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RACIC report

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RACIC report

REMOTE AREA CONFLICT INFORMATION CENTER SELECTED ACCESSION LIST

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FOREWORD

This annotated monthly accession list is based on information received in the Remote Area Conflict Information Center (RACIC) in support of Project AGILE of the Advanced Research Projects Agency (ARPA). The indicated abbreviation or word precedes the title of the extract when the document is significantly concerned with one of the areas listed below:

COMM-SURV	Communications and Surveillance
ENVIR SCI	Environmental Sciences
FIREPOWER	Firepower
LIFE SCI	Life Sciences
MOBILITY	Mobility
PHYS SCI	Physical Sciences
MISC	Miscellaneous

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AVAILABILITY OF INFORMATION

Comprehensive extracts of the listed items are available for study at the RACIC-Washington and RACIC-Columbus facilities. Original items are available for study at the Columbus facility but can be made available, in most cases, at the Washington facility.

Duplicate copies of reports may be requested by AD number from the Defense Documentation Center. The AD number is provided, when known, with the annotation for the report.

COMM-SURV (PA 16, 116) Secure Communications - A Literature Survey (U). Edythe Moore, El Segundo Technical Operations, Aerospace Corporation, El Segundo, California, Report No. TOR-269(9990)-5, LRG-63-B-17, November, 1964 (November 1, 1963), AF 04(695)-269 (Commander, Space Systems Division, Air Force Systems Command, Los Angeles Air Force Station, Los Angeles, California), AD 355 990. (Secret)

(U) One hundred thirty-seven references on the multiple aspects of secure communications have been compiled.

LIFE SCI (PA 16, 124) Batrachotoxin. The Active Principle of the Colombian Arrow Poison Frog, Phyllobates Bicolor. Journal of the American Chemical Society, January 5, 1965, pp 124-126. (Unclassified)

The venom obtained by Marki and Witkop from the skin of the Colombian arrow poison frog, Phyllobates bicolor, is the most active venom so far known. The recent expedition (December, 1963-January, 1964) to the Choco rain forest of Western Colombia netted 2400 frogs whose skin extracts yielded a total of 30 mg of the crystalline major active principle which was named batrachotoxin. The exact molecular weight of batrachotoxin was determined by high-resolution mass spectrometry to be 399.2413, which corresponds to the empirical formula $C_{24}H_{33}NO_4$ (mol. wt calculated: 399.2409).

MISC (PA 16, 127) Survey of Casualties Republic of Vietnam Military Forces 1962 (U). Richard T. Borden, Richard W. Parker, Jr., and Robert B. Ryan, Research Analysis Corporation, Field Office, Vietnam, Field Paper RACFO-V FP-1, October, 1964, SD-212 (ARPA), ARPA Order No. 272, RAC 65-881, 138 pp. (Confidential)

(C) This paper surveys and analyzes the military-battle and accident admission records of the military hospitals in the Republic of Vietnam for the year 1962. (1) The battle-casualty admissions to the hospitals are predominantly casualties taken by the conventionally organized forces (the RVNAF) engaged in a counterinsurgency situation. (2) The military-casualty experience of the RVNAF displays patterns similar to those reported for U. S. forces in the Pacific and in Korea under conditions in which enemy use of field artillery was negligible or nonexistent and the use of enemy mortars was limited. (3) The ratio of combat casualties for the RVNAF killed in action to wounded in action, with the best available data, was found to be 1:3. (4) Military-operations data indicate that the RVNAF (and the para-military forces) casualties were taken largely when in a defensive posture. (5) Correlation between the reported level of military operations (RVNAF initiated) and casualties recorded in the hospital admissions was found to be poor. (6) The casualty data reflected variations in the effectiveness and employment of enemy weapons. (7) A large proportion of the casualties admitted to the hospitals resulted from accidents. Nearly one out of every four of all RVNAF casualties admitted was due to an accident, and 55 per cent of these accidents involved vehicles. (8) The increased use of helicopter-evacuation methods during 1962 did not appear to result in reduced casualty recovery time or fewer deaths from wounds, as might be expected with a presumed shorter elapsed time from the incurrence of the wound to hospitalization.

LIFE SCI (PA 16,135) Research on New Chemical Incapacitating Agents - Part I (U) (June, 1963 - June, 1964). Chas. Pfizer & Co., Inc., Annual Report 1, DA 18-108-AMC-240(A) (Army CRDL), 57 pp. (Confidential)

(C) During the first quarter of the contract period, it was necessary to devote a large part of the effort to organizing the research program. A variety of leads has been considered in the research program on incapacitating agents. The program on new incapacitating agents has been directed toward two major groups of chemical structures for exploration; the thymol ethers and the substituted 2-aminoimidazolines.

MISC (PA 16,137) A Further Analysis of the Effectiveness of Psychological Warfare. Lessing A. Kahn, The Johns Hopkins University, and Thomas G. Andrews, University of Maryland, The Journal of Applied Psychology, Vol. 39, No. 5, 1965, pp 386-374. (Unclassified)

The purpose of these researches was to determine certain of the antecedent and attendant psychological factors that influence the effectiveness of tactical psychological warfare. The present study is on the Communist Terrorists of Malaya. The basic hypothesis of this study was that it would be possible to isolate certain factors that had predisposed individuals and groups differentially to increased receptiveness for propaganda. The primary results are presented in a correlation matrix. Relationships of possible military and social importance are deducible from the data obtained.

PHYS SCI (PA 16,148) Corrosion of Metals in Tropical Environments Part 6 - Aluminum and Magnesium. C. R. Southwell, C. W. Hummer, Jr., and A. L. Alexander, Organic and Biological Chemistry Branch, Chemistry Division, U. S. Naval Research Laboratory, Washington, D. C., NRL Report 6105, December 1, 1964, AD 609 618, 16 pp. (Unclassified)

This report is on a long-term study of the corrosion rates of 50 metals and alloys exposed to five local environments in tropical latitudes. Most metals were exposed for 16 years.

LIFE SCI (PA 16,149) Feasibility and Design Summary Report (Phases I and III) on Collective Protection for Combat Field Structures, Volume I (June, 1963 - September, 1964). M. T. Landsberg, Applied Science Division, Litton Systems, Inc., Saint Paul, Minnesota, Report No. 2630, September 30, 1964, DA-18-108-AMC-214(A) (U. S. Army Chemical Research Laboratories, Edgewood Arsenal, Maryland), AD 609 805, 94 pp. (Unclassified)

Project personnel have demonstrated that technically it is entirely feasible to provide relatively long-term protection to personnel against B and C agents.

COMM-SURV (Pa 16,150) Effects of Display Polarity on Target Detection With Side-Looking Radar. Barbara A. Van Ausdall and Herschel C. Self, Behavioral Sciences Laboratory, Aerospace Medical Research Laboratories, Aerospace Medical Division, Air Force Systems Command, Wright-Patterson Air Force Base, Ohio, AMRL-TR-64-82, October, 1964, AD 609 246, 29 pp. (Unclassified)

One group was tested on a positive copy and the other on a negative copy of the same film. Target-detection times on the positive display were significantly shorter. There was no significant difference between groups in number of responses to nontarget objects. For nontarget objects, the negative group was only half as likely to express high confidence that they were targets. It appears unlikely that either polarity should be considered as definitely superior for systems applications.

MISC (PA 16,152) Preservative Treatment of Wood for Combat Vehicles (Final Report). John P. Hill, U. S. Army Coating and Chemical Laboratory, Aberdeen Proving Ground, Maryland, CCL Report No. 172, December 7, 1964, AD 609 663, 36 pp. (Unclassified)

Ninety-six simulated truck floors, comprising 328 wood specimens, were prepared and exposed outdoors for 3 years. Exposure results indicated that the controlled-retention, maximum-penetration treatment cycles, combined with the experimental primer and preservative, contributed to a substantial improvement in outdoor durability. This report includes proposed specifications for the laboratory-developed preservative and primer.

LIFE SCI (PA 16,153) Lateralization of Sounds at the Unstimulated Ear Opposite to a Noise-Adapted Ear. Edward C. Carterette, Morton P. Friedman, William Lindner, and Jean Pierce, University of California, Los Angeles, Department of Psychology, Human Communication Laboratory, Technical Report No. 24, October 1, 1964, Nonr 233(58) (U. S. Office of Naval Research), AD 609 456, 18 pp. (Unclassified)

Some experiments aimed at clearing up disparate results in work on auditory adaptation led to the discovery of monaural-stimulation conditions under which a sound image could be located toward the contralateral, unstimulated ear. The phenomenon helps to clarify divergent experimental results. A tentative model, with testable psychophysiological consequences, is outlined.

MISC (PA 16,156) Dynamic Measurements of Protective Masks (Final Report). Robert N. Sato, Spacelabs, Inc., Van Nuys, California, Report No. SR 64-1014 (7200), December 5, 1964, DA 18-108-AMC-228(A) (Edgewood Arsenal, Edgewood, Maryland), AD 609 582. (Unclassified)

This document is the last of a series of progress reports. The program led to the development of a system capable of detecting and measuring pressure and flow conditions existing within a protective mask worn by subjects under dynamic operating conditions.

PHYS SCI
(PA 16,157)

Structural Design for Fuel Containment Under Survivable Crash Conditions. P. M. Nissley and T. L. Heid, General Dynamics Convair, San Diego, California, August, 1964, FA-WA-4607 (Federal Aviation Agency, Washington, D. C., Technical Report ADS-19), AD 609 615, 39 pp. (Unclassified)

This study was made to develop design principles for improving fuel containment in aircraft fuel tanks during survivable-crash conditions. Efforts were confined to integral fuel tanks for multiengined transport aircraft. Results of the study indicate that a substantial improvement in fuel-containment capability can be designed into wings similar to those in use today.

LIFE SCI
(PA 16,159)

Collective Protection Against CB Agents (Second Bimonthly Progress Report, August - October, 1964). J. Makowski, G. Counas, and P. Stone, AiResearch Manufacturing Company, A Division of The Garrett Corporation, Los Angeles, California, Report CB 1002, December, 1964, DA 18-035-AMC-279(A) (U. S. Army Chemical Research and Development Laboratories, Edgewood Arsenal, Maryland), AD 453 641, 245 pp. (Unclassified)

During the report period, evaluation and selection of subcontractors were completed and contracts submitted to CRDL for approval. The literature survey was continued and the CB library was organized.

LIFE SCI
(PA 16,162)

Calculation of Efficiencies of Aerosol Generating Devices From Flux Measurements Obtained in Field Trials. Robert W. McMullen, Aerosol Laboratory, Metronics Associates, Inc., Palo Alto, California, Technical Report No. TR 111, November 18, 1964, DA 42-007-AMC-21(R) (United States Army Dugway Proving Ground, Research and Development), AD 609 840, 25 pp. (Unclassified)

A method used for calibrating aircraft-mounted aerosol generators has involved a "fly-by" of the aircraft upwind of a sampling array on a tall tower. This method is re-examined to determine whether it is suitable for calibrating aerosol generators mounted on slow-moving ground vehicles. It is shown that when the vehicular speeds are as small as only twice the wind speed, the calibration results are likely to be erratic and many trials must be run to obtain a reasonable good estimate of the aerosol-generator's efficiency.

PHYS SCI
(PA 16,163)

Applications of Lasers. C. Martin Stickley, Air Force Cambridge Research Laboratories, Office of Aerospace Research, United States Air Force, L. G. Hanscom Field, Massachusetts, AFCRL-64-914, Special Reports Nr 15, November, 1964, AD 609 846, 35 pp. (Unclassified)

This article is a survey of applications of lasers. A table of the basic characteristics of the major types of lasers is provided. Applications in each of these areas are described in some detail.

FIREPOWER (PA 16, 165) Conversion of Caliber .30 Weapons to 7.62 mm (First Interim Report). Marine Corps Landing Force Development Center, Marine Corps Schools, Quantico, Virginia, 10+ pp. (Unclassified)

It is recommended that the M-1 Rifle converted to fire 7.62-mm NATO ammunition not be considered suitable for Marine Corps use until a chamber bushing can be obtained that will remain permanently seated in the weapon. The conversion efforts on other weapons of interest to the Marine Corps will continue to be closely monitored as work progresses on them.

FIREPOWER (PA 16, 166) Study of the Effects of Firing a 105-mm Howitzer From the H-21 Helicopter (Final Report). Max L. Coppock, Rock Island Arsenal, Rock Island, Illinois, Technical Report No. 64-3450, December, 1964, AD 454 502, 178+ pp. (Unclassified)

Test firings were conducted on the ground using a 105-mm Howitzer mounted on the H-21A Helicopter. Results of the firing tests indicate that personnel inside the aircraft during firing will require protection for their ears.

PHYS SCI (PA 16, 172) Compounds to Change Color With Environmental Change (Final Technical Report). John W. Krueger and Patrick C. Gokey, John W. Krueger Research Laboratory, Madison, Wisconsin, September 30, 1964, DA-31-124 ARO (D) -125 (U. S. Army Research Office, Durham, North Carolina), AD 453 658, 33 pp. (Unclassified)

The purpose was to study compounds changing color with ordinary environmental change, particularly change in illumination, and to project and prepare compounds showing intensified behavior. Such photochromic compounds are of particular interest to provide an automatically changing camouflage. One compound, among many prepared and studied (mostly anils) gave a new conception of an automatically changing camouflage in which changes would take place in seconds or less.

FIREPOWER (PA 16, 179) Project Study on Repeatable and Reusable Mine, Utilizing Standard Hand Grenades. Thomas R. Stanton and Harry F. Ewach, Ammunition Engineering Directorate, Picatinny Arsenal, Dover, New Jersey, Technical Memorandum 1517, November, 1964, AD 454 520, 17 pp. (Unclassified)

The grenade launcher discussed in this report was found to be feasible and can be fabricated by indigenous personnel.

FIREPOWER (PA 16, 180) Experimental MLU-10/B Land Mine Impact Test. Wilford C. Sodoma, Captain, Deputy for Test Operations, Air Proving Ground Center, Air Force Systems Command, United States Air Force, Eglin Air Force Base, Florida, APGC-TR-64-88, December, 1964, AD 454 535, 18 pp. (Unclassified)

(PA 16,180) (Continued) This test was conducted to evaluate the impact sensitivity of the MLU-10/B land mine filled with H-6 explosive and with vacuum-loaded combination fills of H-6, Tritonal, and Picratol explosives. All of the MLU-10/B land mines detonated prematurely at impact.

FIREPOWER (PA 16,186) A Study for Physical Properties of Ceramic Materials for Personnel Armor (April - July, 1964). Richard S. Liebling and John E. Niesse, The Carborundum Company, Niagara Falls, New York, First Quarterly Report, July 15, 1964, DA-19-129-AMC-280(N), 2 pp. (Unclassified)

The study of ceramic personnel armor has been undertaken to obtain relationships between ballistics performance and physical properties of various ceramic materials. Ceramics have shown some success in armor applications. The materials chosen for study are: hot-pressed and sintered alumina, self-bonded and recrystallized silicon carbide, hot-pressed boron nitride and titanium diboride, and sintered Boride "Z".

FIREPOWER (PA 16,188) Riverine Mine Countermeasures (U) (Phase I Report, January-April, 1965). U. S. Naval Weapons Laboratory, Dahlgren, Virginia, Advanced Research Projects Agency Order No. 555, 9 pp. (Confidential)

(C) The objective of this study is to investigate the possibility of using rf energy to remotely initiate the Viet Cong moored-underwater mines. For the preliminary estimate, it must be concluded that initiation is not feasible with present rf transmitting equipment.

PHYS SCI (PA 16,191) A Preliminary Study of Factors Affecting Magnesium Dry Cell Performance Characteristics. Donald B. Wood, U. S. Army Electronics Laboratories, U. S. Army Electronics Command, Fort Monmouth, New Jersey, Technical Report ECOM-2561, February, 1965, 17 pp. (Unclassified)

Preliminary investigations were carried out to determine the cell parameters that influence the "delayed action" of "N" size magnesium dry cells when subjected to the duty cycle and rain rate encountered in the AN/PRT-4 radio set. High concentrations (5N) of magnesium perchlorate electrolyte, protective films such as Cramolin, applied to the anode, and low concentrations of chromate ion were found to be beneficial in reducing the delayed-action characteristic of the magnesium dry cell, but had a deleterious influence on the service capacity of the cell.

FIREPOWER (PA 16,193) Report of Visit to South Vietnam (February - March, 1965). Army Materiel Command, Aircraft and Aircrew Armor Team, RAC 65-1142, 25 pp. (Unclassified)

(PA 16,193) (Continued) A team of specialists versed in all aspects of aircraft and aircrew armor protection visited South Vietnam during the period February 10 through March 21, 1965. Conclusions: (1) The AMC armor team successfully accomplished the purpose of its visit to South Vietnam. (2) As a direct result of this visit, USASCV has been able to prepare a definitive statment of requirements for aircraft and aircrew armor protection. (3) Acceptable concepts of armor protection for aircraft and individual aircrewmen have been established. (4) Aircraft and aircrew armor protection systems furnished field units should have sufficient item identification and supporting manuals to permit normal supply and maintenance actions. (5) Protective armor kits should be installed in Army aircraft to the maximum practicable extent prior to their being shipped to South Vietnam.

MISC
(PA 16,205)

Research on the Projection of Multilayered Fragments (U). Edward C. Poston, Jr., Poulter Research Laboratories of Stanford Research Institute, November, 1964, AF 08(635)-2951 (Directorate Armament Development, Det 4, Research and Technology Division, AFSC, Eglin Air Force Base, Florida, ATL-TR-64-74), AD 356 143, 160 pp. (Confidential)

(C) This report describes a research program directed toward developing methods for explosive acceleration of multiple-fragment layers to a uniform velocity. The main conclusion of this study is that multiple layers of fragments can be projected by explosive systems so as to form clouds of the desired flat shape.

MOBILITY
(PA 16,213)

Mobility Environmental Research Study in Thailand - Interim Reports on the Great Soilgroup Survey - I: Khon Kaen Study Area. Santhad Rojanasoonthon, Edited by the Kasetsart University and Land Development Department, Soil Survey Division, Bangkok, Report SSR-28-1964, October, 1964, RAC 65-1138, 17 pp. (Unclassified)

This reconnaissance soil map with report of the Khon Kaen Study Area was completed in September, 1964, for the MERS project. The main objectives of this study were to produce a generalized soil map of the Study Area from available data and from reconnaissance survey trips. The soil map was drafted on a scale of 1:250,000, using the great soil group level as mapping units.

MISC
(PA 16,225)

The Employment of Airpower in the Greek Guerrilla War, 1947-1949. M. A. Campbell, E. W. Downs, and L. V. Schuetta, Concepts Division, Aerospace Studies Institute, Air University, Maxwell Air Force Base, Alabama, December, 1964, AD 454 915, 74 pp. (Unclassified)

This study has been prepared as part of the continuing program to examine the role of air power in guerrilla warfare.

MISC (PA 16, 227) Some Observations Concerning the Capture of Sub-Micron Particles by Fine Fibres in Filters. L. G. Wilson and P. Cavanagh, Defence Chemical Biological and Radiation Laboratories, Ottawa, Canada, Report No. 445, November, 1964, (Defence Research Board of Canada), AD 454 845, 8 pp. (Unclassified)

When aerosols of sub-micron particles pass through a fibrous filter, the fibres capture some of the particles. In order to find the relative importance of various possible mechanisms of capture, a means was devised for using and observing sub-micron fibres in the form of a two-dimensional filter. It was found that by far the greatest effect in causing capture of particles was the vibratory component of air flow.

MOBILITY (PA 16, 230) Heliborne Command Post (U) (Final Report). Army Concept Team in Vietnam, APO San Francisco, March 31, 1965, RAC 65-1188, 17 pp. (Confidential)

(U) The purpose for the heliborne command post (HCP) project was to determine the concepts for employing a helicopter as an aerial command post in counterinsurgency operations in the Republic of Vietnam. The UH-1B heliborne command post is an effective command and control vehicle for the conduct of counterinsurgency operations in the Republic of Vietnam. The command post radio console should be capable of quick installation and removal.

FIREPOWER (PA 16, 239) Evaluation of XM-75 40-mm Podded Gun (Grenade Launcher) (U) (Final Report). Kenneth A. Simonet, Air Force Test Unit in Vietnam, APO, San Francisco, March 20, 1965, RAC 65-1143. (Confidential)

(C) The XM-75 40-mm Podded Gun was evaluated in the Republic of Vietnam (RVN) to determine its suitability and effectiveness when used on air-strike missions by A-1E aircraft. The gun was found to be more effective when used against area and line targets than when used against point targets such as huts or sampans. The 40-mn XM-384E2 projectile was observed to penetrate and detonate on ground and water surfaces. It is therefore believed to be well suited for use against personnel in jungle, wooded and swampy areas, and in open terrain.

MISC (PA 16, 240) Handbook of Intelligence and Guerrilla Warfare. Alexander Orlov, Ann Arbor, The University of Michigan Press, 1963, 187 pp. (Unclassified)

This book analyzes the differences between the Soviet and Western intelligence doctrines and describes the eight different kinds of Soviet intelligence. It tells how Soviet agents are trained to use various identities, how they recruit informants in foreign states, and the skill they must develop to outwit counterspy agents. Alexander Orlov wrote the original version of the Handbook of Intelligence and Guerrilla Warfare for use by the officers of the NKVD. It was also used as a text by Orlov to teach intelligence tactics to his students at the Central Military School in Moscow. The author was a general in the NKVD, and he is the highest ranking intelligence officer ever to break with the Kremlin.

FIREPOWER (PA 16, 241) — System Predictions Report, Railroad Sabotage Detection Research (June, 1964, to January, 1965). Texas Instruments Incorporated, Science Services Division, Dallas, Texas, First Interim Technical Report, DA-44-009-AMC-657(X) (U. S. Army Engineer Research and Development Laboratories, Fort Belvoir, Virginia), ARPA Order No. 293/10, 148 pp. (Unclassified)

The results of the experiments performed under this contract indicate that the most feasible method for detection of railroad sabotage is by use of acoustic sensors attached to the rail for the detection of rail-transmitted energy.

MISC (PA 16, 242) — Fabrication of Three Prototype 100-Watt Steam Power Units for Field Service Tests (Second Quarterly Progress Letter). Robert J. Harvey, Thermo Electron Engineering Corporation, Waltham, Massachusetts, Report No. TE 75-65, April, 1965, N600-62753, ARPA Order 386 Amended, 2 pp. (Unclassified)

This is the second quarterly progress letter. The work described refers to a prototype to verify the performance characteristics of the power supply. After adequate testing of this prototype, the final three units for ARPA will be fabricated, tested, and delivered.

FIREPOWER (PA 16, 245) — Riverine Mine Countermeasures Quick Fix Program; Electromagnetic Detonation Phase (U) (February Monthly Report). D. W. Stoner, By Direction, Commander, U. S. Naval Weapons Laboratory, Dahlgren, Virginia, To: Chief, Bureau of Naval Weapons, March 15, 1965, RAC 65-764, 2 pp. (Confidential)

(C) The tests conducted this month were designed to investigate the transfer of energy into Viet Cong mines by either of two modes: (1) coupled into the firing leads along the portion which is out of the water; or (2) coupled into the leads along the portion which is on the river bottom or suspended in the water and connected to the mine. The data collected during the above tests have not been completely evaluated, but most of the induced currents in the MARK 1 squib were below 100 ma. A cursory evaluation of the data indicates that in the 4-30 Mc frequency range, field intensities several times greater than the test conditions would be required to reliably initiate the Viet Cong mines under optimum conditions.

LIFE SCI (PA 16, 256) — Development of an Orally Effective Insect Repellent (Quarterly Progress Report, February to April, 1965). IIT Research Institute, Report No. IITRI-L6021-2, DA-49-193-MD-2281 (Headquarters, U. S. Army Medical Research and Development Command, Office of the Surgeon General, Washington 25, D. C.), 21 pp. (Unclassified)

(PA 16,256) (Continued) During the period covered by this report, work was directed mainly toward the development of an accurate and reliable method to detect the bite of a mosquito, regardless of whether engorgement takes place.

COMM-SURV (PA 16,257) AN/MRC-95 Radio Set (Final Report). Herbert A. Schulke, Jr., Lieutenant Colonel and Co-Tan-Ho, Captain, Advanced Research Projects Agency, Research and Development Field Unit, San Francisco, February 1, 1965, (OSD/ARPA Project AGILE), 54 pp. (Unclassified)

The AN/MRC-95 proved to have a satisfactory communication capability in limited-duty situations with the 2nd Air Division and with Army aviation units. It was not satisfactory for use as a base station in continuous-duty situations due, principally, to low overall equipment reliability. The radioteletype mode of operation was unsatisfactory because of low transmission efficiency. The vehicular mobility of the AN/MRC-95 was of limited usefulness in RVN. The AN/MRC-95 failure rate was too high. It was concluded that the AN/MRC-95 Radio is not suitable for use by U. S. forces in RVN and it was recommended that requirements for voice SSB radios in base or semifixed roles be met by such equipment as the AN/FRC-93.

FIREPOWER (PA 16,260) Development of 120-mm Recoilless Rifle Systems, XM89, XM105, and XM105E1 (U). Army Materiel Command, Research and Development, Technical Information Report 1-2-1M1(2), June, 1963, DA-36-034-AMC-3785(X) (Army Materiel Research Staff, University of Pittsburgh), AD 356 472, 15 pp. (Confidential)

(C) XM105E1 120-mm recoilless-rifle weapon system is the most recent development of a series of recoilless rifles. The XM105E1 120-mm rifle is a recoilless, air-cooled, breech-loaded, man-transportable weapon. The whole assembly weighs 247 pounds and, overall, is 11.77 feet (3.59 meters) long. The rear-blast danger area of the XM105E1 recoilless rifle is triangular in form, extending, overall, 130 feet rearward from the breech to a maximum width of 150 feet.

MOBILITY (PA 16,262) Development of Cargo Carrier, XM548E1 (Interim Report). University of Pittsburgh, Army Materiel Research Staff, August, 1964, DA-36-034-AMC-3785(X) (U. S. Army Materiel Command, Technical Information Report 30.7.2.1), AD 449 585, 10 pp. (Unclassified)

This technical information report describes the development of a full-tracked, unarmored, amphibious, air-droppable cargo carrier. Its primary role will be to accompany self-propelled artillery and carry part of the gun crew and a supply of ammunition; it can also be used to carry 12,000 pounds of general cargo. The carrier uses the same power package, running gear, and suspension as the M113A1 armored personnel carrier.

MOBILITY (PA 16, 267)

Development of Low-Cost Cargo Parachutes. University of Pittsburgh, Army Materiel Research Staff, February, 1964, DA-36-034-AMC-3785(X) (Army Materiel Command, Research and Development, Technical Information Report 20-53-1C1), AD 438 503, 4 pp. (Unclassified)

Following an extensive survey of readily available canopy materials, some outstanding possibilities were selected for testing. These included nylon paper, scrim reinforced and without reinforcement; polyethylene film, with scrim reinforcement and without reinforcement, and cotton print cloth. Suspension line materials selected were braided polypropylene of coarse and fine filaments, braided polyethylene, and braided nylon. Subsequent tests of the selected materials disclosed serious deficiencies in most of them.

PHYS SCI (PA 16, 272)

Investigation of Alkyl Aluminum Compounds (U) (Third Quarterly Progress Report, June through September, 1964). U. A. Lehikoinen, R. G. Lyben, and M. E. Gluckstein, Ethyl Corporation, Research Laboratories, Ferndale, Michigan, GR 64-49, Ethyl CD-1822, October 1, 1964, DA 18-035-AMC-109(A) (U. S. Army Chemical Research and Development Laboratories, Edgewood Arsenal, Maryland), AD 356 354, 19 pp. (Confidential)

(U) The 90-day storage stability tests on Formulation 90603-4 have been completed. No deleterious effects from storage at -40 F, room temperature, and +160 F, or from a cyclic test between these temperatures have been observed. Firing tests made at intervals of 30, 60, and 90 days show the same behavior for the stored material as for freshly prepared material.

FIREPOWER (PA 16, 273)

The Effect of Underwater Explosions on Underwater Storage Systems (U) - Report 1 - Results of Small-Scale Explosion Tests on Pseudo Models of Underwater Storage Containers. J. N. Strange and J. M. Pinkston, Jr., U. S. Army Engineer Waterways Experiment Station, Corps of Engineers, Vicksburg, Mississippi, Miscellaneous Paper No. 1-689, January, 1965, (Defense Atomic Support Agency), AD 356 460, 52 pp. (Confidential)

(C) The objectives of this study are to evaluate effects of underwater shock waves on various types of submerged POL (petroleum, oils, and lubricants) storage systems and to plan a full-scale test for validating the techniques developed from small-scale explosion tests. The results described herein exhibit preliminary trends that offer sufficient data to adequately describe the response of different containers when exposed to underwater shock waves.

MOBILITY
(PA 16,278)

Nonhazardous Dissemination and Delivery Concepts (U) (Quarterly Report, October, 1964, to January, 1965). Donald Werle, IIT Research Institute, Technology Center, Chicago, Illinois, Report No. IITRI-C6011-21, January 5, 1965, DA 18-108-AMC-129(A) (Commanding Officer, U. S. Army Chemical Research and Development Laboratories, Edgewood Arsenal, Maryland), AD 356 349, 79 pp. (Confidential)

(C) The EA1729 and EA3528 programs show that explosive and cold-gas dissemination of these agents is indeed feasible.

PHYS SCI
(PA 16,281)

Investigation of Gelled Liquid Oxidizing Agents (U) (Quarterly Progress Report No. 1). Dr. James W. Dale, Henry P. Beltramini and Carl A. Olson, Monsanto Research Corporation, Boston Laboratory, Everett, Massachusetts, Report Number MRB402201, February 23, 1965, DA-18-035-AMC-284(A) (U. S. Army Chemical Research and Development Laboratories, Edgewood Arsenal, Maryland), AD 357 450, 31 pp. (Confidential)

(C) The three halogen fluorides of possible applicability as incendiary agents are chlorine trifluoride, bp 12 C, bromine pentafluoride, bp 40 C, and bromine trifluoride, bp 129 C. Successful gellants for CTF have been found to give only clear solutions in BTF, even at excessively high contractions. Binary and ternary BTF/BPF and BTF/BPF/CTF blends have been gelled with the above additives although at BTF concentrations less than 50 per cent. Investigations are continuing to define maximum BTF contents consistent with gel stability.

FIREPOWER
(PA 16,283)

Research on Fluoroexplosives (U). Josef J. Schmidt-Collerus, John A. Young, and John A. Drimmel, Denver Research Institute, University of Denver, Denver, Colorado, July, 1964, AF 08(635)-2109 (Directorate of Armament Development, Det 4, Research and Technology Division, Air Force Systems Command, Eglin Air Force Base, Florida, ATL-TDR-64-45), AD 356 515, 260 pp. (Confidential)

(C) As part of a research program on "Fluoroexplosives", the syntheses of the following types of high-energy compounds containing fluorine were investigated: (1) aromatic nitramine derivatives; (2) heterocyclic nitramine derivatives; (3) aliphatic nitramine derivatives; (4) nuclear-fluorinated polynitro aromatics; (5) side-chain-fluorinated polynitro aromatics; (6) nuclear and side-chain fluorinated polynitro aromatics.

PHYS SCI
(PA 16, 284)

Phase III Extension, B/DWS, Model DA-88 (U) (Final Report, November, 1963, through August, 1964). Missile & Space Systems Division, Douglas Aircraft Company, Inc., Santa Monica/California, Douglas Report SM-47687, August 15, 1964, DA-18-064-CML-2746 U. S. Army Chemical Corps Biological Laboratories), AD 356 539, 139+ pp. (Confidential)

(C) This report describes the technical progress made during the Biological Detection and Warning Systems Phase III Extension Program from November, 1963, through August, 1964. This Extension Program was primarily concerned with the evaluation of the Mark IV Partichrome Analyzer, the Particle Size Analyzer, and the Pyrolyzer as detection instruments. Analysis of the data from these trials showed the Mark IV Partichrome to be an effective detector for most B/DWS applications.

MISC
(PA 16, 285)

Pacification Force Requirements for South Vietnam (U). C. V. Sturdevant, The RAND Corporation, Santa Monica, California, Memorandum RM-4421-ARPA, March, 1965, SD-79 (ARPA), ARPA Order No. 189-61, 45 pp. (Confidential)

(C) This memorandum consists of a parametric examination of force requirements to accomplish the Vietnamese National Pacification Program. A considerable portion of this work was accomplished during the author's tour of assignment with the OSD/ARPA Research and Development Field Unit, Vietnam, in the spring of 1964. The military forces and the amount of time required to effect the pacification of South Vietnam are at present essentially unknown. In general, current military programs for pacification involve two phases: Phase I, the introduction of battalion-size units to effect conventional search and clear operations; and phase II, attrition of the remaining Viet Cong (VC) through area saturation tactics, employing a reduced number of troops, with the eventual goal of leaving the area under the control of trained civilian administrative, civic-action, and security groups. A major reason for the failure of many of the pacification efforts to date is that after the successful accomplishment of Phase I of the pacification plan, the conventional military forces have been withdrawn from the area prior to the complete accomplishment of Phase II. For relatively small local pacification efforts, it has been shown that the planned times of accomplishments of the two phases of pacification have been appreciably in error. Except around the major cities, province capitals, and district towns of Vietnam, there do not exist any truly pacified areas.

PHYS SCI
(PA 16, 286)

Basic Esters of Glycolic Acids (U) - IX. Thermogravimetric and Other Thermal Studies on Some Glycolates (BZ, EA 3443, EA 3580) (C). Samuel Sass and Paul M. Davis, U. S. Army Chemical Research and Development Laboratories, Edgewood Arsenal, Maryland, Technical Report CRDLR 3232, December, 1964, AD 356 308, 41 pp. (Confidential)

(C) This report represents a study of BZ, N-methyl-4-piperidyl cyclopentylphenylglycolate (EA 3443), and N-methyl-4-piperidyl cyclobutylphenylglycolate (EA 3580) under various temperature conditions. The temperature profiles have shown that better than 80 per cent of dissemination recovery should be obtainable for BZ and about 90 per cent

for EA 3443 and EA 3580. EA 3443 and EA 3580 are less thermolabile than BZ, thus showing good vaporization characteristics over a variety of temperatures.

PHYS SCI (PA 16, 293) Investigation of VG Conversion Prefilter for Point-Sampling Alarms (U) (Bimonthly Progress Report, October - December, 1964). William J. Barrett, Donald V. Brady, James B. Hostettler, and David E. Crawford, Southern Research Institute, Birmingham, Alabama, Report No. 3, January 11, 1965, DA 18-035-AMC-276(A) (U. S. Army Chemical Research and Development Laboratories, Edgewood Arsenal, Maryland), AD 356 640, 27 pp. (Confidential)

(C) The purpose of this work is: (1) to develop an improved VG conversion prefilter possessing greater physical strength and durability than the existing prefilter and giving improved response to agents, particularly after storage at elevated temperatures, and (2) to develop an improved paper tape for the Advanced Schoenemann Reaction alarm. Prefilters that gave reasonably good agent response have been made.

FIREPOWER (PA 16, 295) Lethal Area Estimates of An Air Burst 20-Pound AN-M41 Anti-Personnel Bomb (U). John C. Lauzau, Ballistic Research Laboratories, Aberdeen Proving Ground, Maryland, Memorandum Report No. 1595, August, 1964, AD 356 689, 31 pp. (Confidential)

(U) Experimentally determined fragmentation characteristics, together with the latest available casualty criteria, are used in the development of these estimates. The dependence of bomb lethality on such parameters as height of burst, angle of impact, target posture, and final bomb velocity are determined and presented graphically herein.

FIREPOWER (PA 16, 299) An 81-mm High Angle Barrage Missile System Study (U). Walter B. Wilson, Jr., William M. Hadaway and John W. Wallace, Advanced Systems Laboratory, Directorate of Research and Development, U. S. Army Missile Command, Redstone Arsenal, Alabama, Report No. RD-TR-64-3, November 30, 1964, AD 356 586, 65 pp. (Confidential)

(C) The 81-mm High Angle Barrage Missile system is a man-transportable weapon capable of high sustained rates of fire from a closed-breech launcher tube. The HABM delivers the standard 81-mm M362 shell, launched from a modified 81-mm mortar. When compared with the standard 81-mm mortar, the High Angle Barrage Missile system has a number of advantages. The HABM system has greater range, faster operation, and better recoil characteristics (with potentially better accuracy). It is not necessary, however, to embrace the entire HABM system in order to achieve one or more of its advantages.

LIFE SCI (PA 16,305) Foreign Technology Handbook - Index of Trade, Chemical and Common Names of Foreign Drugs and Other Pharmacologic Agents. Aerospace Medical Division, Deputy for Foreign Technology, Air Force Systems Command, Brooks Air Force Base, Texas, Report No. AMD-TH-65-1, January 15, 1965, AD 609 908, 82 pp. (Unclassified)

The purpose of this Handbook is to present an index of trade, chemical, and common names of drugs, chemotherapeutic compounds, and other pharmacologic agents that have been found in the scientific and technical literature of foreign countries.

FIREPOWER (PA 16,312) In-Process Review of the 107-mm, HE, XM-, Boosted Mortar Cartridge (U). Emil K. Merz, Rocket Development Section, Solid Rocket Propulsion Laboratory, Ammunition Engineering Directorate, Picatinny Arsenal, Dover, New Jersey, RDS Report No. 2, November, 1964, AD 356 825, 35 pp. (Confidential)

(C) This report presents the current status of exploratory development and engineering tests of the 107-mm XM- High Explosive Boosted Mortar Cartridge (BMC). This ammunition is designed to meet the military requirements specified for the XM95, 107-mm mortar. Prototype ammunition has been designed. Preliminary field trials of this ammunition demonstrated a range of approximately 12,000 meters. The observed precision in range and deflection probable error was 0.83 per cent and 4.6 mils, respectively.

FIREPOWER (PA 16,314) Evaluation of M14 and T52 APERS Mines (U). George M. Stewart, Clarence E. Hawkins, Richard L. Williams, and Jack C. London, Jr., U. S. Army Chemical Research and Development Laboratories, Edgewood Arsenal, Maryland, CRDLR 3244, December, 1964, AD 356 808, 67 pp. (Confidential)

(C) The research efforts covered by this report had a threefold purpose: (1) to determine whether the T58-1 mine-clearance ensemble would offer protection to personnel engaged in M14 APERS mine-clearance activities; (2) to determine the efficiency, along with the distribution, shape, size, and quantity, of fragments from the T52 APERS mine when tested right-side-up or upside-down; (3) to evaluate the effectiveness of the T52 APERS mine against human lower extremities. Conclusions: (1) Mine-clearance personnel wearing the mine-clearance ensemble will be protected from fragments resulting from detonation of the M14 APERS mine. (2) The Marine sabot will give 100 per cent protection against the blast forces of the M14 APERS mine. (3) The T52 APERS mine will be extremely effective in producing incapacitating battle casualties due to lower-extremity injury. (4) The T52 APERS mine, detonated in either the upside-down or right-side-up position, will produce secondary fragments that may cause incapacitation of troops adjacent to and within 5 to 10 feet of the mine.

LIFE SCI (PA 16,315) Changes in Cholinesterase Activity and Toxicity Following Poisoning With GD (U). Joseph H. Fleisher, Joseph Bursel, and Larrel W. Harris, U. S. Army Chemical Research and Development Laboratories, Edgewood Arsenal, Maryland, Technical Report CRDLR 3245, January, 1965, AD 356 809, 29 pp. (Confidential)

(C) Addition of oximes to acetylcholinesterase (AChE) inhibited by pinacolyl methylphosphonofluoridate (GD) in vitro leads to little or no recovery of enzyme activity. Comparable information on the effects of GD on AChE following poisoning in vivo is still very limited. Conclusions: (1) Mice and rabbits given approximately 0.8 and 1.0 LD50 of GD, respectively, showed little or no recovery of cholinesterase (ChE) in 3 days following poisoning. (2) Monoisonitrosoacetone (MINA) or 1, 1'-trimethylene bis-(4 formylpyridinium bromide) dioxime (TMB-4), used as adjuvants to atropine either singly or together, failed to save mice injected with 1.8 LD50 of GD. The small recovery in brain ChE of mice treated with the combined oximes was apparently inadequate for survival. (3) Pretreatment with eserine resulted in protection of rat-brain ChE from inhibition by GD in vitro and in vivo. In the latter study, the LD50 of the agent was raised 3.8 times.

FIREPOWER (PA 16,317) Feasibility of a Hybrid-Propellant Gun (U). K. Tsuji, U. S. Naval Missile Center, Point Mugu, California, Technical Memorandum No. NMC-TM-64-72, February 5, 1965, AD 357 011, 30 pp. (Confidential)

(C) Conclusions: (1) A hybrid-propellant gun appears feasible, but experimental data are needed to verify theoretical combustion and ignition characteristics that were used for hybrid propellants in the analysis. (2) Calculations with interior ballistics equations indicate that a hybrid-propellant gun will have a constant chamber pressure substantially lower than the peak chamber pressure of guns using powder charges. (3) High gas temperatures are predicted because of the high-flame-temperature values associated with many high-energy hybrid propellants.

FIREPOWER (PA 16,318) 40-mm Grenade Round (U) (Monthly Progress Report). Aircraft Armaments, Inc., Report No. ER-2939-W, November, 1964, DA-36-034-AMC-0004A, AD 357 072, 18 pp. (Confidential)

(C) This is the twenty-third in a series of progress reports, and it covers the period from November 1, through November 30, 1964. During this report period the effort initiated in October with the objective of reducing the XM463 velocity deviation was satisfactorily completed. A series of 100 rounds was loaded and fired at the Aberdeen Proving Ground, with a resulting average velocity deviation of 2.33 fps, which satisfies the original program goal of 2.50 fps or less.

LIFE SCI (PA 16,322) Behavior and Stabilization of VX Exposed to Atmosphere (U). Stephen M. Lewis, U. S. Army Chemical Research and Development Laboratories, Edgewood Arsenal, Maryland, Technical Report CRDLR 3259, December, 1964, AD 356 721, 39 pp. (Secret)

(PA 16,322) (Continued) (C) Conclusions: VX is intrinsically unstable in an atmosphere containing moisture. VX can be protected for 1 month against atmospheric effects by the addition of stabilizer. The rate of hydrolytic decomposition of thin films of VX is independent of film thickness (6×10^{-4} to 2 mm) and the substrates pyrex, polyethylene, aluminum, and Kel-F. Bulk samples of VX were unaffected by various types of illumination, such as tungsten and Sylvania Blacklite Blue lamps.

PHYS SCI
(PA 16,325) Development Test of the Internal Defoliant Dispenser, A/A 45Y-1, Supplement I - Grid Data. Charles L. Flynn, Deputy for Test Operations, Air Proving Ground Center, Air Force Systems Command, United States Air Force, Eglin Air Force Base, Florida, Report No. APGC-TR-64-82, Supplement I, December, 1964, AD 455 537, 216 pp. (Unclassified)

This supplement contains the data and spray-deposition patterns experienced during flight testing of the A/A 45Y-1 defoliant dispenser installed in the C-130 and C-125 aircraft.

PHYS SCI
(PA 16,326) Development Test of the Internal Defoliant Dispenser, A/A 45Y-1. Charles L. Flynn, Captain, Air Proving Ground Center, Air Force Systems Command, United States Air Force, Eglin Air Force Base, Florida, Report APGC-TR-64-82, December, 1964, AD 455 536, 71 pp. (Unclassified)

The A/A 45Y-1 dispenser is designed to deliver a ground concentration of 3 gallons per acre (gpa) over an area of 1 square mile for the C-130 aircraft and 0.5 square mile for the C-123 aircraft. The A/A 45Y-1 dispenser was characterized by small area coverage at minimum concentration levels of 1.5 and 3.0 gpa. The tail-mounted spray boom does not deliver the defoliant agent far enough outboard to be affected by the action of the wingtip vortices. Previous testing with defoliant agent has demonstrated that wing-mounted booms subject the spray to these vortices and produce wider swath widths.

MOBILITY
(PA 16,329) Test Results of Research for Rapid Site Preparation for VTOL Aircraft. A. Vasiloff, Air Force Aero Propulsion Laboratory, Research and Technology Division, Air Force Systems Command, Wright-Patterson Air Force Base, Ohio, Technical Documentary Report No. APL-TDR-64-104, November, 1964, AD 455 562, 41 pp. (Unclassified)

From the research conducted thus far on rapid site preparation for VTOL aircraft, it was concluded that: (1) there is a definite need for rapid site preparation when operating VTOL aircraft in remote areas; (2) the vertical J-85 jet engine test facility is a useful tool in evaluating the exhaust effects of VTOL aircraft on soil hardeners; (3) some materials have been formulated that will withstand the afterburner effects of the J-85 jet engine; (4) fabricating large-scale VTOL pads from specially formulated polyester material is feasible; (5) site size and fabrication materials will depend on pilot visibility, aircraft design, and soil conditions for the specific area; (6) only a

smaller basic pad need be fabricated to withstand the direct blast of the VTOL aircraft engines. The remainder of the pad can be lightweight, as it serves only as a dust palliative.

LIFE SCI (PA 16, 333) Modification of Toxic Proteins With Additives for Total Collection (Final Comprehensive Report, May through December, 1964). Alan E. Weinberg, Pascal E. Esemplare, and Howard L. Blostein, Resin Research Laboratories, Inc., Newark, New Jersey, Report No. 65-20, January, 1965, DA 18-035-AMC-132 (A) (U. S. Army Chemical Research and Development Laboratories, Edgewood Arsenal, Maryland), AD 454 888, 78 pp. (Unclassified)

This report is a summation of investigative work on the spray drying of toxic proteins for total collection. This work clearly demonstrates the feasibility of using an electrostatic precipitator to increase collection of spray-dried product.

MOBILITY (PA 16, 341) Theoretical Study of Gyro-Stabilized Float Concept for Amphibious Helicopters. Gyrodyne Company of America, Inc., Saint James, Long Island, New York, Report No. RD47-313400-1, November, 1964, NOw 63-0463-c (Navy, BuWeps), AD 455 334, 92 pp. (Unclassified)

Basic parameters have been decided upon for a stabilization system suitable to stabilize a float-type helicopter in the general size category of the Model QH-50C (DSN-3). It is calculated that the system whose parameters have been determined will maintain a neutral fuselage attitude within very small pitch and roll angles.

LIFE SCI (PA 16, 342) Project Bears (Bacteriological Effects, Aircraft Refueling Systems). Richard R. Rogowski and Robert N. Brown, U. S. Army Engineer Research and Development Laboratories, Fort Belvoir, Virginia, Technical Report 1789-TR, October, 1964, AD 609 527, 136 pp. (Unclassified)

This report covers investigations carried out to determine characteristics and growth rates of microbial contaminants in military fuels.

MISC (PA 16, 349) Lessons Learned Numbers 47-51 (U). Headquarters, United States Military Assistance Command, Vietnam, APO U. S. Forces. (Confidential/Modified Handling Authorized)

NUMBER 47, River Assault Group Operations (U), March 30, 1965. (C/MHA) This issue of "Lessons Learned" discusses two operations involving RAG support of ground operations and illustrates the value of naval support to military operations in the Delta area. Ground commanders should always consider the use of RAG units in planning operations in the Delta area. Coordinated joint operations employing naval elements can be extremely successful.

(PA 16, 349) (Continued) NUMBER 48, Combat Tips II (U), April 7, 1965. (C/MHA) This item stems from the activities of a company of the 37th Ranger Bn engaged in a road-clearing operation in Phuoc Long Province. The lead platoon was ambushed. A total of seven VC were killed, with no friendly casualties. The company commander was prepared for an ambush and had dispersed his unit on the march and provided for an adequate reserve. His quick response and sound tactics turned a possible VC victory into a defeat.

NUMBER 49, Operation Hoai Au (U), April 13, 1965. (C/MHA) This issue of Lessons Learned concerns a highly successful GVN action that took place in response to a VC initiated operation in early March, 1965. It is an excellent example of how a large VC force can be outmaneuvered by a quick-thinking aggressive commander who adjusts plans to take advantage of opportunities in battle.

NUMBER 50, Naval Conduct of Amphibious Operations (U), April 13, 1965. (C/MHA) This lesson describes two offensive amphibious landings. Some lessons learned were: (1) amphibious operations require some detailed basic planning; (2) employment of an LST as a CP for amphibious operations is not only desirable but extremely practicable; (3) adequate beach reconnaissance should be conducted; (4) adequate preparations for loading must be made if side loading of troops aboard LSM's is required; (5) utilization of SSB's for administrative purposes between naval units affords rapid transfer to captives, personnel or other items; (6) amphibious training should be emphasized and carried out.

NUMBER 51. Operational Employment of Riot Control Munitions (U), April 24, 1965. (C/MHA) A great deal has been written or said recently about the RVNAF employment of riot-control munitions on operations. Most remarks have been highly critical and give the impression that these munitions have had widespread use and have caused many casualties. However, after action reports were studied, it was obvious that these munitions have had only limited effect on the enemy at best.

MISC
(PA 16, 369)

Final Report on the Development of a Pack for Vietnamese and Thai Military Forces - Phase II (May, 1964, through March, 1965). U. S. Army Natick Laboratories, Natick, Massachusetts, April 30, 1964, ARPA Order No. 267, Amendment 11), 5 pp. (Unclassified)

This report covers the work done by the U. S. Army Natick Laboratories in the development of a Ranger pack. Conclusions: (1) The pack developed for the Army of the Republic of Vietnam and for the Royal Thai Army is an acceptable item. (2) This report concludes the Ranger Pack development.

MOBILITY
(PA 16, 371)

XV-8A Flexible Wing Aerial Utility Vehicle (Final Report). F. Landgraf and P. F. Girard, Ryan Aeronautical Company, San Diego, California, Report No. 65B003, February, 1965, DA 44-177-AMC-874(T) (U. S. Army Transportation Research Command, Fort Eustis, Virginia, USATRECOM Technical Report 64-74 for ARPA, ARPA Order 294-62, Amendment No. 3), AD 460 405, 98 pp. (Unclassified)

(PA 16,371) (Continued) This final report concerns procedures and accomplishments of the design, fabrication, and test program of the XV-8A for the following phases: (1) investigation of the feasibility of construction of a flexible wing light utility vehicle simple to operate and capable of transporting a 1,000-pound payload for a distance of 100 miles at a speed of 50 miles per hour; (2) design, building, and testing of two vehicles. The conclusion is that the vehicles are feasible.

FIREPOWER (PA 16,377) Some Statistical Methods of Analysis Related to Weapon Effects. Booz-Allen Applied Research Inc., Chicago and Washington, Informal Report No. 4, May, 1964, DA-18-108-CML-7174 (Systems Analysis Division, Chemical Research and Development Laboratories, Edgewood Arsenal, Maryland), AD 456 538, 4 pp. (Unclassified)

Two statistical approaches are indicated that might be employed in relating burst heights (of fuzing times) to target and operational parameters. Once a potential weapon system has been subjected to test and is considered "ready" for use, it is important to relate operational parameters to expected casualties. As a first step in learning more about these interactions, it is suggested that an existent statistical procedure might be adapted to this situation. It seems reasonable to use analysis-of-variance techniques to identify and isolate some of these potentially influencing factors.

FIREPOWER (PA 16,378) Requirements for the M79 Grenade Launcher in Units Other Than the Marine Rifle Squad. Marine Corps Landing Force Development Center, Marine Corps Schools, Quantico, Virginia, AD 456 532, 5 pp. (Unclassified)

A normal ratio of four M79 grenade launchers will provide sufficient internal and local protection for a unit without detracting from the primary mission of personnel so armed. By assigning M79's to designated squad/section leaders at rifle company and infantry battalion level, the unit's defensive capability will be increased.

FIREPOWER (PA 16,388) Impact Sensitivity and Penetration Test of the MLU-10/B Land Mine and Related Fuzes and Adapter Boosters. Wilford C. Sodoma, Captain, Deputy for Test Operations, Air Proving Ground Center, Air Force Systems Command, United States Air Force, Eglin Air Force Base, Florida, Report No. APGC-TR-64-87, December, 1964, AD 456 181, 41 pp. (Unclassified)

This project was conducted to determine whether the tritonal-filled MLU-10/B land mine could be safely delivered from a low-flying aircraft at a high delivery velocity. None of the fuze boosters or adapter boosters detonated at impact on reinforced concrete at velocities up to 1000 ft/sec. The tritonal-filled MLU-10/B land-mine case (without fuze) detonated when impacted head-on against a 6-ft-thick, reinforced-concrete target at velocities as low as 651 ft/sec; however, none of the tritonal-filled MLU-10/B land-mine cases detonated on impact against simulated standard railroad targets at velocities up to 1266 ft/sec.

FIREPOWER (PA 16, 389)

Electrical Augmentation of a Light Gas Gun. William G. Howell and James P. Kottenstette, Mechanics Division, Denver Research Institute, University of Denver, Denver, Colorado, Report No. AEDC-TR-65-32, January, 1965, AF 40(600)-1024 (Arnold Engineering Development Center, Air Force Systems Command, Arnold Air Force Station, Tennessee), AD 455 811, 50 pp. (Unclassified)

This report covers the experimental and analytical research directed toward the development of a system for electrical augmentation of a light gas launcher. The results of this program were positive but fell far short of the velocity of 15 kilometers per second, which was set forth as the original objective. The highest velocity obtained with the augmented launcher was 8.23 kilometers per second, representing a velocity increase of 0.98 kilometer per second and a sabot kinetic energy increase of 2.68 kilojoules.

MISC (PA 16, 392)

Psychological Operations Bibliography, Supplement No. 4. Gail Owens, Special Operations Research Office, The American University, Washington, D. C., Research Memorandum 64-15, November, 1964 (Department of the Army), AD 456 200, 23 pp. (Unclassified)

FIREPOWER (PA 16, 394)

A Note on Thermal Radiation From TNT Explosions in Air. T. K. Groves, Suffield Experimental Station, Ralston, Alberta, Suffield Technical Paper No. 256, December, 1964 (Defence Research Board, Department of National Defence, Canada), AD 456 417, 40 pp. (Unclassified)

A simple model is presented for calculating the spectral emittance of the thermal radiation emitted in a TNT explosion in air from the thermodynamic properties in the blast wave.

FIREPOWER (PA 16, 398)

Development of Time Fuze, XM561E1 (M77, Modified) (Final Report). University of Pittsburgh, Army Materiel Research Staff, December, 1964, DA-49-186-AMC-214(D) (Army Materiel Command, Technical Information Report 27.2.11.2), AD 455 699, 7 pp. (Unclassified)

This report is an illustrated account of the development of the XM561E1 fuze, which is a modification of the M77 fuze.

MISC (PA 16, 403)

From Colonialism to Communism - A Case History of North Vietnam. Hoang Van Chi, with an Introduction by P. J. Honey, Pall Mall Press, London and Dunmow, 1964, 252 pp. (Unclassified)

(PA 16,403) (Continued) From Colonialism to Communism is the most detailed inside story yet published of the establishment of communism in North Vietnam. Hoang Van Chi surveys the various nationalist movements in Indochina since the turn of the century and the history of the Comintern's efforts in the interwar period to establish a strong Communist Party in the country. The key role of Ho Chi Minh in these developments is discussed in detail. After a brilliant description of the way in which the communists seized the initiative in the struggle against France, the author moves to his main theme: the aims and methods of Mao's imitators in North Vietnam.

MISC (PA 16,404) Nationalism and Revolution in Egypt - The Role of the Muslim Brotherhood. Christina Phelps Harris, The Hoover Institution on War, Revolution, and Peace, Stanford, California, Mouton & Co., The Hague/London/Paris, 1964, 276 pp. (Unclassified)

Dr. Harris, in this case study, shows that almost inevitably the Muslim Brotherhood was a natural result of Egyptian experience during the 19th and early 20th Centuries. In background chapters she describes Egypt's entry into the modern world, with the arrival of Napoleon and his troops and savants in 1798, and the prolonged relationship with Great Britain eventuating in independence. In conclusion Dr. Harris evaluates the very real potentialities of the movement, suggesting its future possibilities for good or ill. Not withholding sympathy and admiration where these are due, she vividly illuminates recent and current events in Egypt and provides evidence for balanced judgments on the country and its role in the Arab world.

MOBILITY (PA 16,408) Report of Evaluation Tote Gote Tests in Thailand (Summary Report - Volume One). Joint Thai-U. S. Military Research and Development Center, Bangkok, Thailand, 64-014, December, 1964, 22 pp. (Unclassified)

The disadvantages of the Tote Gote were its vulnerability to soft soils and water, limited payload-lift capability, inability of personnel to operate from both a mounted and dismounted position without incurring prohibitive fatigue, poor stability on longitudinal and side slopes, during obstacle crossing and movements at slow speeds, and a configuration incompatible with the average user. The Tote Gote vehicle is not acceptable for military use as a small load-carrying device under tropical environments encountered during the evaluation. Employment of a small load-carrying device in remote areas must be characterized by maintenance-free operation. Frequency of maintenance requirements and down-time was determined to be unacceptable. Characteristics that enhanced performance of the Tote Gote should be considered for retention in any future development of a load-carrying device. No further consideration should be given to the Tote Gote vehicle for military use as a small load-carrying device under tropical environments similar to those encountered during this evaluation.

LIFE SCI
(PA 16,411)

Development of an Orally Effective Insect Repellent (Quarterly Progress Report, November, 1964, through January, 1965). IIT Research Institute, Report Nr IITRI-L6021-1, DA-49-193-MD-2281 (U. S. Army Medical Research and Development Command Headquarters, Office of the Surgeon General, Washington 25, D. C.), AD 610 357, 11 pp. (Unclassified)

Further characteristics of chemically induced feeding behavior of mosquitoes were determined. In addition, studies on the skin permeability of potential insect repellents were initiated. Mosquitoes once fed on blood do not feed again for at least 72 hours.

COMM-SURV
(PA 16,414)

A Study of Wavelength Dependence of Transhorizon Radio Propagation (Final Report). R. Bolgiana, Jr., Center for Radio Physics and Space Research, Cornell University, Ithaca, New York, Research Report No. CRSR 188, June 15, 1964, AF 19(604)-3494 (Air Force Cambridge Research Laboratories, Office of the Aerospace Research, United States Air Force, Bedford, Masachusetts, Report No. AFCRL 64-561), AD 610 643, 67 pp. (Unclassified)

The investigations of uhf and microwave transhorizon radio propagation carried out under this contract are summarized briefly. These include studies of fading, wavelength dependence, median diversity effect or anomalous propagation over irregular terrain, and information theoretic analysis of troposcatter circuits. It is concluded that, for the path involved, the wavelength dependence of excess propagation loss does vary in a seemingly erratic manner from day to day and week to week and, in a more consistent way, seasonally. The short-term median signal levels on adjacent paths of a space diversity system may vary in an uncorrelated manner, but this variation is considerably less than that between circuits widely separated in frequency on the same path.

MISC
(PA 16,418)

Indonesia in 1964: Toward a "People's Democracy"?. Guy J. Pauker, The RAND Corporation, Santa Monica, California, P-3056, January, 1965, AD 610 575, 16 pp. (Unclassified)

What had started in July, 1959, as a personal regime, based on a delicate balancing of political forces and labeled "guided democracy" for public consumption, is being transformed slowly but steadily into a political system shaped by the Communist Party of Indonesia.

COMM-SURV
(PA 16,423)

Measurements and Models for Relating the Physical Characteristics of Images to Target Detection. Donald G. Corbett, N. D. Diamantides and R. H. Kause, Goodyear Aerospace Corporation, December, 1964, AF 33(657)-9476 (Behavioral Sciences Laboratory, Aerospace Medical Research Laboratories, Aerospace Medical Division, Air Force Systems Command, Wright-Patterson Air Force Base, Ohio, Report No. AMRL-TR-64-117, AD 610 254, 104 pp. (Unclassified)

(PA 16,423) (Continued) Three metrics for predicting the time required to identify targets in high-resolution radar pictures were developed. One metric, based on four automatically measured variables related to transmissivity of positive transparencies, was tested. Through multiple-regression analysis, a correlation of 0.69 between observed and predicted identification times was obtained. When these relationships were applied to a new set of radar pictures and new test subjects, the correlation coefficient was too low to be significantly different from zero with the number of pictures used. A principal reason for the low correlation was the unexpected correlation between the four transmissivity variables. The metric also had an insignificant correlation coefficient when applied to optical and infrared photographs (0.07 and 0.04, respectively). It is hypothesized that, if additonal variables are utilized, the metric examined in this study may be useful as a base to develop a more effective prediction equation.

LIFE SCI
(PA 16,432)

The Use of Polymer Unzipping for the Detection of Biologically Active Agents (Second Quarterly Report). Edward B. Dismukes, Edward R. Covington, and Russel E. Wellman, Southern Research Institute, Birmingham, Alabama, Report No. 2, January 29, 1965, DA-18-035-AMC-265(A) (U. S. Army Chemical Research and Development Laboratories, Edgewood Arsenal, Maryland), AD 455 760, 23 pp. (Unclassified)

This report describes attempts to prepare polyacetone for an experimental evaluation of the utility of polymers that can depolymerize through an unzipping chain mechanism for the detection of biologically active agents. In a preliminary experiment to polymerize acetone by simultaneously condensing magnesium and acetone vapors on a cold surface, a small amount of product identified tentatively as polyacetone was recovered.

FIREPOWER
(PA 16,440)

Armor Protection for Pilot/Copilot Seat With Crash Safety Features for CH-47A Helicopter. David F. Thompson and Philip Harper, The Boeing Company, Vertol Division, Morton, Pennsylvania, Report No. R-361, December, 1964, DA 44-177-AMC-94(T) (U. S. Army Transportation Research Command, Fort Eustis, Virginia, USATRECOM Technical Report 64-73), AD 610 587, 148 pp. (Unclassified)

An armored crash pilot/copilot seat was designed and manufactured for the CH-47A helicopter. Armor is most effective when placed as close as possible to the man. Dual use of the armor material as a load-bearing structure appears feasible and is employed in this seat design. Provision of high crash-load seat/man retention strength (45 g) is feasible with a moderate weight penalty.

MISC (PA 16,443) Military Technology in Developing Countries. H. Roberts Coward, Center for International Studies, Massachusetts Institute of Technology, Cambridge, Massachusetts, Report No. C/64-5, April, 1964 (United States Arms Control and Disarmament Agency), AD 610 185, 51 pp. (Unclassified)

The data suggest that continually larger amounts of expenditures on security programs can be expected in coming years, accompanied by further influxes of weapons technology into the underdeveloped areas. This will mean in turn a constantly increasing level of sophistication attaching to their military technology, even though the level will remain far behind the more advanced weapons systems of the great powers. The precise security requirements of the developing nations remain undefined at present, although internal security is clearly emerging as a dominant consideration in the development of military forces. It does not appear that any solid consensus on actual security requirements has yet emerged.

PHYS SCI (PA 16,445) The Effects of 2,4-D and Related Compounds on Plants. Frederick L. Monroe, Air Proving Ground Center, Air Force Systems Command, United States Air Force, Eglin Air Force Base, Florida, Report No. APGC-TR-65-7, January, 1965, AD 610 462, 24 pp. (Unclassified)

The effects of 2,4-D and related compounds on plants and animals, including information concerning the sensitivity of plants, physiological action of the herbicides, characteristic appearance of affected plants, and methods of determining the herbicide on the plant are presented. One ounce of 2,4-D evenly distributed over 35 acres will seriously injure a cotton crop. For this reason, extreme care should be taken during all herbicide spray operations. Grasses, being fairly tolerant to 2,4-D, are not injured by a dosage of 1 lb/acre. Tolerance of other crops is given.

PHYS SCI (PA 16,447) Study of Chemical Agent Decontamination Systems for Multipurpose Use (Final Report). S. Preis, Z. Oser, F. Serafin, J. Poling, and H. E. Podall, Melpar Inc., Falls Church, Virginia, June, 1964, DA-18-108-AMC-203(A), AD 455 384, 112 pp. (Unclassified)

This 1-year study program has provided basic information concerning the development of a multipurpose catalytic system for decontamination of persistent CW agents at ambient temperatures. The feasibility of catalytic autoxidation of the G-agents has been shown by the demonstration of the essential features of the autoxidation process - radical initiation and chain propagation. Thus, methyl, phenyl, and tert-butoxy radicals have been found to attack GB, GF, phosphonate esters, and HD. Also, one mole of indene plus oxygen consumes approximately 4 moles of GF at 25 C, suggestive of a propagation chain length of about 4.

MISC (PA 16,449) Soviet Strategy at the Crossroads. Thomas W. Wolfe, The RAND Corporation, Santa Monica, California, Memorandum RM-4085-PR, April, 1964, AF 49(638)-700 (United States Air Force Project RAND), AD 601 140, 338 pp. (Unclassified)

(PA 16, 449) (Continued) In the period since the Cuban crisis of October, 1962, the Soviet political and military leadership has found itself at a crossroads of decision on many issues of strategy and military policy. The present study provides an analysis of Soviet thinking and debate on these issues. A central problem relates to the allocation of resources. The continuing Sino-Soviet rift represents another problem of great magnitude. The development of a military posture suitable to Soviet needs in the power contest with the United States apparently presents troublesome and unresolved problems.

MISC
(PA 16, 452)

Employment of Field Artillery in Guerrilla Operations. Fire Support Division, Marine Corps Landing Force Development Center, Marine Corps Schools, Quantico, Virginia, September 5, 1963, AD 456 533, 12 pp. (Unclassified)

The fundamental principles of artillery usage remain valid in the conduct of counter-insurgent/counterguerrilla operations. The present Marine Corps field-artillery tactics and techniques are adequate to support operations in a counterinsurgent/counterguerrilla environment. Marine Corps field-artillery organizations engaging in civic-action programs in the theatre of operations can make a major contribution to counterinsurgency operations.

FIREPOWER
(PA 16, 457)

Effects of Rifle Configuration on Quick-Fire Accuracy (U). Richard R. Kramer and James P. Torre, Jr., U. S. Army Human Engineering Laboratories, Aberdeen Proving Ground, Maryland, Technical Memorandum 6-64, March, 1964, AD 356 888, 20 pp. (Confidential)

(C) Previous experience has shown that, given a long time to fire, the average rifleman's scores are not affected by considerable changes in configuration, but may be degraded by additional weight. Some investigators, however, feel that the average rifleman may be quite sensitive to configuration when the time to fire is short and the shots are "unaimed". The significance of unaimed fire can be assessed by reports stating that 80 per cent of the shots in combat are unaimed.

PHYS SCI
(PA 16, 458)

Experiments on the Use of Silica Gel Ointment for the Decontamination of CW Agents From Skin (U). H. L. McDermot, J. E. Mayhood, R. M. Heggie, B. Zanette, O. Erickson, and O. Sturk, Defence Research Board of Canada, Defence Chemical Biological and Radiation Laboratories, Ottawa, Report No. 446, November, 1964, AD 356 879, 20 pp. (Confidential)

(C) A decontaminating ointment consisting of powdered silica gel suspended with gelling agent in a volatile base has been formulated with the hope of obtaining better skin coverage and contact with the agent than is obtained with dry-powder decontaminants.

PHYS SCI (PA 16,475) Improved Heat Flux Hydrocarbon Fuels (U) (Second Quarterly Progress Report). Martin E. Gluckstein, John Hu, and U. A. Lehikoinen, Ethyl Corporation, Research and Development Department, Research Laboratories, Ferndale, Michigan, Report No. GR 65-15, May, 1965, DA-18-035-AMC-285(A) (U. S. Army Chemical Research and Development Laboratories, Edgewood Arsenal, Maryland), ARPA Order No. 535 Task C, 50 pp. (Confidential)

(U) Mathematical analysis of the interaction of fuel and target has revealed that physical parameters of the target must be considered along with chemical characteristics of the fuel in determining the rate of heat transfer to the target. The preliminary screen showed that certain additives containing organic sulfur are effective in increasing the burning time of an M-1 thickened gasoline or the peak temperature attained by burning a sample on a stainless steel plate. Inorganic oxidizers give greater charring of the target lying directly under the gel than does the base-line M-1 thickened gasoline.

FIREPOWER (PA 16,476) A Project Summit Report, Secondary Lethalities From the Use of Incapacitating B/C Weapons. E. MacAfee, K. A. Krieger, and Clifford R. Lindahl, The Institute for Cooperative Research, University of Pennsylvania, Philadelphia, Pennyslvania, June 10, 1064, DA-18-064-Cml-2757, AD 440 867, 11 pp. (Unclassified)

The effects of an attack by incapacitating B/C weapons on a target population include secondary lethalities resulting from the breakdown of normal daily routine and community services. This breakdown is assumed to arise from direct casualties of 1 to 2 per cent lethality in the target population and incapacitation of 50 per cent of the remaining population for a period of 5 days. The conclusion is that secondary lethalities will rarely, if ever, exceed 3 per cent of the target population.

MOBILITY (PA 16,479) Development of Low-Cost Cargo Parachutes (Interim Report). University of Pittsburgh, Army Materiel Research Staff, Washington, D. C., April, 1965, DA-49-186-AMC-214(D) (Army Materiel Command, Technical Information Report 18.4.2.1), 8 pp. (Unclassified)

This report covers the current status of a low-cost, expendable, cargo-parachute development program. Loads of from 150 to 35,000 pounds are to be delivered at high and low rates of descent. A 12-foot ring-slot parachute has been successfully tested. A 26-foot ring-slot parachute with a maximum load capacity of 2,200 pounds is under test, as well as 25.5-foot and 34-foot (nominal diameter) parachutes with maximum load capacities of 300 and 500 pounds, respectively.

FIREPOWER (PA 16,480) The Constant Acceleration Gas Gun Problem: An Analytical Study of the Constant Acceleration Gas Gun Problem and the Evaluation of Suggested Constant Acceleration Gas Gun Systems. Ernst H. Winkler, U. S. Naval Ordnance Laboratory, White Oak, Maryland, NOLTR 64-111, Ballistics Research Report 133, August 15, 1964, 102 pp. (Unclassified)

(PA 16,480) (Continued) It has been shown that a necessary and sufficient condition exists that the propellant flow in the gun barrel must fulfil in order to maintain a constant pressure at the base of the projectile. The particular flow phenomenon that fulfills the required condition is characterized by the absence of any relative variation of flow velocity. The whole flow then is in a state of constant acceleration. The governing equation of this constant-acceleration flow and the gradients that exist in it are derived.

LIFE SCI
(PA 16,483) Law Enforcement USAF Sentry Dog Program, Air Force Manual. Department of the Air Force, Washington 25, D. C., No. 125-5, December, 1964, 100 pp. (Unclassified)

This manual contains authoritative instructions, procedures, and techniques for increasing the effectiveness of the USAF Sentry Dog Program. It is for sentry-dog handlers and program supervisors, and is used as a reference text in formal courses that include instruction on the Sentry Dog Program.

LIFE SCI
(PA 16,484) Inventory of Information Basic to the Planning of Agricultural Development in Latin America - Colombia. Pan American Union - General Secretariat, Organization of American States, Washington, D. C., December, 1964, 81 pp. (Unclassified)

The report is an inventory of information basic to the planning of agricultural development in Colombia. No attempt is made to describe or analyze the state of agriculture in the country - only to determine what essential information exists and where it is to be found. Attention is also given to the agencies that make their information available to farmers or serve them in other ways.

LIFE SCI
(PA 16,485) Inventory of Information Basic to the Planning of Agricultural Development in Latin America - Brazil. Pan American Union - General Secretariat, Organization of American States, Washington, D. C., December, 1964, 156 pp. (Unclassified)

The report is an inventory of information basic to the planning of agricultural development in Brazil. No attempt is made to describe or analyze the state of agriculture in the country - only to determine what essential information exists and where it is to be found. Attention is also given to the agencies that make their information available to farmers or serve them in other ways.

PHYS SCI
(PA 16,487) Theoretical and Experimental Procedures for Determining the Magnetic Permeability and Susceptibility of Soils. Ittipon Padunchewit, Electronic Engineering Research Laboratory, College of Engineering Chulalongkorn University, Bangkok, Report No. 1, May 1, 1965 (The Research and Development Field Unit - Thailand, ARPA, U. S. Government for The Military Research and Development Center, Supreme Command Headquarters, Bangkok, Thailand), 9 pp. (Unclassified)

(PA 16,487) (Continued) The theoretical and experimental procedures for determining the magnetic permeability and susceptibility of soils conducted by the Electronic Engineering Research Laboratory are submitted to the Military Research and Development Center. They will be used as a part of the analysis throughout the project with future modifications, if necessary, in order to acquire the highest degree of efficiency and accuracy. The purpose of this report is to present a procedure in theoretical and laboratory experiment for measurement of magnetic permeability of soils.

MISC
(PA 16,488) The Political Attitudes of University Students in Brazil (U). Research and Reference Service, United States Information Agency, R-93-64, July 6, 1964, 39 pp. (Confidential)

(C) This is a report of Brazilian student thinking about current political issues, chiefly those of Brazilian national development and political ideology. It is to some extent also a study in political semantics, since it investigates what students mean when they use some of the particular terms of ideological debate, such as "democracy", "capitalism", or "socialism". Interviews show more support than opposition for the current leadership and its slogans of "socialism" and "anti-imperialism". The indications are that "communism" is very unpopular and that only a small minority will want to implant any thoroughly statist system in Brazil. However, many - probably a majority - will be against or deeply suspicious of North American private capital.

FIREPOWER
(PA 16,501) Stoner 63 Weapons System (U). Marine Corps Landing Force Development Center, Marine Corps Schools, Quantico, Virginia, 1964, 55 pp. (Confidential)

(U) A service and troop test was conducted on the Stoner 63 weapons system to determine its suitability for use within the Marine Corps as the Basic weapon and/or weapons system, and to evaluate the operational and organizational concepts, doctrine, tactics, and techniques affected by this weapons system. It was concluded that the Stoner 63 weapons system will be suitable for use within the Marine Corps, upon the correction of several deficiencies, as the replacement system for the present M14, M14(m), M60, an and M3A1 weapons. The Marine rifle squad armed with the M14 and M14(m).

FIREPOWER
(PA 16,521) Development of Conventional Artillery Ammunition (U) (Interim Report), University of Pittsburgh, Army Materiel Research Staff, March, 1965, DA-49-186-AMC-214(D) (Army Materiel Command, Technical Information Report CD-9 Supplement IV), 14 pp. (Confidential)

(U) This fourth supplement to Technical Information Report (TIR) CD-9 describes briefly the changes and trends in the development of conventional ammunition for artillery and mortars and its components during fiscal year 1964.

MISC (PA 16,522) Development of Mobile Pipe Mill (Interim Report). University of Pittsburgh, Army Materiel Research Staff, Washington, D. C., March, 1965, DA-49-186-AMC-214(D) (Army Materiel Command, Technical Information Report 33.8.6.1), 8 pp. (Unclassified)

This report covers the first phase of the development of a mobile pipe mill intended for the production of petroleum-product pipelines in the field. It is to construct pipelines of 8- and 12-inch welded pipe more than 100 miles long at the rate of 40 feet per minute from coils of flat steel (skelp).

MOBILITY (PA 16,523) Development of Shallow-Draft Boats (Interim Report). University of Pittsburgh, Army Materiel Research Staff, March, 1965, DA-49-186-AMC-214(D) [Army Materiel Command, Technical Information Report 30.8.1.1(1)], 15 pp. (For Official Use Only)

This report traces the background and current status of development of shallow-draft boats, including hulls, engines, and propulsion units. Tests have not yet uncovered a boat with operational characteristics sufficiently adequate to warrant acceptance.

FIREPOWER (PA 16,532) Transparent Armor Materials (U). Anthony L. Alesi, U. S. Army Natick Laboratories, Natick Massachusetts, Presented at ATAC Symposium on Lightweight Armor, November 5-6, 1964, 9 pp. (Confidential)

(U) The Army Materiel Command program on lightweight armor materials has so far identified two transparent systems capable of stopping a caliber .30 AP M2 projectile at a weight level of a little less than that of steel armor. These systems are: (1) a glass-plastic system, and (2) a stretched-acrylic laminate. A third system considered promising is a stretched acrylic tipping plate combined with a lighter version of either system.

FIREPOWER (PA 16,554) Final Report of Engineering Test (Desert Summer) of Fuze, Mine, Antitank, XM608E3 (U). Headquarters, Yuma Proving Ground, Yuma, Arizona, YPG Report 4033, September, 1964, (U. S. Army Test and Evaluation Command), AD 355 794 L, 13 pp. (Confidential)

(C) Tests were conducted at Yuma Proving Ground, Yuma, Arizona, during the period June 3 to August 26, 1964, to determine the suitability of the XM608E3 antitank mine fuzes for use under desert summer environmental conditions. It was concluded that the XM608E3 fuze will function reliably after 84 days of mine-field emplacement, both in and on desert soil and desert sand.

MOBILITY (PA 16,584) Spryte Model 1301 (U) (Final Report). Joseph J. Berkow, USAF, Acting Director, Memorandum for Director, Remote Area Conflict, May 12, 1965. (Confidential)

(C) Assuming that the vehicle would stand up under CI and overt war operations, it could particularly enhance the mobility of the RTA mechanized cavalry squadrons and the infantry-division reconnaissance companies. In spite of the advantages in mobility to be gained from the Spryte, factors virtually preclude U. S. MAP procurement of the Spryte for Thailand under present guidance. (1) Planned U. S. MAP funds for Thailand are so low that funds for investment items (such as Spryte) are practically nonexistent. (2) The forecast Thai military budget holds little promise for a Thai materiel procurement program such as Spryte purchases would entail. (3) The supply and maintenance problems involved with a nonstandard item such as Spryte would tend to compound the problems of the already strained RTA logistical support system.

LIFE SCI (PA 16,586) Field Studies on the Effectiveness of Repellents Against Terrestrial Leeches in Southern Thailand. Paja Sirivorasarn and Varaporn Isarangura, Royal Thai Army Medical Department, Joint Thai-U. S. Military Research and Development Center, Bangkok, Thailand, Report No. 65-004, January, 1965, 61 pp. (Unclassified)

The objective of the studies reported here was to determine the effectiveness of several insect repellents against terrestrial leeches in southern Thailand under field conditions and to determine the persistence of these repellents on human skin after repeated washings. (1) All the repellents tested provided protection for over 1 hour when test subjects remained relatively immobile. (2) Each repellent was penetrated ultimately when the subjects waded in muddy water typical of the rice paddies and jungle streams found in the area. (3) Increasing the persistency of cosmetically acceptable repellents remains the principal problem. (4) Improvements should continue to be sought in the substances already tested, and more effective combinations, which retain features of military utility, should be developed.

COMM-SURV (PA 16,587) Acoustic and Seismic Research (September, 1964 - March, 1965). Jansky & Bailey, Research and Engineering Division, Atlantic Research Corporation, Alexandria, Virginia, Semiannual Report No. 2, April, 1965, SD-243 (Office of Secretary of Defense, ARPA), ARPA Order No. 480, 8 pp. (Unclassified)

This report covers the second semiannual period in the performance of a research project on acoustic and seismic phenomena, with particular emphasis on combat surveillance and target acquistion. A principal aim of the project is to collect and analyze fundamental data needed to improve the design and performance of acoustic and seismic systems to be used in these combat functions.

MOBILITY (PA 16, 588) Low Altitude Turbulence Over Hilly Terrain, Counting Accelerometer Data From Jet Aircraft (Aeronautical Report). H. N. C. Lyster and K. G. Pettit, National Research Council of Canada, National Aeronautical Establishment, Ottawa, Report No. LR - 417, December, 1964, 12 pp. (Unclassified)

Counting accelerometer data, obtained during low-altitude flights over the Canadian Shield, north of Ottawa, are reported. Conclusions: (1) Up and down gusts at low altitude are approximately evenly distributed. (2) Equivalent gust velocities at low altitude follow a gamma distribution. (3) The rms equivalent gust velocity increases linearly with mean wind speed at low altitude. (4) The slope of the rms equivalent-gust-velocity versus mean-wind-speed curve increases with increasing roughness of terrain.

LIFE SCI (PA 16, 589) Survey of Forest Zones of Thailand (December, 1964, to February, 1965). Llewelyn Williams, Crops Research Division, United States Department of Agriculture. (Unclassified)

The objectives are to undertake ground and aerial surveys of the vegetation of Thailand, in order to determine the range and distribution of dominant forest types in that country; to ascertain the size and spacing of tree trunks in each type; density and area of canopy, and other features, particularly in areas not investigated during 1963-64; as well as to make a more thorough investigation of zones, such as Rain and Mangrove forests, previously studied. The firs hand information obtained in the field is invaluable in establishing a basis to correlate the floristic composition and structure of vegetation of Thailand, which is representative of the Mekong Basin countries, with that of CONUS and Puerto Rico.

MISC (PA 16, 594) Montagnard Refugee Problems: The BRU and HRE of the Central Vietnamese Highlands. Gerald C. Hickey, The RAND Corporation, OSD/ARPA RDFU, APO San Francisco, May 4, 1965. (Unclassified)

This paper is focused on the refugee situations among two montagnard groups of the central Vietnamese highlands - the BRU in the vicinity of Khe Sanh in Quang Tri province and the HRE of Gia Vuc in Quang Ngai province. It illustrates some of the similarities in the problems faced by refugees of these rather widely separated ethnic groups, and it also underlines some of the problems unique to each group due to traditional economic activities, different physical environments, and other variables. There is need for a policy concerning refugees. The traditional economic activities of refugee groups should be examined and used as the basis for planning and implementing programs designed to make them self-sufficient. Rice should be the cereal crop distributed to all refugees. Wheat is an alien cereal. Montagnard leaders should be given a more responsible role in refugee programs.

COMM-SURV (PA 16,595) Orientation of Linearly Polarized HF Antennas for Short-Path Communication Via the Ionosphere Near the Geomagnetic Equator. George H. Hagn, Stanford Research Institute, Menlo Park, California, Research Memorandum 5 (Revised), June, 1964, DA-36-039-AMC-00040(E) (United States Army Electronics Laboratories, Fort Monmouth, New Jersey), ARPA Order No. 371, 56 pp. (Unclassified)

This report suggests that there is an optimum orientation for linearly polarized antennas used on short ionospheric paths near the geomagnetic equator. Consideration of the magneto-ionic theory and of its application to antenna-to-medium coupling problems indicates that aligning such antennas parallel to the earth's magnetic field will maximize signal strength while minimizing polarization fading on such paths. Linearly polarized antennas with such an orientation may intercept less interference than vertically polarized antennas. If this is true, the signal-to-noise ratio would be maximized and the orientation would be truly optimum.

FIREPOWER (PA 16,602) Assessments of the Lethality of Some Gun-Fired Projectiles Against a Typical Surveillance Helicopter and a Typical Ground-Attack Fighter Aircraft (U). M. R. Skipsey, Royal Aircraft Establishment (Farnborough), Technical Note No. MECH. ENG. 386, September, 1963, AD 346 930 L, 21 pp. (Confidential)

(C) Single armor-piercing projectiles of the types considered appear to be relatively ineffective against a typical surveillance helicopter. The pilot is the largest component vulnerable to A. P. projectiles, and against him they have a high probability of lethal effect.

FIREPOWER (PA 16,603) New Concepts for Flame Weapons (Quarterly Progress Report). J. D. Palmer, O. A. Pipkin, and C. M. Sliepcevich, University of Oklahoma Research Institute, Norman, Oklahoma, Report No. 1454-QPR-4, May, 1965, DA-18-035-AMC-116(A) (U. S. Army Chemical Research and Development Laboratories, Edgewood Arsenal, Maryland), 61 pp. (Unclassified)

In the area of target definition and analysis, the effect of offset error on target destruction has been studied, and the physiological effects of flame weapons have been reviewed. Radiation studies are continuing in two areas: (1) measurement of spectral-emission coefficients and self-absorption characteristics of flames and (2) utilization of these data in computer programs to determine the total incident flux on targets. The wind-tunnel facility was completed, and the first experimental data were obtained on the effect of wind on flames from pools of burning liquid. The use of skin simulation in flame-weapon evaluation has been reviewed.

LIFE SCI (PA 16,608) Letter Report for Evaluation - Ranger Ration. Ben F. Hardaway, Colonel, USAF, ARPA, RDFU, APO San Francisco, April 20, 1965, 8 pp. (Unclassified)

(PA 16,608) (Continued) The Ranger Ration is palatable to Vietnamese tastes, easy to prepare, and preferred over existing RVNAF field rations for operational use. The ration consists of foods that are indigenous to Vietnam, but the means for preparation and packaging of these foods, other than the rice, do not exist in Vietnam. Insofar as is presently possible, the ration satisfies the objectives of the Ranger Ration project.

FIREPOWER (PA 16,609) A Kinematic Evaluation of the AR18 Rifle, Cal. 0.223. Richard F. Cronin, Ballistic Research Laboratories, Aberdeen Proving Ground, Maryland, Memorandum Report No. 1635, February, 1965, (U. S. Army Materiel Command), 55 pp. (For Official Use Only)

Two AR18 rifles were fired to obtain a kinematic evaluation of the weapon. A comparison in functioning of a lubricated and an unlubricated rifle was made. Functioning of the AR18 rifle varies from lot-to-lot of ammunition. In view of the results obtained in the kinematic study, it is concluded that the basic design of the AR18 rifle is good. However, because of the neglect in providing a positive feeding system and positive locking devices for some of the subassemblies, the weapon in its present state of design is unsatisfactory, and in some conditions is unsafe. The rifle is in an unfinished state of design but could become both satisfactory and safe without major revisions.

COMM-SURV (PA 16,611) Development of Infrared Detecting Set, AN/AAS-10 (U) (Interim Report). University of Pittsburgh, Army Materiel Research Staff, Washington, D C., April, 1965, DA-49-186-AMC-214(D) (Army Materiel Command, Technical Information Report 9.5.1.1), 5 pp. (Confidential)

(C) This detection set is designed to produce a photographic-type, pictorial record of thermal activity in the area covered. Details of enemy equipment are recorded. It is to be usable during the day or night in high-performance aircraft.

COMM-SURV (PA 16,612) Development of Mohawk Surveillance System (U) (Interim Report). University of Pittsburgh, Army Materiel Research Staff, March, 1965, DA-49-186-AMC-214(D) (Army Materiel Command, Technical Information Report 18.1.2.2), 26 pp. (Confidential)

(C) This is a comprehensive report on the Mohawk surveillance system, which provides visual-photographic, side-looking radar (SLAR), and infrared surveillance as well as mutually interlocking mission support. Improvements in all versions are still being made.

FIREPOWER (PA 16,613) Development of Sheridan Weapon System (U) (Interim Report). University of Pittsburgh, Army Materiel Research Staff, March, 1965, DA-49-186-AMC-214(D) (Army Materiel Command, Technical Information Report 24.1.6.1), 204 pp. (Confidential)

(PA 16,613) (Continued) (C) The Sheridan weapon system, consisting of a full-tracked, armored, amphibious vehicle armed with a 152-mm gun-launcher cannon that can selectively fire either a guided missile or a conventional cartridge, is described in this report. Requirements for the Sheridan weapon system are that it can be transported by aircraft, can be dropped by parachute, and can cross inland waterways under its own power without a flotation kit. Up to a range of 2,000 meters, it must be able to defeat hard targets having 150 millimeters of rolled homogeneous armor at an obliquity of 60°, equivalent tripartite targets with spaced armor, and soft targets. It is planned that the Sheridan weapon system will replace the M41-series light tank and the M56 90-mm airborne support weapon.

PHYS SCI
(PA 16,614) Magnetic Section B to System Predictions Report Railroad Sabotage Detection Research (U). J. E. Arceneau, R. E. Brannian, T. J. Scherbel and A. E. Sobey, Jr., Texas Instruments Incorporated, Science Services Division, Dallas, Texas, First Interim Technical Report, DA-44-009-AMC-657(X) (U. S. Army Engineer Research and Development Laboratories, Fort Belvoir, Virginia), ARPA Order No. 293/10, 10 pp. (Confidential)

(C) This is a classified section of an unclassified system predictions report on the feasibility studies for detection of railroad sabotage. Tests performed with a large, balanced magnetic loop buried beneath a railroad are described and compared with results obtained on a similar loop buried in an open field. The results obtained from both loops are similar and indicate a loop could detect sabotage activity on a railroad.

MOBILITY
(PA 16,621) Operation, Maintenance and Lifetimes of M60 Tanks, M113 Armored Personnel Carriers, and M88 Tank Recovery Vehicles - Volume I (U). Jerry L. Buffay, Conway J. Christianson, Gerald E. Cooper, Richard G. Huver, Howard A. Markham, Elizabeth C. Seip and Harry D. Sheets, Research Analysis Corporation, McLean, Virginia, Technical Memorandum RAC-T-460, February, 1965, DA 44-188-ARO-1 (Department of the Army), 101 pp. (Confidential)

(C) Age and use have a substantial deleterious effect on the performance of M60 tanks, M113 APCs, and M88 recovery vehicles. After 4500 miles of use a critical mobility-disabling failure is expected to occur for every 200 miles of tank or personnel-carrier operation. The first 2000 miles of tracked-vehicle operation are relatively trouble free. One of the major factors affecting tracked-vehicle materiel readiness is the replacement of parts that affect the mobility of the vehicles. An analysis of estimated M60 tank and M113 APC performance on an unannounced 50-mile road march shows that by the time each vehicle in a fleet has accumulated 4500 miles, 25 percent of the fleet cannot be expected to reach a march objective 50 miles away. Track replacements are the most costly parts expenditures on M60 tanks, M113 APCs, and M88 recovery vehicles. Fuel and electrical systems continue to be a problem for the current generation of tracked vehicles, as they were for their predecessors.

COMM-SURV (PA 16,624) Field Tests of VHF Man-Pack Radios. N. K. Shrauger, Stanford Research Institute, Menlo Park, California, Special Technical Report 8, April, 1965, DA-36-039-AMC-00040(E) (U. S. Army Electronics Laboratories, Fort Monmouth, New Jersey), ARPA Order No, 371, 45 pp. (Unclassified)

A field test program was conducted in Thailand to determine the performance capability of selected VHF man-pack radio sets. The principal objective of the test program was to determine the effective range of the sets in flat, open terrain, with standard whip antennas, and under controlled conditions simulating potential operational situations. The following sets were tested: 1. AN/PRC-35 (XC-3); 2. AN/PRC-25. (1) Received signal strengths generally varied with range in accordance with calculations. (2) Increases in transmitter power gave significant increases in useful range. (3) No significant difference was observed between day and night operation. (4) Variations in range capability were found as frequency was changed. (5) Effective ranges during the dry season over flat, open, delta regions have been determined. (6) At the range where received signals disappeared, a set evaluation of about 10 feet was required to regain communications.

FIREPOWER (PA 16,627) BLU-15/B, Antimateriel Bomb (U). S. C. Piccoli, C. F. Lucy, and H. J. Woods, Harvey Engineering Laboratories, Torrange, California, January, 1965, AF08(635)-3491 (Directorate of Armament Development, Det 4, Research and Technology Division, Air Force Systems Command, Eglin Air Force Base, Florida, Technical Report No. ATL-TR-65-1), AD 356 837, 182 pp. (Secret)

(C) This summary report presents results obtained during the design and development of the BLU/15/B bomb. The primary goal of this program was to develop an improved antimateriel bomb possessing an incendiary side effect, an increased fragmentation effectiveness against materiel, and impart a greater antipersonnel side effect than possessed by the existing BLU-3/B bomb. The most significant performance improvements are: Increased antimateriel and effectiveness through better fragmentation of the steel liners, better penetration provided by use of maraging steel balls, increased reliability due to improved structural integrity provided by the steel liners, and the unique incendiary effect provided by use of zirconium-tin balls.

LIFE SCI (PA 16,629) A Study of Chemical Agent Protective Substances and Concepts for Percutaneous Protection (U). G. L. Braude, et. al., W. R. Grace & Co., Research Division, Clarksville, Maryland, 8th Bimonthly Progress Report, February 4, 1965, DA-18-108-AMC-263(A) (U. S. Army Edgewood Arsenal, Chemical Research and Development Laboratories, Edgewood Arsenal, Maryland), AD 357 065, 111 pp. (Confidential)

(C) To study the effectiveness of higher boiling sulfoxides as solvents for the base catalyzed decomposition of mustard, kinetic studies were made in dipropyl, diallyl and allyl methyl sulfoxide. It is concluded that study of higher sulfoxides should generally not be continued, but sulfoxides may be worth investigating.

MISC (PA 16,650) — The Field Experience of a Medical Civic Action Team in South Viet Nam. Capt. James Erwin Anderson, Jr., Reprinted from Military Medicine, Vol. 129, Nr. 11, November, 1964, AD 453 504, pp 1052-1057. (Unclassified)

The field experience of a military advisory medical civic action team in the Republic of Viet Nam has been presented. The team made 121 village visits and saw 20,079 patients. The frequency of the 10 most common diagnoses is tabulated, and it is pointed out that aside from helminthiasis, tropical diseases as a group were not a problem in the coastal areas. The frequency of use of medications is presented, and it seems apparent that a relatively short list of medicaments can cover nearly all the problems encountered in the field.

MISC (PA 16,658) — Counterinsurgency: Principles and Practices in Viet-Nam. James Farmer, The RAND Corporation, Santa Monica, California, Report No. P-3039, December, 1964, 35 pp. (Unclassified)

This paper discusses the criteria and indicators used for measuring success in counterinsurgency. A military victory is not possible for the Viet Cong in South Viet Nam as long as the U. S. is supporting the government. The paper suggests the problems of motivating the Vietnamese soldier to fight a war which he no longer feels will be won in the near future. There have been few successful counterinsurgency operations.

FIREPOWER (PA 16,660) — Letter Summary Report Antipersonnel Bomb Development (U). D. T. Chaput, Aerojet-General Corporation, Downey, California, Report No. 0887-01(10)LFPR, May 15, 1965, AF 08(635)-4458 (Research and Technology Division, Detachment 4, Eglin Air Force Base, Florida), ARPA Order No. 543, 64 pp. (Confidential)

(C) The objective of the program was to provide an aircraft-dispensed munition capable of penetrating a jungle canopy and detonating near ground level to inflict lethal wounds on enemy personnel. This objective was accomplished through the development of a munition containing a unique fuzing concept in which angular velocity arms the munition, and, upon spin decay, the munition detonates. It is concluded that the development of the BLU-24/B Bomb has been proven feasible. It is recommended that additional work be performed to develop the munition for production capability.

MISC (PA 16,661) — Railroad Sabotage Monitoring System (Initial Monthly Report, March - April, 1965). Gordon L. Jacox, Atlantic Research Corporation, Alexandria, Virginia, March 18, 1965, DA-44-009-AMC-1002(T) [illegible]ommanding Officer, USAERDL, Barrier and Intrusion Detect[illegible] Branch, Fort Belvoir, Virginia), ARPA Order No. 293/12, 6 pp. (Unclassified)

(PA 16,661) (Continued) The requirement of this contract is to design and construct a system for detecting and annunciating disturbances arising from such sabotage activities. The current concept involves a vibration sensor attached to the rail and coupled to electronic conditioning and logic. A valid alarm would excite an R. F. transmitter tuned to a remote receiving-annunciating station. Sufficient sensors are required to instrument 3 kilometers of track. The R. F. transmission link is to be a maximum of 2 kilometers. Some preliminary research has been conducted.

PHYS SCI
(PA 16,664)

Letter Report of the Feasibility Test of KONTAX (U). Bentley Harris, Colonel, USAF, Director, Munitions Test Directorate, Headquarters, Air Proving Ground Center, Air Force Systems Command, USAF, Eglin Air Force Base, Florida, To: Det 4 RTD (ATWD/Mr. Ron Boulet), April 21, 1965, RAC 65-1209. (Confidential)

(C) This report is to provide the appropriate personnel with the information that they need to determine whether or not to acquire the patent rights for KONTAX prior to the publication of the Technical Report. KONTAX does burn with water or ice. The addition of more water to the Type N powder and the gel makes it burn more fiercely, but only a small amount of water should be used to ignite the Type S powder. Fire, electrical sparks, and detonations also ignite KONTAX. KONTAX gel is not very adhesive or cohesive. KONTAX is not shock or vibration sensitive. KONTAX is compatible with aluminum, steel, glass, plexiglass, fiberglass, and some other plastics. It is not compatible with styrene, and the gel form is additionally not compatible with rubber. KONTAX may be an effective illumination agent or target marker for targets on water if a container can be devised so as to expose the KONTAX to the water slowly. The ability of the Type N powder to form a residue that can be ignited at a later date by being disturbed is too much dependent upon ideal weather conditions to be of any value. KONTAX is ineffective when applied thinly over a wide-spread area. BLU-10/B fire bombs that are filled with KONTAX gel show no general combustion superiority over WESTCO, the existing standard fire bomb mix, on either land or water. The only advantage that KONTAX might have over the present incendiary composition is the lack of a need for a fuzing system and the simplicity of the containers that can be used. KONTAX may have a use as an igniter for fire bombs that filled with WESTCO or napalm and are to be used against targets in a water environment.

COMM-SURV
(PA 16,665)

The Strategic Setting for Conflict in South Thailand (U). Russell F. Rhyne, Operational Research Division, Stanford Research Institute, Menlo Park, California, Research Memorandum ORD-RM 4923-1, April, 1965, DA-31-124-ARO-D-200 (U. S. Army Research Office, Durham, North Carolina, Sponsored by the ARPA for the Thai-U. S. Military Research and Development Center, Supreme Command Headquarters Bangkok, Thailand), ARPA Order No. 538, 50 pp. (Confidential)

(PA 16,665) (Continued) (C) This report presents the first major step in the work of the Stanford Research Institute Counterinsurgency Surveillance Analysis Project. The jungle itself will not support anything like the number of CT who live in it, and much that they need cannot be obtained even from nearby villages. This offers a possible means of both detecting and combatting the CT in the jungles. The Chinese dominate several regions along the border. Each government in Southeast Asia has had to reckon with the fact that Chinese generally work harder, count better, and somehow make out better than other groups. Given an equal chance at political power, it seems that their energy and skill could have brought them to control the government in a number of countries. The rulers have perceived this potential and have carefully blocked off the roads the Chinese might follow to reach political dominance. The CT now appear to live almost entirely in the jungle. More than 200 of their camps have been found in south Thailand during the last four years.

FIREPOWER
(PA 16,704)

Aircraft Component and Structures Armor Investigation (UH-1B) (U) (Final Report). Bell Helicopter Company, Fort Worth, Texas, Bell Report No. 299-099-253, December, 1964, DA 44-177-AMC-104(T) (U. S. Army Transportation Research Command, Fort Eustis, Virginia, TRECOM Technical Report 64-62), AD 356 093 L, 42 pp. (Confidential)

(C) An analysis has been conducted to determine the vulnerability of selected components of the UH-1B with the expressed purpose of determining the need for and the design of experimental kits for their protection. Due to the relative invulnerability of the UH-1B in accordance with the criteria established, considerable emphasis has been placed on detailed examination of components. None of the components in the system specified meet the criteria established for immediate kills. While critical components are afforded a limited degree of protection due to projectile tipping by aircraft structure and other components, none of the component vulnerable areas were reduced by masking to any large degree. As a result of this analysis it is recommended that no component protection be provided or armor material allocated for component protection be used for additional crew protection.