21 July 1968

BEHAVIORAL PROGRAM

Our training methods are based on modified operant conditioning techniques (as proposed by B.F. Skinner) combined with inputs from ethological, ecological and other biological disciplines.

We have deviated from the classical and somewhat simplistic Skinnerian and pavlovian views because of our recognition of the complex nature and importance of the relationship between internal biological mechanisms and external environmental factors. We recognize even the simplest conditioned behavior is actually a more or less complicated behavioral chain or sequence.

Our approach to situations [redacted] is one of engineering design rather than statistical experimental research. Experiments tend to be of the go—no go type, with few subjects and with a subject acting as its own control. Requirements for data are kept to a minimum commensurate with answering questions vital to the success of the mission. Our engineering design is based on program goals, our knowledge of the animals in question, the anticipated environmental situation, degree of behavioral control required, equipment available and cost of time factors.

The training plan is tailored to fit the requirements of the engineering design. Critical aspects or probable problem areas of the proposed behavioral chain are identified and avenues of approach are initiated immediately. Problems of a critical nature we try to attack on more than one front simultaneously. The data requirements are included in the training plan.

Our training plan also includes milestones but the milestones seldom have dates attached. It is difficult to predict the "building rate" of behaviors, especially under the conditions of poor control of environmental factors such as might occur outside the laboratory. Training is a growth process and to push ahead on a fixed schedule without maintaining a firm behavioral base is an unwise practice and courts long-term disaster.

Daily training programs are constructed for each animal based on his previous record--particularly the previous day's record, but also using the earlier records of rate of progress, incidence of regression, health conditions, etc. Occasionally routine steps of progress such as increasing range a certain number of yards are sacrificed for increased accuracy of discrimination, polishing certain skilled terminal behaviors, correcting or extinguishing problem behaviors and the like.

Very little quantitative or qualitative experimental evidence exists on long chains of behavior such as are involved in the present project. There are little data available on extensibility of secondary reinforcement over a long time periods of high effort tasks. The evidence available now, however slight it may be, must form the basis of our present design and we must gather the necessary data for future engineering designs. In view of the paucity of pertinent evidence a coryain amount of art, skill, evaluation and educated guess-work must be used in judging how far animals can be stretched each day, when new stimulus situations can be introduced and when behavioral links can be dropped without disrupting the whole chain.

SPECIFICS:

From September through December of 1967, we analyzed the program goals and requirements.

The goals were to get the vehicle to a remote point and back again. A simple terminal behavior may be required. The guidance system must utilize the capabilities of an R F Link.

In our analysis, two areas seemed to be most critical and in need of investigation, development and selection of guidance methods and establishing a maximum range capability.

We proposed several approaches to the guidance problem, one of which was not directly compatible with the R F Link. We proposed to assess the efficacy of continuous information input systems and intermittant information inputs systems as well as compare positive information systems with negative information systems.

Once the system(s) of choice had been selected, we proposed to gather data on range extension. We were interested in biological factors such as attention span, physical endurance, total range and effect of different reinforcement schedules.

Once we had a sufficient amount of data to support that the system could possibly achieve the desired range we proposed to incorporate [redacted] behaviors and attempt to achieve maximum range. Included at this time also would be the systems integration aspects.

The training protocol involves systematically increasing the complexity and skill level of the animal responses under the conditions of an expanding and frequently changing environment.

We conditioned the animals to search for targets and respond to the targets once they found them. We supplied auditory cues to the animals to aid them in their search for targets. We also attempted to train an animal without the use of targets but the results in comparison to the target situation were poor.

The auditory cues were a continuous signal when the animal was heading towards the proper target, a signal meaning turn to the left (target on left) and a signal meaning turn right (target on right). These signals were used in different combination for different animals depending on the particular approach in training. The basic approaches were: On course
Left/Right
On course--Left/Right
Whether the guidance signals were continuous or intermittant was another variable in our training scheme.

The initial training is accomplished with the relatively sterile confines of a small [redacted] pen--essentially an oversized skinner box!

Once the behavior was established in the small pen we moved to a larger pen with a more complex environment and also introduced gate training and more extensive handling procedures.

By this method of continual environmental and behavioral expansion we moved the animals outside the compounds.

The data kept during most of the training sessions were numbers of trials, positions and range of targets, number of correct choices, environmental factors and occasionally time per trial number of course corrections and, most importantly and at all times, a detailed record of behavioral observations.

13 March 1969

MEMORANDUM FOR:

VIA:

SUBJECT: Animal Studies Projects

REFERENCES: A.

B.

C.

1. A recommendation for your approval is contained in paragraph 4.

2. The [ ]program relating to the utilization of trained animals has provided useful information to the [ ]. Currently the program involves the development of [ ]capability for [ ]as the transport and [ ]vehicle, and the development of several cats for [ ]evaluation as [ ]vehicle. The work with [ ]is directly related to specific [ ]requirements, and it is planned that [ ]will provide funds in the amount of [ ]in FY 1970 for continuation and improvement of this trained animal capability.

3. Additional R & D support by [ ]would continue to contribute information of value to [ ]in providing more

optimized systems, as well as new system concepts for Agency applications. I understand that there are no funds programmed for R & D support of the trained animal program by [redacted] for FY 1970.

4. I think a modest level of forward looking R & D activity designed to improve the guidance systems and operational versatility of various animals should be maintained. I, therefore, recommend that you approve such a [redacted] research effort for FY 1970.

19 December 1967

MEMORANDUM FOR:

SUBJECT : Animal Programs

1. and I have completed a number of meetings with representatives regarding the future of the animal programs. As you know, we were told that we could continue Project through FY 1968. Unfortunately this decision came after we reduced the budget by in order to meet the reduction required in FY 1966. This entire situation was discussed with

2. On the basis of the above, we presented a program to for their review which they felt was reasonable (see attached). You will note that the Agency will provide the additional (this will be deducted from (current budget). will provide approximately in FY 1968 which includes all support for the dogs and cats and administrative funds for monitoring, travel, and consultation. They will fund the study and program management contracts which will be let after appropriate bidding from In FY 1969, will pick up any of the remaining costs for Project and a considerable portion of the costs for Project There are two caveats in this arrangement, however. The entire agreement will be null and void unless

a. The Agency agrees to act as technical monitor for both programs, and

b. The Agency is willing to assume partial funding of Project provided suitable feasibility is proven by 1 January 1969.

C00021906

SUBJECT: Animal Programs

3. I can assure you that neither project will be undertaken unless we direct them, but I also recognize your position with regard to the Director's statement about monitoring programs not directly in the Agency's interest. If the attached agreement is not receptable to the Agency, I recommend that we divorce ourselves entirely from all animal programs since I cannot, in good conscience, stretch the relationships that we have established with [ ] over the years beyond this point. I think it would be wise if we discussed this matter, perhaps with the Director. If, on the other hand, this agreement is acceptable, I propose that we send a follow-up letter to the [ ] indicating our willingness to work with them as outlined.

PROGRAM - ANIMAL STUDIES

AIMS AND OBJECTIVES

It is the intent of the Agency to fund projects from FY1968 funds as shown on the adjacent spread sheet. The funding proposed, is shown in breakdown form on the spread sheet. This procedure is suggested rather than asking to contribute during FY1968 because the Agency can fund through to January 1969 with funds that are presently available from FY1968. As of January 1969, however, we have no funds that we can commit. It is anticipated that with a successful series of demonstrations between now and January 1969 that we will go back to our management and request further funding for carrying on worthwhile tasks of this type. The reason it is felt that should be extended past June 30, 1968 is because of the lack of ability to give the program complete orientation until after the three month study program proposed by through the program management firm has been completed. Even if we could start at this point in time it would be the end of March before we could know what is really expected of the contractor. Therefore, it is felt that the contract should be continued from June 30, 1968 to January 1, 1969 in order to completely and effectively orient this program. The purpose of the FY1968 funding will be to examine the feasibility and practicability of the animal control, signalling, guidance, and location system proposed previously. In addition, it is felt that the proposal for should be undertaken at this time and we therefore propose to split the cost of this effort between and myself. We feel that this should be undertaken at this time in order to begin studying mechanisms, both animal and hardware, to be used and to do this covertly and in a nonattributable fashion. We also feel that as soon as possible we should undertake, at least on an in-house basis, a study, i.e., configurations, characteristics, system characteristics, flow rates, and the like. Also, at the earliest possible time, we feel that we should undertake a alternative study, i.e.,

It is proposed by and agreed to by the Agency that it would be highly desirable to acquire the services of a program management group who will be expected to respond to the government program manager and in addition, to conduct a three month study of the problems and ramifications which must be assorted in order to achieve an integrated program with usable products within a reasonable time period. The estimate in the contribution spread sheet for program management of for the initial period is based on a 50% figure of the total of that the Agency proposes to put into the effort area.

C00021906

[redacted] PROGRAM - ANIMAL STUDIES

AIMS AND OBJECTIVES

[redacted]

It is proposed that the [redacted] program in the [redacted] effort area be directed at the development of [redacted] in dogs. These dogs would then be coupled from the [redacted] to external leads going to externally borne hardware which, in turn, would communicate through the [redacted] system to acquire infiltrators in combat areas. Since, as shown on the spread sheet, the Agency has no fund for [redacted] in FY1968 or FY1969, it is proposed that [redacted] contribute the estimated cost of development of these animal vehicles as shown on the spread sheet. This would constitute the total contribution in FY1968 and it would be anticipated that unless drastic and unexpected change in Agency policy takes place, all the contribution for follow-on in FY1969 would have to be borne by [redacted] In addition to the development of the canine capability outlined above, we would continue to do some small amount of work with felines to use them as testbeds for [redacted] capabilities, and the like. This is highly desirable because of the much lower expense of utilizing cats as experimental vehicles for laboratory work than dogs. Details of the overall proposed work will be worked out by the Program Manager and/or an [redacted] representative with the proposed prime contractor, [redacted] In addition, if a program management firm is selected and retained by [redacted] the work of [redacted] will be integrated into an overall program area with the work outline for [redacted]

C00021906

AGENCY BUDGET PROPOSAL - ANIMAL STUDIES

Project Area	$K-FY1968	$K-FY1969

breakdown - FY1968 funds

SUGGESTED CONTRIBUTION - FY1968&69

3 month study & program management

funding

study and follow-on

(estimated)

Administrative funding

C00021896

6 March 1967

MEMORANDUM FOR:

SUBJECT : Status Report on Animal Programs

1. This memorandum contains a current status report on the [redacted] as well as a request for a current expression of [redacted] requirements, technical modifications and [redacted] guidance.

2. Background. You may recall that in 1963, [redacted], in a memorandum to the Director recommended that the [redacted] take over responsibility of [redacted] and that it continue to develop animal systems which might carry out a number of useful [redacted] (Attachment A). [redacted] became active in this area beginning in 1964; and in May 1965 in response to a request by [redacted] I provided you with a summary of our current programs and projects (Attachment B).

3. Current Status.

a. Project [redacted] Technical feasibility was demonstrated for this system approximately one year ago. We anticipate operational feasibility will be demonstrated in July of this year at which time these animals will carry out [redacted]. The requirements stem from [redacted] and in part from [redacted] who is jointly funding this program. There has been close collaboration with [redacted] through the course of this program, and I have recently alerted [redacted] through the [redacted] that a decision will be required as to the interest of the [redacted] following the demonstrations.

RELEASED---SEP 1993---

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SUBJECT: Status Report on Animal Programs

b. Studies. The use of for the emplacement of devices is under active investigation at this time. Results to date are quite encouraging although it is too early to come to a decision as to their usefulness. This program is being coordinated on a regular basis with I understand that is going to provide us with suitable hardware for testing out this system.

c. Project under the direction of has now developed a number of systems in cats prototypes). The animals' behavior is normal, the system is reliable and relatively inexpensive. A number of the cats are undergoing training at this time. Dogs can also be used in the same manner, are easier to train, but do not have A demonstration of these was provided for representatives of the on 20 and 21 February. It is important that we receive specific guidance from the at this time before engaging in any follow on action. I would like to request your assistance in surveying the various offices for specific technical requirements and modifications which would be required to implement land animal systems.

4. Possible Options.

a. Cats and dogs were originally chosen for study since they are common in most parts of the world. Although we have concentrated on system, animals could be trained for a variety of other missions, as a means of emplacing other devices, or as systems. However, current needs may dictate that smaller or larger animals be investigated for other kinds of missions.

b. You may wish to have us train these animals to do other kinds of activities.

C00021897

MEMORANDUM FOR:

SUBJECT: Views on Trained Cats for Use

1. Our final examination of trained cats for use in the convinced us that the program would not lend itself in a practical sense to our highly specialized needs. Repeated checks on the state of training and equipment showed us that it was indeed possible to train

locations; we were not able to visualize use for this technique under conditions that prevail

2. We have satisfied ourselves that it is indeed possible

This is in itself a remarkable scientific achievement. Knowing that cats can indeed be trained to move short distances we see no reason to believe that a cat can not be similarly trained to approach

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Again, however, the environmental and security factors in using this technique in a real foreign situation force us to conclude that, for our purposes, it would not be practical.

3. The work done on this problem over the years reflects great credit on the personnel who guided it, particularly whose energy and imagination could be models for scientific pioneers.