[redacted]

BARRIER RESEARCH

PROBLEM: (U) There is an urgent requirement for concerted research to provide a sound scientific basis for radically new and improved military barrier elements.

ORIGIN:

(C) Barrier Research was approved as a project in May 1961. It received added prominance as a result of CINC USAREUR interest in development of a selective and responsive barrier for employment across the Seventh Army front in Europe.

ACTION TO DATE: (C)

1. An internal working team of highly competent scientists and engineers was formed to search for applicable scientific principles and to evaluate these principles in applicability and practicability for military barriers under future tactical concepts and conditions.

2. This group of selected scientists, headed by Dr. Paul Gross, Duke University, met at Fort Belvoir, Virginia in July 1963 under the auspices of the Army Research Office, Durham. The objective of the group was to launch a multi-discipline attack on the barrier problem.

3. Previous conferences had concluded that antitank mines by themselves are inadequate as land barriers, and had determined that a barrier program with the goal of reducing logistical and operations requirements by a factor of 10 to 1 was mandatory and 100 to 1 was desirable. Specifically the desirable goal was to reduce the current 36 tons of equipment and 815 man hours required to install a barrier on a 1000 meter front, to 700 lbs and 8 man hours for the same frontage.

4. One promising approach to the problem was a "controlled barrier". This envisions a barrier system designed to engage a target in the prescribed zone. An unattended system would attack targets within 25 - 500 meters from the desired barrier; an attended barrier might have a range of up to 1000 meters. The controlled barrier requirements would be:

a. To act against enemy vehicles only.

b. Be capable of functioning attended or unattended using sensory and/or self regulating devices.

c. Be compatible with other operations on the modern battlefield.

(Barrier Research - Continued)

5. The report recommended that an expanded research program should be conducted in:

a. Designing kill mechanism concepts for barriers using: chemical agents; materials which will cause catastrophic material failures; denying air to engines; neutralizing night vision devices; causing unusual effects on nervous systems by microwaves.

b. Delivering kill mechanisms using: land torpedoes; vehicle signatures and other sensory and aiming systems.

c. Defeating communications at a barrier.

d. Designing passive barriers.

6. Programmed expenditures for FY 64 are:

a. Internal: 40 M

b. External: 156 M

(1)	Controllable Barrier Sensory	96 M
(2)	Frankford Arsenal Special Reactions	25 M
(3)	Library of Congress Scientific	20 M
(4)	ARO-D Vulnerability of Personnel	15 M

PROBLEM TO INVESTIGATE:

(C) Should the barrier program be directed toward a weapon system approach or should the study be directed toward the enhancement of natural and/or artificial resources to impede or channelize the movement of enemy vehicles and foot troops?

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on

BARRIER RESEARCH

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BARRIER RESEARCH (Terms of Reference)

PROBLEM: To assess the Army RDT&E effort in the field of barriers.

CONSIDERATIONS:

1. The barrier, in a military sense, is something which acts to inhibit or prevent enemy movement and to channel this movement in directions most advantageous to friendly forces. New barrier techniques for restricting enemy mobility are desirable, particularly when considered in the context of the flexible, highly-mobile operations characteristic of current doctrine. These new configurations would embody the following advantages:

a. Improved selective mobility of friendly forces with respect to enemy forces.

b. Controllability and responsiveness to changing requirements of the tactical commander in fluid situations.

c. Low cost.

d. Low logistic burden.

e. Rapidly deployable.

f. Reusable and recoverable for subsequent use elsewhere.

2. The Army still relies on conventional minefields as the main barrier element. These patterns of conventional explosives are time consuming to lay and logistically demanding to support.

Question: Is this type of barrier commensurate with today's science and engineering?

3. The Army has an approved Research Project on Barriers.

Question: Should the barrier research program be directed toward an unmanned weapon system approach or should study be directed toward the identification and enhancement of natural and/or advanced unique artificial barriers?

4. Assuming the enhancement of natural barriers is a fertile field.

Question: What research and exploratory development areas should be given priority?

5. Assuming advanced and unique artificial barriers are feasible.

Question: What research and exploratory development areas should be given priority?