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ORD-3764-74
PROP-082374/3

PROPOSAL FOR AVIAN OPERATIONAL SUPPORT

Submitted by

[redacted]

12 August 1974

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INTRODUCTION

Dear Sirs:

Enclosed is a proposal for the Avian Operational Support project based on a 12 month period and starting September 13, 1974 through September 12, 1975. Although not indicated in the body of this proposal, a paramount consideration is the expansion, or acceleration, level of effort.

At the present time the personnel at the San Diego location are working a 7 day week so it is not a question of increasing the work load but rather a question of adding more people. As more subjects are available, and they will be a considerable number in the coming weeks, we hope to add 2 more trainers.

This will give us 4 people, or two teams, at the Point Loma location and at least 1 person in the [redacted] area at all times.

We were fortunate in acquiring the services of a young man training to be a veterinarian. Coincidently, he is an experienced falconer and probably has more medical knowledge concerning falcons than anyone in this part of the country. It is the opinion of this contractor this young man will be a welcome asset to the project.

It is not expected that these additional trainers will increase the level of funding to any extent. In certain areas the costs will be cut but in others it will slightly increase. A case in point would be maintenance of the living quarters in San Diego and the new [redacted] facility.

Since this proposal was completed there have been small changes in the bird procurement department. There is now a definite commitment for 3 falcons from the B.C. source. A gyr falcon has been contracted and paid for and will be delivered in November. Another prairie falcon, paid for previously, is now in our possession but presently at the veterinarian's for treatment on feet. This is the picture:

Falcons	on hand	contracted for
	4	4

The total of 8 should be ample for our needs since 3 of the ones we now have are proven birds as is one of the B.C. birds already mature and of good disposition.

Please advise us of any additional information you may need to round out this proposal. Funding requirements will follow in a day or so but it will in are already discussed.

Regards,

[redacted]

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Chief/ Life Sciences Research Division

SUBJECT: Avian Operational Support

GOAL: The essential purpose of this project will be to provide reliable trained avian vehicles for emplacement, transport and/or recovery of reconnaissance-surveillance sensors to meet operational requirements as defined by the Sponsor. Additionally, Package orientation and sample matching will be initiated to amplify and augment the scope of possibilities. The accomplishment of this goal requires: bird procurement, (reduced basis) domestication, health maintenance, transport and housing facilities approved by government regulatory agencies, minimal 7' x 10' facility for each trained bird, task training, package and harness and release mechanisms, integration of vehicle and system test and evaluation. Besides these requirements the Contractor will be responsible for the support and housing of personnel at the San Diego location. It will be vital to maintain other trained birds at the [redacted] facility when they are not actively working on the top priority task. The details and effort necessary for meeting each of the sub-requirements vary with the nature of the operational scenario defined by the Sponsor.

PRESENT STATUS: The lines of specialization appear to have formed more clearly during the past months as work and training continue with a varied stable of birds. Included among these raptors are GOLDEN EAGLES, PEALE'S FALCONS, HARRIS HAWKS, PRAIRIE FALCONS, RED TAIL HAWKS, HORNED OWL and RAVENS. The latter is not a raptor but is considered to be in the bird of prey category.

While personnel on this project have worked with birds of this kind for many years it has only been during the last months when they have come to realize what great potential they offer.

It is a considered opinion that many of them are capable of performing certain tasks and behaviors, in many instances with a high degree of reliability, not considered possible only a wear or so ago. Certainly, advocates of the ancient sport of falconry would not have entertained such a notion. The present research indicates these birds do have special attributes which might be utilized to perform a wide variety of tasks.

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To support these beliefs a number of reasonably good samples of documentation are available.

One might well ask why this information is just coming to light. Why has no one discovered such great potential before this? We can only speculate. Before the current effort no one has ever really tried to combine sophisticated behaviors with the birds in question. The falconer has always been interested in the use of his birds in pursuit of his sport which allows the birds to excercise its natural instincts with man as his partner. On the other hand, the animal behaviorist's work, for the most part, has been confined to the laboratory where experimental work is usually conducted with rabbits, rats, chickens and pigeons, perhaps because they are more available.

The final report covers the activities more fully over the last months but a few highlights may be worth presenting at this time. Since not all the species are committed to the same scenario they will be listed seperately.

HAWKS: 6 of these birds have been carefully selected from a total of approximately 30 which have been tediously hand fed and trained over the last 2 years. They represent a tremendous investment in man-hours, training, patience and just plain hard work. Are they worth it? It would certainly seem so. They are capable of performing tasks which are uniquely different in concept and in some cases could not, perhaps, be done in any other way. Each of them will fly up to several miles, in a strange area, and locate to objects or specific features to which they have been previously trained. They can perform certain behaviors such as emplacement of packages or objects and of removing them from harness' they might be wearing. Wearing a small camera on their legs, they can fly over a sensitive area and photograph it without causing undue suscicion. In fact, they have the capability of almost any behavior requiring beak or talon combined with a fairly high level of intelligence. Reliability and determination are their strong points. They become so heavily reenforced that, once committed to a course, they are not easily diverted. Even though not strong flyers some of them are able to carry a 13 ounce package for more than 1 mile when weather conditions are favorable.

GOLDEN EAGLES: Eagles respond in much the same manner as hawks, although not as adaptable because of their greater size. In training they have been able to carry a 3 lb weight for a distance of 1 mile. They could be used for such a special purpose when weather conditions are right.

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RAVENS: Unfortunately, only one raven was available for work this past season. He was a member of the troop for a number of years and an actor, both in front of the camera and on stage, for most of that time. Among his other talents, he was an excellent flyer so it was decided to try him on the project. From the very beginning he was a great success. In a mere matter of weeks he was flying 6 miles over water to a boat not visible to the human eye. It was a sad event when he was lost as the result of an attack by wild ravens. In an earlier report an account of this misfortune is covered in detail.

Hopefully, this will never happen again. We now have a telemetry system made particularly for this kind of work. Reliable sources inform us that reception is good from 10 to 20 miles when the bird is airborne and from ½ to 1 mile on ground or in water. This should afford enough protection to prevent another disaster. The system consists of a small beacon weighing approximately 30 gms which is attached to the bird's leg. The receiver is a 3 lb unit with a directional antenna capable of tracking a bird in flight. It has been used successfully by the National Fish and Wildlife Service.

The arrival of this kind of help is timely. It is a reminder that the indicated flight for the TACANA Operation is very substantial. A round trip of 12 nautical miles translates into a flight of about 30 land miles. If ravens are capable of this task this project will be prepared. 8 excellent specimens were taken in the spring, hand fed and imprinted to humans. Experience has shown that juvenile ravens must not be subjected to deprivation until they are at least 5 months old. They are ready to start. There are high hopes they will be as good as the former bird.

HORNED OWL: This interesting bird, like the others, is imprinted. He has displayed unusual possibilities but priorities have prevented a great deal of time being devoted to him. His training includes recall in free flight as well as responding to recall in almost total darkness.

FALCONS: The big reward with these birds is in their capacity for strong flight. It is an established fact that they are one of the fastest creatures on earth which, of course, gives them a decided advantage. For some, not well defined, reason any bird entering strange territory is subject to attack by all residents.

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For the falcon this does not present a problem. He can outfly anything he might meet except another falcon and they display very little aggression toward each other.

Acquiring a sufficiency of them has been a frustrating matter. Governmental controls have made it most difficult to import them even when they have been bred in captivity. We have a commitment for an additional 3 Peale's falcons as soon as permit requests have been granted. We are satisfied the total number will give us enough depth for the operation. Of the 4 birds we presently have 2 of them are working 1 mile round trips from boat to shore. A 3rd one is ready to start and the 4th has a physical handicap and is in the process of being traded for one more suitable. It is our expectation falcons will be the choice vehicle for this project.

CHANGE OF TRAINING LOCALE As a result of a number of considerations it was decided by both our Director and ourselves to move the base of operations from San Clemente Island,California to Point Loma, California. Both these locations are Naval Undersea Center Installations.

There were a number of disadvantages at the San Clemente location, not the least of which was erratic and unreliable transportation to and from the Island. In addition, we were completely without maintenance support for either boats or vehicles. In consequence days at a time were spent installing new brakes on cars or repairing boat malfunctions without the proper tools and equipment.

Most important, however, was the weather consideration. During winter months there were several weeks when wind velocities averaged 30 to 40 miles per hour. For a good portion of this time work was limited to 1 or 2 days per week. Another factor was prevailing wind directions. The side of the Island from which we were allowed to work was subject to wind directions opposed to what it would be relative to our project scenario.

POINT LOMA LOCATION The first order of business here was to provide housing for birds actively in training. Since there was no existing facilities available we purchased 10 metal utility buildings for this purpose. These were assembled and placed in a location suitable to the NUC Director. Wooden framing of a special design was constructed for the doors of the buildings. It consists of vertical 1" x 3" lath spaced 1" apart so that birds can avail themselves of daylight as well as protect their feathers from breakage. From the standpoint of appearance this arrangement satisfied the NUC

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It appears the Point Loma location is very favorable in regards to this project. The prevailing wind direction is suitable and is much more moderate, allowing a great deal more training time.

Travel time from boat slip to working area is approximately the same as it was on San Clemente Island.

Commuting personnel [redacted] San Diego seems to be too time consuming so an apartment has been rented at a location only 5 minutes from the Installation.

Initial costs for utility buildings were a little over $1,000.00 with the apartment rental at $250.00 per month.

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TASK ASSIGNMENTS:

1 Bird Procurement

Requirements will be reduced considerably since new falcons have already been contracted for and quotas for other birds filled.

2 Care and Maintenance of birds

a. Dietary supervision is a 7 day a week obligation. Training procedures require that each bird be weighed daily on a sensitive scale in order to control weight within narrow limits. Charts must be maintained for each indivdual indicating what volume of intake is needed to hold constant body weight. Roughage (fur and feathers) must supplement feedings at regular intervals to act as a cleansing agent for the bird's crop. Bird ailments are very poorly understood even by the best authorities. It is, therefore a practice to have x-rays made of each bird in its normal state for later comparison in the event of serious illness. Since exercise is an important part of conditioning each bird is flown at least 5 times per week while in training or on deprivation.

b. Housing

Each subject once trained, or having reached a keen working edge, requires seperate housing or flyway. 7' x 10' areas are minimal. The enclosures must be made of smooth surfaces (no wire) with vertical lath strips on all doors and other openings to prevent feather damage. Approximately 30 birds are involved in the Project. Half this number will be located at the Point Loma location and the others housed at facility

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3 SA-5 Training

a. Preliminary training for new birds on an indivdual basis includes about 1 hour per bird of handling-taming and short flight training on tether. Considering the addition of at least 8 new birds this schedule is a full day's work for 1 man.

b. Condition all vehicles to become accustomed to 50-80 gram package attached to harness.

c. Training of all vehicles for minimal flight of 24 nautical miles from boat to shore and back.

d. Recognition relating to overall target area and specific target within that area.

e. Condition vehicles to assume various positions on immediate target for photographic purposes before starting return flight.

f. Last portion of schedule necessitates converting trainees to respond to sail boat with distinguishing features rather than power boat used in earlier training.

TRAINING PROCEDURE FOR TASK 3

a. As described.

b. Heavy package training is achieved by graduating weights upward from 10 grams to desired level. Additional muscular development occurs to compensate for increased weight.

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c. The vehicle must become so strongly reenforced to the boat that it will start its flight to sea without, we may assume, having visual contact. The distance of the flights start at only a few hundred yards in the beginning and are gradually increased. Under normal conditions the vehicle will be heading into a head wind which will require the greatest output of energy. When the length of flights become longer the vehicle learns to reach for higher altitudes to conserve strength. As proficiency on both legs of flight is reached the order will be changed from shore to boat to boat to shore and return.

d. A broad semi-open area is sufficient for the initial recognition as bird approaches shore. Specific portion of target could easily be seen for at least 2 miles. It is taken into consideration that target simulation on a large scale may not be practical so training has been predicated on training to a specific portion which is moved from one area to another without regard to similarity.

e. Concealed rewards are positioned in various positions on target in unscheduled pattern which causes the bird to move from point to point in a searching behavior. This concept is proving valid.

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f. Stimulus transference from power boat to sail boat will require approximately 3 weeks. This estimate is based on the difficulty of removing, from the bird's point of view, the frightening appeaance of the sails.

4 Overfly Operation

a. Refine present methods of handling procedure to correct problems in bird transportation. Recent excercises were not satisfactory due to putting bird on work call shortly after a 400 mile car trip. When operation was attempted bird was listless and without appetite. After 1 day's rest it was back to normal. Stange territory was not a factor since former training had included many short trips to strange areas where performance was satisfactory.

b. Further refinement suggests training bird to fly inside simulated luggage rack on moving car or truck.

c. Using falcons for this scenario would increase considerably its options for usage. The falson's flight is a direct one and it has very little dependence on wind conditions. The time element would be much shorter thus reducing the risk factor.

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5 Package Orientation

a. Experimental efforts have been made in orientation using a simulated compass to establish feasibility so this task would, in part, deal with acquiring a compass with stable characteristics needed for training. A cockatoo was used in the experiment and it was able to reliably orient the simulated compass by rotating a double layered disc until a red indicator on the bottom disc was lined up exactly with a hole in the top disc. No other test bird has been tried but it is almost certain that a raven, at least, would be capable of the same behavior.

b. Package delivery on shorter flights of several hundred feet would be achieved by training the bird to hold it between its upper and lower mandible. On longer distances involving more physical stress it would be necessary the package be attached to a harness for release at destination.

c. Combining the 2 parts of the above task with the additional schedule of quick location identification is our proposal. It would mean training the bird to deliver to a new location after a minimal rehearsal time or in response to an audio or visual signal such as a beam of light.

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It is understood that certain modifications may be required to complete this proposal. This is, therefore,a rough draft so we look forward to receiving your comments. There has been some film shot with the intention of putting together a sequence for presentation. Time considerations, however, have not allowed us to assemble anyhting as good as what you already have. A picture of the [redacted] is enclosed but since it was taken all the construction has been completed. We will also be sending still pictures of the bldgs. at the other site and anything else we think might be of help.

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PROPOSED BUDGET FOR AVIAN SUPPORT
13 Sept. 1974 - 12 Sept. 1975

CONTRACT		$102,693.82	
DIRECT COST:			
Labor:		UNITS OF PAY	RATE
[redacted]	$20,800.00	220	$94.55
	14,300.00	220	65.00
	9,100.00	220	41.36
	6,760.00	220	30.72
Other (Part time)	5,200.00	150	34.67
	56,150.00		
MATERIALS & SUPPLIES			
Meat, Feed, Vitamins $1.11 Lb 4,500#s	4,995.00	104	48
TRAINING EQUIPMENT			
Fixtures, Release cages, Project Props, Misc.	1,000.00		
Film Project Reports and Camera Expense	1,000.00		
TOTAL DIRECT COST	$63,155.00		
INDIRECT COST:			
Trucks, cars, Depreciation	3,000.00	2 trucks used in S.D.	
Tires, Repairs, Fuel	1,000.00	1 truck commuting	
Veterinarians	2,900.00		
Apartment Rental & Utilities At San Diego	3,500.00	3 people S.D., 1 commuting	
[redacted] Location For Additional Birds (Utilities, Operating Expenses, Bldg.	2,500.00	Building constructed to conform to wildlife regulations	
INSURANCES & TAXES			
Workmans Comp.	1,516.05	2.7%	
Payroll Taxes	2,776.41	5.85%	
FUCA	105.05	0.05%	
SUI	462.00	2.2%	
Truck & Auto Ins.	750.00		
Liability	300.00		
Phone	3,000.00		
Accounting	1,500.00		
Mail & Postage	50.00		
Travel, San Diego [redacted]			
Other Training Locations	4,500.00		
Rental Boats, (Motor Sailer, Larger Boat For Final Phase	2,500.00		
Jib (sail) Training	200.00		
Use & Expense Wind Machine Trainer	500.00		
TOTAL INDIRECT COST	$31,059.51		
TOTAL COST		$94,214.51	
NET PROFIT		8,479.31	9%

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