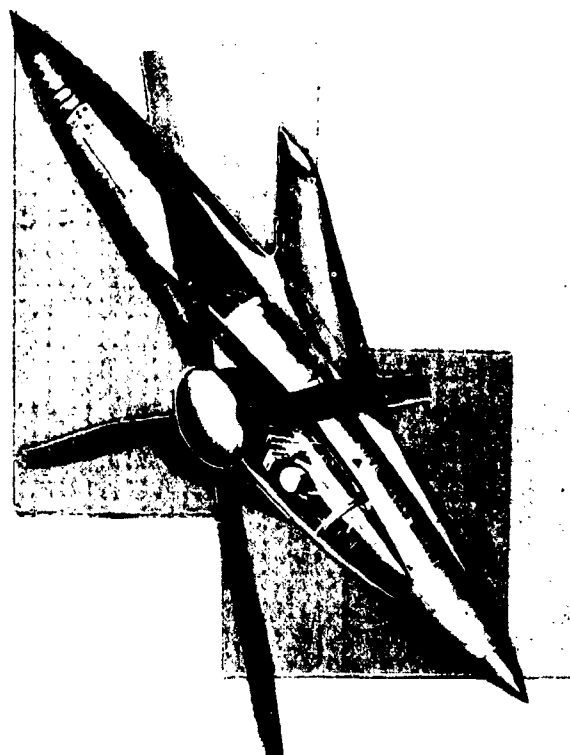
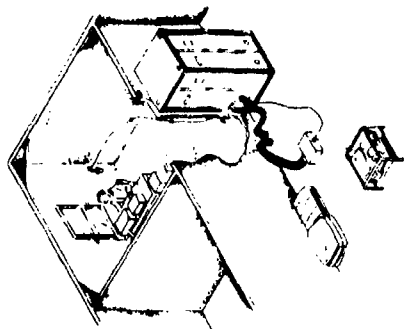
COLLECTIVE PROTECTION  
DEVELOPMENT  
Mr. Davis  
(301) 676-3956

AIR FILTRATION  
TECHNOLOGY  
Mr. Puhala  
(301) 671-2295

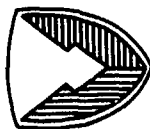
A0332- WW73715-02



# COLLECTIVE PROTECTION



# COLLECTIVE PROTECTION OBJECTIVES



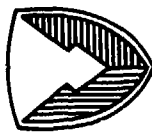
- ASSURE FULL CB PROTECTION WITH ENVIRONMENTAL CONTROL INTEGRATION
- ASSURE EASE OF ENTRY/EXIT
- MINIMAL SIZE AND WEIGHT
- MAXIMIZE LIFE OF AIR PURIFIER

- MINIMAL OPERATIONAL DEGRADATION
- NBC SURVIVABILITY

YIELDS

**SUSTAINED OPERATIONS**  
in a  
**CB ENVIRONMENT**

# COLLECTIVE PROTECTION

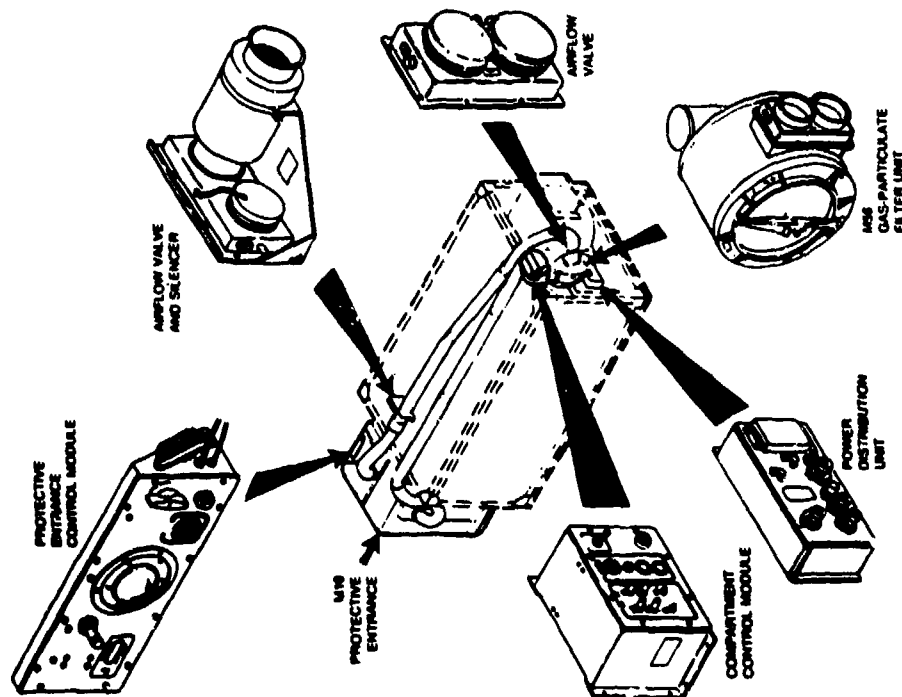
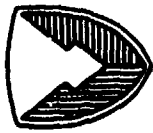


## PRODUCTION OPPORTUNITIES

FY88 - FY93

<\$43 MILLION

# MODULAR COLLECTIVE PROTECTION EQUIPMENT



## CONTRACT/PROCUREMENT INFORMATION

PROCUREMENT: FY88-FY91

## PRODUCTION OPPORTUNITIES/CHALLENGES

- VARIOUS MANUFACTURING DISCIPLINES  
(i.e., METAL, ELECTRONIC, ELECTRICAL,  
FABRIC, PLASTICS, AND CHEMICAL)
- SOME COMPLEX MANUFACTURING  
PROCESSES
- METAL CASTINGS REQUIRED
- SPECIAL TEST PROCEDURES

## POINTS OF CONTACT

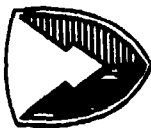
TECHNICAL: William Pribyl, (301) 671-4351

Roger Staso, (301) 671-3956

ADMIN: Richard Dimmick, (301) 671-2031

A0332- A7-0038-08.03

# MODULAR COLLECTIVE PROTECTION EQUIPMENT



## CONTRACT/PROCUREMENT INFORMATION

PROCUREMENT: FY80-FY83

### PRODUCTION OPPORTUNITIES/CHALLENGES

- VARIOUS MANUFACTURING DISCIPLINES  
(i.e., METAL, ELECTRONIC, ELECTRICAL,  
FABRIC, PLASTICS, AND CHEMICAL)
- SOME COMPLEX MANUFACTURING PROCESSES
- METAL CASTINGS REQUIRED.
- SPECIAL TEST PROCEDURES

### POINTS OF CONTACT

TECHNICAL: William Pribyl, (301) 671-4361

Roger Staso, (301) 671-3956

ADMIN: Richard Dimmick, (301) 671-2031

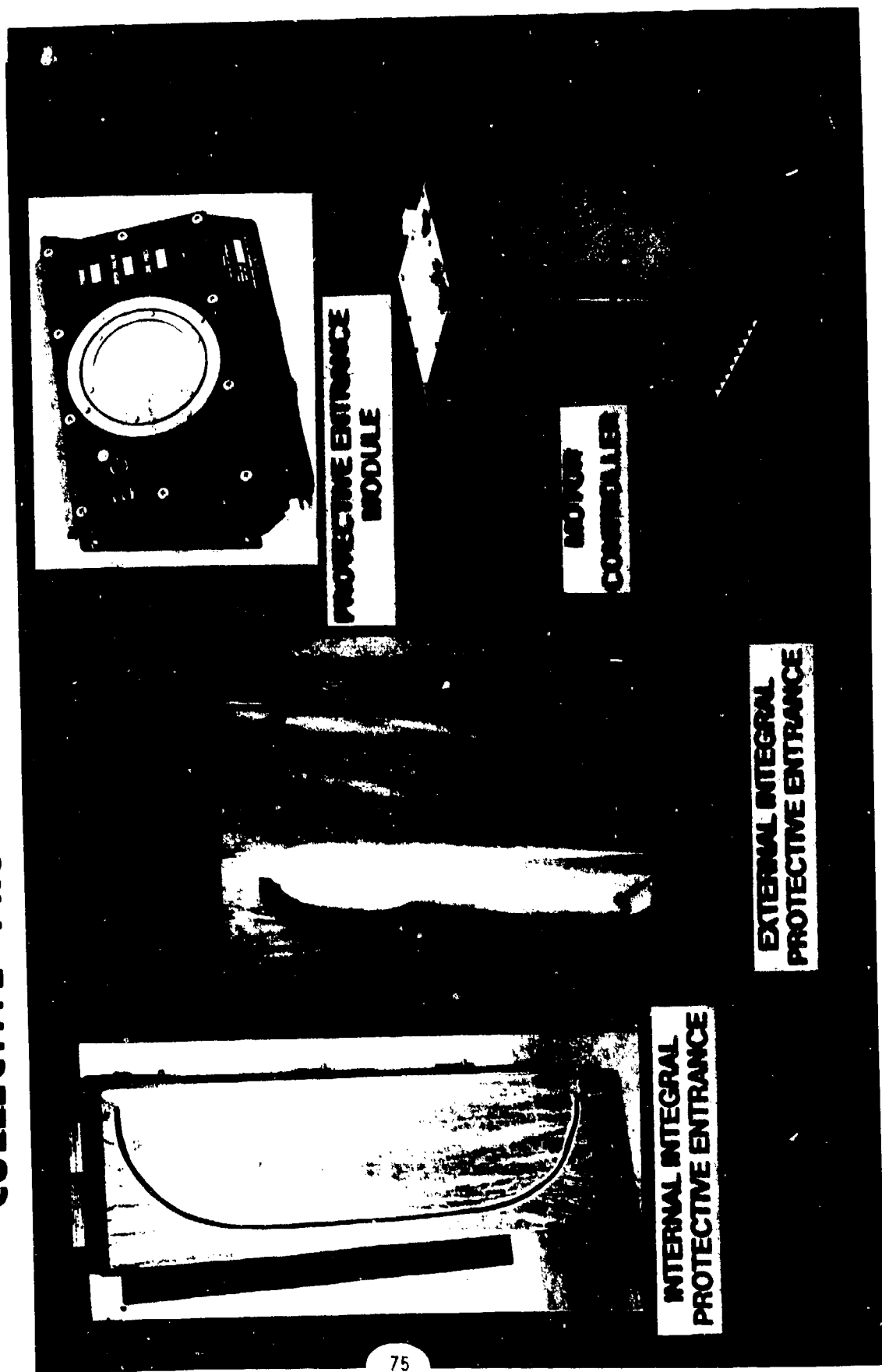
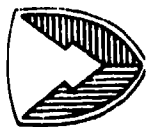
ADDL: AF 4029-08-02



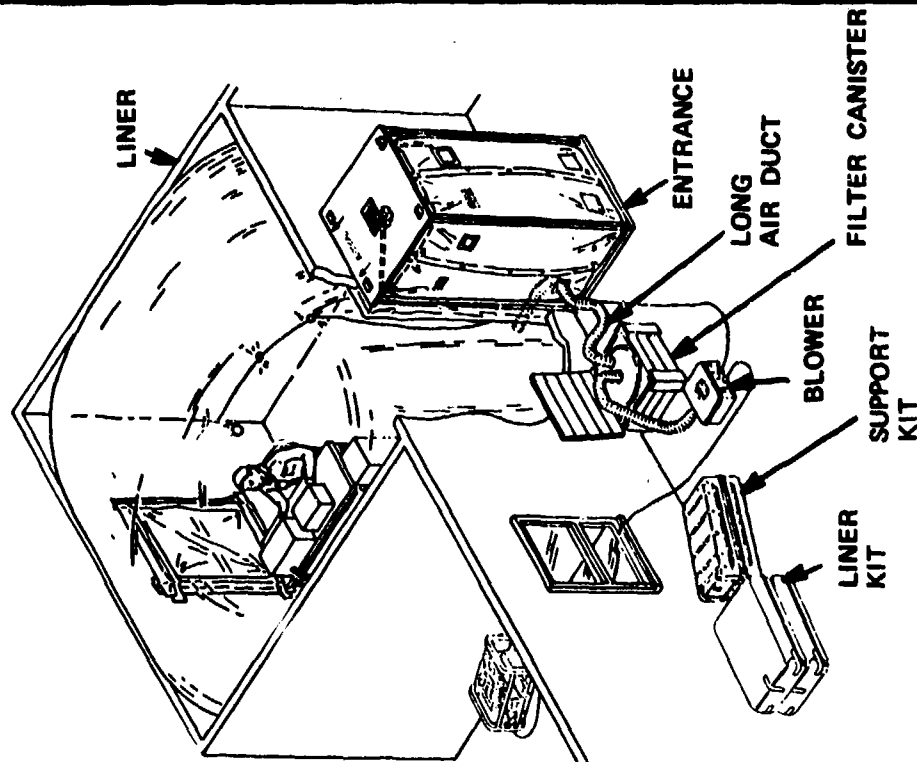
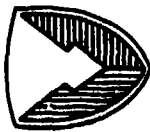
AND ONE OR  
MORE OF THE FOLLOWING



# MODULAR COLLECTIVE PROTECTION EQUIPMENT



# SIMPLIFIED COLLECTIVE PROTECTION EQUIPMENT (SCPE)



## CONTRACT/PROCUREMENT INFORMATION

CONTRACT: COLLECTIVE PROTECTION  
EQUIPMENT, NBC, SIMPLIFIED M20

RFP: OCT 87

PROCUREMENT: FY88

DOLLAR AMOUNT: <\$5M

## PRODUCTION OPPORTUNITIES/CHALLENGES

- POLYETHYLENE MATERIAL
- HEAT SEALING REQUIRED —  
LABOR INTENSIVE
- AUTOMATION POSSIBLE
- CONVENTIONAL ASSEMBLY —  
LABOR INTENSIVE
- DIE CASTING REQUIRED
- CLOSE TOLERANCES (MOTOR BLOWER)
- MULTIPLE DISCIPLINES

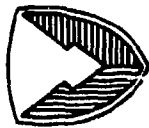
## POINTS OF CONTACT

TECHNICAL: Mark Diglio, (301) 671-4351

ADMIN: Richard Dimmick, (301) 671-2031

AD332- A7-0038-08.03

# SIMPLIFIED COLLECTIVE PROTECTION EQUIPMENT (SCPE P31)



## CONTRACT/PROCUREMENT INFORMATION

CONTRACT: COLLECTIVE PROTECTION EQUIPMENT, NBC, SIMPLIFIED M20A1

RFP: MAR 88

PROCUREMENT: FY89 FY90-92

DOLLAR AMOUNT: <\$5M <\$30M

## PRODUCTION OPPORTUNITIES/CHALLENGES

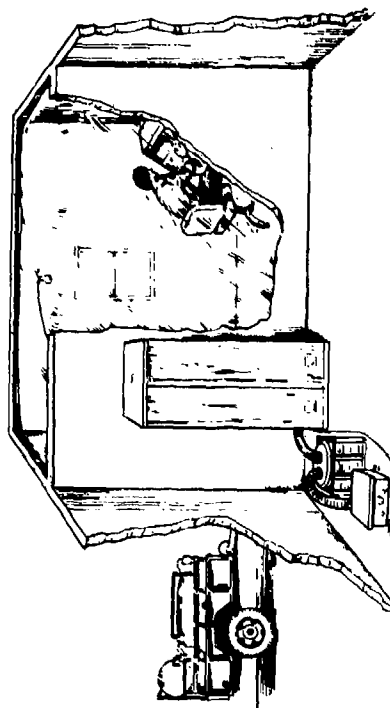
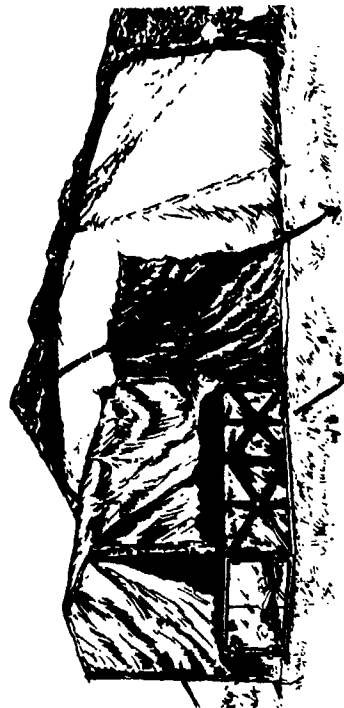
- POLYETHYLENE MATERIAL
- HEAT SEALING REQUIRED —  
LABOR INTENSIVE
- AUTOMATION POSSIBLE
- CONVENTIONAL ASSEMBLY —  
LABOR INTENSIVE
- DIE CASTING REQUIRED
- CLOSE TOLERANCES (MOTOR BLOWER)
- MULTIPLE DISCIPLINES

## POINTS OF CONTACT

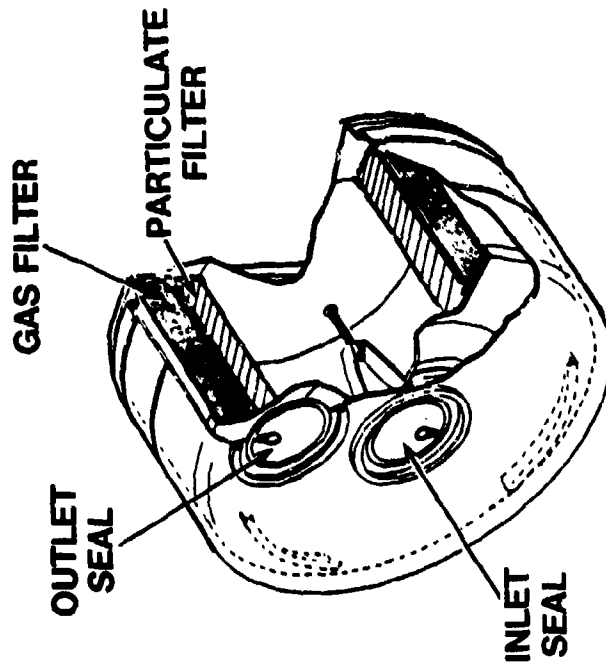
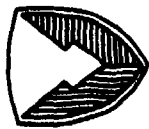
TECHNICAL: Mark Diglio, (301) 671-4351

ADMIN: Richard Dimmick, (301) 671-2031

A0332-A7-0036-10.03



# HERMETICALLY SEALED FILTER CANISTERS FOR SCPE



## CONTRACT/PROCUREMENT INFORMATION

CONTRACT: HERMETICALLY SEALED FILTER  
CANISTER

PROCUREMENT: FY88 FY89-FY92

DOLLAR AMOUNT: <\$500K <\$3500K

## PRODUCTION OPPORTUNITIES/CHALLENGES

- SPECIAL ASSEMBLY TECHNIQUES
- LARGE TOOLING INVESTMENT
- FILTER CONSTRUCTION REQUIRES SKILLED LABOR
- SPECIAL TEST PROCEDURES

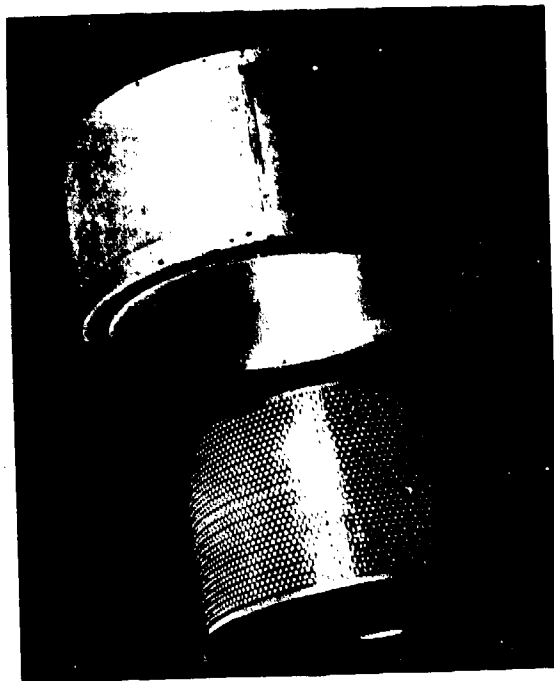
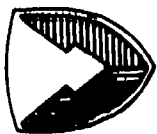
## POINTS OF CONTACT

TECHNICAL: Mark Diglio, (301) 671-4351

ADMIN: Richard Dimmick, (301) 671-2031

AD332- A7-0038-11

# STANDARD FILTER SET (G&P) FOR MCPE



200 CFM GAS & PARTICULATE  
FILTERS

## CONTRACT/PROCUREMENT INFORMATION

CONTRACT: STANDARD FILTER SET, GAS  
PARTICULATE

RFP: OCT 86

PROCUREMENT: FY88 FY89-FY92

DOLLAR AMOUNT: <\$500K <\$3.5M

CONTRACT/PROCUREMENT INFORMATION

## POINTS OF CONTACT

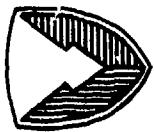
TECHNICAL: William Pribyl  
(301) 671-4351

ITEM MGR: Eldora Fullerlove  
(309) 782-3262

ADMIN: Richard Dimmick, (301) 671-2031

A0332- A7 0008-12

# COLLECTIVE PROTECTION



## SUMMARY OF CONTRACTOR OPPORTUNITIES

| YEAR | TITLE                                                    | AMOUNT  | POINT-OF-CONTACT                |
|------|----------------------------------------------------------|---------|---------------------------------|
| FY88 | HIGH PRESSURE NBC FILTER                                 | <\$400K | DENNIS BAYLOR<br>(302) 671-2160 |
| FY88 | COLLECTIVE PROTECTION EQUIPMENT,<br>NBC, SIMPLIFIED,M-20 | <\$5M   | MARK DIGLIO<br>(301) 671-4351   |
| FY88 | HERMETICALLY SEALED FILTER<br>CANISTER                   | <\$500K | MARK DIGLIO<br>(301) 671-4351   |

A0332- A7-0038-15.01

# COLLECTIVE PROTECTION

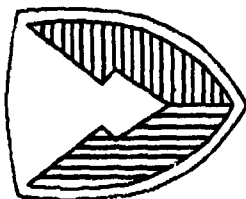


## SUMMARY OF CONTRACTOR OPPORTUNITIES

| YEAR      | TITLE                                                   | AMOUNT  | POINT-OF-CONTACT                    |
|-----------|---------------------------------------------------------|---------|-------------------------------------|
| FY88-FY93 | MODULAR COLLECTIVE PROTECTION EQUIPMENT                 | TBD     | DOLORES WELSH<br>(309) 782-3262     |
| FY88-FY91 | STANDARD FILTER SET, GAS AND PARTICULATE                | <\$3.5M | ELDORA FULLERLOVE<br>(309) 782-3262 |
| FY89-FY92 | HERMETICALLY SEALED FILTER CANISTER                     | <\$3.5M | MARK DIGLIO<br>(301) 671-4351       |
| FY90-FY93 | COLLECTIVE PROTECTION EQUIPMENT, NBC, SIMPLIFIED, M20A1 | <\$25M  | MARK DIGLIO<br>(301) 671-4351       |

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U.S. ARMY  
ARMAMENT  
MUNITIONS  
CHEMICAL COMMAND  
CHEMICAL RD&E CENTER

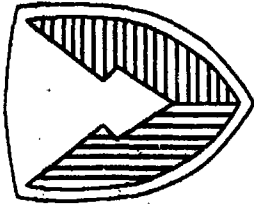
# INDIVIDUAL PROTECTION

by

**DR. RONALD A. WEISS**  
Physical Protection Directorate

SMCCR-PPI  
AREA CODE (301) 671-2519  
AUTOVON (584) 2519

AO332-C-H726069



U.S. ARMY  
ARMAMENTS  
MUNITIONS  
CHEMICAL COMMAND  
CHEMICAL RD&E CENTER

# INDIVIDUAL PROTECTION

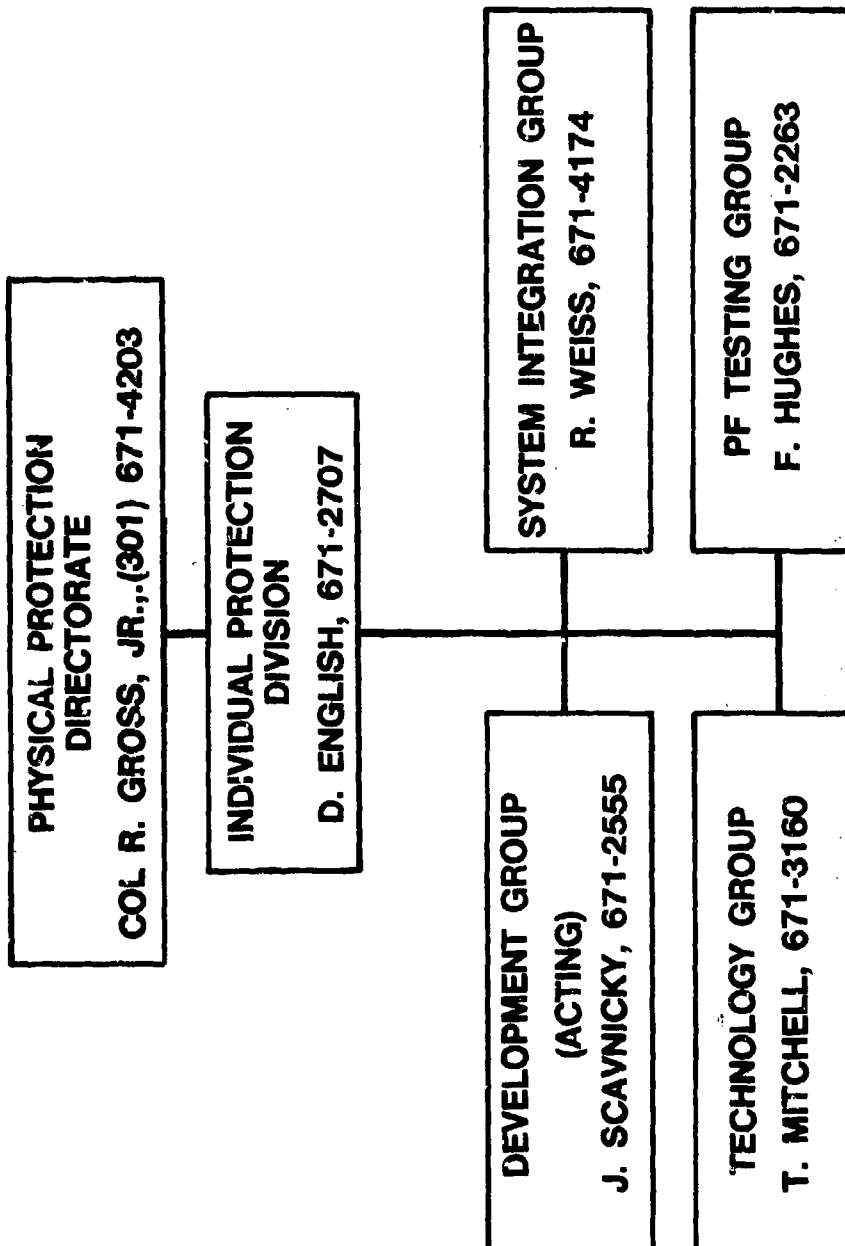
by

MR. FRANCIS P. HUGHES  
Physical Protection Directorate

SMCCR-PPI  
AREA CODE (301) 671-2263  
AUTOVON (584) 2263

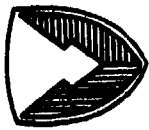
AO332-C-H7226070

# INDIVIDUAL PROTECTION



A0332-WW7 0108-03

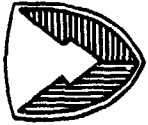
# INDIVIDUAL PROTECTION



## MISSION STATEMENT

- DEVELOP "OPERATIONALLY" EFFECTIVE PROTECTIVE EQUIPMENT
  - CRDEC (EYE AND RESPIRATORY)
  - NRDEC (BODY, HANDS, AND FEET)
- DEVELOPMENT/SUPPORT THROUGH PRODUCTION
- TRI-SERVICE CENTER OF EXCELLENCE FOR INDIVIDUAL PROTECTION
- TRI-SERVICE COORDINATION POINT FOR INDIVIDUAL PROTECTION

# INDIVIDUAL PROTECTION



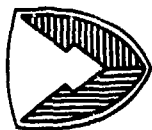
PRODUCTION  
CONTRACT OPPORTUNITIES

FY88

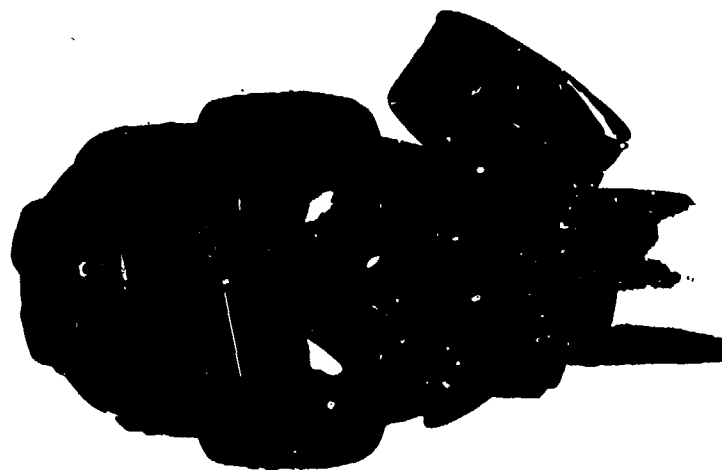
~\$25 MILLION



# INDIVIDUAL PROTECTION

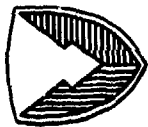


M40



A0332-

# INDIVIDUAL PROTECTION

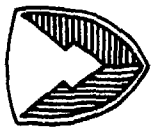


## M40 ACQUISITION STRATEGY

- USED FORMAL SOURCE SELECTION PROCEDURES TO SELECT INITIAL PRODUCTION SOURCE AND WINNING DESIGN
  - MULTIYEAR INITIAL PROD CONTRACT FOR EARLY DELIVERY, TDP VALIDATION AND ASSURANCE OF SUCCESSFUL PRODUCTION
  - DOMESTIC PRODUCTION
- AWARD PARALLEL MULTIYEAR CONTRACT - FULL AND OPEN COMPETITION EXCLUDING SUCCESSFUL DEVELOPER
  - CONTRACT AWARD TO COINCIDE WITH VALIDATION OF TDP BY DEVELOPER BY ACHIEVEMENT OF 10,000 MASKS/MONTH SUSTAINED RATE (APPROXIMATELY 1 YEAR AFTER INITIAL PRODUCTION CONTRACT)
- SUBSEQUENT FOLLOW-ON PRODUCTION CONTRACTS COMPETITION

AD552-1/WT 2808-01

# INDIVIDUAL PROTECTION

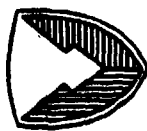


## RESPIRATORY PROTECTIVE EQUIPMENT PRODUCTION OPPORTUNITIES

| <u>ITEM</u> | <u>RELEASE TO<br/>PROCUREMENT</u> | <u>ESTIMATED<br/>REQUIREMENT</u> |
|-------------|-----------------------------------|----------------------------------|
| M40         | 3rd QTR FY88                      | 107,800                          |

POC: MR. FRANK MARTIN, (301) 671-2682

# INDIVIDUAL PROTECTION



## RESPIRATORY PROTECTIVE EQUIPMENT PRODUCTION OPPORTUNITIES

| <u>ITEMS</u>                      | <u>RELEASE TO PROC</u> | <u>ESTIMATED AVERAGE<br/>YEARLY REQUIREMENTS</u> |
|-----------------------------------|------------------------|--------------------------------------------------|
| M15A1 CARRIER<br>(M17A2 MASK)     | 3rd QTR FY88           | 67,000 EA                                        |
| M7 AIRCRAFT CB HOOD<br>(M24 MASK) | 1st QTR FY88           | 8,000 EA                                         |

POC: ROCK ISLAND, MRS. LANEY, (309) 782-4285

# INDIVIDUAL PROTECTION



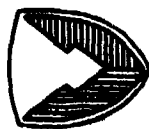
0.4

ENGINEERING DEVELOPMENT  
CONTRACT OPPORTUNITIES

FY88 - FY89

\$1,500 - \$2,500K

# INDIVIDUAL PROTECTION



## M43 PROTECTIVE MASK

- INTEGRATED HOOD/MASK SYSTEM
- LENSES MOUNTED CLOSE TO EYES
- SKULL-TYPE SUSPENSION SYSTEM
- PORTABLE MOTOR/BLOWER SYSTEM ASSEMBLY (4 CFM)
- ADJUSTABLE AIRFLOW CONTROL

## M43 PROTECTIVE MASK



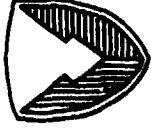
## M43 (P3I)

- OXYGEN ADAPTABILITY
- REPLACEABLE LENSES
- MOTOR/BLOWER WITH STANDARD BATTERY
- ENHANCE PF
- NBC SURVIVABILITY
- FACEPIECE ASSEMBLY CARRIER



A0332-B7 0106-28

# INDIVIDUAL PROTECTION



## CONTRACT OPPORTUNITY

### OBJECTIVE

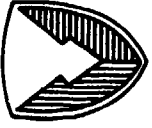
- TO DESIGN AND FABRICATE PRODUCT IMPROVED M43 CB PROTECTIVE MASK SYSTEMS FOR AH-64 AND OTHER IDENTIFIED APPLICATIONS AND TO SUPPLEMENT SUCH DESIGNS WITH ENGINEERING DOCUMENTATION AND PROVISIONING SUPPORT NEEDED FOR A FIELDED ITEM

### PERTINENT INFORMATION

- FUNDING LEVEL (\$1,500 - \$2,000K)
- STATUS - (6.4) ENGINEERING DEVELOPMENT
- SYNOPSIS DATE - SEPTEMBER 1987
- CONTRACT LENGTH - 24 MONTHS
- POC - MR. R. W. DECKER, (301) 671-3789

A0332- D7 0105-01

# INDIVIDUAL PROTECTION



## TECHNOLOGY PLAN, 6.2

### ADVANCED RESPIRATORY PROTECTION CONCEPTS

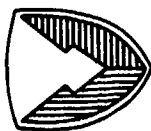
- TECHNOLOGY CONCEPTS
  - COMPUTER AIDED DESIGN
  - TECHNOLOGY BARRIERS
  - TECHNOLOGY EXPLOITATION
- IPE TEST TECHNOLOGY
  - NONDESTRUCTIVE FIT TEST
  - FOREIGN RESPIRATOR EXPLOITATION
  - PF TESTING
  - VAPOR SIMULANT AND TEST METHOD

### SYSTEMS INTEGRATION

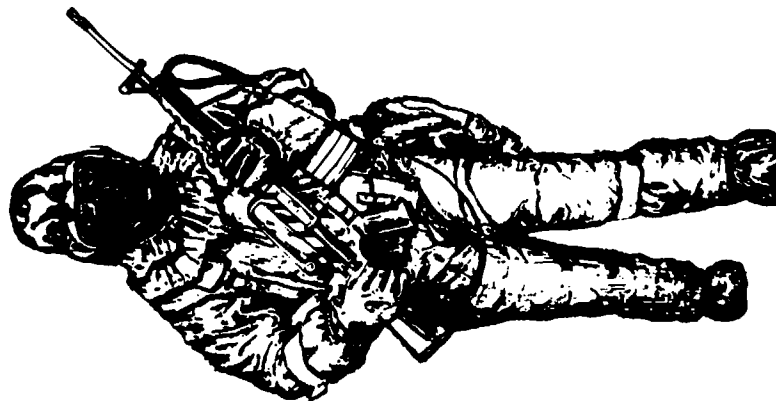
- PHYSIOLOGICAL MASK TESTING
- FIELD EQUIPMENT INTEGRATION
- SENSORY
- TOTAL ENSEMBLE EVALUATIONS
- CLOSED CIRCUIT BREATHING SYSTEMS

AO332-WW7 2827-06

# INDIVIDUAL PROTECTION



## RESPIRATORY PHYSIOLOGY/BIOENGINEERING

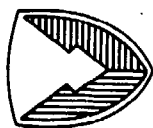


- PROTECTIVE EQUIPMENT CREATES MAJOR PHYSIOLOGICAL BURDENS FOR THE SOLDIER IN AREAS OF RESPIRATION, VISION, SPEECH/ HEARING, THERMAL LOAD, SIZING AND MOBILITY

- CRDEC HAS ESTABLISHED A NEW ADVANCED PROTECTION SYSTEMS INTEGRATION LABORATORY TO INVESTIGATE THESE PROBLEMS AND FIND SOLUTIONS TO BE INCORPORATED INTO FUTURE NBC PROTECTIVE EQUIPMENT

AO332-WW7 0109-08

# INDIVIDUAL PROTECTION



## SUMMARY OF CONTRACTOR OPPORTUNITIES

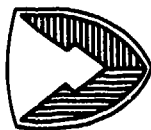
### DEVELOPMENT

| <u>YEAR</u> | <u>TITLE OF<br/>CONTRACT ACTION</u>                    | <u>FUNDING<br/>LEVEL</u> | <u>POINT OF<br/>CONTACT</u>        |
|-------------|--------------------------------------------------------|--------------------------|------------------------------------|
| SEP<br>1987 | A PRODUCT IMPROVED<br>M43 CB PROTECTIVE<br>MASK SYSTEM | \$1,500 - 2,000 K        | Mr. R. W. Decker<br>(301) 671-3789 |

### PRODUCTION

|      |                                   |                     |                              |
|------|-----------------------------------|---------------------|------------------------------|
| 1988 | M15A1 CARRIER (M17A2<br>MASKS)    | \$350 K             | Mrs. Laney<br>(309) 782-4285 |
| 1988 | M7 AIRCRAFT CB HOOD<br>(M24 MASK) | \$65 - 75 K         | Mrs. Laney<br>(309) 782-4285 |
| 1988 | M40 PROTECTIVE MASK               | \$20,000 - 25,000 K | Mr. Martin<br>(301) 671-2682 |

# INDIVIDUAL PROTECTION

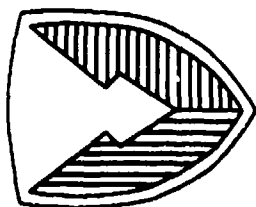


## SUMMARY

INDIVIDUAL PROTECTION READINESS REQUIREMENTS ARE PROVIDING PRODUCTION OPPORTUNITIES WHILE OPERATIONAL CONSIDERATIONS AND NEW THREATS MANDATE THE USE OF NEW AND EMERGING TECHNOLOGIES TO ADDRESS/MEEET THE USERS NEEDS

OUR FUTURE SUCCESS DEPENDS HEAVILY  
ON A CREATIVE INDUSTRY

F3332-A7 0106-24



U.S. ARMY  
ARMAMENTS  
MUNITIONS  
CHEMICAL COMMAND  
CHEMICAL RD&E CENTER

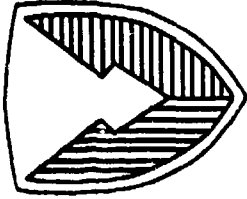
# DECONTAMINATION SYSTEMS

by

MR. RINALDO J. BUCCI  
Physical Protection Directorate

SMCCR-PPD  
AREA CODE (301) 671-2881  
AUTOVON (584) 2881

AO332-C-G7226057



U.S. ARMY  
ARMAMENTS  
MUNITIONS  
CHEMICAL COMMAND  
CHEMICAL RO&E CENTER

# DECONTAMINATION SYSTEMS

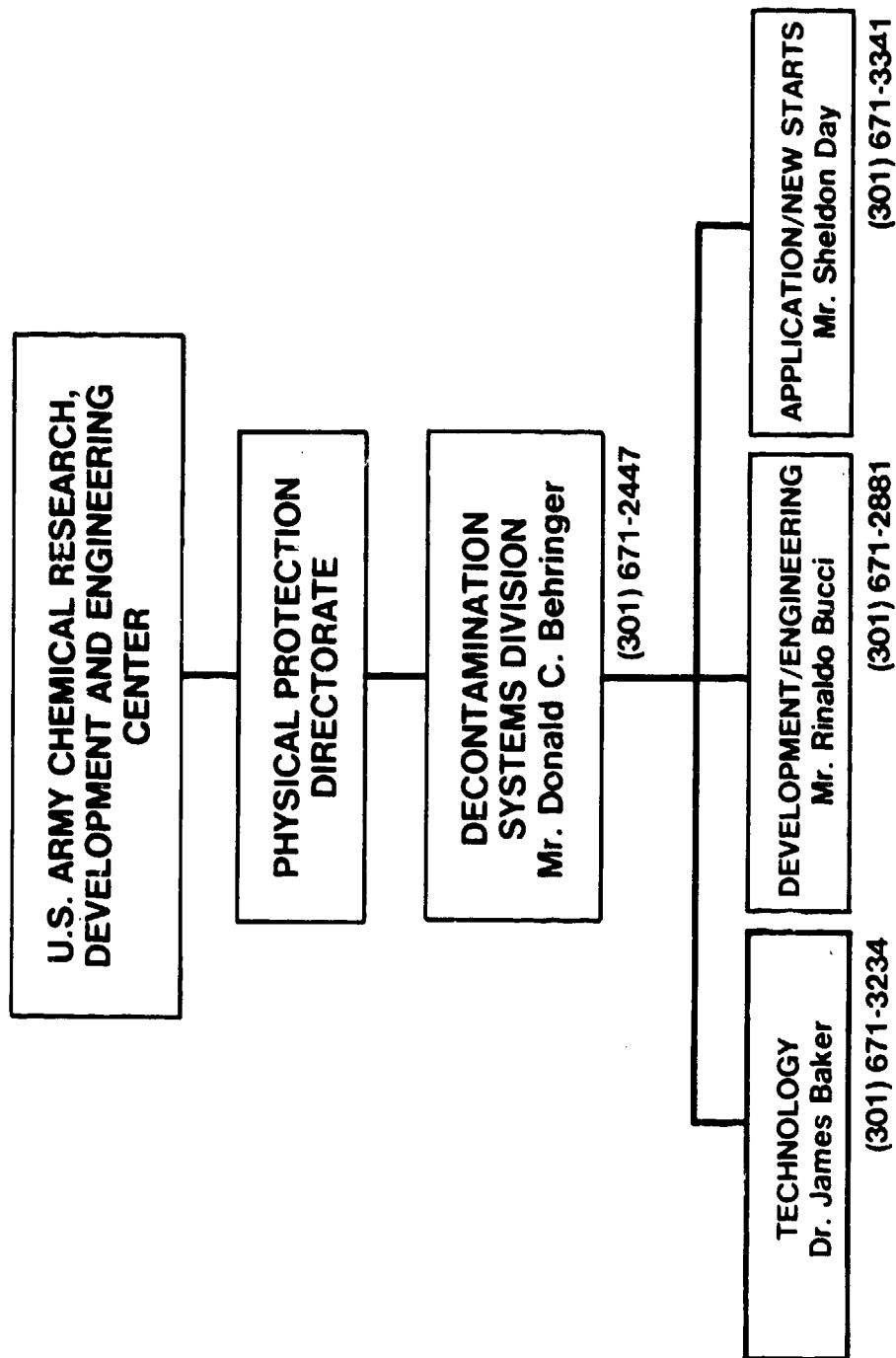
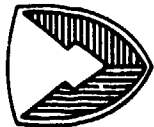
by

MR. DONALD C. BEHRINGER  
Physical Protection Directorate

SMCCR-PPD  
AREA CODE (301) 671-2447  
AUTOVON (584) 2447

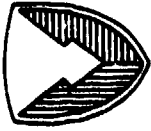
AO332-C-G7226064

# DECONTAMINATION



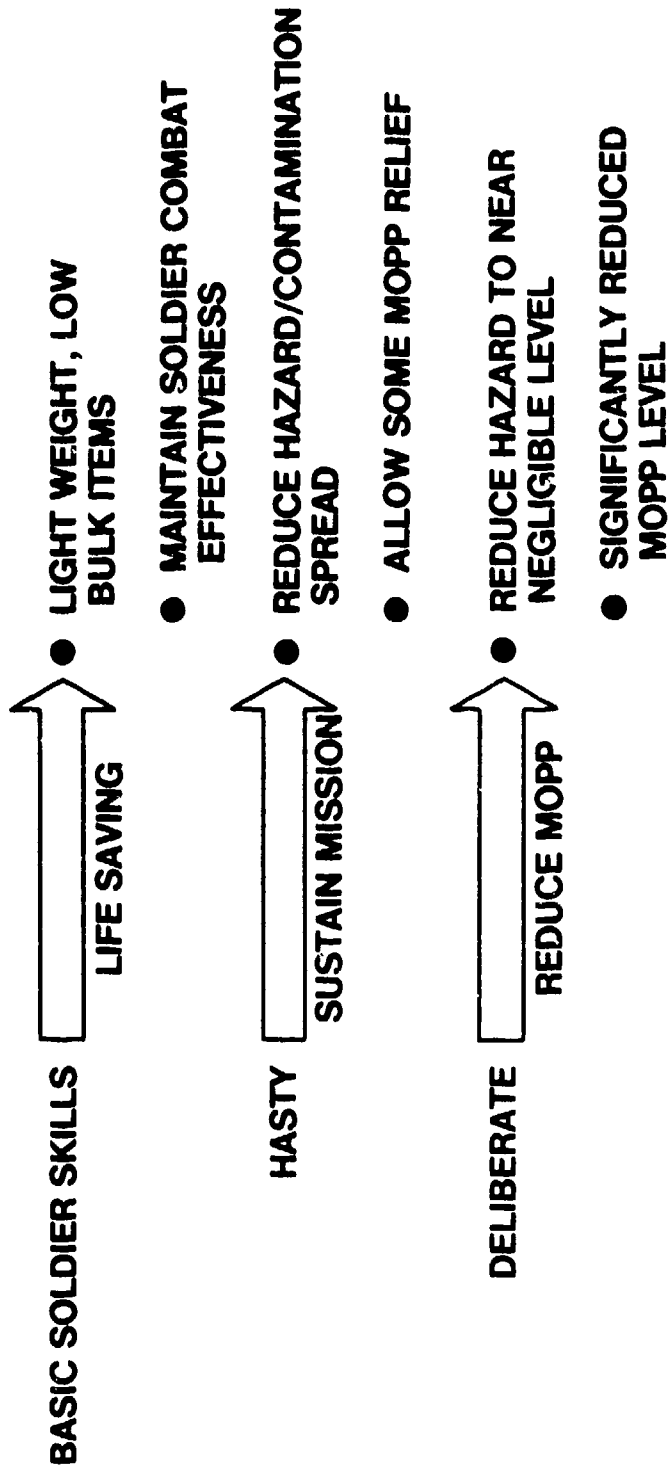
A0332- 87 0257-04

# DECONTAMINATION EFFORTS



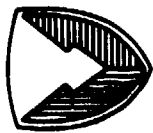
FM 3-5  
NBC DECON

PROVIDING:



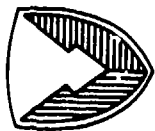
# DECONTAMINATION OBJECTIVES

---



- ELIMINATE NUCLEAR-BIOLOGICAL-CHEMICAL HAZARDS ON THE BATTLEFIELD
- DECONTAMINATE ALL AGENTS
- INTEGRATE WITH DETECTION TECHNOLOGIES
- REDUCE LOGISTICAL BURDEN & WATER DEPENDENCY
- REDUCE TIME IN PROTECTIVE CLOTHING
- DEVELOP DECONTAMINANTS/EQUIPMENT TO SUPPORT THE SOLDIER ON THE BATTLEFIELD
- STREAMLINE ACQUISITION AND FIELDING OF EQUIPMENT

# TECHNICAL CHALLENGES OF DECON

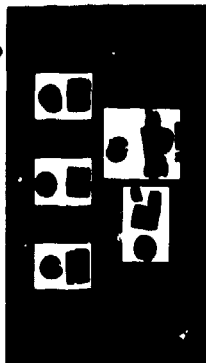


MATERIAL  
COMPATIBILITY

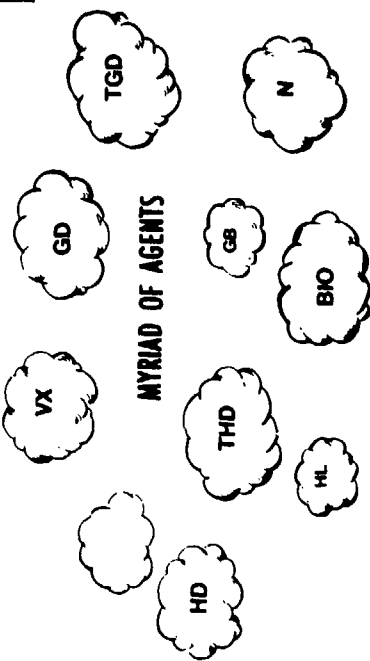
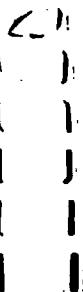
PERFORMANCE NUMBER 100



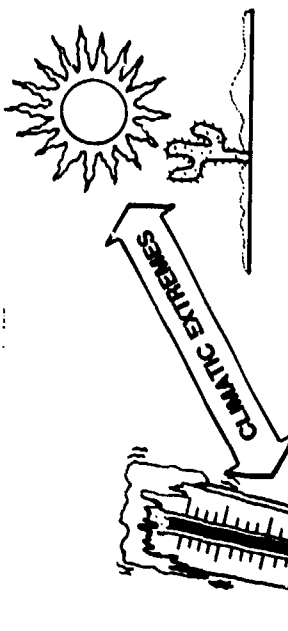
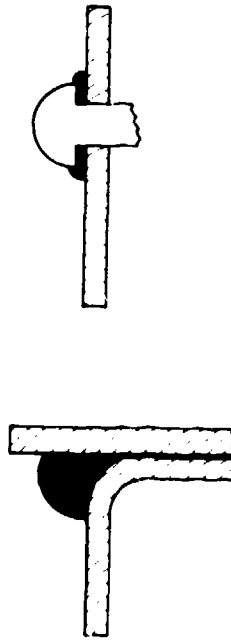
DECONSTRUCTION OF DECON



DECONSTRUCTION OF DECON  
(POLYMERIZATION) AT 90°C



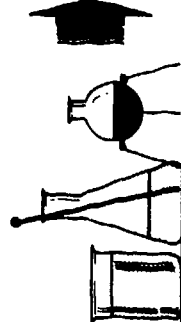
AGENT-SUBSTRATE INTERACTIONS



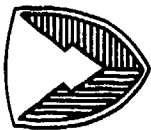
SUITABILITY FOR FIELD USE



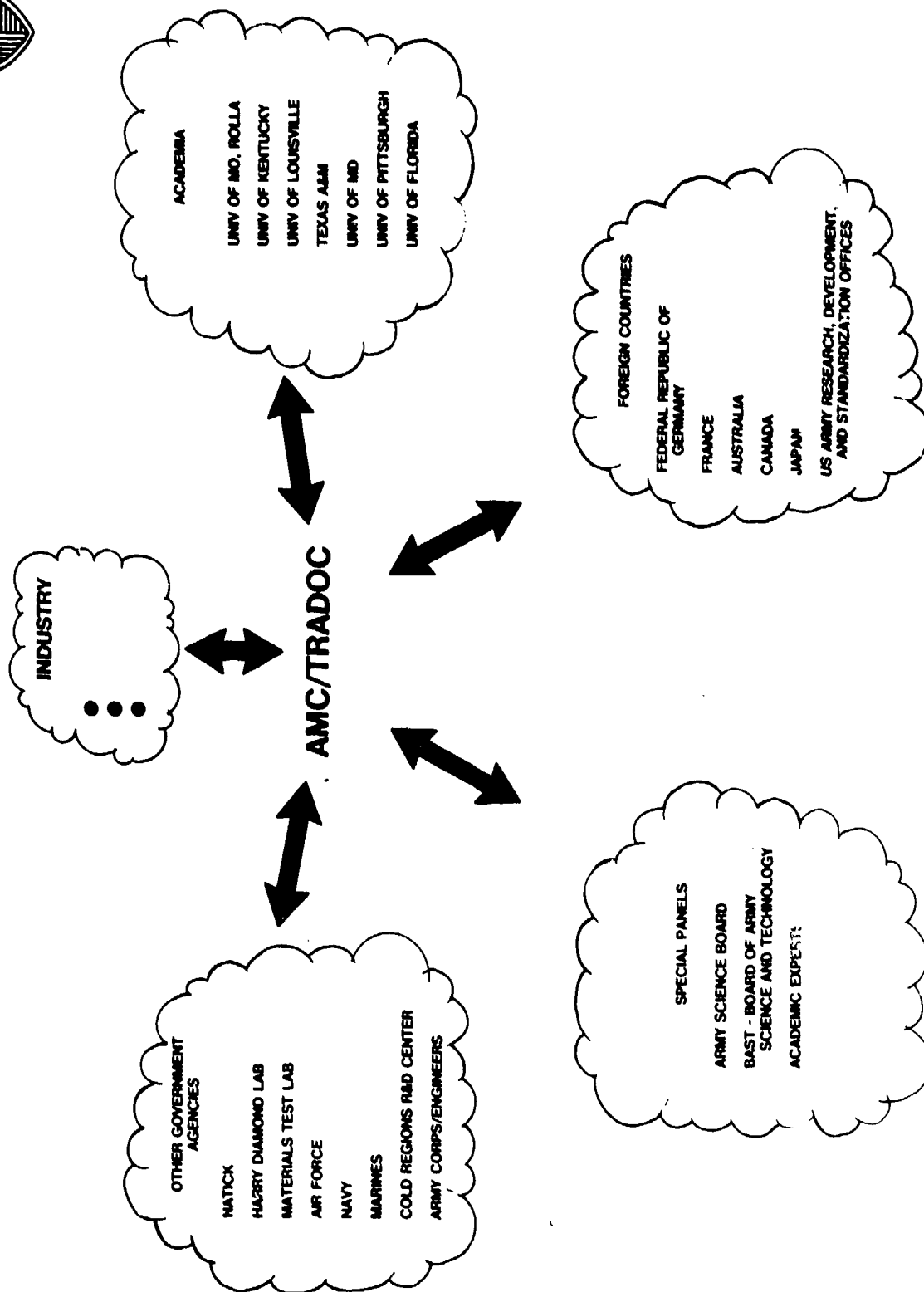
INCREASED SIMPLICITY IN THE FIELD



INCREASED SOPHISTICATION IN LABORATORY

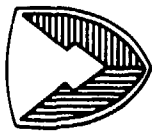


## KEY PLAYERS IN DECONTAMINATION



WWS 2565-12

# DECONTAMINATION

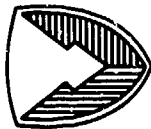


## TECHNOLOGY PLANS, 6.2 FY88/89

| <u>TASK/DESCRIPTION</u>                                | <u>DOLLARS<br/>(K)</u>        | <u>DATE</u>          | <u>TECHNICAL POC</u>    |
|--------------------------------------------------------|-------------------------------|----------------------|-------------------------|
| ● MICROENCAPSULATION OF<br>HALAMINES FOR STABILIZATION | < \$ 60                       | 2Q88                 | J. Hovanec<br>671-2761  |
| ● APPLICATION HARDWARE FOR<br>MICROEMULSION            | < 130                         | 2Q88                 | J. Thompson<br>671-3236 |
| ● INITIATIVES IN HOMOGENEOUS<br>CATALYSIS (3)          | < 100<br>< 160<br>< 160       | 2Q88<br>2Q89<br>2Q89 | J. Thompson<br>671-3236 |
| ● FEASIBILITY DEMONSTRATION OF<br>COATING HARDWARE     | < \$100                       | 2Q89                 | J. Richmond<br>671-3234 |
| ● INITIATIVES IN HETEROGENEOUS<br>CATALYSIS (3)        | < \$100<br>< \$100<br>< \$110 | 2Q89<br>2Q89<br>2Q89 | J. Richmond<br>671-3234 |
| ● OPTIMIZE/EVALUATE COATING<br>FORMULATION             | < \$100                       | 2Q89                 | J. Richmond<br>671-3234 |
| <u>TOTAL ~ \$1,120</u>                                 |                               |                      |                         |

AO332-JU7 0257-03

# DECONTAMINATION



## DEVELOPMENT PLANS, 6.3/6.4 FY88/89

| <u>TASK/DESCRIPTION</u>   | <u>DOLLARS<br/>(K)</u> | <u>DATE</u> | <u>TECHNICAL POC</u>  |
|---------------------------|------------------------|-------------|-----------------------|
| ● XM56 LASS DECON MODULES | <\$ 800                | 2Q89        | R. Cerar<br>671-2547  |
| ● MODULAR DECON SYSTEM    | <\$5000                | 4Q89        | J. Daniel<br>671-2654 |
| <u>TOTAL</u>              |                        | ~           | \$5,800               |

# SMOKE/DECONTAMINATION



GENERATOR, SMOKE, MECHANICAL

XM56



XM56 DUAL PURPOSE SMOKE  
AND DECONTAMINATION SYSTEM

DESCRIPTION/USE:

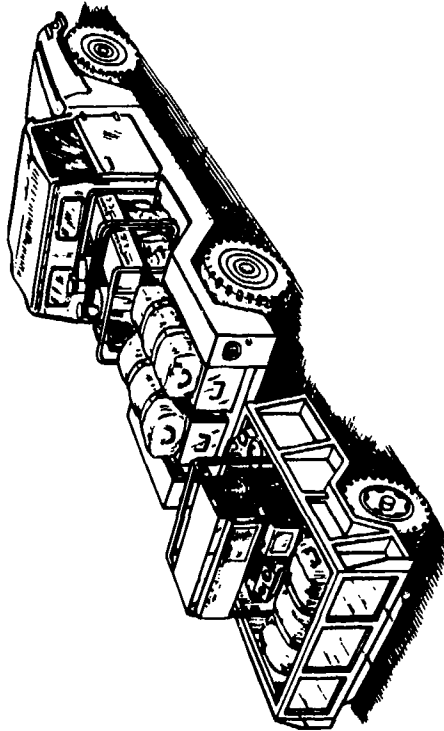
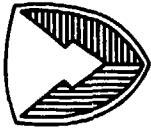
- MODULAR DESIGN
- POWERED BY TURBINE ENGINE
- VISUAL SCREENING
- INFRARED SCREENING
- MILLIMETER WAVE SCREENING
- AQUEOUS DECON, HIGH PRESSURE  
HOT WATER
- MOUNTED ON M1037 HMMWV

PHASE:

FULL SCALE DEVELOPMENT 6.4

A0332- WW7 2903-02

# MODULAR DECON SYSTEM (MDS)



M1037 HMMWV & M101A2 3/4 TON TRAILER

## SYSTEM CONFIGURATION/PRIME MOVER:

- CONTINUOUS DECONTAMINANT MIXER (CDM)
- HIGH PRESSURE HOT WATER CAPABILITY
- DS2 APPLICATOR/SCRUBBER MODULE

## DESCRIPTION USE:

- MIXES/DISPENSES N, B. & C CONTAMINANTS
- HIGH PRESSURE HOT WATER FOR PRIMARY WASH AND RINSE STEPS
- PERSONAL SHOWERS
- REPLACES M12A1 IN HEAVY DIVISIONS AND M17 IN LIGHT DIVISIONS

## PHASE:

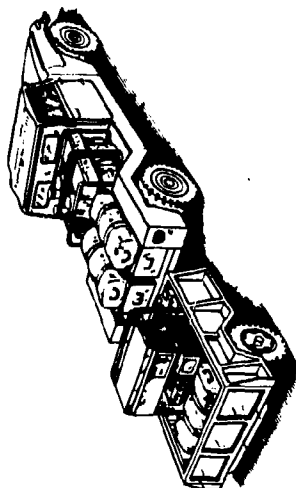
- EXPLORATORY DEVELOPMENT
- P3I PLANNED - FUTURE DECONTAMINANTS

AO332- VV7 2666-01

# MODULAR DECON SYSTEM (MDS) CONCEPT OF USE



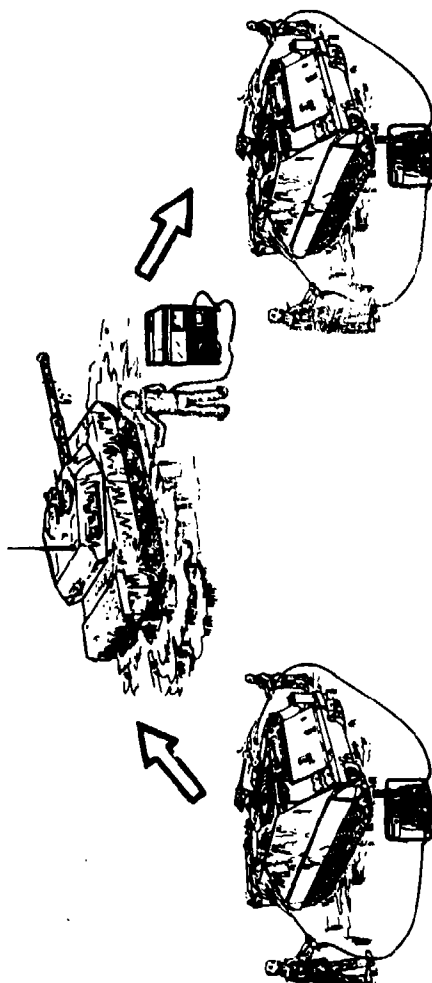
DECON PLATOON  
(DELIBERATE DECON)



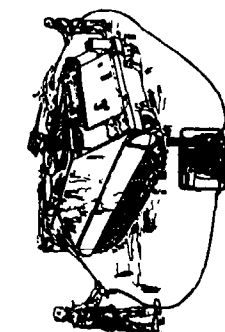
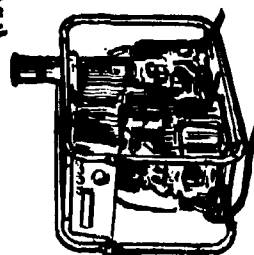
PRIMARY WASH  
HIGH PRESSURE HOT  
WATER APPARATUS

DECONTAMINATE APPLICATION  
(CDM & DS2 APPLICATOR)

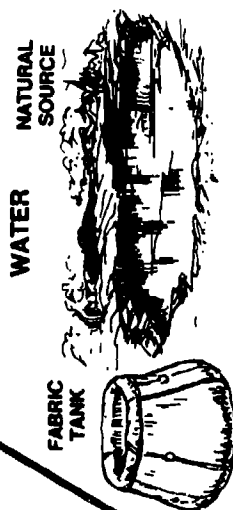
RINSE  
HIGH PRESSURE HOT  
WATER APPARATUS



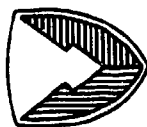
LINE UNITS  
(HASTY DECON)



VEHICLE WASHDOWN



W7 3368-02



# DECONTAMINATION

## PRODUCTION PLANS, FY88/89

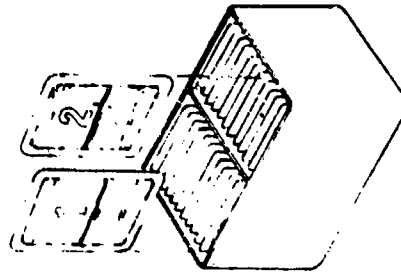
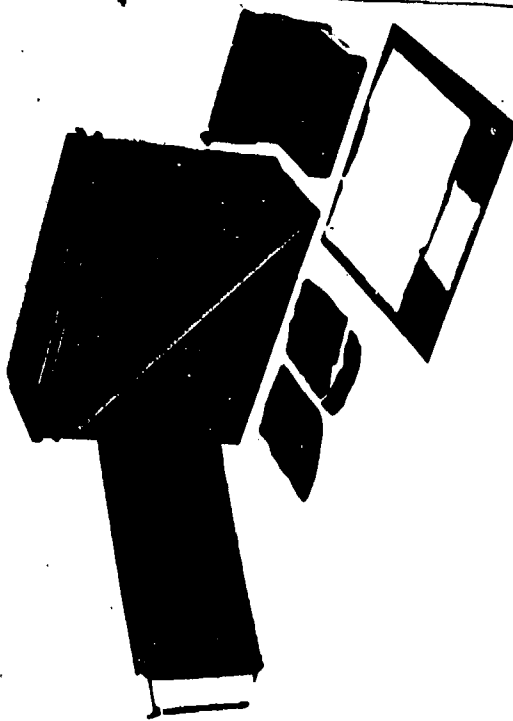
### 'SYSTEMS'

| <u>TASK/DESCRIPTION</u>                 | <u>DOLLARS<br/>(K)</u> | <u>DATE</u> | <u>TECHNICAL POC</u>                                                          |
|-----------------------------------------|------------------------|-------------|-------------------------------------------------------------------------------|
| ● M280 P3I DECON KIT                    | < \$ 8,500             | 2Q89        | J. Szalajda @ CRDEC<br>301-671-3943<br>B. Huffman @ AMCCOM<br>309-792-3111    |
| ● M17 LIGHTWEIGHT DECON<br>SYSTEM       | < \$45,000             | 2Q89        | R. Mueilerscheon @ CRDEC<br>301-671-3943<br>A. Novak @ AMCCOM<br>309-792-3262 |
| ● XM19 NONAQUEOUS EQUIP<br>DECON SYSTEM | < \$ 2,000             | 2Q89        | C. Lamka @ CRDEC<br>301-671-3943                                              |
| ● M11 DECON APPARATUS                   | < \$ 3,450             | 3Q89        | T. Hoff @ CRDEC<br>301-671-3943<br>J. Fortney @ AMCCOM<br>309-792-3111        |

**TOTAL ~ \$58,950**

A0332-WW7 0257-04

# DECONTAMINATION KIT INDIVIDUAL EQUIPMENT (DKIE)



## M280 DKIE

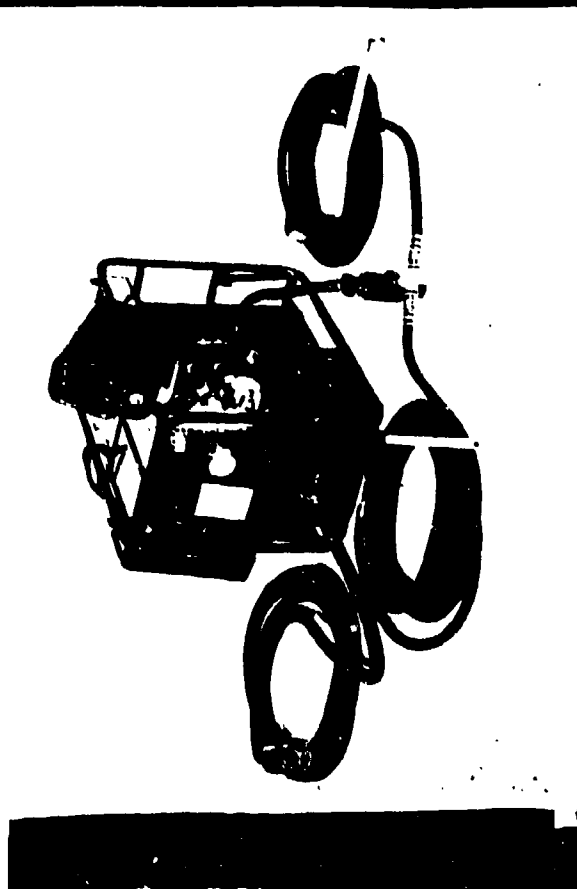
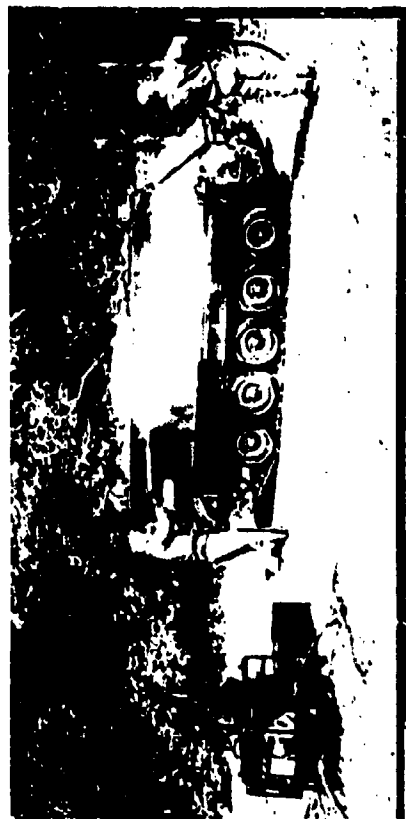
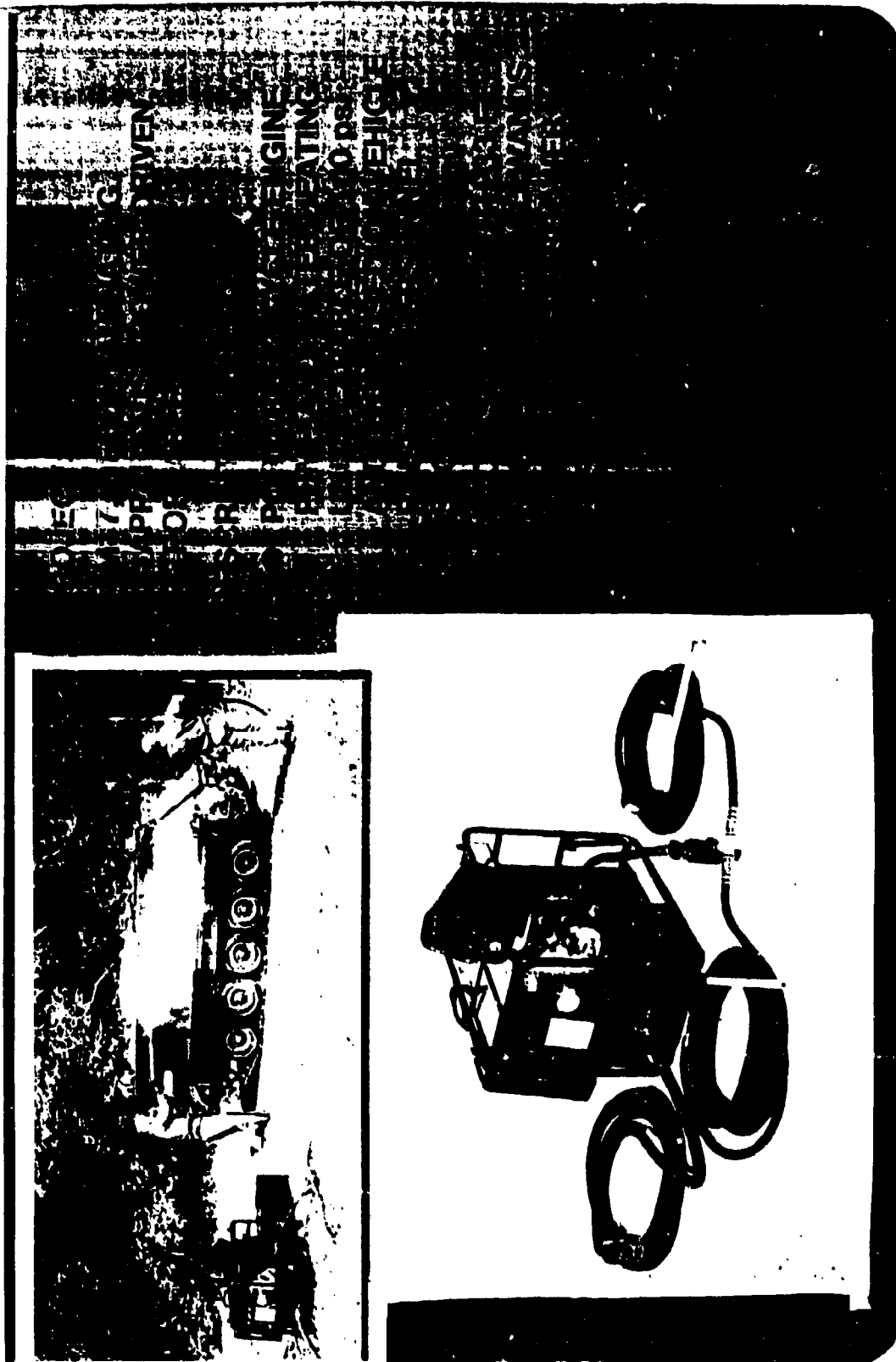
- 35 LBS . . . . . ● 20 LBS
- 1.3 FT<sup>3</sup> . . . . . ● 0.75 FT<sup>3</sup>
- HARD INDIVIDUAL CONTAINER. . . . . ● INDIVIDUAL CONTAINER ELIMINATED
- GLASS AMPULS IN PACKET 2 . . . . . ● GLASS AMPULS ELIMINATED
- DECON AT 2.5 G/M<sup>2</sup> LEVEL . . . . . ● DECON AT HIGHER CONCENTRATION LEVELS
- DECONS BUTYL RUBBER AND . . . . . ● IMPROVED CAPABILITY TO DECON LBE  
M16A1 RIFLE

## M280 P<sup>3</sup>

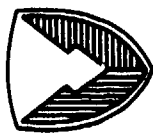
\*PRE-PLANNED PRODUCT IMPROVEMENT

A0332- NK7 0779-01

# LIGHTWEIGHT DECON SYSTEM SANATOR



# NONAQUEOUS EQUIPMENT DECONTAMINATION SYSTEM (NAEDS)



FIXED SITE, XM19

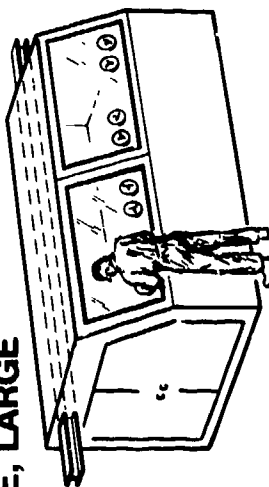
PROJECT:

NAEDS

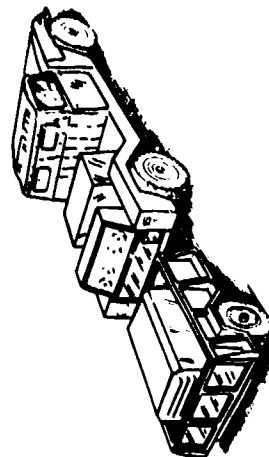
DESCRIPTION/USE:

- MODULARIZED FOR MULTIUSE CAPABILITY
- USES NON-AQUEOUS DECONTAMINANT
- DOES NOT DAMAGE SENSITIVE ITEMS (AVIONICS, ELECTRONICS, RADIOS)
- PROVIDES DECONTAMINATION CAPABILITY NOT CURRENTLY AVAILABLE

FIXED SITE, LARGE



MOBILE



PHASE

PROOF OF PRINCIPLE

A0332- BB62026-01.01

# NONAQUEOUS DECONTAMINATION

- SAFE DECON OF ELECTRONICS, OPTICS, & WEAPONS
- EFFECTIVE NBC DECONTAMINATION
- FIXED AND MOBILE SYSTEMS

IMMERSION  
SYSTEM

SOLVENT  
SPRAY  
SYSTEM

JOINT ARMY/AIR FORCE DEVELOPMENT

# DECONTAMINATION



ITEM: M11 DECONTAMINATING APPARATUS

DESCRIPTION:

THE M11 IS A 1½ QT STEEL CONTAINER WITH A SPRAYHEAD. IN USE IT IS FILLED WITH 1⅞ QUARTS OF DS2. THE M11 IS PRESSURIZED THROUGH THE USE OF NITROGEN CYLINDERS

USE:

THE M11 IS USED TO SPRAY DS2 DECONTAMINATING AGENT ON AREAS OF EQUIPMENT WHICH ARE REQUIRED TO BE SERVICED/MAINTAINED FOR CONTINUED OPERATIONS

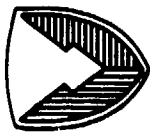
PHASE:

PRODUCTION

A0032- A461080-07.01



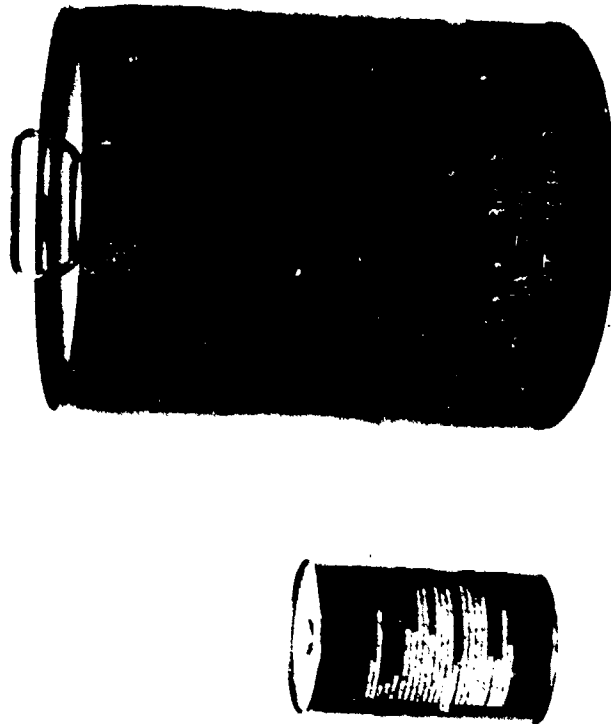
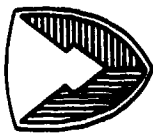
# DECONTAMINATION



## PRODUCTION PLANS, FY88/89 'MATERIALS'

| <u>TASK/DESCRIPTION</u> | <u>DOLLARS<br/>(K)</u> | <u>DATE</u> | <u>TECHNICAL POC</u> |
|-------------------------|------------------------|-------------|----------------------|
| ● DS2 (1 1/2 QUART)     | < \$ 300.0             | 3Q88        | J. Szalajda @ CRDEC  |
|                         | < \$ 300.0             | 3Q89        | 301-671-3943         |
|                         |                        |             | J. Fortney @ AMCCCOM |
|                         |                        |             | 309-792-3111         |
| ● C8 EMULSION           | < \$20,200.0           | 1Q89        | J. Szalajda @ CRDEC  |
|                         |                        |             | 301-671-3943         |
|                         |                        |             | B. Shird @ AMCCCOM   |
|                         |                        |             | 309-792-3111         |
| <hr/>                   |                        |             |                      |
| TOTAL                   | ~ \$20,800             |             |                      |

# DECONTAMINATING AGENT, DS2



## PROJECT:

DECONTAMINATING AGENT, DS2

## DESCRIPTION:

DS2 IS A LIQUID DECONTAMINATING AGENT COMPOSED OF DIETHYLENETRIAMINE, METHYL CELLOSOLVE AND SODIUM HYDROXIDE. IT IS AVAILABLE IN 1 $\frac{1}{3}$  QUART CANS, 5 GALLON PAILS, AND IN THE M13 DECONTAMINATING APPARATUS, PORTABLE. IT ALSO IS USED IN THE M11 DECONTAMINATING APPARATUS.

## PRODUCIBILITY ACTIONS:

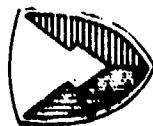
- PROVIDE ENGINEERING SUPPORT TO AMCCOM
- PROVIDE ENGINEERING SUPPORT TO PRODUCTION CONTRACTORS

## PHASE:

PRODUCTION AND DEPLOYMENT

D5083112

# IMPROVED CHEMICAL/BIOLOGICAL AGENT DECONTAMINANT



- PROJECT:  
ICBAD
- DESCRIPTION/USE:  
USED WITH RETROFITTED M12A1  
TO DECONTAMINATE  
EQUIPMENT
- PHASE:  
INTERNATIONAL MATERIEL  
EVALUATION  
FULL SCALE DEVELOPMENT

## C8 EMULSION TRAINING SIMULANT

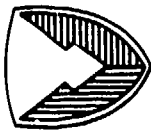
|                  |       |
|------------------|-------|
| WATER            | 94.4% |
| TALC             | 3.6%  |
| METHYL CELLULOSE | 0.9%  |
| SODIUM CARBONATE | 0.5%  |
| SODIUM BISULFATE | 0.3%  |
| TITANIUM DIOXIDE | 0.3%  |

A0332

## C8 EMULSION COMPOSITION

|                      |     |
|----------------------|-----|
| WATER                | 76% |
| PERCHLOROETHYLENE    | 15% |
| CALCIUM HYPOCHLORITE | 8%  |
| EMULSIFIER           | 1%  |

# DECONTAMINATION



## ENGINEERING SERVICES CONTRACT

**PURPOSE:** TO SUPPORT CRDEC IN DESIGN/DEVELOPMENT AND CONDUCT OF ENGINEERING STUDIES IN SUPPORT OF THE DECONTAMINATION PROGRAM

**CONTRACTOR:** BATTELLE COLUMBUS, OHIO - SUBCONTRACTING OPPORTUNITIES

### FUTURE TASKS IN FY87:

- STUDY OF DECON PROCEDURES IN AN ARCTIC ENVIRONMENT < \$65K
- DS2 PUMPER/POWERBRUSH < \$40K
- C8 IMPINGING STREAMS < \$80K
- OPERATIONAL GAIN STUDY < \$60K

**POC:** Philip Bartram (301) 671-2532

AO332-UJ7 0257-06

# DECONTAMINATION



## CONTRACTOR OPPORTUNITIES

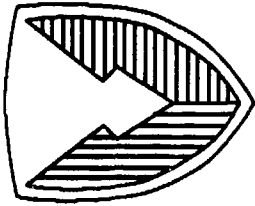
### SUMMARY

| <u>CONTRACT TYPES</u> | <u>ESTIMATED<br/>VALUE</u> | <u>TIME FRAME</u> |
|-----------------------|----------------------------|-------------------|
| TECHNOLOGY            | \$ 1,120 K                 | FY 88/89          |
| DEVELOPMENT           | 5,800 K                    | FY 88/89          |
| PRODUCTION            | 79,750 K                   | FY 88/89          |
| <u>TOTAL</u>          | <u>\$86,670 K</u>          |                   |

POC: Mr. Donald C. Behringer (301) 671-2447

AO332-JU17 0257-08

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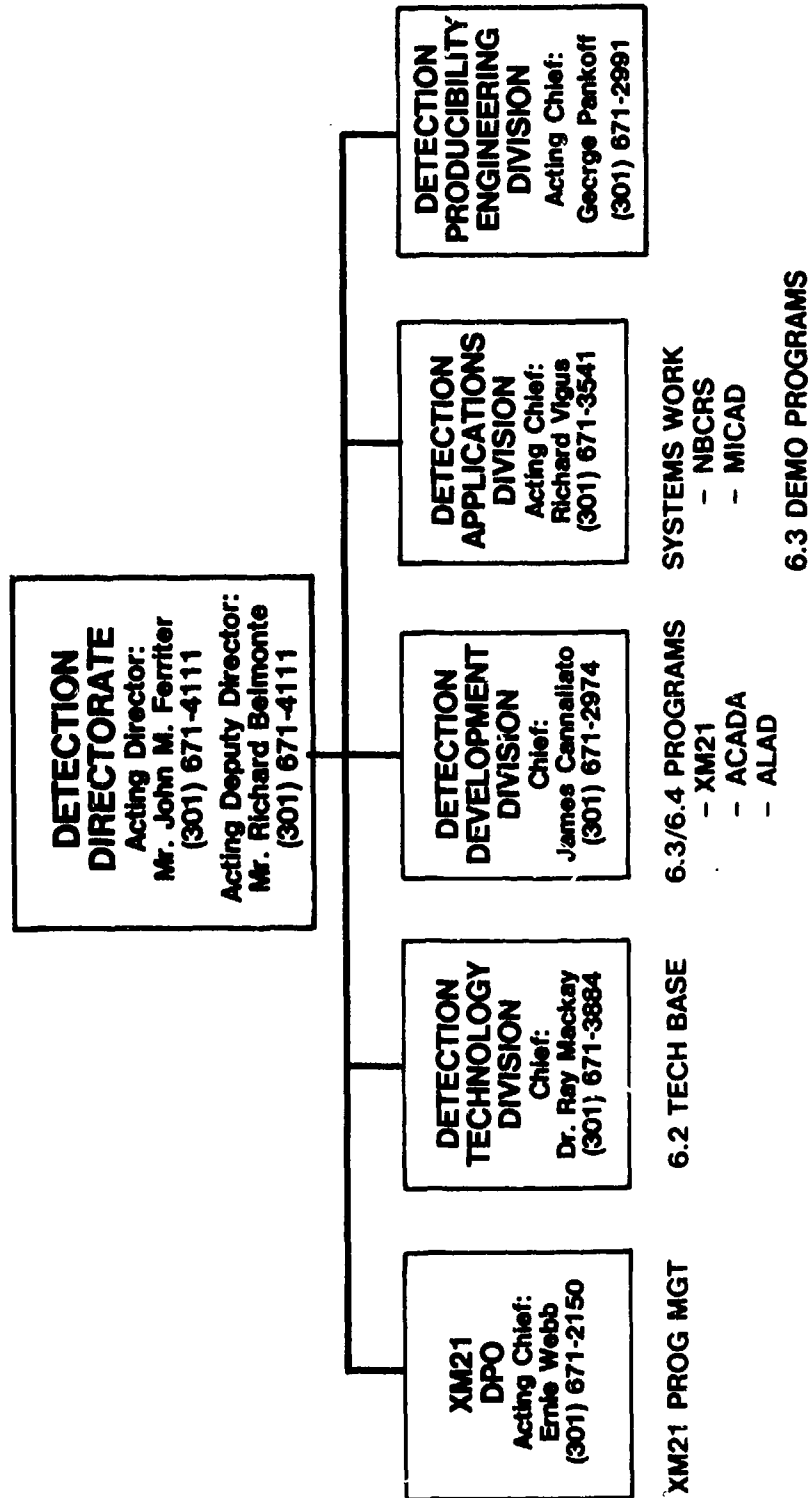
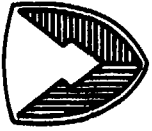
U.S. ARMY  
ARMAMENTS  
MUNITIONS  
CHEMICAL COMMAND  
CHEMICAL RD&E CENTER

# STANDOFF AND POINT DETECTORS

by

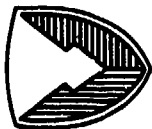
DR. RAYMOND MACKAY  
Detection Directorate

SMCCR-DDT  
AREA CODE (301) 671-3884  
AUTOVON (584) 3884



A0332- B7 0107-12.03

# THRUSTS



## ACCELERATE EXPLOITATION OF TECHNOLOGY

MASS SPECTROMETRY

LASER

BIOTECHNOLOGY

## ACCELERATE INTEGRATION OF ITEMS INTO SYSTEM

CADNET

NBC RECON

FIXED SITE DETECTION AND  
WARNING

## ACCELERATE FIELDING OF ITEMS IN DEVELOPMENT

ACADA

ALAD

CAM

## ACCELERATE UPGRADE OF FIELDIED ITEMS WITH NEW TECHNOLOGY

T2 TOXIN - M256/M272

KITS

M8A1

# CB MINI-DETECTOR TECHNOLOGY



## CB MINI-DETECTOR

### DESCRIPTION:

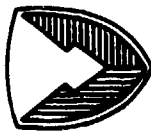
- POINT DETECTION ALARM
- CLASSIFIES AND SEMIQUANTITATES NERVE/BLISTER/PATHOGEN/TOXIN AGENTS
- DETECTS RADIATION
- SENSITIVITY - HUMAN RESPONSE LEVELS
- UNATTENDED OPERATION - 24 HOURS
- WEIGHT/SIZE - 10 POUNDS, 1 CUBIC FOOT
- MODULAR

### PHASE:

EXPLORATORY DEVELOPMENT

A0332- A0332-N7 0746-02

# CB MINI-DETECTOR

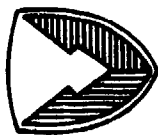


## CONTRACT OPPORTUNITY

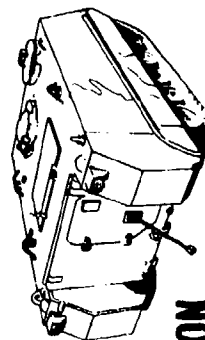
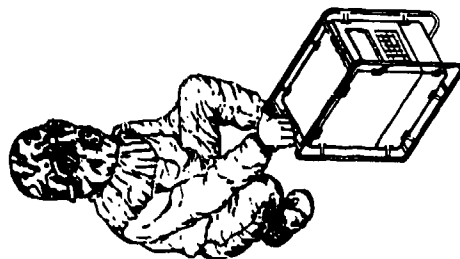
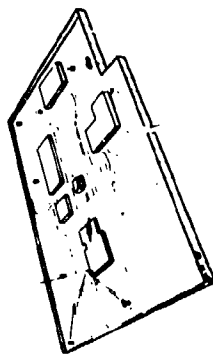
**OBJECTIVE: FABRICATE PROTOTYPE CB MINI-DETECTOR AND  
DEVELOP PRELIMINARY TECH DATA PACKAGE**

- 6.3A PROOF OF PRINCIPLE
- AWARD DATE: 1QFY92
- CONTRACT LENGTH: 24 MONTHS
- APPROXIMATE VALUE: < 2 MILLION
- TYPE: COST PLUS FIXED FEE

# CB MASS SPECTROMETER TECHNOLOGY



## FIXED SITE DETECTION AND WARNING



## NBC GROUND RECON

### CB MASS SPECTROMETER

#### DESCRIPTION:

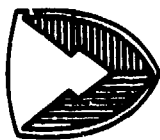
- POINT DETECTION ALARM
- IDENTIFIES AND QUANTIFIES ALL CHEMICAL AND BIOLOGICAL AGENTS
- CHARACTERIZES NEW AGENTS
- SENSITIVITY - HUMAN RESPONSE LEVEL
- MODULAR DESIGN
- WEIGHT/SIZE - 40 POUNDS, 4 CUBIC FEET

#### PHASE:

EXPLORATORY DEVELOPMENT

AO332-W7 0746-01

# CB MASS SPECTROMETER



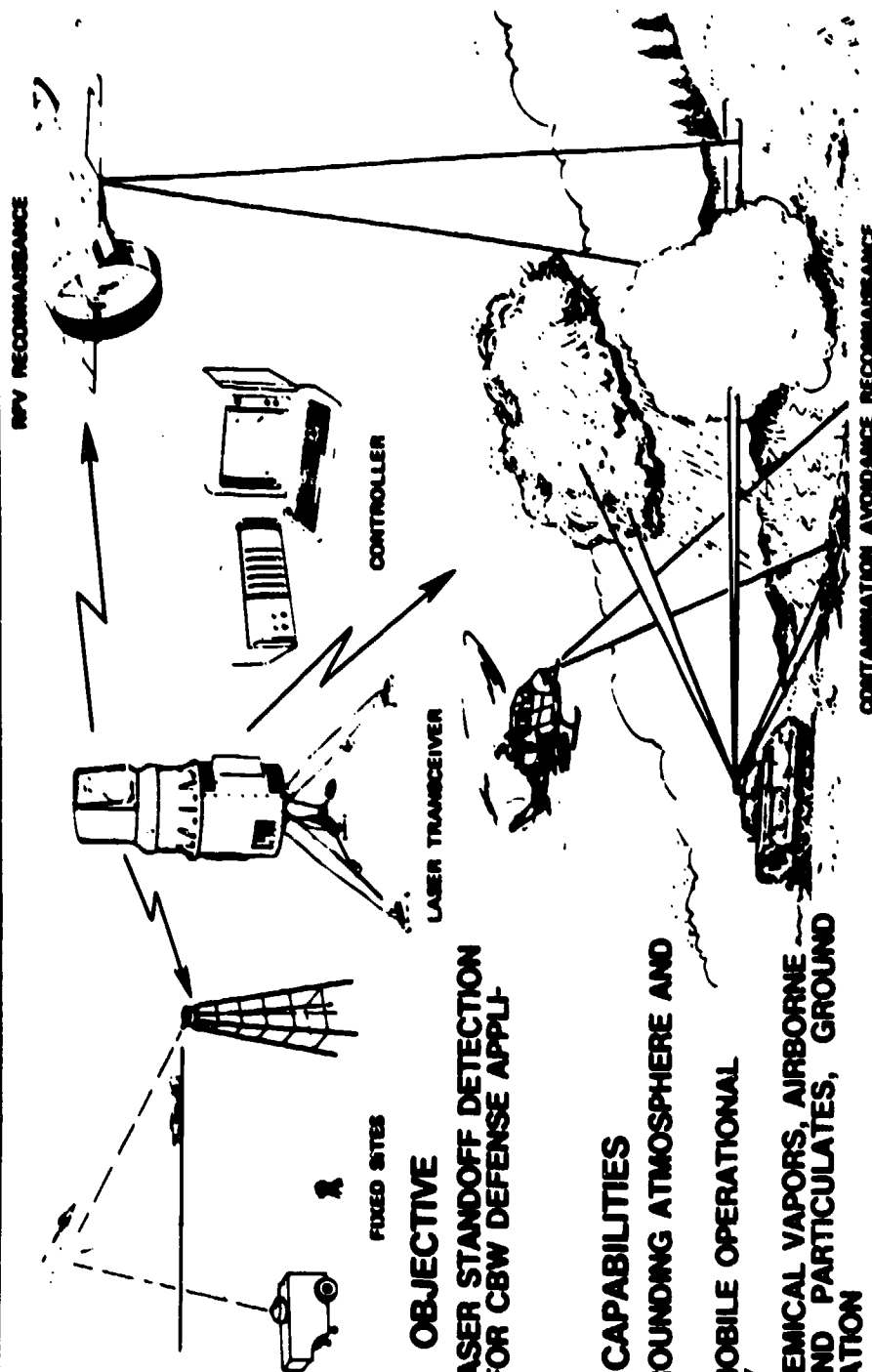
## CONTRACT OPPORTUNITY

**OBJECTIVE: FABRICATE PROTOTYPE CB MASS SPECTROMETER  
AND DEVELOP PRELIMINARY TECH DATA  
PACKAGE**

- 6.3A PROOF OF PRINCIPLE
- AWARD DATE: 1QFY93
- CONTRACT LENGTH: 24 MONTHS
- APPROXIMATE VALUE: < 3 MILLION
- TYPE: COST PLUS FIXED FEE

AO332-UJ7 4477-00

# STANDOFF DETECTION DISC/DIAL



## OBJECTIVE

- DEVELOP LASER STANDOFF DETECTION SYSTEMS FOR CBW DEFENSE APPLICATIONS

## CAPABILITIES

- SCAN SURROUNDING ATMOSPHERE AND TERRAIN
- FIXED OR MOBILE OPERATIONAL CAPABILITY
- DETECT CHEMICAL VAPORS, AIRBORNE LIQUIDS AND PARTICULATES, GROUND CONTAMINATION
- RANGING DATA
- QUANTITATIVE DATA
- CONTAMINATION PROFILE MAPPING
- NBC ENVIRONMENT SURVIVABLE

MS183504

# LASER SYSTEM PROGRAMS

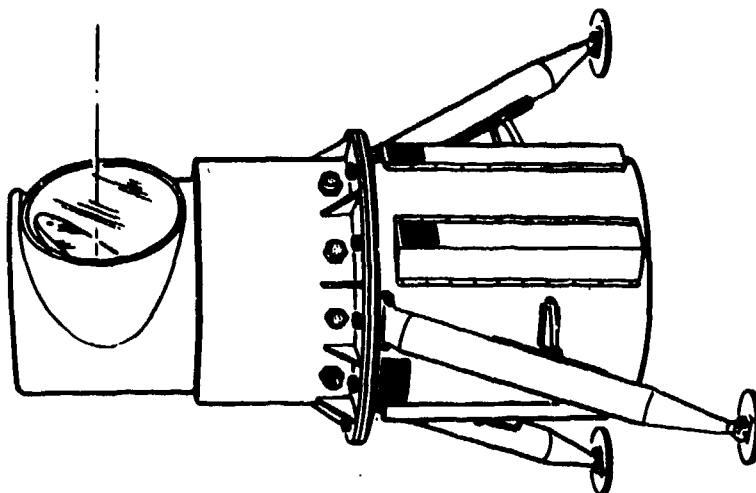
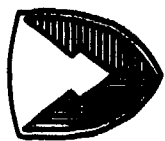


## IR AND UV LASER APPROACHES INVESTIGATED FOR CHEMICAL AND BIOLOGICAL DETECTION:

- IR FOR CHEMICAL DETECTION CURRENTLY UNDER DEVELOPMENT
  - MAIN THRUST IS SURFACE CONTAMINATION DETECTION
  - OTHER CAPABILITIES INCLUDE RANGING AND LIQUID AGENT AEROSOL/RAIN DETECTION
- BIOLOGICAL DETECTION LASER TECHNOLOGY DEMONSTRATED USING UV LIF

A0332- VV7 0107-03

# REMOTE ACTIVE SPECTROMETER (RAS)

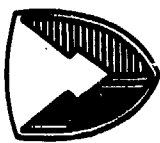


## JOINT CRDEC/CNVEOC EFFORT

- LASERS - 4
- PULSE WIDTH
- SPECTRAL RANGE
- PULSE RATE PER LASER - > 10<sup>6</sup> PULSES/LASER
- LIFETIME
- ENERGY OUTPUT
- SIZE - < 5 cu ft
- WEIGHT WITH TRIPOD - < 200 LBS
- INPUT POWER - < 600 WATTS
- NOMINAL CL SENSITIVITY
- NOMINAL RANGE
- SCAN

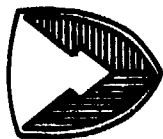
# FUTURISTIC SYSTEMS

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- ARE THERE BETTER WAYS TO PERFORM STAND-OFF DETECTION?
  - USE SOME OTHER MEANS TO DETECT EVENT; RESERVE LASERS/INTERFEROMETERS FOR IDENTIFICATION/DISCRIMINATION
    - DETECT OTHER PHYSICAL PARAMETERS OF THREAT
      - \* TRANSPORT FEATURES – VELOCITY/SPATIAL EXTENT/TEMPORAL DISTRIBUTION CHARACTERISTICS
      - \* THERMAL IMAGING MULTI SPECTRAL SCANNER
      - \* RADAR TARGET ACQUISITION/TRACKING
- THERE APPEARS TO BE A NEED FOR BOTH ACTIVE AND PASSIVE CAPABILITIES
  - INTEGRATED SYSTEM
    - MODULAR DESIGN
- ADVANCED SIGNAL PROCESSING
  - HARDWARE
    - ARTIFICIAL INTELLIGENCE

# CHEMICAL STANDOFF DETECTION



**OBJECTIVE:** BUILD A SECOND GENERATION OF LIGHT WEIGHT, FREQUENCY AGILE, GROUND MOBILE BREADBOARD SYSTEMS FOR DEMONSTRATION OF FEASIBILITY OF A CHEMICAL STANDOFF GROUND RECON SYSTEM

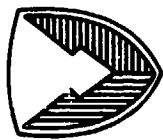
**TYPE:** COST PLUS FIXED FEE

**6.2:** AWARD DATE - FY89

**CONTRACT LENGTH - 42 MONTHS**

**APPROXIMATE VALUE - < \$3M**

# CHEMICAL STANDOFF DETECTION



## CONTRACT OPPORTUNITY

**OBJECTIVE:** BUILD SEVERAL DIFFERENT TYPES OF LIGHT WEIGHT, FREQUENCY AGILE CO2 PULSE LASERS AND CONDUCT SIDE BY SIDE EVALUATIONS TO DETERMINE THE BEST DESIGN FOR FUTURE GROUND RECON LASER STANDOFF DETECTORS

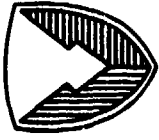
**TYPE:** COST PLUS FIXED FEE

**6.2 (NUNN):** AWARD DATE - FY89

CONTRACT LENGTH - 18 MONTHS

APPROXIMATE VALUE - < \$6M

# STAND-OFF LASER RECON DEMO

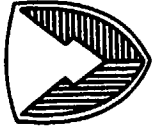


## CONTRACT OPPORTUNITY

**OBJECTIVE:** INTEGRATE AND INSTALL XD PROTOTYPE  
LIDAR SYSTEM (REMOTE ACTIVE  
SPECTROMETER ) INTO GROUND RECON  
TEST BED VEHICLE AND SUPPORT USER  
DEMONSTRATION

**TYPE:** COST PLUS FIXED FEE

**6.3A PROOF OF PRINCIPLE:** AWARD DATE - FY 92  
CONTRACT LENGTH - 24 MONTHS  
APPROXIMATE VALUE - < \$3 MILLION



# SBIR

## SMALL BUSINESS INNOVATIVE RESEARCH - PHASE I

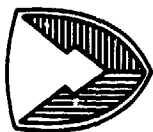
**TITLE:** GLASS ON PLASTIC SURFACES FOR IMMUNOLOGICAL REACTIONS

**CATEGORY:** EXPLORATORY DEVELOPMENT

**OBJECTIVE:** The Army is currently evaluating an instrument which monitors fluorescence-based immunoassays using evanescent wave excitation. The immunological reactions occur on the surface of quartz rods 1 mm in diameter and approximately 8 cm in length. The Army is interested in obtaining glass or plastic rods, along with coating procedures, that will result in reproducible optical properties in the rods and reproducible immunological performance.

AO332-VV7 2859-22

# SBIR



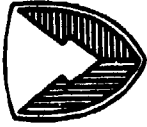
## SMALL BUSINESS INNOVATIVE RESEARCH - PHASE I

**TITLE: INFRARED INTERFEROMETER WITH NO MOVING PARTS**

**CATEGORY: BASIC RESEARCH**

**OBJECTIVE:** Recent technology has been introduced that allows interferometry to be done in the infrared spectral region without the need for moving mirrors, prisms, etc. If such a device can be built and adapted for field use, the payoffs in ruggedness of construction of interferometers will be extremely significant, both in the military and civilian chemical monitoring communities.

# SBIR



## SMALL BUSINESS INNOVATIVE RESEARCH - PHASE I

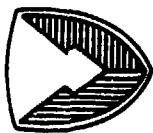
**TITLE:** PYROLYSIS OF AEROSOLS IN MASS SELECTIVE  
ION-TRAPPING DEVICES

**CATEGORY:** EXPLORATORY DEVELOPMENT

**OBJECTIVE:** In mass spectrometry, most analyses that have been done to date, either the pyrolysis or the ionization process occurs outside of the mass filtering devices and, as a result, significant amounts of pyrolysates or ions are lost prior to the mass filtering and detection process. Pyrolysis and ionization inside the analyzer of mass selective devices (e.g., ion trap detectors or ion cyclotron resonance instruments) should improve the efficiency of the combined ionization/mass analysis step and, therefore, improve reliability of detection and identification of the aerosols.

AO332-VV7 2659-24

# DETECTION PRODUCIBILITY



## PRODUCTION PLANS FY89-93

| TITLE/ITEM                                     | YEARS   | DOLLARS<br>(M) | TECHNICAL POC             |
|------------------------------------------------|---------|----------------|---------------------------|
| ● XM21 ALARM CHEMICAL AGENT,<br>REMOTE SENSING | 89 - 91 | < 50.0         | Mandy Sanchez<br>671-4424 |
| ● CAM CHEMICAL AGENT MONITOR                   | 89 - 93 | < 70.0         | Nancy Grice<br>671-4424   |
| ● XM86 AUTOMATIC LIQUID AGENT<br>DETECTOR      | 90 - 93 | < 25.0         | Mandy Sanchez<br>671-4424 |
| ● XM22 CHEMICAL AGENT ALARM                    | 90 - 93 | < 125.0        | Ken Kammerer<br>671-4424  |

AO332-UU7 0107-01

# CHEMICAL WEAPONS TREATY COMPLIANCE VERIFICATION

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## CONTRACT OPPORTUNITY

**OBJECTIVE:** EVALUATE SCENARIOS REQUIRING MONITORING TO  
ESTABLISH TASKS, OPERATIONAL CONSTRAINTS AND  
EQUIPMENT REQUIREMENTS FOR INSPECTION TEAMS

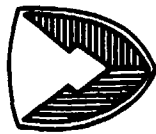
**TYPE:** COST PLUS FIXED FEE

**SCHEDULE:** AWARD DATE - FY88

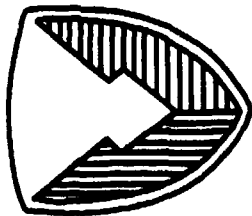
**CONTRACT LENGTH - 12 MONTHS**

**APPROXIMATE VALUE - < \$200K**

# FUTURE CONTRACT OPPORTUNITIES



| YEAR    | TITLE                                              | AMOUNT    | POC AND PHONE                            |
|---------|----------------------------------------------------|-----------|------------------------------------------|
| 92 - 93 | CB MINI-DETECTOR                                   | < \$2 M   | Dr. Kenneth Thames<br>(301) 671-3729     |
| 93 - 94 | CB MASS SPECTROMETER                               | < \$3 M   | Dr. William Lagna<br>(301) 671-3166      |
| 89 - 93 | STANDOFF LASER                                     | < \$3 M   | Mr. Steven Gutoff<br>(301) 671-3484      |
| 89 - 91 | STANDOFF LASER (NUNN)                              | < \$6 M   | Mr. Steven Gutoff<br>(301) 671-3484      |
| 92 - 94 | STANDOFF LASER RECON DEMO                          | < \$3 M   | Mr. David Sickenberger<br>(301) 671-3893 |
| 88      | SBIR's                                             |           | Mr. Achille Silvestri<br>(301) 671-3729  |
| 88 - 89 | CHEMICAL WEAPONS TREATY<br>COMPLIANCE VERIFICATION | < \$200 K | Mr. Steven English<br>(301) 671-3166     |



U.S. ARMY  
ARMAMENTS  
MUNITIONS  
CHEMICAL COMMAND  
CHEMICAL RD&E CENTER

## DETECTION SYSTEMS

by

**MR. RICHARD A. VIGUS**  
**Detection Directorate**

SMCCR-DDE  
AREA CODE (301) 671-3541  
AUTOVON (584) 3541

AO332-C-G7000259

# DETECTION APPLICATIONS DIVISION



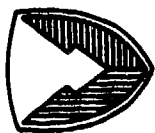
## PROGRAMS

- RECONNAISSANCE (GROUND/AERIAL)
- DETECTOR NETWORKING/C<sup>3</sup> INTERFACES
- VEHICLE APPLICATIONS

## THRUST AREAS

- SYSTEM INTEGRATION
- CONCEPT DEMONSTRATIONS
- BATTLEFIELD AUTOMATION
- PROOF OF PRINCIPLE

# DETECTION APPLICATIONS



## DETECTORS

XM22  
ACADA

XM21  
STAND-OFF DETECTOR

XM85/86  
ALAD

## SYSTEMS

NBC RECON

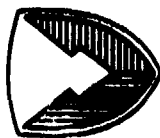
CADNET

FIXED SITE

MICAD

A0002-57 1130-01.01

# CHEMICAL AGENT DETECTOR NETWORK

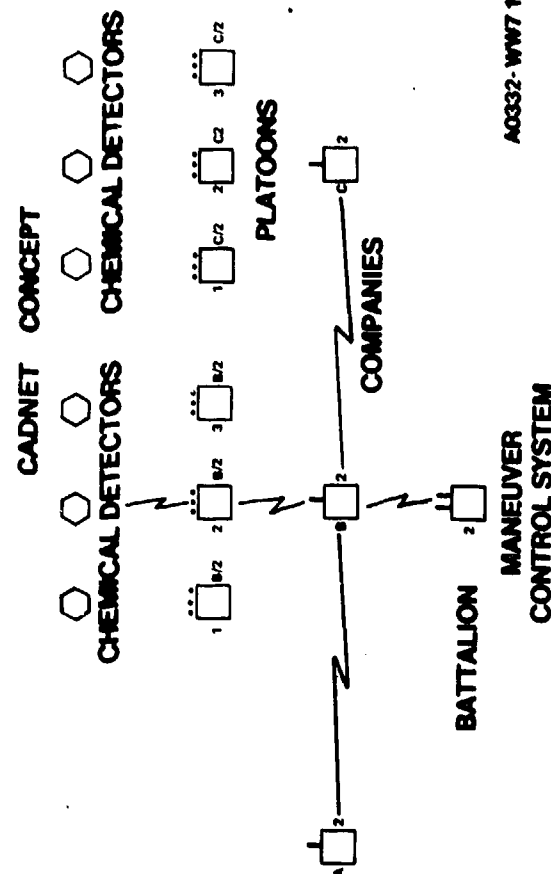


## DESCRIPTION/USE

- OPERATES WITH CURRENT & DEVELOPMENTAL DETECTORS TO PROVIDE AUTOMATIC WARNING TO ADJACENT UNITS & HIGHER HEADQUARTERS
- INTERFACES WITH MANEUVER CONTROL SYSTEM (MCS) & AMBACS SOFTWARE
- INVESTIGATE TWO AUTOMATIC WARNING SYSTEMS
  - CADNET - (XM23 & XM24)
  - CADNET - DIGITAL

## PHASE

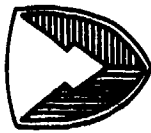
- PROOF OF PRINCIPLE PHASE



A0332-WW7 1523-01

# CONTRACT OPPORTUNITY PRODUCTION

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## CADNET

**OBJECTIVE:** PRODUCE CADNET SYSTEMS FOR FIELDING

**TYPE:** COMPETITIVE, FIXED PRICE

**STATUS:** PRODUCTION, OPA

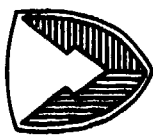
**SCHEDULE:** AWARD DATE - FY91  
CONTRACT LENGTH - 4 YEARS

**APPROXIMATE VALUE:** <\$30 MILLION

A0332- VV7 0009-05

# **CONTRACT OPPORTUNITY ENGINEERING DEVELOPMENT**

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## **CADNET DIGITAL**

**OBJECTIVE:** DESIGN, DEVELOP, FABRICATE AND DOCUMENT  
CADNET DIGITAL COMPONENTS FOR DT/OT II  
AND TYPE CLASSIFICATION

**STATUS:** 6.4 ENGINEERING DEVELOPMENT

**TYPE:** COMPETITIVE, CPFF

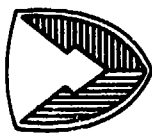
**SCHEDULE:** AWARD DATE - 2QFY90  
LENGTH - 48 MONTHS

**APPROXIMATE VALUE:** <\$10 MILLION

A0332-VV7 2703-03

# CONTRACT OPPORTUNITY PRODUCTION

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## CADNET DIGITAL

**OBJECTIVE:** PRODUCE CADNET DIGITAL SYSTEMS FOR  
FIELDING

**TYPE:** COMPETITIVE, FIXED PRICE

**STATUS:** PRODUCTION, OPA

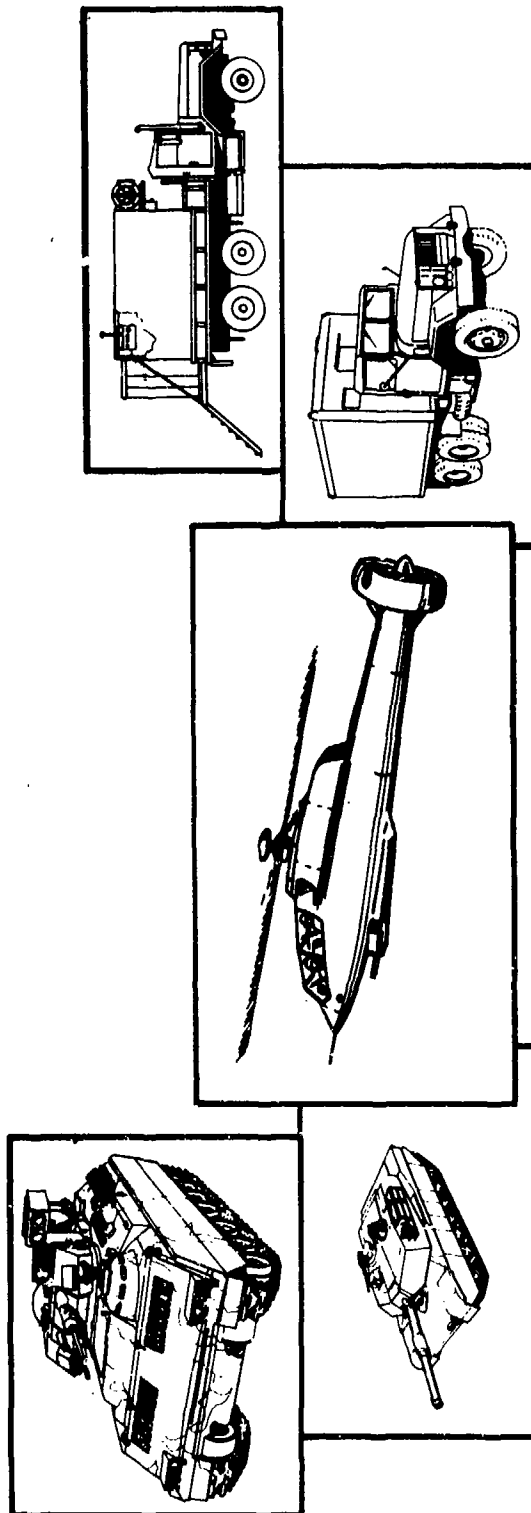
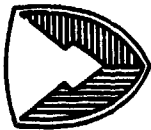
**SCHEDULE:** AWARD DATE - FY94  
CONTRACT LENGTH - 4 YEARS

**APPROXIMATE VALUE:** <\$20 MILLION

A0332-W7 2703-01

# MULTIPURPOSE INTEGRATED CHEMICAL AGENT DETECTOR (MICAD) PROGRAM

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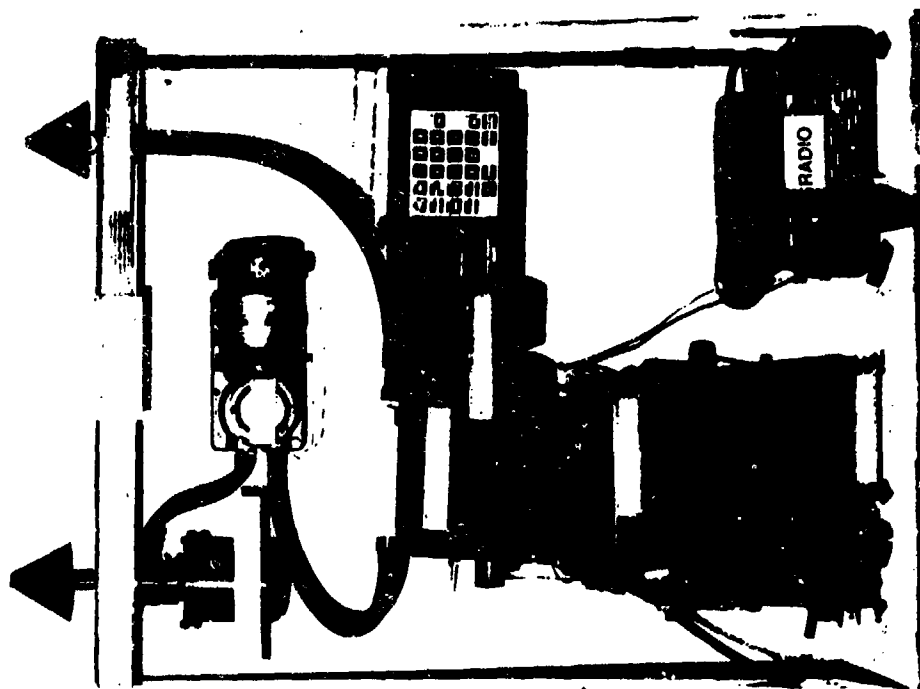
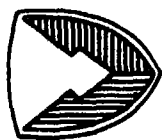


150

PRESENTER: CHEMICAL RESEARCH, DEVELOPMENT AND ENGINEERING  
CENTER  
DETECTION DIRECTORATE

A0332-

# MULTIPURPOSE INTEGRATED CHEMICAL AGENT ALARM (MICAD)



**PROJECT:**

# MICAD

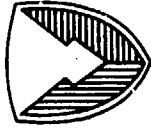
**DESCRIPTION:**

- FULLY AUTOMATIC SAMPLING SYSTEM
- INTEGRATED CONTROL PANEL
  - INTERPRETS, PROCESSES, AND FORMATS "DIGITAL" INFORMATION FROM DETECTOR (ACADA)
  - PROVIDES ALARM TO CREW VIA INTER-COM AND DIGITAL CREW DISPLAY
  - SENDS ALARM TO SURROUNDING UNITS AND TRANSMITS DIGITAL DATA UP CHAIN OF COMMAND VIA STANDARD RADIOS
  - TIES INTO ANBACIS

**A0332- S7-1164-01**

# **CONTRACT OPPORTUNITY ENGINEERING DEVELOPMENT**

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## **MULTIPURPOSE INTEGRATED CHEMICAL AGENT DETECTOR (MICAD) SYSTEM**

**OBJECTIVE:** INTEGRATION OF XM22 ACADA FOR MICAD APPLICATIONS  
(SAMPLING SYSTEM, DISPLAY/INTERFACE BOX)

**TYPE:** COMPETITIVE, CPFF

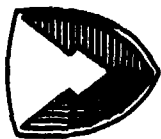
**STATUS:** 6.4 ENGINEERING DEVELOPMENT

**SCHEDULE:** AWARD DATE - 2QFY92  
CONTRACT LENGTH - 48 MONTHS

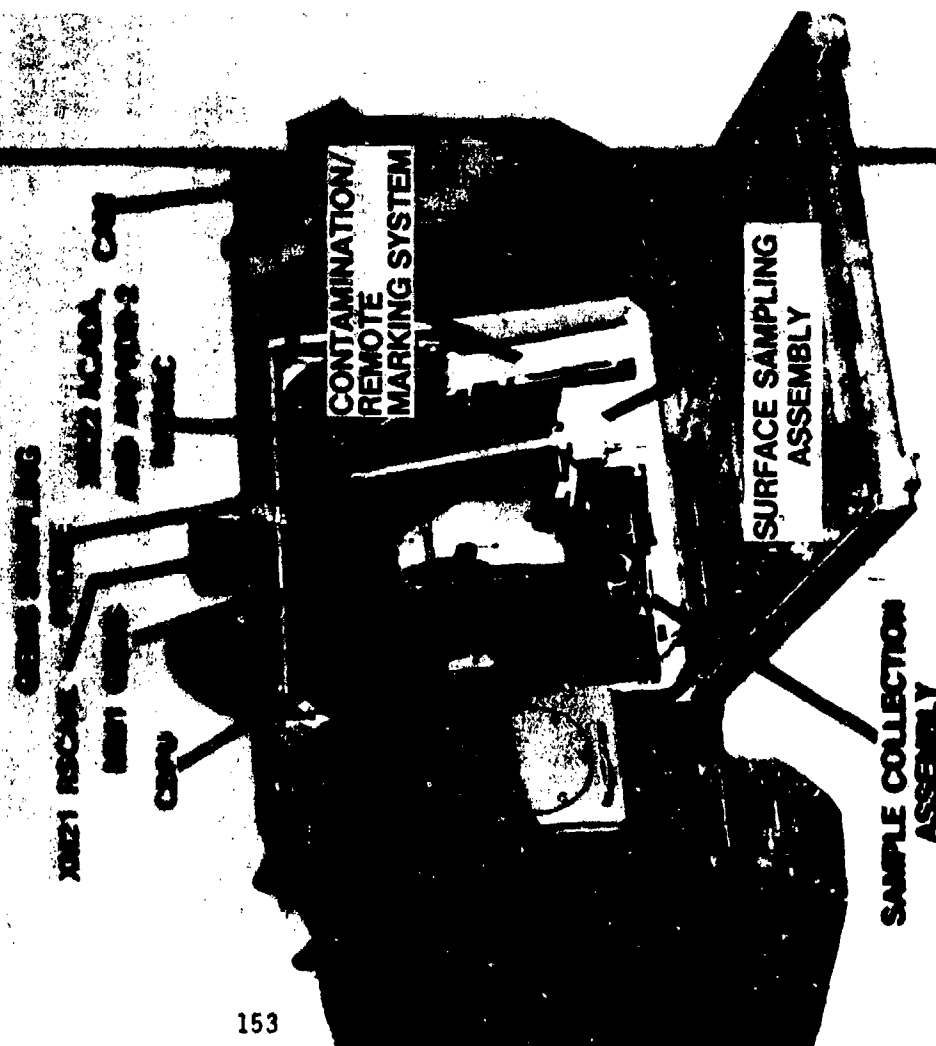
**APPROXIMATE VALUE:** <\$7 MILLION

A0332-VV7 0003-04

# XM87 NBC RECONNAISSANCE SYSTEM



(NBCRS)



## CONCEPT:

- PROVIDE ACCURATE AND RAPID NBC INFORMATION
- DEDICATED VEHICLE

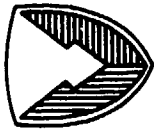
## CAPABILITIES:

- INTEGRATED DATA ACQUISITION SYSTEM
- POINT AND STANDOFF CHEMICAL DETECTORS
- NUCLEAR DETECTOR
- MECHANIZED SURFACE SAMPLING
- MARK CONTAMINATION/CLEAR LANES
- OVERPRESSURE WITH MICROCOOLING
- SAMPLE COLLECTION/STORAGE
- DIGITAL BURST COMMUNICATIONS

AO332-47 2004-01

# CONTRACT OPPORTUNITY ENGINEERING DEVELOPMENT

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## NBC RECON P<sup>3</sup>I

**OBJECTIVE:** INTEGRATE ADVANCED SENSOR PACKAGE INTO  
M113, WHEELED VEHICLE DERIVATIVE AND  
AFV

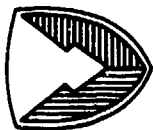
**TYPE:** COMPETITIVE, CPFF

**STATUS:** 6.4 ENGINEERING DEVELOPMENT

**SCHEDULE:** AWARD DATE - 2QFY90 (M113/WVD)  
- 2QFY92 (AFV)  
CONTRACT LENGTH - 48 MONTHS

**APPROXIMATE VALUE:** <\$15 MILLION (M113/WVD)  
<\$12 MILLION (AFV)

# CONTRACT OPPORTUNITY PRODUCTION



## NBC RECONNAISSANCE

**OBJECTIVE:** PRODUCE NBC RECON SYSTEMS FOR FIELDING

**TYPE:** COMPETITIVE, FIXED PRICE

**STATUS:** PRODUCTION, OPA

**SCHEDULE:** AWARD DATE - FY90 (XM87)

- FY94 (P<sup>3</sup>I for WVD)

- FY96 (P<sup>3</sup>I for AFV)

**CONTRACT LENGTH** - 5 YEARS (XM87, P<sup>3</sup>I for AFV)  
- 4 YEARS (P<sup>3</sup>I for WVD)

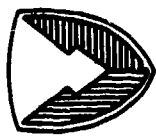
**APPROXIMATE VALUE:**

<\$150 MILLION (XM87)

<\$150 MILLION (P<sup>3</sup>I for AFV)

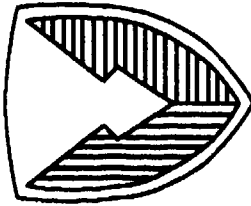
<\$350 MILLION (P<sup>3</sup>I for WVD)

# DETECTION SYSTEMS SUMMARY



| YEAR                      | TITLE           | AMOUNT | POINT OF CONTACT                 |
|---------------------------|-----------------|--------|----------------------------------|
| DEVELOPMENT OPPORTUNITIES |                 |        |                                  |
| FY90 (2Q)                 | CADNET DIGITAL  | < 10M  | James Szachta<br>(301) 671-3850  |
| FY92 (2Q)                 | MICAD           | < 7M   | James Szachta<br>(301) 671-3850  |
| FY90 (2Q)                 | NBCRS P3I (WVD) | < 15M  | Joseph Wienand<br>(301) 671-3893 |
| FY92 (2Q)                 | NBCRS P3I (AFV) | < 12M  | Joseph Wienand<br>(301) 671-3893 |
| PRODUCTION OPPORTUNITIES  |                 |        |                                  |
| FY91                      | CADNET          | < 30M  | George Pankoff<br>(301) 671-2991 |
| FY94                      | CADNET DIGITAL  | < 20M  | George Pankoff<br>(301) 671-2991 |
| FY90                      | NBCRS (XM87)    | < 150M | George Pankoff<br>(301) 671-2991 |
| FY94                      | NBCRS P3I (WVD) | < 350M | George Pankoff<br>(301) 671-2991 |
| FY96                      | NBCRS P3I (AFV) | < 150M | George Pankoff<br>(301) 671-2991 |

AO332-WW7 0223-01



U.S. ARMY  
ARMAMENTS  
MUNITIONS  
CHEMICAL COMMAND  
CHEMICAL ROLE CENTER

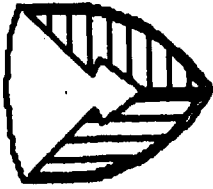
## CONTRACTOR MAIL

by

MR. JAMES D. WOOD  
Management Information Systems Directorate

SMCCR-MS  
AREA CODE (301) 671-2345  
AUTOVON (584) 2345

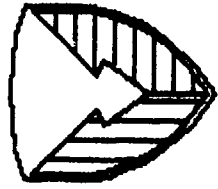
AO332-C-G7226056



## PURPOSE

---

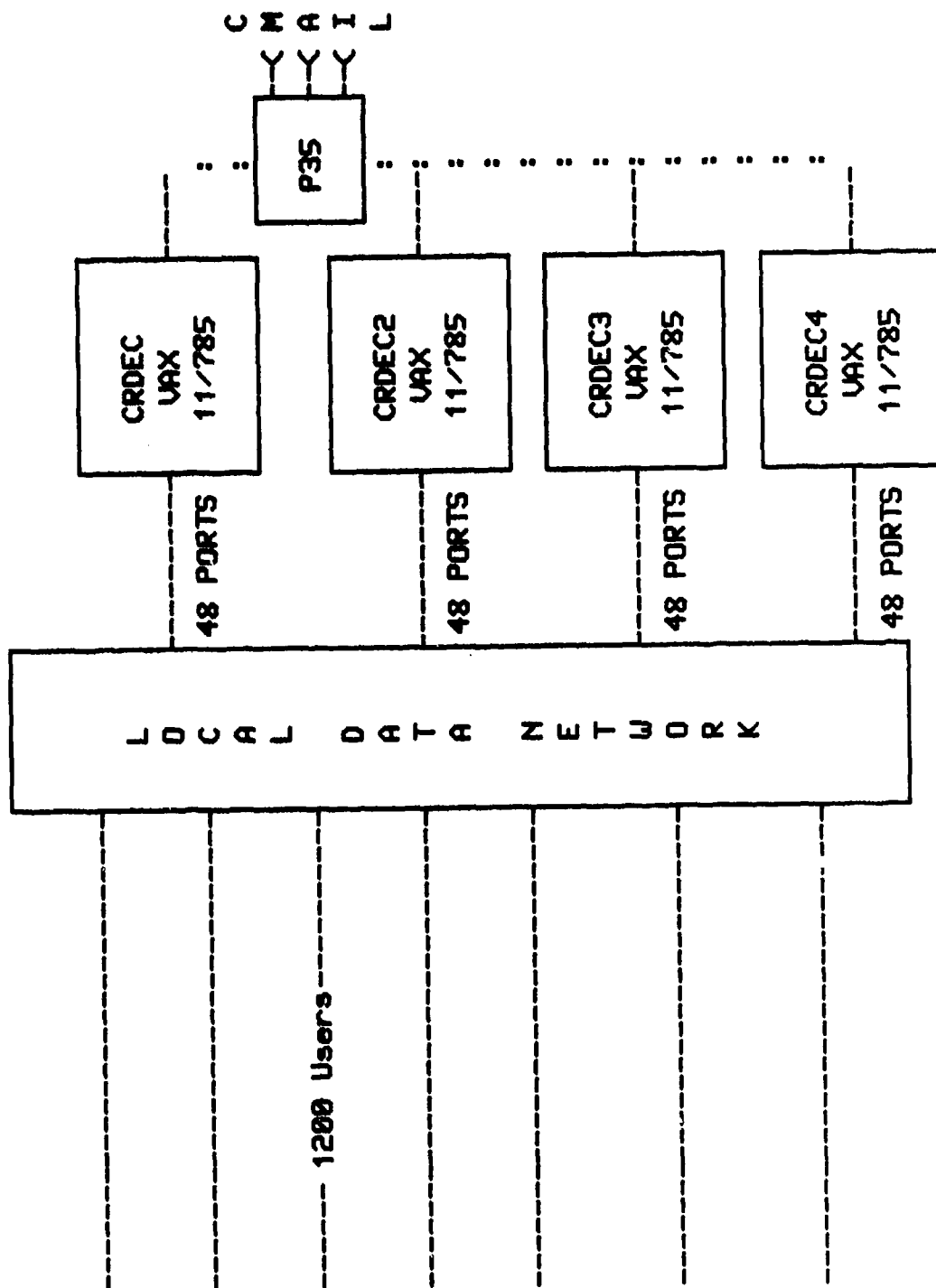
- To provide electronic mail service between CRDEC contractors and
  - CRDEC personnel,
  - AMCCOM, and
  - potentially other selected agencies



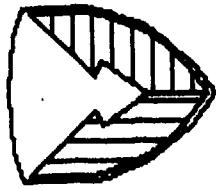
## METHOD

---

- PLEXUS P35 Minicomputer is dedicated for the function
- Commercial 300/1200 baud dial-in lines
- Costs
  - Computer: CRDEC
  - Terminal/phone/modem/training: contractor
  - Commercial phone charges: contractor



# MECHANICS



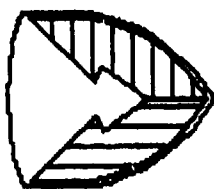
---

## UNCLASSIFIED USE ONLY

- Using commercial phone lines, dial directly into P35.
- Plexus will provide Message handler, send processor, screen editor, simple text formatter, in addition to UNIX 3.
- Printed instructions for non-UNIX functions will be provided.

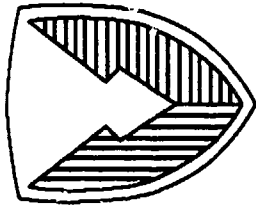
# MECHANICS II

---



## UNCLASSIFIED USE ONLY

- Request in writing through COR for each account required.
- USERIDs, passwords, phone numbers and unique instructional materials supplied by return mail.
- Cognizant KO must receive carbon of all communications.



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CHEMICAL COMMAND  
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## MISSION SUPPORT CONTRACTS

by

**MR. JOSEPH F. CARTELLI**  
**Advanced Systems Concepts Directorate**

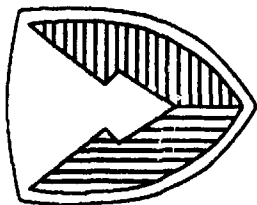
SMCCR-OP  
AREA CODE (301) 671-2031  
AUTOVON (584) 2031

AO332-C-H7226071

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THIS BRIEFING PACKAGE WAS DISTRIBUTED AT THE SEVENTH ANNUAL INDUSTRY MEETING.

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# VALUE ENGINEERING

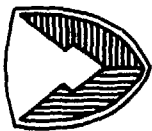
by

MR. A. FRANCIS KOHUT  
Value Engineering Office

SMCCR-VE  
AREA CODE (301) 671-3592  
AUTOVON (584) 3592

AO332-C-G7226067

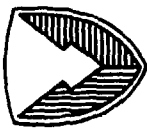
# USE OF VE CLAUSE



ALL CONTRACTS OVER \$100,000 EXCEPT CONTRACTS:

- FOR RESEARCH AND DEVELOPMENT OTHER THAN FULL-SCALE DEVELOPMENT;
- FOR ENGINEERING SERVICES FROM NOT-FOR-PROFIT OR NON-PROFIT ORGANIZATIONS;
- FOR PERSONAL SERVICES;
- PROVIDING FOR PRODUCT OR COMPONENT IMPROVEMENT, UNLESS THE VALUE ENGINEERING INCENTIVE APPLICATION IS RESTRICTED TO AREAS NOT COVERED BY PROVISIONS FOR PRODUCT OR COMPONENT IMPROVEMENT;
- FOR COMMERCIAL PRODUCTS THAT DO NOT INVOLVE PACKAGING SPECIFICATIONS OR OTHER SPECIAL REQUIREMENTS OR SPECIFICATIONS; OR
- WHEN THE AGENCY HEAD HAS ELECTED TO EXEMPT THE AGENCY (OR A CATEGORY OF CONTRACTS) FROM THE REQUIREMENTS OF THIS PART 48.

# INCENTIVE CLAUSE

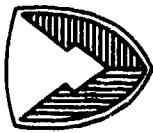


“... APPROACH IN WHICH CONTRACTOR PARTICIPATION IS VOLUNTARY AND THE CONTRACTOR USES ITS OWN RESOURCES TO DEVELOP AND SUBMIT ANY VALUE ENGINEERING CHANGE PROPOSALS (VECPs). THE CONTRACT PROVIDES FOR SHARING OF SAVINGS AND FOR PAYMENT OF THE CONTRACTOR'S ALLOWABLE DEVELOPMENT AND IMPLEMENTATION COSTS ONLY IF A VECP IS ACCEPTED. THIS VOLUNTARY APPROACH SHOULD NOT IN ITSELF INCREASE COSTS TO THE GOVERNMENT.”

FEDERAL ACQUISITION REGULATION (FAR)  
CLAUSE 52.248-1

A0332- EE62150-02.02

## PROGRAM REQUIREMENTS CLAUSE



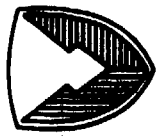
“ . . . A MANDATORY PROGRAM IN WHICH THE GOVERNMENT REQUIRES AND PAYS FOR A SPECIFIC VALUE ENGINEERING PROGRAM EFFORT. THE CONTRACTOR MUST PERFORM VALUE ENGINEERING OF THE SCOPE AND LEVEL OF EFFORT REQUIRED BY THE GOVERNMENT'S PROGRAM PLAN AND INCLUDED AS A SEPARATELY PRICED ITEM OF WORK IN THE CONTRACT SCHEDULE. EXCEPT IN ARCHITECT-ENGINEER CONTRACTS, THE CONTRACTOR SHARES IN SAVINGS ON ACCEPTED VECP's BUT AT A LOWER PERCENTAGE RATE THAN UNDER THE VOLUNTARY APPROACH.”

FAR CLAUSE 52.248-1  
(ALTERNATE I)

A0332-EE62150-03.01

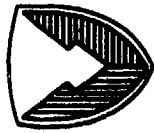
# SHARING ARRANGEMENTS

---



- SHARED — INSTANT, CONCURRENT AND FUTURE CONTRACTS (THREE YEARS)
- LUMP SUM — SHARE MAY BE PAID AS LUMP SUM RATHER THAN ROYALTIES
- NO-COST — CONTRACTOR KEEPS ALL SAVINGS ON INSTANT CONTRACT AND ITS CONCURRENT CONTRACTS
- COLLATERAL — USUALLY 20 PERCENT OF ESTIMATED SAVINGS IN AN AVERAGE YEAR

# CONTRACTOR'S SHARE OF NET ACQUISITION SAVINGS



(FIGURES IN PERCENT)

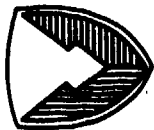
| CONTRACT TYPE                               | SHARING ARRANGEMENT   |                                     |                                 |                                     |
|---------------------------------------------|-----------------------|-------------------------------------|---------------------------------|-------------------------------------|
|                                             | INCENTIVE (VOLUNTARY) |                                     | PROGRAM REQUIREMENT (MANDATORY) |                                     |
|                                             | INSTANT CONTRACT RATE | CONCURRENT AND FUTURE CONTRACT RATE | INSTANT CONTRACT RATE           | CONCURRENT AND FUTURE CONTRACT RATE |
| FIXED-PRICE (OTHER THAN INCENTIVE)          | 50                    | 50                                  | 25                              | 25                                  |
| INCENTIVE (FIXED-PRICE OR COST)             | *                     | 50                                  | *                               | 25                                  |
| COST-REIMBURSEMENT (OTHER THAN INCENTIVE)** | 25                    | 25                                  | 15                              | 15                                  |

\* SAME SHARING ARRANGEMENT AS THE CONTRACT'S PROFIT OR FEE ADJUSTMENT FORMULA

\*\* INCLUDES COST-PLUS-AWARD-FEE CONTRACTS

A00002- X016298506.01

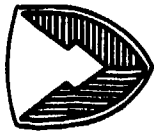
# NONCONFIGURATION AREAS WITH VE POTENTIAL



- CONTRACT REQUIREMENTS
  - TECHNICAL
  - SUPPORT (INCLUDING PACKAGING, TRANSPORTATION AND HANDLING)
  - DATA
- GOVERNMENT FURNISHED EQUIPMENT (GFE)
- MANUFACTURING - PROCEDURES, PROCESSES, EQUIPMENT, ETC.
- INSTALLATION - EQUIPMENT, LAYOUT, PROCEDURES
- OPERATIONS - POLICY, LAYOUT, PROCEDURES, STAFFING
- MAINTENANCE - REPAIR POLICY, PROCEDURES, CYCLE OR LEVEL; TEST EQUIPMENT
- FACILITIES
- SOFTWARE
- TESTING

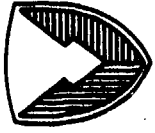
# **SUBSIDIARY BENEFIT OF VE PROGRAM**

---



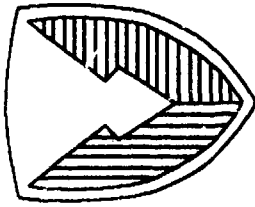
- **APPLICATION TO CONTRACTOR  
INTERNAL PROCEDURES WILL REDUCE  
OPERATING COSTS**
- **CONTRACTOR WILL BE MORE  
COMPETITIVE - OBTAIN MORE BUSINESS**
- **GOVERNMENT WILL RECEIVE LOWER  
PRICED PROPOSALS/BIDS**

# VALUE ENGINEERING



- REDUCING COSTS
- SHARING SAVINGS

Blank



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MUNITIONS  
CHEMICAL COMMAND  
CHEMICAL RD&E CENTER

# INDUSTRIAL LIAISON PROGRAMS

by

MR. RICHARD L. DIMMICK  
Advanced Systems Concepts Directorate

SMCCR-OPP  
AREA CODE (301) 671-2031  
AUTOVON (584) 2031

AO332-C-G7226063

# TECHNICAL INDUSTRIAL LIAISON ACTIVITIES



AMC-PAM 70-6



U.S. ARMY  
MATERIEL COMMAND

INFORMATION  
FOR  
INDUSTRY

RESEARCH AND DEVELOPMENT  
OPPORTUNITIES  
WITH THE  
UNITED STATES ARMY  
MATERIEL COMMAND

A PRIMER  
ON  
TECHNICAL AND INDUSTRIAL  
LIAISON OFFICE (TILO) PROGRAMS

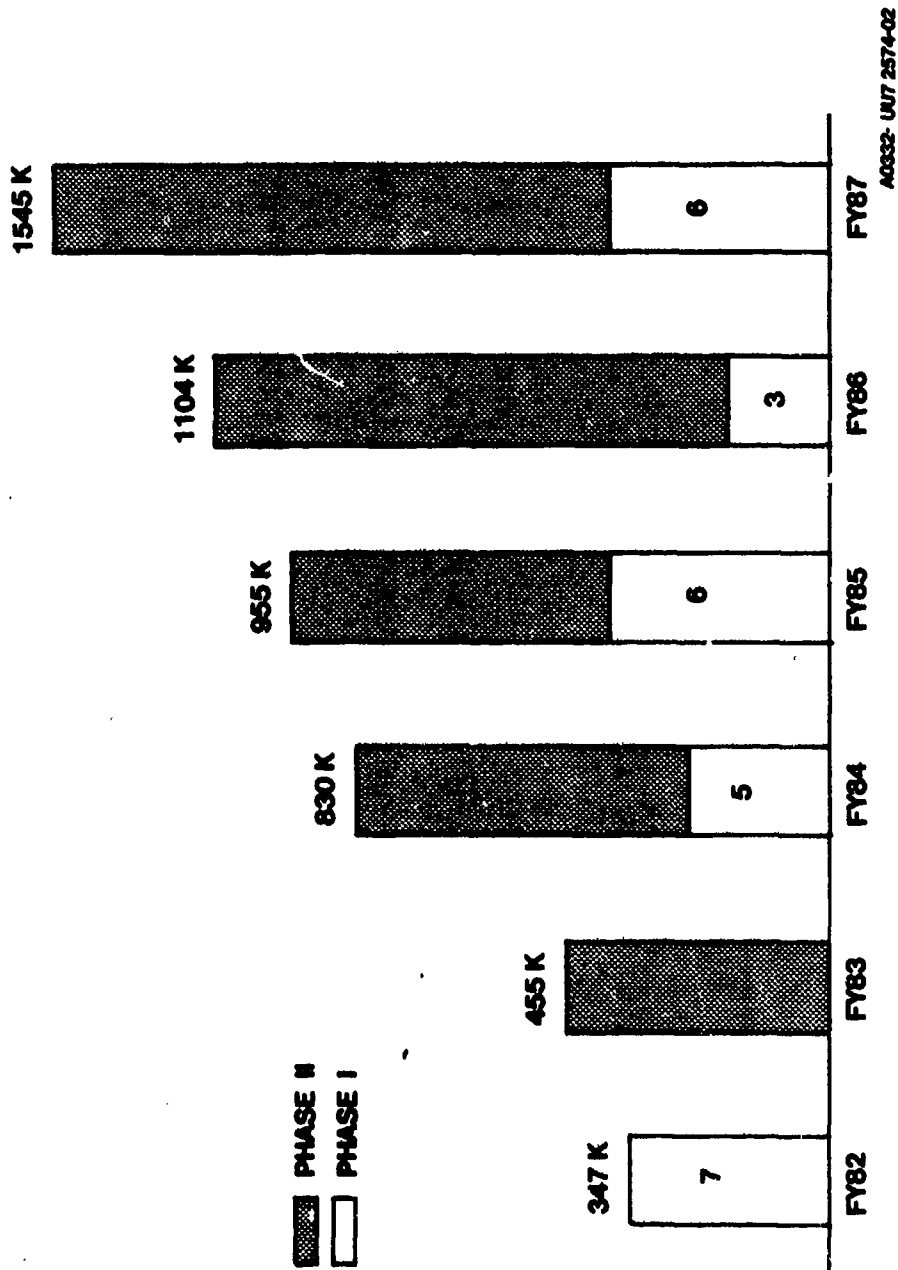
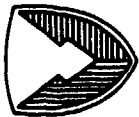
## DISCUSSES:

ARMY POTENTIAL CONTRACTOR  
PROGRAM  
R&D UNFUNDED STUDIES  
UNSOLICITED PROPOSALS  
BROAD AGENCY ANNOUNCEMENTS  
LOGISTICS RESEARCH AND  
DEVELOPMENT  
KEY OPERATIONAL CAPABILITIES  
MISSION AREA MATERIAL PLANS  
SMALL BUSINESS INNOVATION  
RESEARCH  
DEFENSE TECHNICAL INFORMATION  
CENTER

AND LISTS OTHER AMC TILO

A0332-UJ7 2574-01

# SMALL BUSINESS INNOVATIVE RESEARCH



# **SMALL BUSINESS INNOVATIVE RESEARCH**

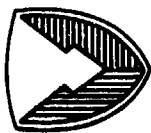


## **CRDEC TOPICS FOR FY88**

- IR INTERFEROMETER WITH NO MOVING PARTS
- PYROLYSIS OF AEROSOLS IN MASS SELECTIVE ION TRAPPING DEVICES
- GLASS OR PLASTIC SURFACES FOR IMMUNOLOGICAL REACTIONS
- SMOKE AND AEROSOL CLEARING
- OXYGEN EXTRACTION FOR LIFE SUPPORT IN A CONTAMINATED ENVIRONMENT
- AUXILIARY MOTOR-BLOWER FOR NBC PROTECTIVE MASKS

# **SMALL BUSINESS INNOVATIVE RESEARCH**

---



## **COPIES OF THE SOLICITATION . . .**

**Defense Technical Information Center**

**ATTN: DTTC / SBIR**

**Building 5**

**Cameron Station**

**Alexandria, Virginia 22304-6145**

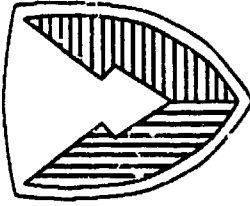
**(800) 368-5211 or (202) 274-6902**

ADVANCED SYSTEMS CONCEPTS DIRECTORATE  
PLANS DIVISION  
TECHNICAL INDUSTRIAL LIAISON OFFICE

PROPOSALS RECEIVED AT CRDEC AS OF 31 AUG 87

|                       |                                | FY 83<br>=====       | FY 84<br>=====       | FY 85<br>=====       | FY 86<br>=====     | FY 87<br>=====     |
|-----------------------|--------------------------------|----------------------|----------------------|----------------------|--------------------|--------------------|
| TOTAL PROPOSALS       | Received<br>Accepted<br>Funded | 123<br>66<br>27(22%) | 142<br>56<br>24(17%) | 236<br>85<br>53(22%) | 83<br>19<br>7(8%)  | 118<br>43<br>5(4%) |
| UNSOLICITED PROPOSALS | Received<br>Accepted<br>Funded | 88<br>52<br>23(26%)  | 83<br>47<br>18(22%)  | 75<br>36<br>16(21%)  | 38<br>12<br>4(11%) | 26<br>6<br>2(8%)   |
| SBIR PROPOSALS        | Received<br>Accepted<br>Funded | 35<br>14<br>4(11%)   | 7<br>1<br>1(14%)     | 17<br>6<br>6(35%)    | 23<br>3<br>3(11%)  | 31<br>6<br>3(10%)  |
| QRI/BAA PROPOSALS     | Received<br>Accepted<br>Funded | -----                | 52<br>8<br>5(10%)    | 144<br>43<br>31(22%) | 22<br>4<br>-       | 61<br>31<br>-      |

NOTE: Acceptance and funding levels are still changing in FY 87 since many proposals are in evaluation or pending contract award.



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## WRAP-UP AND FINAL REMARKS

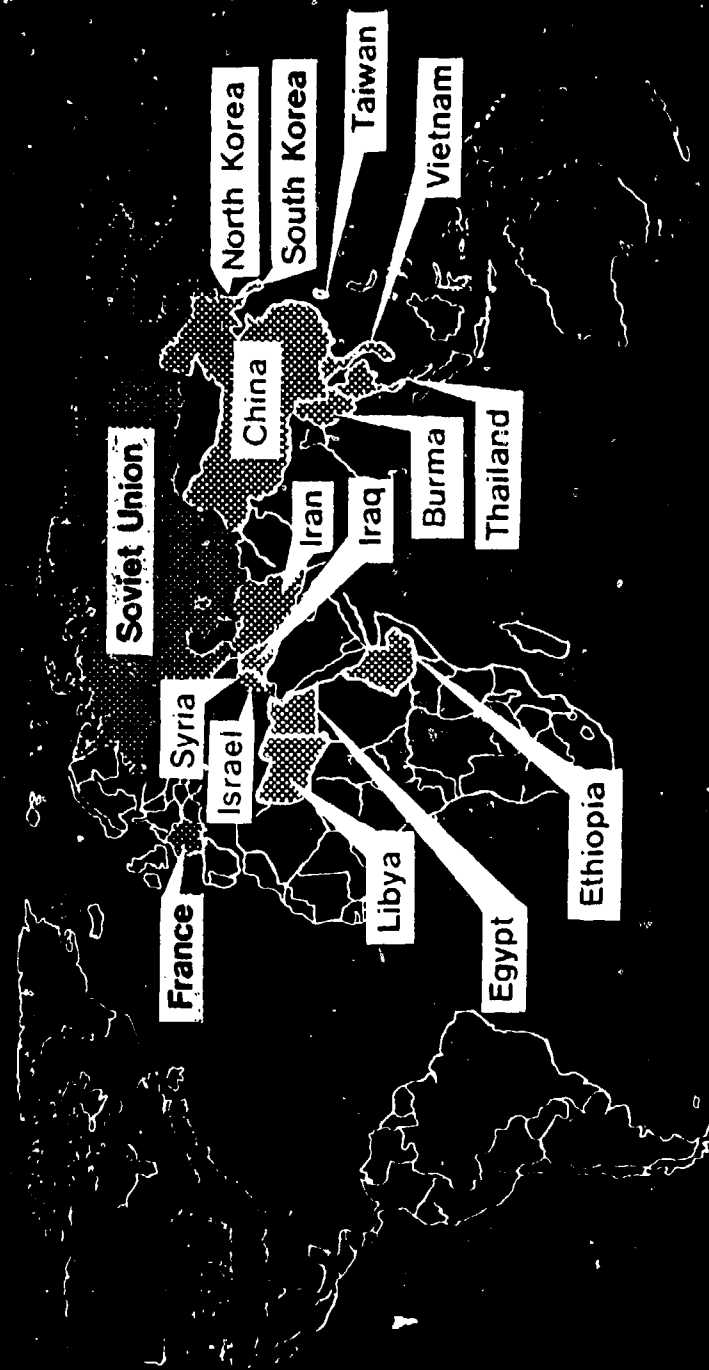
by

MR. JOSEPH J. VERVIER  
Technical Director

SMCCR-TDT  
AREA CODE (301) 671-3498  
AUTOVON (584) 3498

AO332-C-G7226062

# THE CHEMICAL WEAPONS CLUB



## Legend:

Reported to possess

Reported seeking to possess

Source: Chemical and Engineering News (for known and reported to possess); U.S. officials (for seeking to possess)

5701810:

# NEW THREAT



## CB WARFARE

- PENETRANTS

- VAPOR

- AEROSOL

- IMPREGNATED DUST

- BIOCHEMICAL

## SENSORS

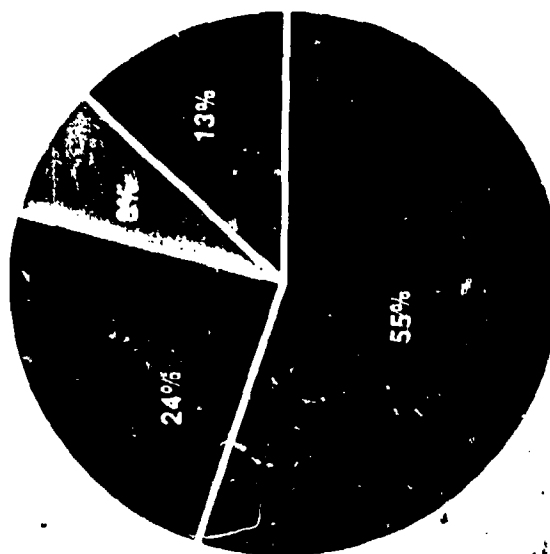
- MM WAVE SURVEILLANCE

# CRDEC ESTMENT STRATEGY

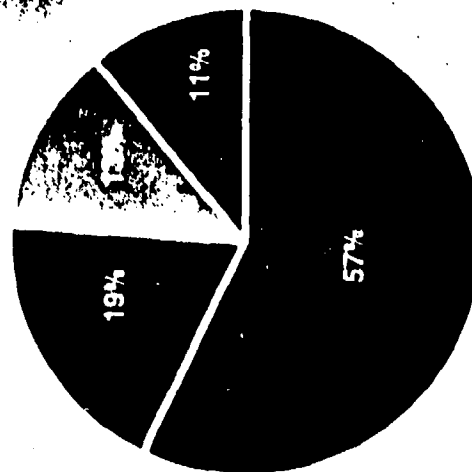
## EMERGING TECHNOLOGIES

- RECEPTOR SITE TECHNOLOGY
- ARTIFICIAL INTELLIGENCE
- ENZYMATIC DECONTAMINANTS
- CATALYSIS
- PLASMA FILTRATION
- MINIATURIZED DETECTORS

- NBC SURVIVABILITY
- THREAT ASSESSMENT
- NONCORROSIVE DECONTAMINANTS
- MODULAR MUNITIONS
- LOW INTENSITY CONFLICT
- LOG R&D



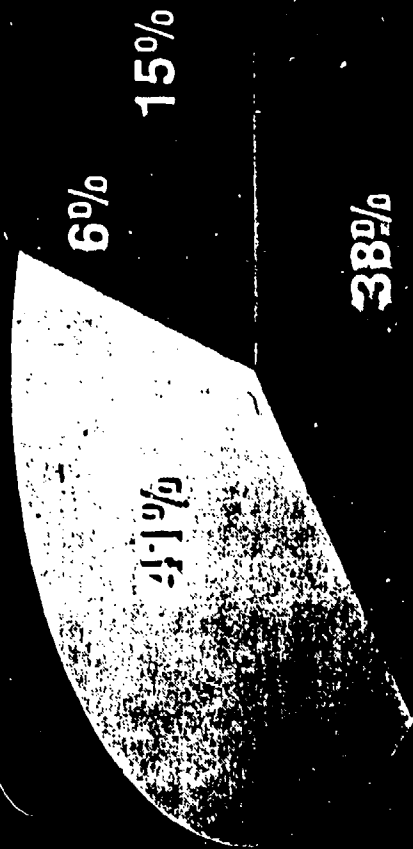
FY87  
AC332-C-E7088601 \$ 65.8M



FY88 CURRENT  
\$ 46.5M  
(INCLUDES 6.1, 6.2, & 6.3A)

# NBC NEXT GENERATION- NOTIONAL SYSTEMS

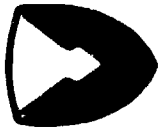
## FY88 FUND DISTRIBUTION



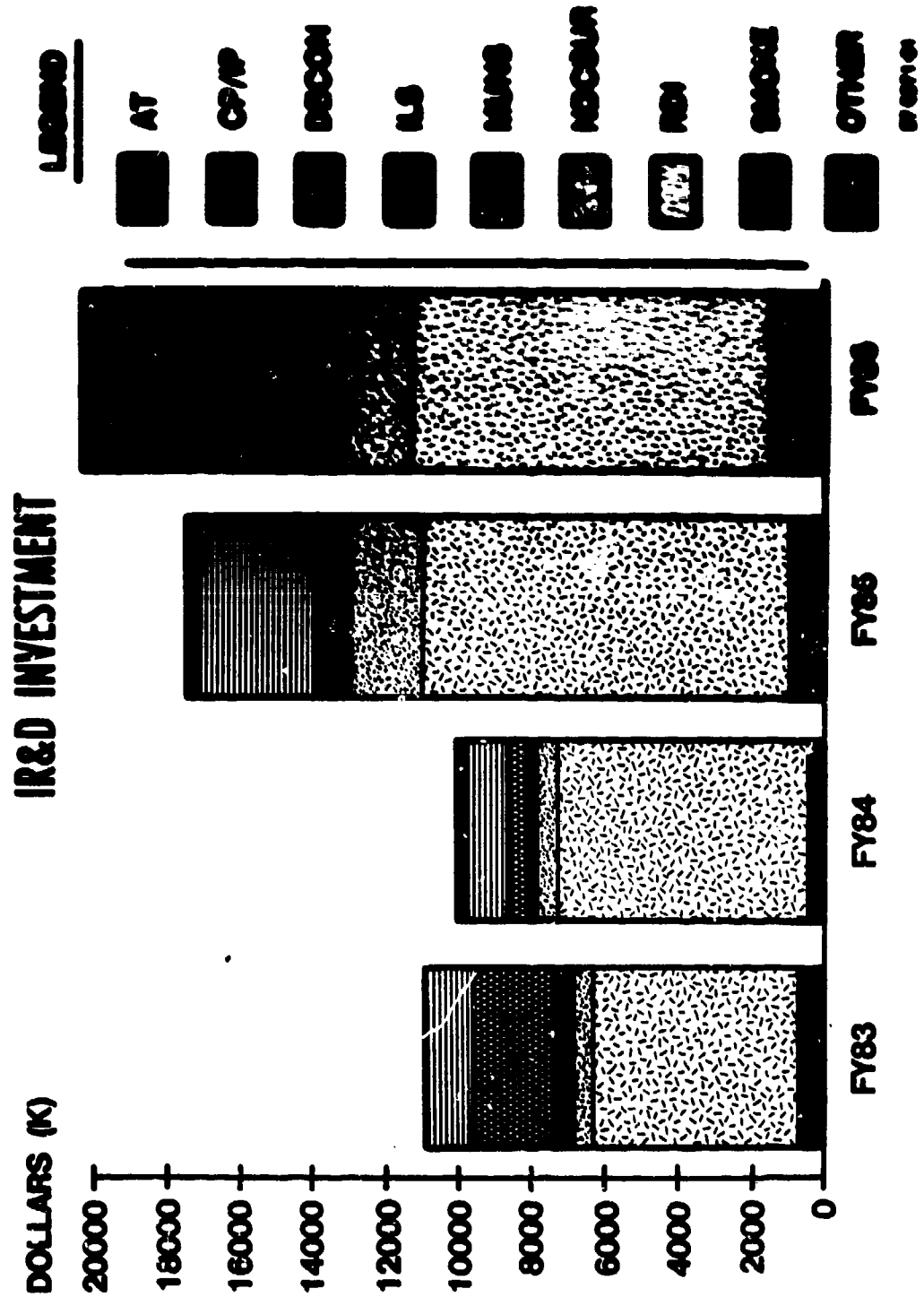
MULTISPECTRAL OBSC  
NBC DECON SYSTEMS  
NBC DETECT & RECON  
ADV RETAL CML MUN

TOTAL = \$ 25.2 M

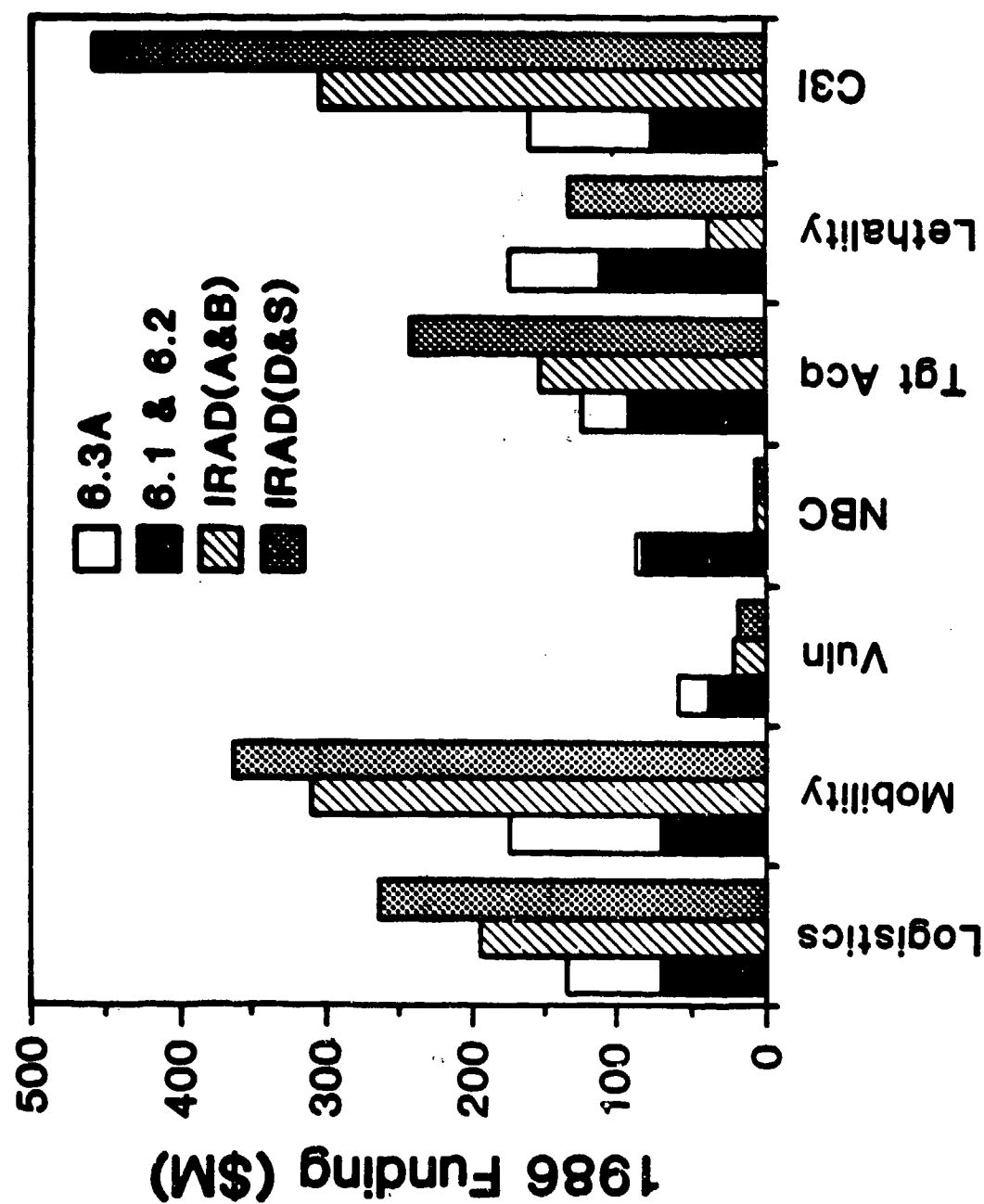
AO332-C-E7071001



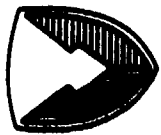
# NBC MISSION AREA



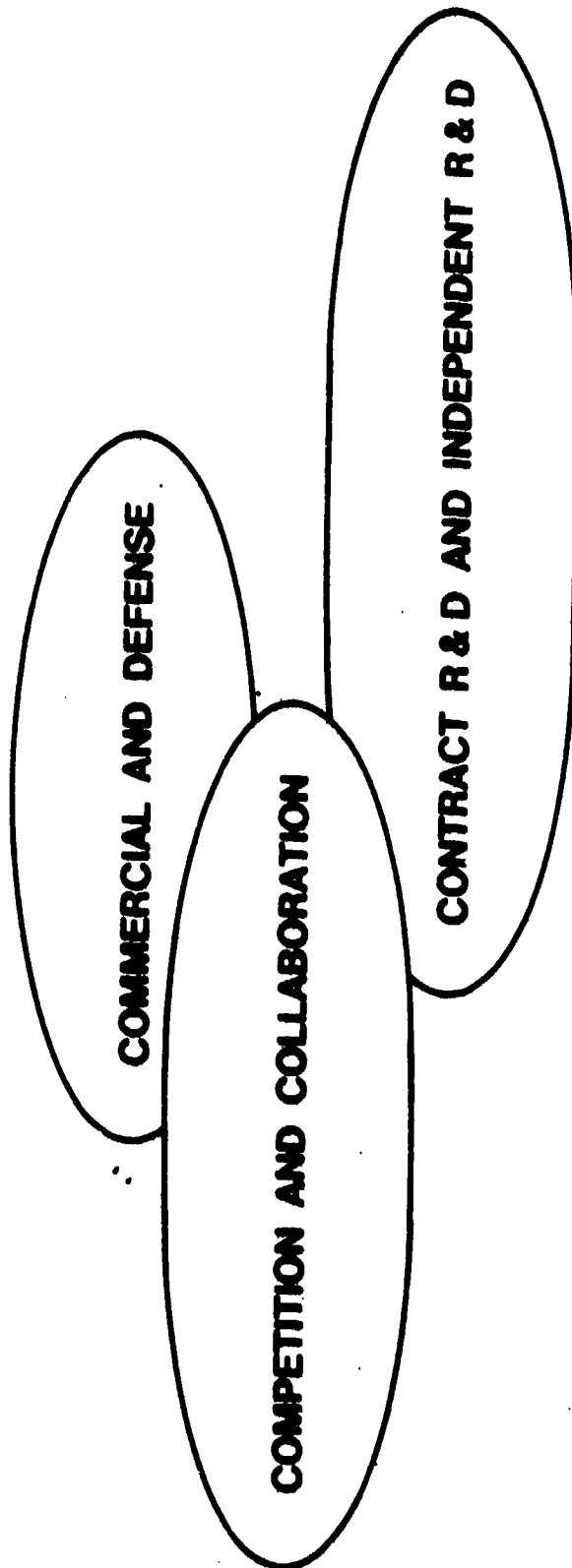
# ARMY INTEREST AREAS



# APPROACH



**STRIKE A BALANCE AMONG...**



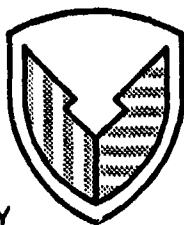
**...AND LOOK FOR NON-TRADITIONAL APPROACHES TO  
WORKING WITH CRDEC  
AND ADDRESSING CHEMICAL DEFENSE**

A0332- D7 3159-03

APPENDIX  
AMC-PAM 70-6  
INFORMATION FOR INDUSTRY

Reproduced by authority of Dr. Charles Chatlynne, Industrial Research and Technology Branch, U.S. Army Laboratory Command, Adelphi, MD, 28 July 1987.

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U.S. ARMY  
MATERIEL COMMAND

AMC-PAM 70-6

# INFORMATION FOR INDUSTRY

**RESEARCH AND DEVELOPMENT  
OPPORTUNITIES  
WITH THE  
UNITED STATES ARMY  
MATERIEL COMMAND**

**A PRIMER  
ON  
TECHNICAL AND INDUSTRIAL  
LIAISON OFFICE (TILO) PROGRAMS**

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DEPARTMENT OF THE ARMY  
HEADQUARTERS, UNITED STATES ARMY MATERIEL COMMAND  
5001 EISENHOWER AVENUE, ALEXANDRIA, VA 22333-0001

AMC PAMPHLET  
No. 70-6

16 March 1987

Research, Development, and Acquisition

INFORMATION FOR INDUSTRY

RESEARCH AND DEVELOPMENT OPPORTUNITIES  
WITH THE U.S. ARMY MATERIEL COMMAND

---

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\*This pamphlet supersedes DARCOM-P 70-6, 1 July 1979.

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## INTRODUCTION

A professional, proactive industrial relations program is a necessary part of the Army's research and development (R&D) program if the Army is to take maximum advantage of the rapidly expanding science and technology in the private sector. A significant segment of this industrial relations program is accomplished by the Information for Industry Program performed by the Army's Technical and Industrial Liaison Offices (TILOs). The Army recognizes that industry's access to advance planning and requirements information as well as advice and guidance on doing business with the Army increases the effectiveness of bids and proposals, fosters competition, helps to surface scientific and technical developments, and increases the productivity of Independent R&D (IRAD), all of which ultimately returns to the Army in the form of enhanced strength and effectiveness as a fighting force.

It is therefore incumbent upon the Army to make available the latest advance planning and requirements information and foster programs to allow industry to provide the Army with their technological developments consistent with proprietary rights and free and open competition. It is the purpose of this primer to summarize briefly the R&D information for industry programs that are provided or supported by the Army's family of TILOs. These programs include access to planning and requirements documents, advice and guidance on doing business with the Army, Advance Planning Briefings for Industry, technology symposia, R&D unfunded studies, the Army Potential Contractor Program, and unsolicited proposals. Also included is selected reference information that should prove helpful to companies wishing to do business with the U.S. Army.

This primer lists the locations of the TILOs, explains the procedures for arranging a visit, and describes the types of information and support that they offer and the programs and services that they provide. AMC invites you to visit your nearest TILO at your earliest convenience. If a TILO cannot answer your questions or if you should have specific questions or suggestions regarding this primer, feel free to call the U.S. Army Laboratory Command at (202) 394-2687. You may also write to the following address:

Commander  
U.S. Army Laboratory Command  
ATTN: AMSLC-TP-TI  
2800 Powder Mill Road  
Adelphi, Maryland 20783-1145

# MISSIONS OF AMC AND ITS MAJOR SUBORDINATE COMMANDS

The U.S. Army Materiel Command (AMC) with headquarters in Alexandria, VA, provides broad policy and basic guidance to its subordinate activities, accomplishes major planning, establishes and coordinates major programs, evaluates AMC programs and operations, allocates resources for mission accomplishment, and assists major subordinate commands (MSC's) in the accomplishment of their missions. AMC has nine major goals: equipping, sustaining, mobilizing and deploying, structuring, manning, training, managing, managing information, and providing facilities. The AMC workforce currently consists of 115,000 civilians and 10,000 military personnel and is entrusted with 92 percent of the the Army's procurement appropriations (\$21 billion in 1986) and 87 percent of the Army's research, development, test and evaluation (RDTE) budget (\$4.6 billion in 1986).

The Armaments, Munitions, and Chemical Command (AMCCOM) with headquarters in Rock Island, IL, is responsible for integrated commodity management of weapons and ammunition, nuclear and non-nuclear munitions, weapons systems and support equipment, fire control equipment, rocket and missile warhead sections, demolition munitions, mines, bombs, grenades, pyrotechnics, boosters, jet-assisted take-off equipment, offensive and defensive chemical materiel, flame and incendiary systems, and defensive biological and radiological materiel as assigned, as well as special tools and test equipment which are part of, or used with, assigned materiel.

The Aviation Systems Command (AVSCOM) with headquarters in St. Louis, MO, is responsible for life-cycle management and technical assistance to users of all Army aviation equipment. Typical procurements include aircraft, airframe systems, gas turbines, hydraulic pumps and starters, materials-handling equipment and supplies for RDTE related to qualification testing of turbine engines, evaluation and development of prototype hardware for fueling and defueling equipment, and fuel-contamination.

The Communications-Electronics Command (CECOM) with headquarters at Fort Monmouth, NJ, is responsible for integrated commodity management and R&D of communications, communications electronics intelligence equipment, electronic warfare, aviation electronics, combat surveillance, target acquisition and night vision equipment, photographic and microfilming equipment, identification friend or foe systems, automatic data processing, radar (excluding that used in fire control and fire coordination of air defense systems assigned to the Missile Command), and meteorological and electronic radiological detection equipment.

The Depot Systems Command (DESCOM) with headquarters at Letterkenny Army Depot, Chambersburg, PA, is responsible for procurement activities of the nine major depots:

Anniston, AL  
Letterkenny, PA  
Red River, TX  
Sharpe, TX  
Tooele, UT

Corpus Christi, TX  
New Cumberland, PA  
Sacramento, CA  
Tobyhanna, PA

The Laboratory Command (LABCOM) with headquarters in Adelphi, MD, is responsible for managing and integrating the tech-base efforts of the AMC laboratories and research, development, and engineering (RD&E) centers along with industry, universities, and other services. LABCOM manages the AMC corporate laboratories and the Army Research Office in such areas as atmospheric sciences, ballistics, electronics, nuclear survivability and radiation effects, fuzing, human factors, materials, and vulnerability assessments.

The Missile Command (MICON) with headquarters in Huntsville, AL, is responsible for integrated commodity management of free rockets, guided missiles, ballistic missiles, targets, air defense, fire control coordination equipment, related special purpose and multisystem test equipment, missile launching and ground support equipment, metrology and calibration equipment, R&D, and initial purchase of Army missile systems and laser weapons.

The Tank-Automotive Command (TACOM) with headquarters in Warren, MI, is responsible for research, design, development engineering, test management, modification, product assurance, integrated logistics support, acquisition, and deployment of the following items: combat, tactical, and special purpose vehicles (e.g., automotive systems, subsystems, and engines, transmissions, suspensions, electrical, peculiar diagnostic test equipment, armor materials application and vehicle survivability, and miscellaneous vehicular components), carriers (e.g., personnel, cargo, missile, and rearm), trailers, tractors, special tools, and special purpose kits. Also, TACOM has the responsibility for procurement, production, maintenance, supply, and repair parts support of the U.S. Armed Forces vehicle fleet, general purpose construction equipment, material-handling equipment, and tactical vehicles for the Department of Defense (DOD) and our foreign allies.

The Test and Evaluation Command (TECOM) located at Aberdeen Proving Ground, MD, is the Army's principal materiel-testing organization. Military hardware of every description can be tested and evaluated under precise laboratory conditions or pitted against the elements themselves in the natural environments in which they are expected to operate.

The Troop Support Command (TROSCOM) with headquarters in St. Louis, MO, is responsible for R&D, engineering, testing, and life-cycle management of the following types of equipment: watercraft, marine and railroad, electric power generators and services, barrier equipment (including mine warfare and demolitions), bridging and stream crossing, petroleum handling and dispensing, general support and supplies (fire fighting, industrial engines, intrusion alarm systems, heating and air conditioning, water purification), test equipment, and ground support equipment.

Figure 1 shows how AMC fits into the structure of the Department of the Army (DA).

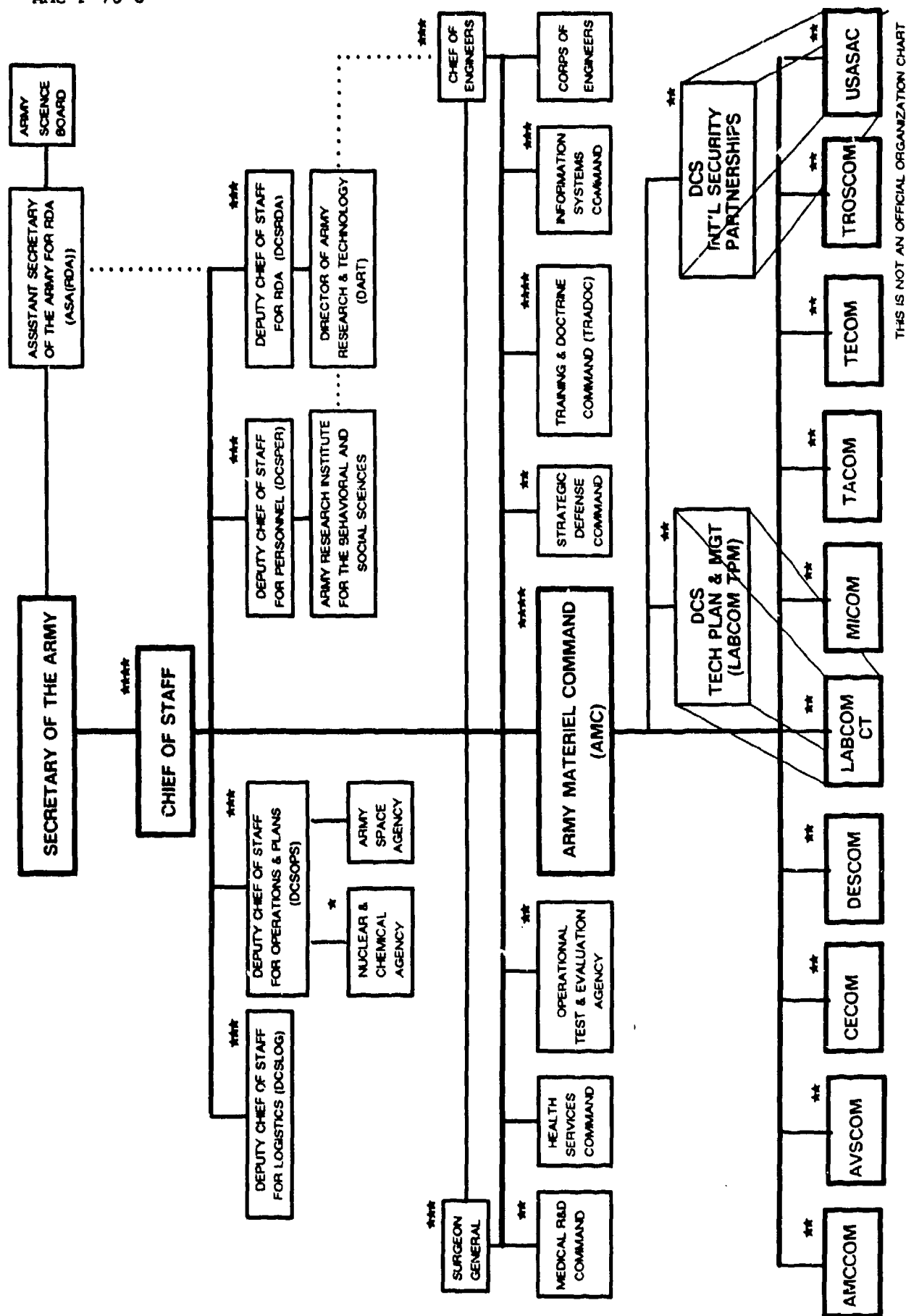


**FIGURE 1. THE ARMY MATERIEL COMMAND IN THE DEPARTMENT OF THE ARMY STRUCTURE**

**TECHNICAL AND INDUSTRIAL LIAISON OFFICES (TILOs)**

There are 11 TILOs within AMC. The TILOs, which are listed below, operate under the general guidance and support of LABCOM, which is the executive agent for the Army Information for Industry Program:

**U.S. Army Armament, Munitions, and Chemical Command****Commander**

U.S. Army Armament RD&amp;E Center

ATTN: SMCAR-AST (Mr. Pat Napoli)

Dover, NJ 07801-5001

(201) 724-6978

**Commander**

U.S. Army Chemical RD&amp;E Center

ATTN: SMCCR-OPP (Mr. Richard Dimmick)

Aberdeen Proving Ground, MD 21010-5423

(301) 671-2031/5432

**Director**

U.S. Army Benet Weapons Laboratory

ATTN: SMCAR-CCB-TP (Mr. Wm. Rosenberger)

Watervliet, NY 12189-5000

(518) 266-5734/5812

**HQ, U.S. Army Aviation Systems Command****Commander**

U.S. Army AVSCOM

ATTN: AMSAV-NR (Mr. Roy Warhover)

4300 Goodfellow Boulevard

St. Louis, MO 63120-1798

(314) 263-1082

**HQ, U.S. Army Communications-Electronics Command****Commander**

U.S. Army CECOM

ATTN: AMSEL-ATDD-TI (Ms. Patricia Locher)

Fort Monmouth, NJ 07703-5000

(201) 544-2240

**HQ, U.S. Army Materiel Command****Commander**

U.S. Army Materiel Command

ATTN: AMCLD-TILO (Ms. Dolores Mahon)

5001 Eisenhower Avenue

Alexandria, VA 22333-0001

(202) 274-8948

(Co-located with Navy and Air Force in the Tri-Service Industry Information Center)

U.S. Army Materiel Command Support Activity

Director  
U.S. AMC Support Activity  
ATTN: AMSTB-T-I (Ms. Kathy DeVries)  
Fort Lewis, WA 98433-5000 (206) 967-8291  
(Supporting the U.S. Army Development  
and Employment Agency)

HQ, U.S. Army Missile Command

Commander  
U.S. Army MICOM  
ATTN: AMSMI-RD-TI (Ms. Anne Esslinger)  
Redstone Arsenal, AL 35898-5243 (205) 876-4270/5270

HQ, U.S. Army Tank Automotive Command

Commander  
U.S. Army TACOM  
ATTN: AMSTA-NKTE (Mr. Robert Hostetler)  
Warren, MI 48397-5000 (313) 574-8588/7545

HQ, U.S. Army Test and Evaluation Command

Commander  
U.S. Army TECOM  
ATTN: AMSTE-TC-M (Mr. Grover Shelton)  
Aberdeen Proving Ground, MD 21005-5055 (301) 278-2170

U.S. Army Troop Support Command

Commander  
U.S. Army Belvoir RD&E Center  
ATTN: STRBE-ZTS (Ms. Connie Harrison)  
Fort Belvoir, VA 22060-5606 (703) 664-1068

WHO MAY VISIT A TILO?

Visitors must meet certain requirements. First, they must be U.S. citizens and a member of a U.S.-controlled organization that has--

- Expressed a desire to participate in the R&D effort of the U.S. Army.
- Obtained the necessary facility and personnel clearances.
- Provided acceptable evidence of an existing or planned R&D capability.

Qualified foreign representatives with appropriate data exchange agreements or memoranda of agreement (MOA) may request a TILO visit through their embassies. TILOs obtain approval for the release of information through Army foreign-disclosure channels.

When an organization's area of interest exceeds current contracts, it may establish need-to-know through registration in the Army Potential Contractor Program which is described on page 10 in this primer.

Normally, industrial visitors must make appointments at least one week in advance in order to process security clearances. Visitors should forward their personal security clearances to the local security office with the annotation "To visit the Technical and Industrial Liaison Office." This is, of course, not required for unclassified, orientation visits.

#### **WHAT MAY ONE GAIN FROM A TILO VISIT?**

Army personnel are available at each TILO to provide technical consultation and guidance on current and long-range R&D projects. These offices have the full-time responsibility of providing information requested by current or potential defense contractors.

This technical information service is complimented by selected R&D planning, requirements, and information documents. These include the following:

Descriptive Summaries of the U.S. Army RDTE Program. These documents, submitted to the Office of the Secretary of Defense and to Congress, contain narrative information on all RDTE program elements and projects. They are sometimes referred to as Program Element Descriptive Summaries (PEDS).

Draft and Approved Materiel Requirements Documents. Basically, two types of requirements documents are available for review by qualified visitors: Operational and Organizational (O&O) Plans and Required Operational Capabilities (ROCs). The O&O Plan is the program initiation document in the materiel acquisition process. It provides decisionmakers with the minimum essential information necessary to initiate the concept exploration phase. The ROC states concisely the minimum essential operational, technical, personnel, manpower, safety, health, human factors engineering, training, logistics, and cost information necessary to initiate the full-scale development phase or procurement of a materiel system.

AMC Project Management List.

AMC Weapon System Managers List.

TRADOC System Managers List.

RDTE Programs Listing (R-1).

Procurement Listing (P-1).

Organization Charts.

Army Modernization Information Memorandum (AMIM). The AMIM contains information on intensively managed and standardized Army systems. Information includes system descriptions, operating and physical characteristics, and component lists, as well as manpower, personnel, training, doctrine, support, and maintenance requirements.

Selected briefing documents, pamphlets, and DA and Department of Defense publications.

**ARMY POTENTIAL CONTRACTOR PROGRAM**

The Army Potential Contractor Program (APCP) has been established to certify and register non-Government organizations for access to controlled scientific and technical information. This includes information on Army needs, requirements, programs, funding, and advance planning associated with research, development, and acquisition. The program can support you in developing and expanding technical competence in order to support Army goals. Under this program, the Army sponsors your access to planning and technical information from the TILOs and the Defense Technical Information Center (DTIC), which is described on page 31.

You are eligible for the APCP if you are a non-Government organization that is not foreign owned, controlled, or influenced and if you have a demonstrable capability to perform R&D and have an intent and a reasonable potential for eventually receiving a contract with the Army. You may obtain a registration package from any of the APCP managers listed on the next page or from any of the TILOs. A registration package contains the following items:

- Instructions.
- Policy Statement.
- Memorandum of Understanding (MOU).
- DD Form 1540 (Registration for Scientific and Technical Services).

Execution of the MOU indicates your concurrence with its associated policy statement regarding your handling of the information that you obtain from the Army and DTIC. Your completion of designated sections of DD Form 1540 facilitates your registration with DTIC. You must also provide the APCP Manager with evidence of your need-to-know (your R&D capabilities). This usually involves names of Government personnel who can provide third-party confirmation of the evidence that you supply. This often consists of describing work performed under past contracts or subcontracts. References to specific Independent Research and Development (IR&D) projects will also suffice. If you have never had a Government contract, you may submit resumes, publication lists, subcontracting information, etc.

Following confirmation of need-to-know, the APCP Manager completes the DD Form 1540, sends copies to DTIC, and returns a copy to you. He or she also executes a security classification specification and sends copies to the Defense Investigative Service and to you.

If you do not have a facility clearance, the APCP Manager may initiate the process of sponsoring your organization for such a clearance. Note that this is on a case-by-case basis and must be in the demonstrated best interest of the Army and not merely as a courtesy to you.

**APCP MANAGERS:****U.S. Army Armament, Munitions, and Chemical Command**

Commander  
 U.S. Army Armament RD&E Center  
 ATTN: SMCAR-AST (Mr. Pat Napoli)  
 Dover, NJ 07801-5001 (201) 724-6978

Commander  
 U.S. Army Chemical RD&E Center  
 ATTN: SMCCR-OPP (Mr. Richard Dimmick)  
 Aberdeen Proving Ground, MD 21010-5423 (301) 671-2031/5432

**HQ, U.S. Army Aviation Systems Command**

Commander  
 U.S. Army AVSCOM  
 ATTN: AMSAV-NR (Mr. Roy Warhover)  
 4300 Goodfellow Boulevard  
 St. Louis, MO 63120-1798 (314) 263-1082

**HQ, U.S. Army Communications-Electronics Command**

Commander  
 U.S. Army CECOM  
 ATTN: AMSEL-ATDD-TI (Ms. Patricia Locher)  
 Fort Monmouth, NJ 07703-5000 (201) 544-2240

**HQ, U.S. Army Missile Command**

Commander  
 U.S. Army MICOM  
 ATTN: AMSMI-RD-TI (Ms. Anne Esslinger)  
 Redstone Arsenal, AL 35898-5243 (205) 876-4270/5270

**HQ, U.S. Army Tank-Automotive Command**

Commander  
 U.S. Army TACOM  
 ATTN: AMSTA-NKTE (Mr. Stephen Adams)  
 Warren, Michigan 48397-5000 (313) 574-8588/7545

**U.S. Army Troop Support Command**

Commander  
 U.S. Army Belvoir RD&E Center  
 ATTN: STRBE-ZTS (Ms. Connie Harrison)  
 Fort Belvoir, VA 22060-5606 (703) 664-1068

Commander  
 U.S. Army Natick RD&E Center  
 ATTN: STRNC-EML (Mr. Richard Day)  
 Natick, MA 01760-5014 (617) 651-4899

## ADVANCE PLANNING BRIEFINGS FOR INDUSTRY

Current AMC policy requires that every MSC sponsor an Advance Planning Briefing for Industry (APBI) for each of its RDTE projects. An APBI includes details on mid- and long-range RDTE plans and programs, background information on current related Army programs, and details on threat, deficiencies, and doctrine. APBIs are announced in the Commerce Business Daily (CBD).

## TECHNOLOGY SYMPOSIA

Technology symposia (also referred to as topical reviews) are similar to APBIs except that Army presenters provide industry attendees with descriptions of current problems for which industrial R&D support is required. AMC encourages symposia sponsors to provide industry with a chance to respond to a Government-only audience, either at the original conference or at a follow-up meeting. Industry may also contact the Army briefers at a later date to discuss mechanisms for the Army to take advantage of industry's applicable technology. Industry can provide this information in the form of proposals, white papers, informal briefings, unfunded studies, or non-developmental items provided for testing or analysis.

## R&D UNFUNDED STUDIES

R&D unfunded studies may be performed for the Army under what is essentially a no-cost contract. The Army recognizes that such studies can be of greater mutual benefit if they are conducted with access to Army scientific, technical, and planning information and with consultation with Army personnel. Study organizations often use such studies to justify an expanded need-to-know and, therefore, greater access to information.

The first step in initiating an unfunded study is for the potential study organization to meet with Army scientists and engineers who might act as the study sponsor. (TILOs can help you make the proper contacts and act as the study coordinator.) If the study organization and the Army can identify a topic of mutual interest, the study organization submits a proposed scope of work and a description of the required level and extent of non-monetary Army support (information and consultation). When the sponsor approves the scope of work, the study organization enters into a Study Agreement with the sponsoring Army activity, which indicates his or her concurrence with Army policy. The study coordinator then completes a DOD Contract Security Classification Specification. Normally, the period of performance is for one year but may be renewed.

### UNSOLICITED PROPOSALS

The Army has a continuing interest in receiving proposals that contain new ideas, suggestions, and innovative concepts for weapons, supplies, facilities, devices, and equipment. "Unsolicited Proposal" (UP) is the term used to describe a unique and innovative proposal submitted on the initiative of a private firm, non-profit organization, or educational institution which is not in response to a formal or informal request (other than a publicized general statement of need). The Government has eliminated from this category advance proposals for specific agency requirements that would normally be procured through competitive methods. Also eliminated are offers of commercial products that are usually sold to the general public. In addition, the Government may not accept a UP that closely resembles a pending competitive acquisition requirement.

Organizations and individuals are encouraged to make preliminary contacts with appropriate agency personnel before expending extensive effort on a detailed UP. Such contacts are, of course, conducted in a manner that will preclude agency commitments, explicit or otherwise, regarding the acceptance of a UP.

Generally, a UP must demonstrate the unique capabilities of the offeror in such areas as proprietary procedures, techniques, or data and/or facilities, staff, or patents. Furthermore, the Army evaluator must be able to justify a sole-source award to the satisfaction of the his or her activity's Competition Advocate. This is often accomplished in part by synopsisizing pending awards in the CBD to give other qualified sources the opportunity to convince the Government that a competitive procurement is required. Proprietary or classified information is, of course, not included in the synopsis.

A UP should contain, as a minimum, a summary, introduction, problem description, proposed approach, personnel resumes, schedule, specific qualifications, cost and work breakdowns, and supporting appendixes. The proposal may also contain a section giving the offeror's position regarding the unique and innovative basis for the proposal.

Submit a minimum of three copies of the UP to the UP coordinator at the appropriate Army activity. (When meeting with scientists and engineers, be sure to ask who their UP coordinator is.) Include an executed copy of the MOU (Figure 2) and indicate in the letter of transmittal if you have discussed your ideas with anyone. This information will help the UP coordinator decide who should review the proposal.

Army regulations require that UPs be acknowledged within 10 working days and a final or interim disposition be made within 90 days. If you do not feel your UP is receiving proper handling, you may wish to contact AMC's UP Program Manager at LABCOM, (202) 394-2687.

More detailed and complete information is contained in AMC Pamphlet 70-8, "Guide for Unsolicited Proposals."

## Policy Statement and Memorandum of Understanding for the Evaluation of Unsolicited Proposals for Contract

Prior to the Army's acceptance of any article of equipment, material, or disclosure of information for evaluation or testing, the individual, firm, or corporation submitting such article, invention, or disclosure must understand and agree to the following policy. (Reference: Federal Acquisition Regulation, Subpart 15.5 and Army Regulation 27-60, Chapter 3)

### POLICY

1. The Army has a continuing interest in receiving and evaluating proposals containing new ideas, suggestions, and inventive concepts for weapons, supplies, facilities, devices, and development activities. Government employees and contractors are constantly engaged in research and equipment and may already know the substance of your proposal, however, or it may even be in the public domain. For such reasons, we have found it desirable, when receiving proposals for evaluation, to ensure that the persons submitting them are aware of the conditions under which the Army may consider proposals for evaluation.

2. You should understand that our receipt and evaluation of the proposal does not imply a promise to pay, a recognition of novelty or originality, or any relationship that might require the Government to pay for the use of information to which we are otherwise lawfully entitled.

3. The Government will exercise due care to ensure that, in addition to the technical design or concept data submitted, any financial and management plans also submitted will not be used by the Government for any purpose other than for the evaluation of the proposal.

4. The Army handles voluntary submissions in accordance with established Government procedures for safeguarding such articles or information against unauthorized disclosure. In addition, we shall not disclose the data forming a part of or constituting the submission outside the Government nor shall we duplicate, use, or disclose the data in whole or in part, except for record purposes or to evaluate the proposal. This restriction extends to and includes financial and management-plan information submitted with, or forming a part of, the proposal. This restriction does not limit the Government's right to use information in such data if we have obtained it from another source, or if it is in the public domain. We may have proposals, without restrictive markings, that we receive from educational or nonprofit organizations evaluated outside the Government provided that the evaluators agree in writing not to reproduce, use, or disclose the information in whole or in part, except for the purpose of evaluation.

5. The Army will furnish you with information covering the results of our evaluations or tests if you request. You may not construe the information as a Government endorsement of the articles or subject matter of the disclosure. You may not use the information in whole or in part for advertising purposes with industry or other Government agencies.

THIS IS A LEGAL DOCUMENT. READ IT CAREFULLY AND BE SURE YOU UNDERSTAND IT BEFORE SIGNING IT.

### MEMORANDUM OF UNDERSTANDING

I, the undersigned, on behalf of myself or \_\_\_\_\_

COMPANY, OR CORPORATION

have read the above policy statement and have made a disclosure of a proposal to the Department of the Army relating to \_\_\_\_\_

It is understood that the Department of the Army has accepted the above proposal for the purpose of evaluating it and advising of any possible Army interest. It is further understood that such acceptance does not imply or create: a promise to pay; an obligation to give up any legal right or to assume any duty; a recognition of novelty, originality or priority; or any relationship, contractual or otherwise, such as would render the Government liable to pay for or to give up any legal right or assume any obligation for disclosure or use of any information in the proposal to which the Government would otherwise lawfully be entitled.

\_\_\_\_\_  
SIGNATURE

\_\_\_\_\_  
PRINTED OR TYPED NAME

\_\_\_\_\_  
TITLE OR POSITION

\_\_\_\_\_  
(AUTHORIZED TO BIND SAID CORPORATION, IF ANY)

\_\_\_\_\_  
DATE

Figure 2. Memorandum of Understanding for Unsolicited Proposals

### BROAD AGENCY ANNOUNCEMENTS

The Broad Agency Announcement (BAA) is one of the more recently developed mechanisms to be used by the Federal Government to solicit R&D proposals from the private sector. Part 6 of the Federal Acquisition Regulation (FAR) provides that one of the procedures available for use in fulfilling the requirement for full and open competition is the "competitive selection of basic research proposals for award that result from a broad agency announcement that is general in nature identifying areas of research interest, including criteria for selecting proposals and soliciting the participation of all offerors capable of satisfying the Government's needs." In other words, if an Army activity issues a BAA that describes its requirements for scientific study and experimentation directed toward advancing the state-of-the-art or increasing knowledge or understanding rather than focusing on a specific system or hardware solution and if the evaluation criteria are published in the BAA, then the resulting proposals are considered to be competitive and an award can be made without the requirement for the Army activity to prepare a sole-source justification. Policy also requires that we may only employ this mechanism if we can reasonably expect to receive meaningful proposals having varying technical/scientific approaches.

Each BAA typically contains the following information:

The activity's research interest, either for an individual program requirement or for a broadly defined area of interest covering the full range of the activity's requirements.

The criteria for selecting the proposals, their relative importance, and the method of evaluation.

The period of time during which the activity will accept proposals submitted in response to the BAA.

Instructions for preparing and submitting proposals.

The activity evaluates proposals in accordance with the published evaluation criteria through a peer or scientific review process. Note, however, that the activity need not evaluate proposals against each other because they are not submitted against a common work statement.

How does one obtain copies of BAAs? For newly published BAAs, read the CBD. For those that have already been published, contact a TILO or HQ LABCOM for a list of active announcements.

One final comment: When you talk to Army scientists and engineers about UPs, be sure and ask if there is an active BAA covering the subject under discussion. If there is, submit your proposal in response to the BAA and not as a UP.

## PROGRAM ELEMENT CODE SYSTEM

In order to control the elements within its programs, DOD has developed a five-component program element (PE) numbering system for ease of identification. For example, for PE 6.1203A, the five elements are 6, 1, 2, 03, and A, where--

|                                  |                                 |
|----------------------------------|---------------------------------|
| 6 is the DOD Program             | 03 is the Serial Number         |
| 1 is the R&D Category            | A is the Service or Agency Code |
| 2 is the Equipment/Activity Type |                                 |

The elements are as follows:

DOD Program Number

|   |                                                   |
|---|---------------------------------------------------|
| 1 | Strategic Programs                                |
| 2 | Tactical Programs                                 |
| 3 | Intelligence and Communications                   |
| 4 | Airlift and Sealift                               |
| 5 | Guard and Reserve                                 |
| 6 | Research and Development                          |
| 7 | Central Supply and Maintenance                    |
| 8 | Training, Medical, and Other Personnel Activities |
| 9 | Administrative and Associated Activities          |
| 0 | Support of Other Nations                          |

R&D Category Number

## 1 Research:

Scientific study and experimentation directed toward increasing knowledge and understanding in those scientific fields that are related to long-term national security needs.

Fundamental knowledge for solution of identified military problems.

Exploration and/or advanced development in defense-related technologies of new or improved military functional capabilities.

## 2 Exploratory Development:

Efforts directed toward solving specific military problems from fundamental applied research to sophisticated prototype hardware, study, programming, planning, and minor developmental efforts.

Efforts pointed toward specific military problem areas with a view toward developing and evaluating feasibility and practicability of proposed solutions and determining their parameters.

### 3 Advanced Development:

Projects that have moved into developing hardware and nonmateriel technological prototypes of techniques for demonstration testing and operational testing.

Technological options or uncertainties. These are characterized by the development of component, subsystem, technology demonstrators (including manufacturing technology research tasks) and non-materiel technological demonstrators that have potential application to a variety of similar generic end products or to a specific, well-defined system.

### 4 Engineering Development:

Developmental projects that are being engineered for military service but have not been type classified. These are characterized by line-item projects.

### 5 Management and Support:

R&D efforts directed toward supporting installations or operations required for general R&D use.

Efforts directed toward the operation and support of general administrative RDTE activities, RDTE liaison offices, test ranges, operational testing, as well as scientific, technical, and management activities.

### 7 Operational Systems Development:

Program elements that constitute RDTE costs associated with operational systems.

R&D efforts directed toward development, engineering, and test of systems, support equipment, vehicles, and weapons that have been approved for production and service employment.

#### Equipment/Activity Type

- |   |                                                  |
|---|--------------------------------------------------|
| 1 | Military Science                                 |
| 2 | Aircraft and Related Equipment                   |
| 3 | Missiles and Related Equipment                   |
| 4 | Military Astronautics and Related Equipment      |
| 5 | Ships, Small Craft, and Related Equipment        |
| 6 | Ordnance, Combat Vehicles, and Related Equipment |
| 7 | Other Equipment                                  |
| 8 | Defense-Wide Management Support                  |

#### Serial Number

Assigned by the Individual Service/Agency.

Service or Agency Code

|   |                                                      |
|---|------------------------------------------------------|
| A | Department of the Army                               |
| B | Defense Mapping Agency                               |
| C | Strategic Defense Initiative Organization            |
| D | Department of Defense                                |
| E | Defense Advanced Research Products Agency            |
| F | Department of the Air Force                          |
| G | National Security Agency                             |
| H | Defense Nuclear Agency                               |
| I | Defense Reconnaissance Support Activities            |
| K | Defense Communications Agency                        |
| L | Defense Intelligence Agency                          |
| M | United States Marine Corps                           |
| N | Department of the Navy                               |
| S | Defense Logistics Agency                             |
| T | DOD Test and Evaluation                              |
| W | Uniformed Services University of the Health Sciences |

## LIFE-CYCLE MANAGEMENT

## ACQUISITION STREAMLINING

In order to get operationally effective and supportable equipment into the hands of troops early, AMC has designed a new life-cycle management model which is called the AMC Streamlined Acquisition Process (ASAP) to shorten the acquisition cycle. A new feature is for development programs to go straight from a proof-of-principle phase into a development prove-out phase. Essential elements of the old demonstration/validation phase will be accomplished in the tech base and proof-of-principle phase. In addition, AMC will accomplish transition from technology development (6.2 and 6.3) to system development (6.4), when possible, by demonstrating the technology in the hands of the troops prior to entering development. ASAP is shown in Figure 3 along with the traditional process for comparison.

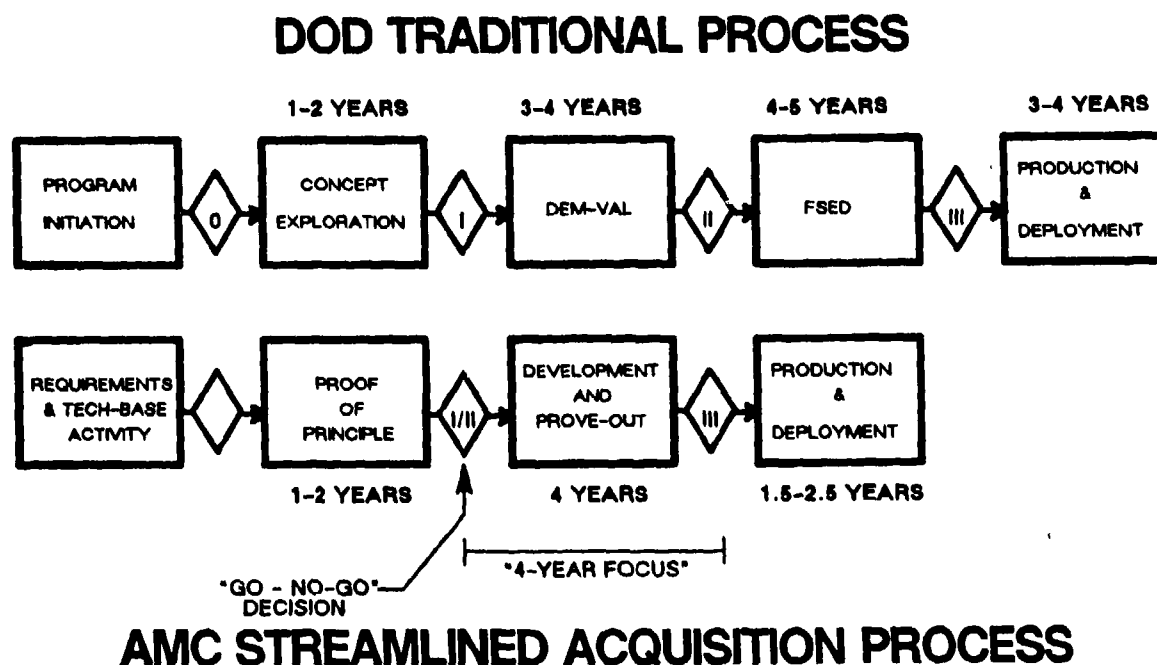


Figure 3. Comparison of the Streamlined and Traditional Acquisition Processes

To demonstrate the technology, a brassboard prototype system will be placed in the hands of user troops and they will use the system in accordance with an O&O plan developed by the Training and Doctrine Command (TRADOC). Ideally, the demonstration process should end in proof-of-principle completion of a ROC, acceptance of the concept, and a commitment of the Army to the system.

The streamlined model accomplishes essential portions of concept exploration and demonstration/validation in the tech-base and proof-of-principle phases, with the first major milestone, a collapsed Milestone I/II, held at the entry to full-scale development and representing a "go/no-go" commitment to the program. This change will permit greater flexibility with RDTE funding in that it eliminates the artificial distinction between system- and non-system advanced development. The accelerated cycle requires early technology focus on the O&O concept, statement of user needs in flexible terms to allow room for operational approaches, demonstration of concepts and components in the proof-of-principle phase, and production readiness prove-out during development. With this approach, accomplishment of full-scale development and production prove-out within the four-year goal is attainable.

Good, up-front planning is essential to successful streamlining. The Army must firm up requirements early and with proper thought and attention to realism; realism in what the materiel must do and the resources to acquire the materiel. This planning must be balanced against the need to avoid premature application of design solutions and premature formulation and enforcement of detailed requirements. Furthermore, DOD policy states that requirements that are not mandated by law or established DOD policy and that do not contribute to the operational effectiveness and suitability of the system or effective management of its acquisition, operation, or support shall be excluded.

A good investment strategy yields a stable program, clearly showing where we are today and where we want to be when we bring on the new system. The Mission Area Materiel Plan (described on page 26) is a key element in this planning because it shows how we eliminate or reduce the impact of the most important of the battlefield deficiencies within allocated resources all within a total acquisition strategy.

The Army expects to reduce risk by bringing to development only mature components and then pre-plan product improvements for follow-on insertion of those technologies that were not ready at the time of initial development. Engineering development then consists primarily of systems integration, integrated logistics support, and production readiness.

Testing must be well-planned and executed. The Army must build on new data, share data with the entire community, work together to analyze and fix, and not take previous failures into the next test.

During all acquisition phases, solicitations and contracts shall state management requirements in terms of results needed rather than how-to-manage procedures for achieving those results. The Army will only specify the minimum required management data to satisfy program needs. The Army shall attempt to use the contractor's management systems, internal procedures, methods, processes, and data-product formats instead of specifying other approaches.

## LOGISTICS RESEARCH AND DEVELOPMENT (LOG R&D)

LOG R&D is a DOD-wide program to fund projects that are outside weapons systems' development programs in order to improve reliability and maintainability, to improve the support elements needed to operate and maintain weapons systems, and to improve the overall Logistics Support System. It is intended to develop, demonstrate, and transfer broad application technologies, to increase inherent weapon reliability/availability/maintainability (RAM), to improve integrated logistics support (ILS), and to achieve productivity gains through logistics systems. LOG R&D includes basic research, technology demonstrations, and subsystem development projects.

In contrast to unique support elements developed within a specific weapon program (e.g., manuals, built-in test equipment, and training devices), LOG R&D develops, demonstrates, and transfers technology for general use and standardized application. It seeks to drive down support costs and reduce support manpower requirements, while improving producibility, inherent weapon availability, and increased logistics support capabilities.

LOG R&D applies technologies to reduce weight, volume, cost, and manpower requirements while improving logistics system effectiveness, logistics unit productivity, logistics lines of communication, throughput, and logistics management efficiency.

Typical technologies that fall under LOG R&D include--

- Composite Materials
- Self-test Capabilities
- Prognostics
- Diagnostics
- Artificial Intelligence Applications
- Tribiology
- Containerization and Packaging
- Ultra-reliable Electronics
- Fuel Conservation
- Fuel Distribution Systems
- Battlefield Casualty Management
- Battlefield Damage Control and Repair
- Corrosion Control
- Producibility Enhancements
- Maintainability Enhancements

## MANPOWER AND PERSONNEL INTEGRATION (MANPRINT)

MANPRINT is the recent Army initiative that makes the following considerations imperative in the materiel acquisition process:

- Human Factors Engineering
- Training
- Manpower
- Systems Safety
- Personnel
- Health Hazards Assessments

The philosophy behind MANPRINT is that soldiers are the Army's most important resource. Emphasis throughout the Army on MANPRINT will ensure that soldiers are considered during the materiel development process from pre-concept exploration up to and including product improvements. The Army will use the initiative to apply human factors engineering and system analysis to help soldier-machine systems reach maximum performance within specified constraints.

How will this new MANPRINT initiative effect you, the contractor? First, reviews of IR&D will include MANPRINT issues as one of the evaluation items. Obviously, high IR&D ratings will be a strong incentive for you to develop advanced MANPRINT technologies. Furthermore, requests for proposal (RFPs) will specify MANPRINT needs and constraints, and MANPRINT experts will be part of the proposal-evaluation process.

There are two types of MANPRINT contributions to the design of materiel. First, there are inputs like human factors engineering analyses, early comparability analyses, task analyses, personnel skills requirements, and logistics-needs assessments. The second type of contribution is the development of generic analytic tools for answering important MANPRINT questions such as whether the soldier can operate the equipment effectively, how well complex soldier-machine interfaces work, what kind of training is required, and so forth.

MANPRINT goals can only be accomplished through close cooperation between industry and the Army. The Army team comprises program managers, ILS managers, TRADOC system managers, safety officers, and testers as well as representatives from the LABCOM Human Engineering Laboratory, the Office of the Surgeon General, and the Army Research Institute for the Behavioral and Social Sciences.

## KEY OPERATIONAL CAPABILITIES

The Army has identified five key operational capabilities (KOCs) to help focus its emphasis between now and the twenty-first century to ensure that, at each stage of the RDA process, deficiencies, priorities, and resource allocations are weighed in terms of enhancing these capabilities. While focusing on the five KOCs, the Army is simultaneously considering three additional factors (lighten the force, low intensity conflict, and deep battle), which together with the KOCs comprise the "big five plus three." The KOCs represent just one way that the Army classifies RDA programs to facilitate the focusing process; selected taxonomies are shown in Figure 4 at the end of this section. The following is a list of the KOCs along with their objectives and supporting technologies:

### Soldier and Unit Performance Enhancement

#### Objectives:

- Maximize soldier combat capability
- Develop leader combat flexibility
- Enhance soldier combat survivability
- Increase unit productivity

#### Supporting Technology:

- Autonomous data integration
- Soldier/machine interface
- Network integration
- Nuclear, biological, and chemical (NBC) pretreatment, decontamination, and therapeutics
- Physical, psychological, and mental reinforcements
- Imbedded training and maintenance expert aids
- Integration of MANPRINT

### Command, Control, and Communications (C<sup>3</sup>)

#### Objectives:

- Improve ability of commanders to win
- Increase combat output for signal personnel
- Enhance continuity of C<sup>3</sup> function

#### Supporting Technology:

- Improved hardware design
- Relational database management
- Advanced display technology
- Battlefield identification capability
- Modular communications and data processing
- Portable extremely high-frequency tactical communication
- Next-generation architecture

### Reconnaissance, Surveillance, and Target Acquisition (RSTA)

#### Objectives:

- Enhance battlefield intelligence
- Enhance munition vectoring capability
- Enhance survivability of sensor platforms
- Increase combat output of RSTA soldiers

#### Supporting Technology:

- Sensor netting, preprocessing, and correlation and real-time displays
- Advanced sensors for signal detection, recognition, and exploitation of laser, digital, millimeter wave (MMW), and low probability-of-intercept signals

Reconnaissance, Surveillance, and Target Acquisition (RSTA) (Cont'd)

Supporting Technology (Cont'd)

- Multispectral, multimode sensors
- High-accuracy location systems
- Artificial intelligence decision aids
- Automatic target recognition and cueing
- Embedded weapon system surveillance
- Subsystem and communications interfaces
- Non-cooperative Identification, Friend or Foe (IFF)

Battlefield Sustainment

Objectives:

- Balance pre-position war reserve
- Eliminate unneeded weight and bulk
- Field-survivable logistics support systems
- Significantly reduce maintenance requirements
- Reduce logistics demand for resources
- Field-capability to manage mass casualties
- Protect critical industrial-base resources

Supporting Technology:

- High-speed automated petroleum, oil, and lubricants (POL), water distribution
- Survivable forward-area logistics vehicles
- Night maintenance capability
- Embedded prognostic/diagnostic capability
- Follow-on supply, maintenance, and transportation management
- Logistics Robotics
- Fail-safe, ultra-reliable electronics
- Reduced signature, enhanced efficiency power generation equipment
- Reduced battlefield POL consumption
- NBC rations

Battlefield Lethality

Objectives:

- Expand area of influence of battlefield commanders
- Ensure survivability of forces
- Develop anti-armor leap-ahead
- Ensure mutually supporting indirect fire and extended air defense

Supporting Technology:

- Affordable, multimode, counter-measure resistant, all-weather capable advanced seekers and guidance technology
- Advanced propellants
- Warheads with increased kinetic-energy (KE) and chemical-energy (CE) penetration
- Advanced air-defense coverage
- Total force survivability in a chemical/biological environment
- Advanced countermeasure system for ground combat

## KEY OPERATIONAL CAPABILITIES

### "BIG FIVE"

COMMAND, CONTROL, & COMMUNICATION  
RECONNAISSANCE, SURVEILLANCE, AND TARGET ACQUISITION  
BATTLEFIELD LETHALITY  
BATTLEFIELD SUSTAINMENT  
SOLDIER & UNIT PERFORMANCE ENHANCEMENT

### "PLUS THREE"

LIGHTEN THE FORCE  
LOW INTENSITY CONFLICT  
DEEP BATTLE

## LONG-RANGE RDA PLAN MISSION AREAS

AIR DEFENSE  
BATTLEFIELD INFORMATION & COMMAND / CONTROL /  
CLOSE COMBAT COMMUNICATIONS / COMPUTERS  
COMBAT SERVICE SUPPORT  
COMBAT SUPPORT / AVIATION / INTELLIGENCE / ELECTRONIC WARFARE  
FIRE SUPPORT  
TRAINING

## ARMY RESEARCH OFFICE TECH-BASE FUNCTIONAL AREAS

LOGISTICS  
MOBILITY  
VULNERABILITY  
NBC INDIVIDUAL PROTECTION  
TARGET ACQUISITION  
LETHALITY  
COMMAND, CONTROL, & COMMUNICATIONS  
ELECTRONIC COUNTERMEASURES / ELECTRONIC COUNTER-COUNTERMEASURES (ECM/ECCM)  
MINE FIELDS / OBSTACLES

## TRAINING & DOCTRINE COMMAND MISSION AREAS

### "THIRTEEN"

FIRE SUPPORT  
NUCLEAR, BIOLOGICAL, CHEMICAL (NBC)  
BATTLEFIELD NUCLEAR WARFARE  
CLOSE COMBAT, LIGHT  
AVIATION  
COMMUNICATIONS  
COMMAND & CONTROL  
INTELLIGENCE / ELECTRONIC WARFARE  
AIR DEFENSE  
CLOSE COMBAT, HEAVY  
COMBAT SERVICE SUPPORT  
ENGINEER AND MINE WARFARE  
SPECIAL OPERATIONS FORCES

### "PLUS TWO"

TRAINING  
STRATEGIC DEFENSE INITIATIVE

## THRUSTS

SENSORS  
SIGNAL PROCESSING  
INFORMATION PROCESSING  
ROBOTICS  
EXPERT SYSTEMS

FIGURE 4. SELECTED ARMY TAXONOMIES

### THE MISSION AREA MATERIEL PLAN (MAMP) PROCESS

Although the evolution of the MAMP is an inherent part of the entire research, development, and acquisition (RDA) review process, its formulation, review, and approval are treated here as a separate process. The MAMPs are based on DA's Long-Range Research, Development, and Acquisition Plan (DA LRRDAP), threat analyses, and on TRADOC's prioritization of the Army battlefield deficiencies reflected in the TRADOC Battlefield Development Plan (BDP). The MAMPs are developed through a fully integrated multiappropriation effort jointly established by the materiel developer (AMC) and the combat developer (TRADOC) to address systematically the user's deficiencies and propose systems strategies that will provide acceptable materiel solutions in a timely manner. The objectives of this process are four-fold: (1) to focus AMC's RDA Program on solving critical battlefield deficiencies; (2) to address user needs in an integrated planning framework; (3) to address all resources available, placing those resources in programs that provide the highest payoff; and (4) to articulate an investment strategy that is sellable to DA, DOD, and Congress. Thus, the MAMP is AMC's baseline RDA planning document.

Through the MAMP process, the focus on the RDA planning and review is transferred from an MSC/commodity basis to a mission-area basis. The MAMPs are defined and analyzed in terms of the 13 TRADOC mission areas plus a special interest area, training. They are listed in Figure 4.

### TRADOC RESPONSIBILITIES

HQ TRADOC coordinates the prioritization and integration of battlefield deficiencies derived from the Mission Area Analysis (MAA) process. (MAAs translate elements of the overall battlefield concept into requirement for materiel development. Mission Area Development Plans (MADPs) translate MAA-corrective actions into specific projects with milestone schedules.) The prioritization process consists of three phases. In Phase I, the mission area proponents identify and prioritize a number of deficiencies by mission area. In Phase II, TRADOC general officers integrate the Phase I lists of deficiencies into a strawman BDP list. In Phase III, a single general officer panel, which includes representatives from HQDA and the major commands, makes the final adjustments to the Phase II list before its being given to the TRADOC Commanding General for approval. The BDP is then published.

The BDP is the pivotal document that represents TRADOC's corporate consensus of future battlefield doctrine, organization, training, and materiel deficiencies. In addition, the BDP deficiency list becomes the principal basis used by TRADOC and AMC to align funding priorities for programs in the LRRDAP.

## AMC RESPONSIBILITIES

AMC's efforts are involved with estimating or describing the following:

Current systems, near-term systems, and future systems, including block modifications and product-improvement programs.

Key milestones for each system and transition milestones from one system to its successor.

Supporting technology base efforts essential to development projects for bringing on new systems and product improvements.

New starts.

Independent R&D and foreign supporting technologies as alternatives to ongoing or proposed Army work.

Significant changes from prior approved program within the system "family."

The bottom 15 percent of funded systems and the top 15 percent of unfunded systems.

Systems and technologies that cross mission area boundaries.

Special thrusts such as MANPRINT and logistics R&D.

### Industry Participation

Even though industry does not participate directly in the MAMP process, we welcome and encourage indirect industry participation. In order to support this participation, AMC and TRADOC jointly publish a compendium of the MAMPs in "Materiel for Winning." We need you to tell us about the technologies and systems that you are developing under, say, IR&D. You can do this by submitting UPs, responding to BAAs, competitive procurements, and sources-sought announcements. In addition, we encourage you to obtain "Materiel for Winning" and to schedule meetings with the appropriate Army scientists and engineers. The TILOs can help you arrange these meetings.

## DESIGN TO COST

Design to cost (DTC) is an acquisition management technique used to control program costs, specifically production and ownership (operations and support) costs. The intent is to influence production and ownership costs during the design/development phases (concept exploration through full-scale development) by focusing on the cost and performance tradeoffs needed to define an affordable system that meets or exceeds required performance levels. The DTC objective is to achieve a proper balance among production and operation and support (O&S) costs. That balance will, of course, vary from program to program depending on the particular requirements a program manager is attempting to satisfy.

To be effective, AMC must address the control of production and O&S costs in development contracts and must treat them as active design parameters. We must establish, track, and compare specific unit production cost goals and thresholds with negotiated production costs. Similarly, developers must select and track specific O&S parameters until they can determine the level of achievement in circumstances that approximate a mature operating environment.

The DTC parameters for O&S may be expressed in dollars or by other measurable factors such as unit operating crew and maintenance manpower requirements or operational and logistics reliability and maintainability requirements. Design-controllable factors should be selected in accordance with DOD Directive 500.40, "Reliability and Maintainability," and should be those that--

Significantly affect O&S costs (cost drivers must be linked to the design process).

Can be measured during test and evaluation and in the operational environment.

Contracting procedures will usually include DTC initiatives to provide a financial reward to contractors after a demonstration that actual costs or other measurable factors are at or below stated goals or, on the O&S side, demonstrate that reliability and maintainability parameters have been met.

## DESIGN FOR DISCARD

The anticipated highly dispersed battlefields of the future require that equipment be repaired as far forward as possible by means of rapid replacement of modules and assemblies. To ensure improved supportability of Army systems on these future battlefields, AMC has designated "design for discard in lieu of repair" as the top priority for design of modules and assemblies. This means that contractors must strive for modularity of design, ease of fault isolation to the replaceable component by built-in test capability or simple external tests, speed and ease of replacement, and (most of all) highest reliability at lowest possible cost. Some combination of these factors is necessary operationally and economically to justify discard in lieu of repair.

Developers must perform trade-off analyses to justify DFD as early as possible in the life cycle, preferably during concept evaluation. Furthermore, the AMC community shall use approved level of repair analysis (LORA) techniques to support the analyses.

**SMALL BUSINESS INNOVATION RESEARCH PROGRAM**

The U.S. Army is an active participant in the Federal Small Business Innovation Research (SBIR) Program mandated by the Small Business Innovation Development Act of 1982, Public Law (PL) 97-219. The objectives of the program include stimulating technological innovation in the private sector, strengthening the role of small business in meeting DOD R&D needs, fostering and encouraging participation by minority and disadvantaged persons in technological innovation and in increasing the commercial application of DOD-supported research or R&D results. For the purpose of the SBIR program, a small business is a firm having fewer than 500 employees.

DOD publishes an annual solicitation in the September-October timeframe. Winning proposers are awarded Phase I contracts for one-half to one man-year efforts over a period generally not to exceed six months, subject to negotiation. The purpose of these Phase I efforts is to determine, insofar as possible, the scientific or technical merit and feasibility of ideas submitted under the SBIR program. Subsequent Phase II awards are made only to firms on the basis of results from the Phase I effort and the scientific and technical merit of the Phase II proposal. Such awards typically cover 2 to 5 man-years of effort over a period generally not to exceed 24 months, subject to negotiation. Phase II is the principal research or R&D effort and is expected to produce a well-defined deliverable product or process. The legislative history of PL 97-219 clearly envisioned that Phase I and II awards would be in the neighborhood of \$50k and \$500k, respectively. DOD invites firms with strong R&D capabilities in science or engineering in any of the topic areas described in the solicitation to participate.

As required for all Federal solicitations, DOD announces the availability of the SBIR solicitation in the CBD. Interested parties may order copies directly from the DTIC by calling toll-free (800) 368-5211 or commercial (202) 274-6902 (from Maryland, Virginia, The District of Columbia, Alaska, and Hawaii).

# ELECTRONIC EQUIPMENT DESIGNATIONS

Each item of U.S. military electronic equipment is assigned an identifying alphanumeric designation that can be used to determine the platform for which the equipment was designed, the type of equipment, and its function. The formal name is the Joint Electronics Type Designation System; however, it is commonly referred to as the "AN System." The AN number has the following form:

"AN / a b c system number (V)" where:

"a" is the platform:

|   |                              |   |                                                |
|---|------------------------------|---|------------------------------------------------|
| A | Piloted aircraft             | S | Water                                          |
| B | Underwater mobile, submarine | T | Ground transportable                           |
| D | Pilotless carrier            | U | General utility                                |
| F | Fixed ground                 | V | Vehicular (ground)                             |
| G | General ground use           | W | Water surface and underwater combination       |
| K | Amphibious                   | Z | Piloted/pilotless airborne vehicle combination |
| M | Mobile (ground)              |   |                                                |
| P | Portable                     |   |                                                |

"b" is the equipment type:

|   |                                            |   |                                  |
|---|--------------------------------------------|---|----------------------------------|
| A | Invisible light, heat radiation            | N | Sound in air                     |
| C | Carrier                                    | P | Radar                            |
| D | Radiac                                     | Q | Sonar and underwater sound       |
| G | Telegraph or teletype                      | R | Radio                            |
| I | Interphone and public address              | S | Special or combinations of types |
| J | Electromechanical or inertial wire covered | T | Telephone (wire)                 |
| K | Telemetering                               | V | Visual and visible light         |
| L | Countermeasures                            | W | Armaments                        |
| M | Meteorological                             | X | Facsimile or television          |
|   |                                            | Y | Data processing                  |

"c" is the equipment function or purpose:

|   |                                                     |   |                                            |
|---|-----------------------------------------------------|---|--------------------------------------------|
| B | Bombing                                             | N | Navigational aids                          |
| C | Communications                                      | Q | Special or combination of purposes         |
| D | Direction finder reconnaissance and/or surveillance | R | Receiving, passive detecting               |
| E | Ejection and/or release                             | S | Detecting and/or range and bearing, search |
| G | Fire control or searchlight directing               | T | Transmitting                               |
| H | Recording and/or reproducing                        | W | Automatic flight or remote control         |
| K | Computing                                           | X | Identification and recognition             |
| M | Maintenance and/or test assemblies                  | Y | Surveillance and control                   |

"(V)" Variable configurations available or "(X)" Experimental

## THE DEFENSE TECHNICAL INFORMATION CENTER

DTIC, an element of the Defense Logistics Agency, is a major component of the DOD scientific and technical information program. DTIC contributes to the management and conduct of Defense R&D efforts by providing access to and transfer of scientific information for DOD personnel, contractors, and potential contractors as well as other U.S. Government agency personnel and their contractors. The Center is located at Cameron Station in Alexandria, Virginia, with field offices in Los Angeles, California, and Bedford, Massachusetts.

The DTIC collection comprises over 1.2 million technical reports under computer control and an additional 300,000 documents available for manual searching. The database consists of bibliographic citations and related summaries concerning planned, ongoing, and completed research. Two of the databases of interest to readers of this primer are the Research and Technology Work Unit Information System and Technical Reports. The former contains summaries of research projects that are currently being performed by DOD and National Aeronautics and Space Administration (NASA) or by their contractors. The latter database is a compilation of abstracts of reports on completed research efforts. The collection is specialized and includes areas normally associated with Defense such as aeronautics, missile and space technology, navigation, and weapons; however, DOD's and NASA's interests are widespread and include such disciplines as biology, chemistry, energy, environmental sciences, oceanography, computer sciences, sociology, and human-factors engineering.

In addition to maintaining the extensive collection of reports and work unit summaries, DTIC provides a family of publications to aid users of their services. Foremost among these publications is the Technical Report Awareness Circular (TRAC), a monthly unclassified (limited) listing of citations to all announced reports (unclassified unlimited, unclassified limited, and classified). There will be five indexes: corporate author/monitoring agency, title, personal author, contract number, and report number. There will be no subject index nor abstracts, however.

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You may learn more about DTIC services by calling (202) 274-7633.

## ACRONYMS AND ABBREVIATIONS

|                   |                                                                            |
|-------------------|----------------------------------------------------------------------------|
| AD                | Advanced Development                                                       |
| ADD               | Automatic Document Distribution                                            |
| AMC               | Army Materiel Command                                                      |
| AMCCOM            | Armament, Munitions, and Chemical Command                                  |
| AMIM              | Army Materiel Information Memorandum                                       |
| APBI              | Advance Planning Briefing for Industry                                     |
| APCP              | Army Potential Contractor Program                                          |
| ARI               | Army Research Institute for the Behavioral and Social Sciences             |
| ARO               | Army Research Office                                                       |
| ASA(RDA)          | Assistant Secretary of the Army for Research, Development, and Acquisition |
| AVSCOM            | Aviation Systems Command                                                   |
| BAA               | Broad Agency Announcement                                                  |
| BDP               | Battlefield Development Plan                                               |
| CAB               | Current Awareness Bulletin                                                 |
| CB <sup>3</sup> D | Commerce Business Daily                                                    |
| C <sup>3</sup>    | Command, Control, and Communications                                       |
| CE                | Chemical Energy                                                            |
| CECOM             | Communications-Electronics Command                                         |
| DA                | Department of the Army                                                     |
| DART              | Director of Army Research and Technology                                   |
| DCSLOG            | Deputy Chief of Staff for Logistics                                        |
| DCSOPS            | Deputy Chief of Staff for Operations and Plans                             |
| DCSPER            | Deputy Chief of Staff for Personnel                                        |
| DCSRDA            | Deputy Chief of Staff for RDA                                              |
| DESCOM            | Depot Systems Command                                                      |
| DFC               | Design for Discard                                                         |
| DTC               | Design to Cost                                                             |
| DLA               | Defense Logistics Agency                                                   |
| DOD               | Department of Defense                                                      |
| DROLS             | Defense Research, Development, Test, and Evaluation On-Line System         |
| DTIC              | Defense Technical Information Center                                       |
| ED                | Engineering Development, Exploratory Development                           |
| FSED              | Full-Scale Engineering Development                                         |
| HQDA              | Headquarters, Department of the Army                                       |
| IFF               | Identification, Friend or Foe                                              |
| ILS               | Integrated Logistics Support                                               |
| IR&D              | Independent Research and Development                                       |
| JATO              | Jet Assisted Take Off                                                      |
| KE                | Kinetic Energy                                                             |
| KOC               | Key Operational Capability                                                 |
| LABCOM            | Laboratory Command                                                         |
| LABCOM CT         | LABCOM Corporate Technology (Deputy Chief of Staff for)                    |
| LABCOM TPM        | LABCOM Technology Planning and Management Directorate                      |
| LOA               | Letter of Agreement                                                        |
| LOG R&D           | Logistics Research and Development                                         |
| LORA              | Level of Repair Analysis                                                   |
| LRRDAP            | Long-Range Research, Development, and Acquisition Plan                     |
| MAMP              | Mission Area Materiel Plan                                                 |
| MANPRINT          | Manpower and Personnel Integration                                         |
| MICOM             | Missile Command                                                            |
| MMW               | Millimeter Wave                                                            |

|          |                                                         |
|----------|---------------------------------------------------------|
| MOU      | Memorandum of Understanding                             |
| MRD      | Material Requirement Document                           |
| MSC      | Major Subordinate Command                               |
| NASA     | National Aeronautics and Space Administration           |
| NBC      | Nuclear, Biological, Chemical                           |
| OASD     | Office of the Assistant Secretary of Defense            |
| O&O Plan | Organizational and Operational Plan                     |
| O&S      | Operation and Support                                   |
| OSD      | Office of the Secretary of Defense                      |
| OTEA     | Operational Test and Evaluation Agency                  |
| OUSD     | Office of the Under Secretary of Defense                |
| PEDS     | Program Element Descriptive Summary                     |
| PM       | Program Manager, Project Manager                        |
| POL      | Petroleum, Oil, and Lubricants                          |
| RAM      | Reliability, Availability, Maintainability              |
| RAM-D    | Reliability, Availability, Maintainability - Durability |
| R&D      | Research and Development                                |
| RDA      | Research, Development, and Acquisition                  |
| RD&E     | Research, Development, and Engineering                  |
| RDTE     | Research, Development, Test, and Evaluation             |
| RFP      | Request for Proposal                                    |
| ROC      | Required Operational Capability                         |
| RSTA     | Reconnaissance, Surveillance, and Target Acquisition    |
| SBIR     | Small Business Innovation Research Program              |
| TACOM    | Tank-Automotive Command                                 |
| TECOM    | Test and Evaluation Command                             |
| TILO     | Technical and Industrial Liaison Office                 |
| TRAC     | Technical Report Awareness Circular                     |
| TRADOC   | Training and Doctrine Command                           |
| TROSCOM  | Troop Support Command                                   |
| UP       | Unsolicited Proposal                                    |

The proponent agency for this pamphlet is the U.S. Army Laboratory Command. Users are invited to send comments and suggested improvements on DA Form 2028 (Recommended Changes to Publications and Blank Forms) to Cdr, U.S. Army LABCOM, ATTN: AMSLC-TP-TI, 2800 Powder Mill Road, Adelphi, MD 20783-1145.

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| <p>Commander<br/> U.S. Army Chemical Research, Development<br/> and Engineering Center<br/> ATTN: SMCCR-OPP<br/> Aberdeen Proving Ground, MD 21010-5423</p> | 100 |
| <p>Director<br/> U.S. Army Benet Weapons Laboratory<br/> ATTN: SMCAR-CCB-TP<br/> Watervliet, NY 12189-5000</p>                                              | 100 |

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|-------------------------------------------------------------------------------------------------------------------------|-----|
| Commander<br>U.S. Army Atmospheric Sciences Laboratory<br>ATTN: SLCAS-D<br>White Sands Missile Range, NM 88002-5501     | 10  |
| Commander<br>U.S. Army Materiel Command<br>ATTN: AMCDE<br>5001 Eisenhower Avenue<br>Alexandria, VA 22333-0001           | 1   |
| Commander<br>U.S. Army Materiel Command<br>ATTN: AMCSB<br>5001 Eisenhower Avenue<br>Alexandria, VA 22333-0001           | 10  |
| Commander<br>U.S. Army Vulnerability Assessment Laboratory<br>ATTN: SLCVA-D<br>White Sands Missile Range, NM 88002-5513 | 10  |
| Director<br>U.S. Army Electronics Technology and<br>Devices Laboratory<br>ATTN: SLCET-D<br>Ft. Monmouth, NJ 07703-5302  | 10  |
| Director<br>U.S. Army Harry Diamond Laboratories<br>ATTN: SLCHD-D<br>2800 Powder Mill Road<br>Adelphi, MD 20783-1197    | 10  |
| Commander<br>U.S. Army Materiel Command<br>Support Activity<br>ATTN: AMSTB-T-I<br>Ft. Lewis, WA 98433-5000              | 100 |