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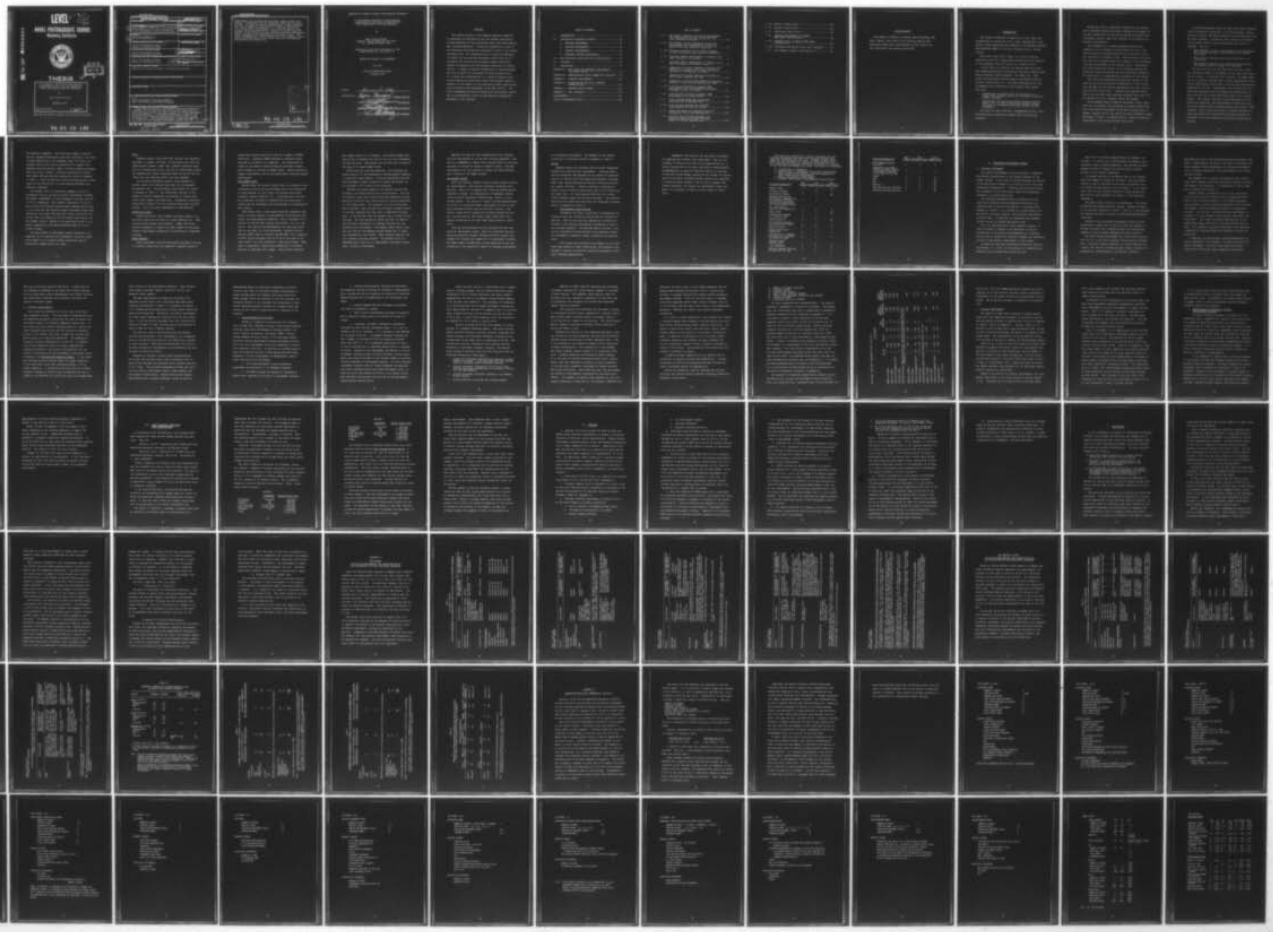

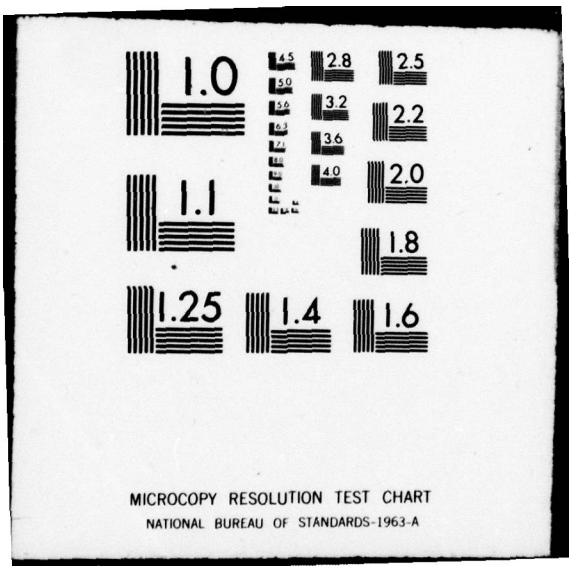
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A COST-BENEFIT ANALYSIS OF THE PROPOSED CONSOLIDATION OF ALL NAVY AND MARINE A6-E FLEET REPLACEMENT TRAINING SQUADRONS

by

Kevin Philip Kelley

December 1978

Thesis Advisors L. Paringer
C. Jones

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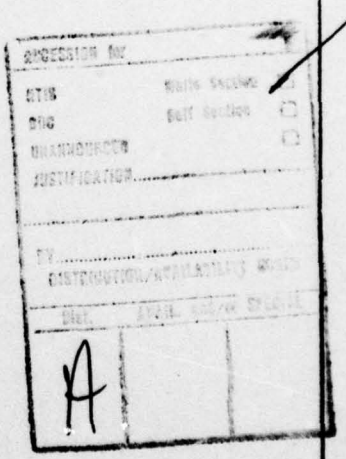

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A Cost-Benefit Analysis of the Proposed Consolidation of All Navy and Marine A6-E Fleet Replacement Training Squadrons

by

Kevin Philip Kelley
Captain, United States Marine Corps
B.S., Boston College, 1969

Submitted in partial fulfillment of the
requirements for the degree of

MASTER OF SCIENCE IN MANAGEMENT

from the

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This thesis contains a Cost-Benefit Analysis conducted to determine the advisability and the economic feasibility of consolidating all Navy and Marine Corps A-6E Fleet Replacement Training Squadrons. A detailed examination is made of the prevailing and projected conditions at each of the current training sites. The accumulated data is analyzed regarding its effect on the training environment overall and the requirements for aircraft and personnel support under both present circumstances and the proposed conditions of consolidation. A range of feasible alternatives is then developed and cost estimates are presented for those possibilities. It is shown that consolidation is a realistic option, with certain logistical constraints, which will produce specific benefits in the quality of the resultant aircrews and possible fiscal savings to the Department of the Navy as well. The final recommendation involves adoption of the proposal according to the guidelines of one of two realistic alternatives developed by the research.

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I. INTRODUCTION

The research conducted in completion of this thesis was accomplished in conjunction with a study commissioned by the Chief of Naval Operations and assigned to the TRAINING ANALYSIS AND EVALUATION GROUP at the Naval Training Center, Orlando, Florida.

Both works trace their origins to a similar analysis completed in 1975 by a study group working under the authority of the Commander Naval Air Force, U.S. Atlantic Fleet.

At that time, as currently, all Marine Corps A6-E pilot and bombardier/navigator training was provided by Marine Fixed Wing All-Weather Attack Squadron - 202 (VMAT (AW) - 202) within the 2nd Marine Aircraft Wing at the Marine Corps Air Station, Cherry Point, N.C. Two major alternatives to that arrangement were considered by the original study group. They were:

1. Transferring all Marine Corps A6-E training to a similar Navy squadron (VA-42) at the Naval Air Station, Oceana, Virginia.

2. Transferring all East Coast Marine training requirements to VA - 42 and all West Coast Marine training to VA-128 at the Naval Air Station, Whidbey Island, Washington.

The result of that study was a recommendation that, "Navy and Marine Corps continue to conduct their own training programs."

During the interim, additional concern with the realization of maximum training efficiency combined with changes in the force composition of both Marine and Navy aviation units to generate renewed, high level interest in the question of possible consolidation.

The assignment of a second operational Marine A6-E squadron to the 3rd Marine Aircraft Wing in El Toro, California presented increased potential for utilization of the Navy facilities at Whidbey Island. Marine aviation officials felt that this situation might well impact on the cost/benefit relationship presented in the original study. Additionally, the proven analytical talents of the Training Analysis and Evaluation Group were determined to be more fully attuned to the completion of a comprehensive evaluation of the problem.

This thesis was generated from personal interest in the question of A6-E consolidation stimulated by a tour of duty with VMAT(AW)-202 and several opportunities to work, on-site, with both VA-42 and VA-128. Research was conducted concurrently with the TAEG study team and included field trips with that group to El Toro, Whidbey Island, and Orlando.

The assignment given to TAEG by the Chief of Naval Operations was to evaluate the possibility of either transferring 60% of the Marine requirement to the Navy training unit at Oceana, Virginia (VA-42) and 40% to the unit at Whidbey Island, Washington (VA-128), or transferring all 100% of the Marine requirement to one of the two Navy facilities.

In accomplishing that task, the TAEG study group concerned itself with matters pertaining to aircrew training, related enlisted training, and other peripheral issues associated with the basic proposal. Included in their work was a consideration of three central issues around which this thesis is centered. They are:

1. What benefits, if any, would accrue to Navy and Marine A6-E aircrew training by consolidation of training facilities?
2. What costs or savings would result from such a consolidation?
3. What specific method of consolidating would maximize any benefits and/or savings to be realized?

The data base for both the TAEG report and this thesis was collected jointly by the members of the TAEG study group and the author. As that data was collected, it became apparent to all parties involved that a sound, comprehensive evaluation should not be restricted to just the two possibilities suggested by the CNO. Consequently, the research for both works was conducted with the intention of establishing the most efficient mix of Navy and Marine Corps' A6-E training assets. That process involved a close examination of the status quo situation, the CNO generated distributions, and any other feasible mixes discovered during the course of the research. Only in this way could all relevant material be fully and objectively analyzed and an accurate answer be provided to the basic questions of realistic consolidation options.

In fact, examination of the collected data revealed that prevailing logistical limitations restricted the feasible consolidation at Naval Air Station, Oceana to approximately 25% of the total annual Marine requirement. That would dictate a 75% allocation to the Naval Air Station at Whidbey Island, Washington. VA-128, at Whidbey, was found to be fully capable of absorbing up to 100% of the Marines if required. These facts generated two options, other than maintaining the status quo, which were then investigated for relative cost factors. They were:

Option A: VA-128 absorbing 100% of USMC pilot and bombardier/navigator training at NAS, Whidbey Island.

Option B: VA-42 absorbing 25% of USMC pilot and bombardier/navigator training and VA-128 absorbing 75%.

In examining these options, the TAEG study group made use of the bombardier/navigator comparability study and the cost estimates contained in this thesis. The author is indebted to the TAEG group for much of the facilities and personnel support data utilized herein.

The cost analysis determined potential annual direct savings of $1,192,199 for Option A and $4,101,224 for Option B. These figures were in addition to estimates of $17.5 million in investment savings to be gained from Option A and $32.5 million from Option B. Investment savings represent a bound in dollars on the uses foregone in operational squadrons. Each of these figures was computed as an increment of current expenditures. Their real value is as an indication of a

trend toward annual savings to be gained from consolidation, rather than increased expenditures.

The determination that prevailing and projected conditions did, in fact, support arguments in favor of consolidation was based on detailed examination of key elements influencing the quality and completeness of A-6E aircrew training. Those elements include the overall environment in which training is conducted; the stipulated requirements of such training; the aircraft and personnel support necessary to the conduct of that training; and the cost/benefit trade-offs that would emerge from the proposals.

Projected costs (savings), discussed above, are more fully detailed in Section III and Appendix F. Benefits are listed in Section IV (Findings). They include quantifiable elements, such as reductions in the overall aircraft and personnel needed to support the total training effort, and more subjective considerations, such as improved training facilities and enhanced quality of trained aircrews. This last element is attributed to numerous factors of attitude and environment.

Finally, an analysis was conducted to examine the critical aspects of those factors which most strongly influence the eventual recommendation for consolidation.

NAVAL AIR STATION, OCEANA

Naval Air Station, Oceana provides services to approximately 9,000 military personnel that include 23 Regular (and

one Reserve) squadrons. The facilities support situation has not changed significantly from that reported to the Chief of Naval Operations by the Commander Naval Air Force, U.S. Atlantic Fleet letter Serial 331D/3456 of 21 August 1975. Bachelor enlisted quarters (BEQ), aircraft parking and hangar space are still critical. Military construction projects that affect BEW and aircraft parking are listed in Appendix A, Table I. Both the BEW and aircraft parking projects could impact on the feasibility of consolidating USN/USMC Fleet Readiness Squadrons.

NAS Oceana, with its associated commands as well as detachments such as the Naval Aviation Maintenance Training Detachment (NAMTRADET), is well equipped to provide services to the A-6 community. The climatic conditions for the 26-year period were obtained from the Naval Weather Service and it was found that NAS Oceana averages Instrument Flight Rule conditions (less than 1000 feet and 3 miles visibility) 13% of the time, as compared to 11% for Cherry Point and 8% for NAS Whidbey Island. Weather is a significant factor in the timely completion of the familiarization phase of the A-6 flight syllabus.

The small number of additional sorties generated by an expansion of A-6 training was determined to provide a negligible impact on air traffic control facilities and Air Installation Compatibility Use Zones.

VA-42

Squadron spaces, while space was limited, were generally excellent to support training. Of particular note were the administrative spaces, ready room, squadron operation space with its briefing facilities, and the Air Intelligence spaces. The squadron has limited classroom space but one of the two rooms used, the learning center, was well equipped.

The aircraft maintenance spaces, while adequate for present needs, were reported deficient for the expanded maintenance load. The maintenance requirements are stated in Appendix A, Table I. Any significant increase in the number of aircraft supported was reported to require additional shop, hangar, and ramp space. Completion of Military Construction Project P-227 will provide additional aircraft parking. This will occur independent of consolidation.

TARGET FACILITIES

Target facilities, while heavily utilized, appear to be excellent except for the lack of a radar bombing site. Bombing and mining targets are available. Target facilities should be adequate to support the small number of additional ordnance requirements generated by consolidation of USN/USMC training.

FRAMP TRAINING

Fleet Replacement Aviation Maintenance Personnel training is presently housed with the squadron's computer system in

double-wide trailers which are used for a number of FRAMP facilities. Extensive FRAMP training is presently being provided to the Marine A-6 community. Any significant increase in the number of Marine enlisted personnel trained would require an increase in FRAMP spaces. Marine instructor support requirements will be discussed under Personnel Support Requirements.

MCAS CHERRY POINT

Marine Corps Air Station, Cherry Point is included in the discussion of the training environment not as an alternative to consolidating (at that sight) but because the station presently supports VMAT(AW)-202. A description of the support presently available to VMAT(AW)-202 will facilitate identifying the advantages and disadvantages of consolidation more readily.

MCAS Cherry Point, while supporting fewer squadrons than Oceana, provides support to approximately 9,000 military personnel including deployed squadrons. The 12 squadrons fly a variety of aircraft that include the Harrier, C-9, A-6, and others. The station has approximately the same space problems as the other two sites considered. Bachelor officer quarters (BOQ) space is limited; 2nd MAW BEQ, with a capacity of 3494, had an occupancy rate of 97.5% at the time of the study team's visit and represents a long term average. Ramp space is expected to improve with completion of a project adjacent to VMAT(AW)-202's hangar. Public Works indicated

that hangar space is at a premium. The present hangar occupied by 202 is adequate for the A-6 but will not accommodate the TC4C aircraft. Maintenance for the TC4C must be done on the ramp or in loaned hangar space.

Unlike the Navy training squadrons, 202 furnishes personnel directly to the Headquarters and Maintenance Squadron in relatively large numbers. Aviation Intermediate Maintenance Detachment (AIMD) personnel at Oceana and Whidbey are not included in VA-42 and VA-128 allowances.

VMAT(AW)-202 spaces appear to be somewhat austere and crowded in the administrative and training areas. The lack of available space for briefing rooms and operations filing facilities requires that crews proceed to station operations to file flight plans. The squadron, as will be discussed under Personnel, does not have the on-board strength enjoyed by the Navy squadrons but does have a comparable training load. It was obvious that the squadron has a strong "can do" attitude. The descriptions of spaces are only to identify the pertinent differences in training resources for the training sites considered. For example, MCAS, Cherry Point does not have an A-6E Weapons System Trainer nor is there one scheduled for the station. This obviously deprives 202 of a valuable training resource. The absence of an A-6 NAMTRADET means that all A-6 replacement crews must receive their training at NAS Oceana.

VMAT(AW)-202 does not have responsibility for training enlisted replacements as do the Navy training squadrons. The lack of a NAMTRADET at Cherry Point requires that all enlisted personnel be trained at Oceana or Whidbey Island. Enlisted replacements must also proceed to Oceana for formal maintenance training in the FRAMP syllabus.

NAS WHIDBEY ISLAND

Naval Air Station, Whidbey Island provides support service for approximately 7,000 military personnel including those deployed. There are 16 Regular and 3 Navy and Marine Reserve squadrons assigned. The Headquarters of Commander, Medium Attack Tactical Electronics Warfare Wing, Pacific is also located aboard. The station is ideally located geographically for access to training airspace requirements of the A-6 and enjoys minimum conflict with non-military aircraft. The weather conditions as reported by the Naval Weather Service, for a 26-year period, are Visual Flight Rules (VFR) for a greater percentage of the year than either Oceana or Cherry Point.

A-6E and EA-6B aircraft are the principal aircraft supported by NAS Whidbey Island. With its associated auxiliary field and excellent targets, Whidbey provides a unique environment for training and support of A-6 replacement training. The small number of additional sorties generated by any consolidation is not expected to impact on airspace requirements

or the general environment. The adequacy of the various facilities is discussed further in Appendix A, Table I.

VA-128

Squadron spaces are excellent and with minor exceptions adequate for consolidation requirements. Training spaces are also excellent and adequate for any degree of consolidation up to 100% of pilot and bombardier/navigator training. Ready room, flight planning and mission briefing facilities are, again, excellent. Weather briefing is available on closed circuit television and flight plans can be filed from the ready room. Air Intelligence facilities are located within squadron spaces and are also excellent. The squadron facilities and supporting facilities are discussed in greater detail in Appendix A, Table II.

1. Environmental Factor Rating

Throughout the study a great deal of information was collected which was considered significant but difficult to quantify. Much of this data was comparative in nature and related to the training environments encountered at each of the training squadrons. The enclosed matrix provides a subjective evaluation of those factors in an organized format. The assignment of numerical values is based on the depicted scale.

The ratings were provided by the members of the TAEG study team because of their unaffiliated, and therefore more detached, position as relatively objective evaluators of the three training organizations.

Judgements were based on the expressed requirements of squadrons and stations where applicable. They are not intended to reflect in any way on the organizations but to assist decision makers in their evaluation of consolidation recommendations in terms of available quality of training. In the case of NAS Oceana, several of the ratings for factors would be increased if pending MILCON projects are completed. It should be noted, however, that in every category, and without exception, the ratings for NAS Whidbey Island were equal to or superior to those at either Oceana or Cherry Point.

Each facility, capability or factor concerned with the training environment has been rated on those factors that impact on consolidation decisions. Inasmuch as MCAS Cherry Point was not considered as a possible consolidation site, only those factors possibly affecting the quality of training or the training environment are rated. The scale is as follows:

0 = No facility or capability
1 = Insufficient or inadequate for present requirements
2 = Meets present requirements, requires expansion to meet consolidation requirements
3 = Meets consolidation requirements
4 = Exceeds consolidation requirements/notable/unique.

FACILITY/CAPABILITY	NAS OCEANA	NAS WHIDBEY ISLAND	MCAS CHERRY POINT
Hangar space	2	3	NA
Aircraft Parking	1	3	3
Maintenance Spaces	2	3	NA
Squadron Operations facilities, capabilities for weather briefing, filing of flight plans, and briefing/debriefing	4	4	1
Air Intelligence facility and capability	4	3	0
Ready Room	3	3	NA
Training Classrooms for (pilots, BNs)	2	3	2
Administration	4	4	NA
Air Traffic Control/ Saturation/Environment	3	4	3
Mission Routes	3	4	3
Target Facilities/ Capability	3	4	3
Availability to Weapons Training Sites (Fallon, El Centro or Yuma)	2	3	2
Weather Factor (percent IFR)	1	3	2
A-6E NAMTRADET	3	3	0
Nuclear Weapons Training Availability at FRS	3	3	0

FACILITY/CAPABILITY	NAS OCEANA	NAS WHIDBEY ISLAND	MCAS CHERRY POINT
*A-6E Weapons System Trai ner	3	3	0
Capability of parent station to meet support requirements peculiar to A-6 and its mission	3	4	3
FRAMP	2	2	0
BOQ	1	3	NA
BEQ	1	3	NA
Messing	3	3	NA
Married Officers Quarters	2	3	NA
Married Enlisted Quarters	1	3	NA

II. EVALUATION OF RELEVANT FACTORS

A. TRAINING ENVIRONMENT

The overall environment in which training is conducted contributes significantly to the eventual quality of the people trained. In the case of aircrew training, the mission of the particular aircraft is a critical, but all too often undervalued consideration. Financial and political factors are frequently the driving forces behind the geographical placement of training facilities.

The following paragraphs offer an evaluation of the logistical situations and environmental characteristics affecting each of the Navy and Marine A-6 training sites. Appendix A, Tables I - VI, provides an in depth analysis of facilities, training resources, and personnel requirements in matrix form. In addition, an unweighted environmental factors rating is provided beginning on page .

Prior to consideration of those elements, however, it would be useful to expand on the importance of mission orientation in the location and management of a training facility and to examine the relative strengths and weaknesses of each of the present organizations in that regard.

To grasp the important differences between one facility and another, it is first of all necessary to understand the mission of the aircraft and aircrew involved.

The A-6 is a two seat, medium attack, all-weather, jet aircraft. It carries up to 18,000 pounds of ordnance, has a relatively long on-station capability, and provides accurate weapons delivery on targets the crew may never visually acquire, in all weather conditions.

Its primary mission in the Marine Corps is all weather, close air support of troops in the field. The Navy concentration is more in the area of low level interdiction and all weather strikes against built up targets. It is significant that the two missions overlap to a great extent and both use the same equipment and similar, if not identical, techniques.

The plane's main assets are its sophisticated electronic navigation and weapons delivery systems. Because of these, it can function essentially "blind." That is, it was designed for maximum efficiency in night or diminished meteorological conditions.

Because of the continuing development of anti-aircraft technologies, planes such as the A-6, which can operate at extreme low levels and in masked terrain, are increasingly valuable tactical systems throughout military aviation.

The ideal training environment for a multi-role aircraft like the A-6 is one which possesses three essential elements: first, logistical support adequate to a smooth running, continuous, and flexible training program; second, proximity to geographical, meteorological, and tactical conditions

approximating those in the projected mission environment; and third, a psychological attitude on the part of the parent and tenant commands which acknowledges the training environment to be of primary importance in the development of all future tactical options.

Any argument for or against consolidation must involve these three elements and weigh them equally against political and economic considerations. An examination of these trade-offs is provided in Section V.

Whidbey Island is essentially an A-6 base (contrasted with the multi-aircraft concerns at both Oceana and Cherry Point), and is located adjacent to the Olympic Mountains. This provides an easily accessible opportunity for low-level, all-weather, terrain-avoidance navigation in uncluttered airspace. Cherry Point, in North Carolina, and Oceana, in Virginia, are both located on the Atlantic Coast about 150 miles apart. The closest available mountains are in the Appalachian range, about one to two hours flying time distant. This presents a distinct limitation to the efficient scheduling of training flights for squadrons at these two facilities.

In addition, the more gentle, rolling Appalachians are barely comparable to the Olympics in terms of diverse navigation challenges. Both east coast bases are further restricted by relatively heavy commercial and private

aviation congestion due to their positions at the southern end of the northeast corridor.

Overall target availability is another area in which Whidbey appears to have superior assets. This is due to the availability of a surveyed Radar Bombing Site in Spokane, Washington and to VA-128's practice of scheduling dedicated weapons deployments.

While VA-42, at Oceana, also schedules deployments solely dedicated to weapons training, there is not a radar bombing site anywhere on the east coast. This lack of facilities was considered significant by instructors interviewed at all three squadrons.

VMAT(AW)-202 suffers from the same lack of a radar bombing site and is further constrained from dedicated weapons deployments by personnel shortages and budgetary limitations. The impact of these restrictions is considered below.

Of similar importance is a particular squadron's ability to concentrate its efforts on the training function. Restricted by the many logistical and personnel limitations outlined in the pages that follow, neither 202 nor 42 experiences the same freedom of dedication to training available to VA-128. There is an unquantifiable, yet nonetheless apparent, attitude at Whidbey Island that training receives precedence, and the overall efficiency of their operation reflects it.

The reasons behind this vary and none are necessarily derogatory to either the service or the command involved. Oceana is a crowded, multi-mission, multi-aircraft facility. Many of VA-42's limitations are attributable to that fact. Cherry Point in many ways typifies the Marine tradition of functioning at maximum capacity under very austere conditions. The problem is determining how much maximum is reduced by the enforced austerity.

Discussions with various Marine aviation officials indicated that the restrictions which apply to 202 are, in their minds, typical of the austerity which characterizes Marine training and operations in general. There appeared to be a genuine sense of pride on the part of many of those interviewed in the squadron's (202's) ability to produce qualified aircrews under such restrictive conditions.

The difficulty encountered with this viewpoint is that if a reasonable way exists to produce aircrews with equal or greater qualification levels at reduced cost, then what has been referred to as austerity is, in reality, an over-expenditure of resources.

As will be demonstrated in some detail in the following pages, this is exactly the situation in this instance.

However, the issue at this point is not one of criticising any particular organization. The point is to recognize and take advantage of an available opportunity to make the

best use of the best possible facilities. A great deal of the information examined in the pages that follow indicates the site which most closely approximates the "ideal" location for either Navy or Marine A-6E training is the Naval Air Station at Whidbey Island.

B. TRAINING REQUIREMENTS

The syllabi for VMAT(AW)-202, VA-42, and VA-128 have been examined in detail. The assistance of experienced pilot and bombardier/navigator instructors was used to analyze the individual flights to determine commonality among them. It was found that while various training tasks are carried out under different descriptions and are located at different points in the syllabi, the pilot syllabus for the Navy and Marine Corps is at least 80% compatible. The bombardier/navigator syllabus compatibility is over 90%. An examination of the respective levels of combat compatibility/readiness attained in the various training units was conducted in accordance with the assignment of percentage levels dictated by the Training and Readiness Manual. It was found that Marines presently achieve about 60% combat capability at 202 while both of the Navy squadrons produce a 70-75% combat readiness. It should be noted that the Navy syllabus includes training in several areas of readiness not now included in the VMAT(AW)-202 syllabi but which are accomplished

after arrival at the operational squadrons. These include such things as nuclear weapons, defensive tactics, and advanced visual weapons.

The Navy requirement for mining was discussed with VMAT(AW)-202 and found to be a desirable additional qualification, particularly as there is a precedent for Marine A-6's conducting mining operations in Hanoi Harbor operations during the Vietnam War. Conversely, the Marine requirement for radar beacon bombing was discussed with the Navy squadrons. It was the general agreement that this qualification could be included in their existing syllabi and would be of value to Navy as well as Marine students.

The need for carrier qualification and the landing practice which precedes it was determined to be of marginal value to the Marine Corps and not cost effective to include in their syllabus. With these two exceptions, the rest of the Navy syllabus was determined to be satisfactory and even desirable for Marine aircrews.

Adoption of the Navy syllabus would increase Marine A6-E first tour syllabus hours from an average of 59.5 to about 80 and decrease the refresher pilot syllabus from 59.5 to 40.5 hours. The increased advantage of using such facilities as the air intelligence center, radar bombing site, and weapons system trainer, coupled with nuclear weapons qualification for increased readiness, would be worth an

undetermined amount of additional expenditure to obtain. The fact that they are available through consolidation at annual savings makes the proposal even more attractive. These savings, which are detailed in the Cost section, are increased further if one considers the elimination of additional training presently required for students after completion of 202, which is made possible by adoption of the proposal.

1. Adjunct/Supportive Training

Adjunct or supportive training was also examined. This includes fire fighting training, aviation physiological training, deep water environmental training (DWEST), survival, evasion, resistance, and escape (SERE) training, Nuclear Weapons Delivery School, VF-43 Instrument School, and Naval Aviation Maintenance Training Detachment courses. First tour A6-E replacement pilots are scheduled to receive this training in the Navy. An analysis of training requirements with VMAT(AW)-202 and various Marine personnel knowledgeable in Marine requirements at Headquarters, Marine Corps concurred in the following:

a. Fire Fighting School is not an essential requirement for Marines as it is shipboard oriented.

b. All SERE training for Marines is conducted at Cherry Point regardless of aircraft or assignment location.

c. Aviation Physiological Training and Deep Water Environmental Survival Training are obtained in undergraduate pilot courses and are not essential for Marine A6-E aircrews. Requalification can be accomplished in the operational commands.

d. Nuclear Weapons Delivery Training is desirable and could be conducted at Oceana.

e. Naval Aviation Maintenance Training is essential and is presently being given to all Marine A6-E crews at Oceana.

f. Instrument refresher training was considered desirable by both the Navy and Marine Corps. It is not included in the VA-42 syllabus. It is included in the VMAT(AW)-202 syllabus in the A6.. Instrument refresher training for Navy students is provided by VF-43 at Oceana in aircraft other than the A-6. It is preferably given prior to start of the A6 training but is sometimes delayed due to a shortage of quotas. Because of the requirement for Marines to receive instrument training as part of their syllabus, certain adjustments would have to be made to the current scheme of training. Possible solutions to the problem include: (1) omit refresher instrument training since all recent graduates of undergraduate pilot training possess up-to-date instrument cards, (2) train all first tour Marines at VF-43, or (3) obtain instrument refresher and currency for the A-6E in the new Weapons System Trainer (Device 2F114).

Since the first choice is inconsistent with a comprehensive training program, and the second possibility would, according to VF-43, involve additional and costly support augmentation, the use of the Weapons System Trainer appears to be the most cost effective. The acceptance of simulators as a valid substitute for in-flight instrument training has been demonstrated by the Navy P-3 community and is an increasingly accepted practice in both the Navy and the Air Force. In this case, it would offer training in an A-6E (simulator) as opposed to a TA-4, which is used by VF-43.

Adjunct training for VA-128 A-6E students is accomplished in a somewhat different manner. Deep water environmental survival training; survival, evasion, resistance and escape training; and instrument refresher training are all accomplished in San Diego prior to reporting to VA-128. The discussion on adjunct training at VA-42 applies with the exception of instrument refresher training. For Marines being trained on the West Coast (VA-128) selection from the following alternatives would apply:

1. Accept the instrument qualification received in undergraduate training. VA-128 has indicated that Marines would be accepted without refresher training.
2. Provide instrument training at VF-126 which would involve additional expenditures for aircraft, instructors and maintenance.
3. Provide instrument refresher training in the Weapons System Trainer.
4. Utilize VMAT-102 to provide the training needed.

VMAT-102 at MCAS, Yuma has indicated that providing instrument training for various Marine commands is included in their mission. The squadron, which operates some TA-4 aircraft, has also indicated a capability in the event that no alternative was available, but stated that additional support would be required.

The alternative of providing the instrument training in the Weapons System Trainer, augmented by a two-day instrument ground school, provided monthly to Whidbey Island by VF-126 and VA-127, appears to be feasible. This would permit Marine students to proceed to Whidbey without delaying at either San Diego or Yuma.

Comparability analysis of the bombardier/navigator training syllabi at the three squadrons (two Navy and one Marine) required unique structuring to render meaningful data. This is attributable to the subjective aspects of the individual syllabus presentations. Close examination of the academic and flight programs reveals content to be essentially identical. Notable exceptions are mining and beacon bombing. It is the order of content presentation that varies significantly, and that variation is usually in direct proportion to the particular squadron's philosophy of weapons delivery and system utilization. More often than not, that philosophy was driven by environmental considerations and asset availability. For example, the Marine Corps emphasis on close air support influences a large part of the program at VMAT(AW)-202.

Similarly, VA-128's access to the Olympic Mountains and the Spokane Radar Bombing Site permits, and to a large extent dictates, a program stressing all-weather terrain navigation and complex bombing. VA-42, on the other hand, is somewhat restricted regarding search radar terrain clearance work due to its distance from and space restrictions in the Appalachian Mountains. VMAT(AW)-202 suffers from similar geographic limitations.

As a result of these differences, each squadron has evolved a training program which attempts to optimize, given the available assets, while pursuing almost identical objectives. The degree to which those assets exist and their quality significantly impacts on the quality of the overall training program. In addition to providing a 10 to 15 percent higher readiness capability per student, the Navy squadrons and VA-128 in particular appear to have a distinct advantage in terms of total assets. The possibility that these facts are related is difficult to ignore.

A flight-by-flight comparison was not feasible due to variations in syllabi structure and nomenclature. Instead, an analysis by Phase of Training and Aircraft Utilized provided a pertinent measure of comparability.

Within the categories, Phase of Training and Aircraft Utilized, the relevant factors examined concerning bombardier/navigator syllabi were:

1. Number of Flights (sorties)
2. Time per Flight
3. Students per Flight
4. Total Flight Time per Student
5. Time on the Equipment (Hands On) per Student
6. Instructor Hours
7. Instructor Hours per Student

The seven categories were weighted evenly. The analysis indicates a commonality in excess of 90 percent. The methodology and statistical data used in computation of bombardier/navigator compatibility are contained in Appendix B. It is structured to permit a close comparison of the two Navy squadrons (one to the other) as well as the Marine unit in terms of each of the Navy organizations. Within any given category, the Navy unit with the highest hour total (or greatest number of sorties) is assigned a value of 1.0000. The other Navy unit is then described as a percentage of that figure. Finally, the Marine Corps squadron is listed, within the category, as a percentage of the first and then the second Navy squadron. This facilities an examination of all the critical relationships and helps verify that even within the same service (Navy) two squadrons doing exactly the same job find substantially different ways to accomplish it. An example has been reproduced and is provided on the following page as an illustration of these points and as an introduction to the kind of information contained in Appendix B.

The estimate of 80 percent compatibility between the Navy and Marine pilot syllabi was developed through discussions with, and concurred in by, representatives of both VMAT(AW)-202

FAM STAGE (FAM AND INSTRUMENT STAGE FOR 202)

A6 FLIGHTS

	VA-128		VA-42		VMAT (AW)-202	RATIO VMAT(AW)-202/VA-128	RATIO VMAT(AW)-202/VA-42
Number of Flights	2	1.000	1.	.500	4	2.000	4.000
Time per Flight	2	1.000	1.5	.750	2.5	1.250	1.667
Time on the Equipment (Total)	4	1.000	1.5	.375	10	2.500	6.667
Instructor Hours	4	1.000	1.5	.375	10	2.500	6.667
NAVIGATION PHASE (NAV AND RADAR TGT. IDENTIFICATION PHASE FOR VA-42) (FORMATION, VISUAL NAV. AND SYSTEM TACTICS FOR 202)							
Number of Flights	4	.400	10	1.000	8	2.000	.800
Time per Flight	V		V	V			
Time on the Equipment (Total)	10.5	.429	24.5	1.000	19	1.800	.776
Instructor Hours	10.5	.429	24.5	1.000	19	1.800	.776
SYSTEM WEAPONS PHASE (SYSTEM ORDNANCE PHASE FOR 202)							
Number of Flights	9	1.000	9	1.000	6	.667	.667
Time per Flight	V		V		1.5		
Time on the Equipment (Total)	24	1.000	19.5	.813	9	.375	.462
Instructor Hours	24	1.000	19.5	.813	9	.375	.462

NOTE: V = Varies

and VA-128. This was deemed appropriate because the skills required to fly the aircraft are quite similar regardless of differences in the primary mission of the particular service branch. The 80 percent estimate is believed to be conservative.

C. AIRCRAFT REQUIREMENTS

The number of flight hours required to support Marine Corps pilot and bombardier/navigator training utilizing the existing Marine syllabus or modified Navy syllabi is compared in Tables I and II of Appendix C. Overall, there is a 6% decrease in A6-E flight hours using the modified Navy syllabi in lieu of the Marine program, and there is no change in TC4C flight hours. The rationale for using the modified syllabi was discussed in Section B, Analysis of Training Requirements.

Table III of Appendix C lists the annual A-6E flight hours required to support the various levels of consolidation suggested by the Chief of Naval Operations, and the number of aircraft needed to meet those obligations. The case requiring the most aircraft is the 60/40 split which would involve a total of 12 additional A-6's. Since this does not exceed the number available from VMAT(AW)-202, no additional expense would be incurred in acquisition.

Based on the analysis of training requirements, the total annual flight hours in the TC4C aircraft for Marine support is 755. Assuming that VA-42 and VA-128 are provided three

TC4C's with complete A-6E systems from existing inventory, there would be no further need for additional TC4C's to support consolidation.

In addition to this determination of aircraft needs, the Navy Fleet Replacement Squadrons independently determined their supplemental aircraft requirements to support the proposals. Table IV of Appendix C presents a comparison of their findings with the thesis estimates. The additional planes determined by both methods are identical. This fact strengthens the argument that consolidation can be accomplished with existing aircraft assets.

Table V of Appendix C is a compilation of A-6E and TC4C flight hours for a 100% Marine requirement added to that of either VA-42 or VA-128. The addition of 100% to either squadron would increase the A-6E aircraft hours by 84% and the TC4C aircraft hours by 86%. Table VI of Appendix C shows the actual number of A-6E's needed for the various consolidations based on an average of 35 flight hours per month per aircraft. While hours increase significantly, the number of planes needed to accomplish the training remains consistant with those required by a modified syllabus. The significant point is, again, that consolidation accomplished under either of these guidelines can be achieved with already existing aircraft assets. More important is the fact that a 100% consolidation requires less total additional aircraft (11 vs. 12) and consequently results in actual savings.

It is realized that there are other considerations used in establishing aircraft allowances which are beyond the scope of this study. Consequently, the author would hesitate to suggest that the total consolidated aircraft allowance should be based on this approach.

1. Substitution of a Synthetic Trainer for In-Flight Trainers

A review of several documents, including the 1975 NAVAIRLANT study, suggested that receipt of the state-of-the-art simulators expected would permit the substitution of simulator time for flight time in the order of 12.5% or more. During the course of research no commitment could be obtained nor were there any syllabi found that provided for substitution of simulator time for in-flight training time. Appendix D contains an analysis of theoretical implementation alternatives which illustrate possible substitution schemes. It is based on personal experience with the subject flights and does not constitute a recommendation.

It is reasonable to expect that a certain percentage of the present A-6E and TC4C syllabus flights can be accomplished in the new simulator. The exact amounts will require assessment after acceptance of the devices. Table VI of Appendix C, however, shows the effect of various degrees of simulator substitution on the number of A-6E aircraft required. Reductions in aircraft hours can be translated into reduced aircraft, reduced personnel support, and facilities support.

The possible substitution of trainer time for aircraft time using the modified Navy syllabi is of importance. Given that in the foreseeable future no state-of-the-art simulators are going to be available to the Marine Corps, there is little possibility that the Marine syllabi could be reduced if Marine replacement training remains at Cherry Point.

D. PERSONNEL SUPPORT REQUIREMENTS

Determination of the personnel support requirements for consolidation of Navy and Marine Fleet Readiness Training was a most difficult undertaking. The Navy A-6E FRS has a squadron allowance and a manning level. Neither include personnel furnished to the parent station for intermediate level maintenance or housekeeping tasks. The Marine Table of Organization includes an allowance for personnel to be provided to the Headquarters and Maintenance Squadron, but personnel must also be furnished for housekeeping duties from on-board strength.

Appendix A, Table III presents the squadron allowances and on-board count for both officer and enlisted of the Navy and Marine Corps units. It should be noted that there are considerable differences in the manning levels of the Navy and Marine squadrons. VMAT(AW)-202 does, however, receive support from other commands, particularly in the area of TC4C pilots and some A-6E instructors.

This indicates one of two possibilities; either the Marine squadron is undermanned or the Navy squadrons have more people than they really need. Since both are accomplishing essentially the same training and are producing very s similar numbers of crews on an annual basis, it may be argued that the Marine manning levels are more realistic. The Navy could respond that the higher readiness levels they achieve and the fact that they do not require outside help proves that their figures are more pragmatic. The critical issue skirts both of these points. It is that consolidation would permit overall reductions in the total number of support personnel needed to provide the same quantity of aircrews and is, therefore, a far more efficient alternative.

Early in the research it became apparent that the Marine personnel support for consolidation requested by the Navy squadrons and parent activities exceeded the total on-board strength of the Marine Replacement Squadron in aviation maintenance Military Occupational Specialty (MOS) codes. It was determined that the most appropriate way to determine the support requirements for various consolidation levels was to request that the Navy Manpower and Material Analysis Center conduct a study to determine the implications of consolidation on manpower levels. NAVMACLANT provided the requested service and the results are contained in Appendix E. A summation of the data contained therein indicates that consolidation would require an additional 24 officers and

approximately 173 extra enlisted personnel regardless of whether it was done on a 100% or a 60/40 basis.

Tables IV and V of Appendix A list the number of personnel requested by the stations/squadrons to support the various proposal levels. NAVMACLANT-furnished data is provided in a parallel column for comparative purposes. It should be noted that in some cases the squadrons have requested fewer officers than determined necessary by the NAVMACLANT analysis. The reverse is never the case, however.

A member of the TAEG study team visited NAVMACLANT to discuss the implications of consolidation. It was informally determined at that time that variations in monthly aircraft utilization would not significantly impact on the manpower requirements.

III. COST ESTIMATES ASSOCIATED WITH CONSOLIDATION

As discussed in the Introduction, cost estimates have been compiled for those options deemed feasible and realistic. They are:

Option A, VA-128 - absorbing 100% of USMC pilot and bombardier/navigator training at NAS Whidbey Island.

Option B, VA-42 - absorbing 25% of USMC pilot and bombardier/navigator training, and VA-128 - absorbing 75%.

A. COST CATEGORIES

Several categories of relevant costs were determined and data was assembled for each in terms of either their investment value or the annual direct cost involved. The value of the information listed in the Investment column requires further explanation. These figures are presented to indicate an opportunity value foregone by use of the particular asset to accomplish training.

In the case of Facilities, the $515,000 savings was arrived at by multiplying 202's hangar space by a factor of value per-square-foot obtained from authorities at Cherry Point. It does not equal either the original acquisition cost of the building or the current replacement cost.

The figure is intended to represent a savings which could be realized by the Marine Corps if consolidation were

implemented and 202's hangar was then utilized for purposes other than training A-6E aircrews. The assumption made is that the substitute use would have required additional expenditures had the building not become available due to consolidation. Consequently, a savings is realized. Were the building allowed to sit dormant as the result of consolidation, then the Investment cost would be zero.

Similarly, Investment savings in A6-E and TC4C aircraft represents an opportunity foregone to utilize those assets in operational flying as opposed to training (it having been indicated that training can be accomplished with fewer planes through consolidation).

The other categories considered are Personnel, Travel, and Ordnance. Appendix D contains definitions for the various categories and derivation of costs (savings) for each category. Tables II to IV (Appendix D) contains summary cost data for all cost categories for Options A and B. The incremental changes in costs for Options A and B follow. (Note: parentheses denote savings.)

OPTION A

	Investment	Annual Direct Cost
Facilities	(515,000)	(50,895)
Personnel	NA	(856,871)
Travel	NA	95,067
A-6E Aircraft	(14,975,538)	304,000
TC4C Aircraft	(2,000,000)	(1,110,000)
Ordnance	NA	426,500
TOTAL		(1,192,199)

OPTION B

	Investment	Annual Direct Cost
Facilities	(515,000)	(50,895)
Personnel	NA	(1,781,266)
Travel	NA	94,437
A-6E Aircraft	(29,951,076)	(1,680,000)
TC4C Aircraft	(2,000,000)	(1,110,000)
Ordnance	NA	426,500
TOTAL		(4,101,224)

The formulas used to determine Annual Direct Costs were obtained from the current Navy Program Factors Manual, or, as in the case of Facilities, from the authorities at the specific base in question. Facilities costs are from the station comptroller's office, Aircraft costs are from the manufacturer, and Travel costs are from the particular service headquarters. The total direct savings indicated refer to the first year of implementation only and should not be interpreted to mean that identical or even similar savings would be realized every year thereafter. Further analysis of available data would be required before that conclusion could be validly drawn.

There are certain restrictions to the viable utilization of these figures. They were developed in an attempt to determine cost trends which would eventually emerge from those levels of consolidation deemed logistically feasible by the study. The importance of the figures is that they indicate a trend of reduced expenditures to produce the same number of crews, and that training would occur in a higher

quality environment. The assumption here is that a higher quality environment will influence a higher quality product. However, the exact figures are not offered as absolutely accurate nor are they in any way guaranteed.

They do indicate that the Department of the Navy can train their required number of A-6E aircrews (both Navy and Marine) in a consolidated fashion which will probably result in overall savings through reductions in aircraft, personnel, and facilities support requirements.

Travel costs and Ordnance costs, on the other hand, would probably increase. Like the other figures presented in this summary, these are averages based on the assumptions listed in Appendix D. It is recognized that in the case of aviation training, variations from these two averages would be the norm rather than the exception. However, even a doubling of the costs in these two categories, which is considered unlikely to occur, would not eliminate overall savings for either of the options.

The key element of the Cost estimates remains a strong indication that not only could higher quality A6-E aircrews be produced by consolidation, but it may well cost less to obtain them. Clearly, a higher quality, more fully trained product even at equal cost would be beneficial to the service. If savings can be realized in the bargain, so much the stronger becomes the argument in favor of the proposition.

IV. FINDINGS

1. Analysis of aircrew syllabi for both the Navy and Marine Corps indicates comparability in excess of 80 percent exclusive of FCLP and carrier qualification. Present Marine replacement training produces pilots and bombardier/navigators with a combat capability of 60 percent. Completion of Navy FRS training less FCLP and CQ is expected to produce Marine graduates with combat capability of approximately 70-75 percent. The additional combat capability is acquired through qualification in nuclear weapons, defensive tactics and advanced visual weapons, qualifications normally received by Marine replacement pilots after assignment to an operational squadron.

2. Consolidation should result in a reduction of aircraft requirements by two A-6E and two TC4Cs. [Appendix C]

3. Personnel support could be reduced by 15 officers and 140 enlisted based on present allowances, or increased by one officer and decreased by 57 enlisted, based on on-board strength. [Table VI, Appendix A]

4. Training of Marine replacements at either VA-42 or VA-128 offers benefits to Marine training of:

a. Use of a modern A-6E Weapons System Trainer

b. Training site availability of a NAMTD

c. Nuclear weapons training

d. Air Intelligence support

e. Increased readiness .

f. Improved training facilities.

5. Provisions could be made to provide an instrument refresher for Marine replacements now received in type either through the use of a Navy squadron such as VF-43 or VF-126, through Marine squadron VMAT-102, or use of the ground training presently provided at either Oceana or Whidbey in conjunction with the new A-6E WST.

6. The facilities at NAS Oceana and VA-42 are presently inadequate for either 60 percent or 100 percent consolidation. Completion of pending MCON projects should resolve the existing BEQ and aircraft parking deficiencies, but not those of hangar space, maintenance spaces, and training spaces. VA-42 pilot and bombardier/navigator production requirements for the period FY 80-84 have been reduced by 17 per year. An equivalent number of Marine replacements could be trained without addition of training assets or personnel unless the responsibility of support must be shared.

7. With the exception of FRAMP spaces and a requirement for additional portable line facilities, the present facilities of VA-128 are adequate to support a 40 percent to 100 percent consolidation. Station facilities are adequate to support a 40 percent or 100 percent consolidation of replacement pilot and bombardier/navigator training. Completion of in-progress MCON projects will further alleviate crowded aircraft parking problems.

8. The precedent for the concept of the Navy assuming responsibility for the training of Marine officers and enlisted personnel as replacements for operational squadrons has been established in the EA-6B program and has been demonstrated to be feasible and appears to be functioning effectively at NAS Whidbey Island.

9. VMAT(AW)-202, the present Marine replacement training squadron, is not responsible for providing aviation maintenance training to Marine enlisted personnel. Decisions concerning consolidation of Marine replacement pilot and bombardier/navigator training should be made exclusive of FRAMP training requirements.

10. FRAMP training for Marine personnel is currently being conducted for a large number of Marine enlisted at both VA-42 and VA-128. Until the assignment of a Marine squadron previously stationed in Iwakuni, Japan to the Marine Corps Air Station at El Toro, California, VA-128 was providing all requested FRAMP training including NAMTD needed to meet the El Toro requirements. Marine enlisted from MCAS Cherry Point are being trained in substantial numbers but in a less formal program. Not all personnel are receiving the complete program nor are there sufficient quotas to meet replacement requirements available.

11. As stated in Section III, analysis of all relevant data indicates consolidation could be efficiently implemented according to one of two options:

A. By VA-128 absorbing 100% of the Marine pilot and bombardier/navigator training at NAS Whidbey Island.

B. By VA-128 absorbing 75% (a-1 first tour pilots and B/N's and two transition pilots) and VA-42 absorbing 25% (all refresher pilots and B/N's.

Option B is driven by stated physical limitations at VA-42. VA-128 is capable of handling any requirement up to 100% of the Marine contingent. VA-42, however, is restricted and option B is therefore based on the expected reduction in the overall Navy A6-E training load during the period of fiscal years 1980-1984. This reduction would correspond to approximately 25% of the Marine Corps' stated needs during the same period and would permit direct substitution without foreseeable additional expense to the Department of the Navy. It is these circumstances which determine the corresponding 75% figure allocated to VA-128 in option B.

12. Another consideration in the process of evaluating options is the historical frequency of Marine refresher trainees generating from the Washington, D.C. and Norfolk, Virginia areas. It is officers completing staff tours in one of these two locals that generally make up the bulk of the refresher training load. This factor favors option B with regard to geographical considerations. Option B also allows all first tour Marine aircrews to enjoy the stated advantages of the facilities at VA-128 (which are listed in the Environmental Factor rating of Section I-A) while maintaining geographical flexibility through the availability of an east coast training site for special case situations.

13. Consolidation of Navy and Marine Corps A6-E training would be entirely feasible under prevailing conditions. It would be economically and qualitatively beneficial if accomplished according to either option A or B. Finally, it would be advisable in terms of maximizing the efficient and effective training of A6-E crewmembers, both Navy and Marine.

V. CONCLUSIONS

In the introduction to Section II (Evaluation of Relevant Factors), the statement was made that any argument for or against consolidation must involve the three elements essential to an ideal training environment, as well as relevant political and economic considerations. The three essential elements were listed as:

1) Logistical support adequate to a smooth running, continuous, and flexible training program.

2) Proximity to geographical, meteoroligical, and tactical conditions approximating those in the particular mission environment.

3) A psychological attitude on the part of the parent and tenant commands which acknowledges the training environment to be of primary importance in the development of all future tactical options.

The relevant fiscal considerations are summarized in Section III (Costs) and show a positive annual savings that can be realized under the recommended conditions of consolidation.

The political influences on the situation are varied and subjective. A brief consideration of them prior to an analytical examination of the trade-offs should be helpful. To begin with, there was sufficient high level interest in the attainment of maximum training efficiency to generate two separate studies of the A-6 proposal within three years. That interest is directly attributable to the general economic

constraints placed upon the military budget as a whole since the end of the Vietnam War.

There is another grouping of political considerations. It involves the natural objections to consolidation which were encountered and are thought to be inherent in the particular organizational branches. The Marine Corps objects to the loss of a squadron of aircraft and the perceived decrease in tactical options which would result. They are also concerned with the loss of initial "service identification" by first tour aircrews trained in a consolidated atmosphere and the loss of operational or mission emphasis due to perceived variances in mission employment.

The primary objection from the Navy noted the additional logistical, personnel, and management burden which they would assume with the Marine training requirement.

In fact, this study indicates that the facility most closely approximating the "ideal" desired is the Naval Air Station at Whidbey Island. It indicates that a consolidation in accordance with the guidelines suggested herein should result in positive annual economic savings to the Department of the Navy. It also indicates that consolidation can be achieved in a manner which minimizes support requirements and in several instances actually reduces them.

Within that framework, the recommendation remains sensitive to a number of influences. They include: alterations in planned squadron output requirements; variations in

available aircraft, personnel, and facilities support; and potential revisions to mission assignments.

The major trade-off for all of these potential influences is the stated enhancement of efficient, quality training which would be realized at apparent savings by consolidation. The degree to which this concern takes precedence over the acknowledged objections and possible changes in the prevailing environment is the key to this proposal's ultimate feasibility.

The Marine Corps' objection to the loss of a squadron and a command billet is not without some justification. Over an extended period of time the loss of a squadron will result in a number of potential commanding officers not receiving experience from which they and the Marine Corps might benefit. The Marine Corps will also suffer the loss of a substantial logistical foundation and the tactical and planning alternatives which it provides.

When, however, the objection is examined in the light of current and projected personnel shortages it begins to lose credibility. The availability of the training squadron at Cherry Point as a convertible tactical asset is very unlikely since crisis has historically increased the need for trained replacement crews and could even require an enlarged training base. A training squadron cannot simply be redesignated and sent off to combat whenever events generate the need for additional assets. It is made up largely of unskilled trainees.

In 202's particular case, the on-hand instructor quota has historically been well below even the manning level required of a tactical squadron.

Objections built on the concept of "service identification" are more difficult to respond to as their specific value defies exact quantification. It may be significant, however, to consider the already mixed and presumably successful flight training programs presently functioning within the Naval Aviation community. Moreover, that particular concept is realistically associated with operational squadrons rather than training units.

It is always possible that major changes could occur in the basic policies governing A-6 training within the Department of the Navy. Such changes and the magnitude of them would probably influence the findings of this thesis and should be considered by the decision-making organization.

While cost estimates indicate a potential annual savings to be realized from either of the proposals, these estimates are clearly tied to all other assumptions. Unforeseen requirements for additional facilities or personnel could rapidly eliminate the projected savings. It should be considered, however, that the kind of circumstances that would radically affect the proposed structure would in all likelihood have similar adverse effects on the current organization. Since the proposal has been shown to be inherently more

efficient, it is not unreasonable to assume that it would remain so under conditions affecting the entire present structure.

What should be examined is the circumstances under which the current structure would actually prove to be more economical than the suggested organization. The point at which that would occur is thought to be an extreme one in which the facilities at both Whidbey Island and Oceana would no longer be responsive to expansion and a third training site became necessary. In all likelihood the circumstances that would cause such a situation would probably be sufficiently catastrophic to invalidate most of the economic considerations prevailing in the current military plan of operation.

Both option A and option B are based on estimated output requirements over the next five year period. Any decrease in those levels would serve to enhance the argument in favor of consolidation. But an unforeseen need to rapidly increase student output could result in the kind of expansion just described. For example, option B's distribution of 25% of the Marine requirement to NAS, Oceana was based on a planned decrease in VA-42's forecast delivery rate. Should environmental factors dictate a rapid build-up of either Marine or Navy crews, Oceana would be restricted for a time by the numerous structural limitations outlined in Section II. Any additional needs would, therefore, fall on Whidbey Island until at least the completion of current MILCON projects

planned for Oceana. It becomes obvious that consolidation does affect the overall flexibility of training response within the A-6 community. Whether that trade-off is sufficient to outweigh the enumerated benefits of the proposal is difficult to pinpoint. It is the author's contention that within the context of five-year planning cycles the contemporary political and socio-economic environment, and the circumstances noted, it is not sufficient.

The major trade-offs, then, are these:

1) Efficiency vs. Flexibility

The gains in efficiency are considered substantial. They include savings in annual direct operating expenses, reduced personnel and aircraft support requirements, and maximum utilization of the best training aids and evaluation techniques available. The loss in flexibility is thought to be minimal. It is also considered critical only in the event of circumstances that would invalidate the basis for the study.

2) Quality vs. Service Identification

Because of the more concentrated use of the best available facilities, the resultant increase in readiness percentages for Marine aircrews, and the more comprehensive training program that would be provided for all users, the proposal appears to enhance the overall quality of the eventual product regardless of service affiliation. Weighted against these benefits is the loss of initial service identification by first

tour trainees. While the value of that loss is difficult to quantify, it should be remembered that even under the proposal the crews would be returning to their individual services for operational flying. Consequently, the development of identification would really only be delayed, not lost. The hard, quantifiable benefits listed appear to justify such a delay.

3) Economic Gain vs. Economic Loss

The proposed system has been shown to provide positive benefits. The extent to which adjustments in the proposal or environmental considerations might erode those benefits is unknown. It is thought by the author to be minimal within the five-year planning period. The system currently utilized represents a continuing economic loss in the face of the proposal's general adaptability.

It is the conclusion of this study that analysis of all relevant, identifiable factors indicates the advisability of consolidating all Navy and Marine Corps A-6E Fleet Replacement Training Squadrons.

APPENDIX A

NAS OCEANA

FACILITIES REQUIREMENTS FOR CONSOLIDATION OF NAVY AND MARINE A-6E FLEET READINESS SQUADRONS

Naval Air Station Oceana supports 23 Regular and 1 Reserve squadrons with approximately 165 aircraft that includes such diverse types as the F-14, F-4, F-5, A-6E, TA-4, TC4C, A-4 and various utility aircraft. An additional squadron (VAQ-33) is expected to move on board on 5 July 1978 for a period of 30 months while runway work is in progress at NAS Norfolk. The squadron has 20 aircraft, approximately 60 officers and 350 enlisted personnel. NAS Oceana has a population of 7,852 enlisted, 1134 officers, and 1464 civilians including the personnel of deployed squadrons. This population is forecast to increase to 8405 enlisted, 1578 officers, and 1606 civilians by 1983.

The present facilities available to support Navy A-6E Fleet Readiness Training and the adequacy of these facilities to support a 60 percent or 100 percent consolidation of Navy and Marine replacement training are identified in this Appendix. Judgements concerning adequacy of present facilities and adequacy for consolidation requirements were furnished by the appropriate commands. Military Construction Projects that could impact on consolidation are also identified.

TABLE I

NAS OCEANA, VIRGINIA

FACILITIES REQUIREMENTS FOR CONSOLIDATION OF NAVY AND MARINE A-6E FLEET READINESS SQUADRONS

FACILITY	SPACE AVAILABLE	SPACE REQUIREMENTS FOR 60% CONSOLIDATION	SPACE REQUIREMENTS FOR 100% CONSOLIDATION
Administration	Adequate (above average)	Adequate	Adequate
Pilot/BN classroom	Two classrooms augmented by excellent facilities for flight planning, debriefing, and air intelligence briefing/ debriefing.	One additional classroom required.	Two additional classroom required.
Aircrew locker room	Barely adequate for present population.	*Require expansion	*Require expansion
Aircraft Maintenance			
Administration	Adequate	Increase by 25%	Increase by 33%
Airframes	Adequate	Increase by 50%	Increase by 100%
Powerplants	Adequate	Increase by 25%	Increase by 50%
AQ Shop (weapons systems)	Adequate	Increase by 25%	Increase by 50%
AE Shop (electrical)	Adequate	Increase by 15%	Increase by 25%
AT Shop (avionics)	Adequate	Adequate	Adequate
Ordnance	Adequate	Adequate	Increase by 25%

* Transfer of Personnel functions to PASS system expected to free this space which may be used for locker room expansion or maintenance administration.

TABLE I (Continued)
NAS OCEANA, VIRGINIA

FACILITY	SPACE AVAILABLE	SPACE REQUIREMENTS FOR 60% CONSOLIDATION	SPACE REQUIREMENTS FOR 100% CONSOLIDATION
Aircraft Maintenance (continued)			
Seat Shop	Adequate	Adequate	Adequate
Line Division (temporary or portable)	Adequate	Adequate	Increase by 50%
FRAMP	4320 square feet (3 double wide trailers adjacent to maintenance aircraft ramp. Houses FRAMP and ATSS computer system.	Increase by one trailer	Increase by one trailer
Ground Support Equipment (GSE)	GSE is included in IMRL. Adjustments in aircraft requirements should be reflected in WSPD. IMRL for AIMD and VA-42 should be adjusted in accordance with requirements of AMMRL/ADMRL program.		
Target Facilities	Dare County (raked target, manned, adequate for bombing requirements) Stumpy Point (mining and low angle, low speed bombing) Tangier (water target with spotter, not raked)	Dare County heavily utilized but adequate for the small percentage increase in total utilization occasioned by consolidation. Presently used on occasion by Marine squadrons at Cherry Point.	

TABLE I (Continued)
NAS OCEANA, VIRGINIA

FACILITY	SPACE AVAILABLE	SPACE REQUIREMENTS FOR 60% CONSOLIDATION	SPACE REQUIREMENTS FOR 100% CONSOLIDATION
Hangar Space	7-8 spaces	5 additional	7 additional
Ramp Space	#Inadequate 5 with wings spread on 45° 8 with wings folded on 45° 3 on TC4C line 4-5 on Maint. line	*Inadequate *The combination of Ramp, Maintenance Line and Hangar spaces should equal aircraft assigned. Completion of MILCON project would meet aircraft parking requirements generated by consolidation.	*Inadequate
WST Facility	Complete, awaiting delivery of Devices 2F114 and 2F122. These facilities are modular and can be expanded to accommodate follow-on devices.		
NAMTRADET	Presently providing NAMTD training for all Marine Officers receiving A-6E replacement training. Approximately 424 courses provided to Marine officers and enlisted per year. Instructor support requirements will be addressed under Personnel Support Requirements.		
Air Installations Compatible Use Zones (AICUZ)	No significant impact based on average number of sorties from Oceana.		
Air Traffic Control	No significant impact based on average number of sorties from NAS Oceana.		

* 53,300 square yards of parking for A-6E aircraft in support of Hangar 122 in MILCON project P-227. (See Military Construction notes at the end of facilities requirements listing).

3 A-6E and TC-4C aircraft are parked on a taxiway.

TABLE I (Continued)
NAS OCEANA, VIRGINIA

FACILITY	SPACE AVAILABLE	SPACE REQUIREMENTS FOR 60% CONSOLIDATION	SPACE REQUIREMENTS FOR 100% CONSOLIDATION
Bachelor Officer Quarters	*253 total beds in 191 rooms. 27 suites. An additional 59 BOQ rooms are used to house E-7 enlisted.	Estimated requirement for housing an average of 14 additional officers.	Estimated requirement for housing an average of 26 additional officers.
Married Officer Quarters	125 sets of quarters, 3-12 mo. waiting period.	Would be unavailable to students due to time on board. Permanent personnel would be required to go on waiting list. Off-base housing readily available during winter months but at a premium during summer months.	
Bachelor Enlisted Quarters	2396 adequate spaces/ 3015 peakload.	**Barracks presently operating at capacity. Dam Neck currently has some space available. This space expected to be limited with opening of Operations Specialist School about June 1979. Additional spaces required to support all personnel utilizing BEQ for entire squadron VMAT-202 based on present situation is only 56. Expansion of FRAMP training would require additional spaces.	
Married Enlisted Quarters	500 adequate, 6-12 mo. wait. 503 inadequate, 3-12 mo. wait. 96 site mobile home park.	Quarters for enlisted on station very limited.	

* Fleet Combat Direction Systems Training Center, Atlantic, at Dam Neck which is about 4 miles distant has accommodations for 162 officers. Expect to be able to accommodate 15-20 officers at all times and more except during summer months.

** 452-man BEQ in MCON. (See note at conclusion of facilities charts).

TABLE I (Continued)
NAS OCEANA, VIRGINIA

Military Construction Projects with possible impact on consolidation of Navy and Marine A-6E FRS training:

P-901(R) Bachelor Enlisted Quarters (BEQ). FY 81. This project to construct a barracks building that will accommodate 452 enlisted men and women. Expected to be funded in December 1980.

P-227 Aircraft Parking. FY 80. This project to provide 31 additional parking spaces for A-6E aircraft (53,300 square yards). Completed Military Review Board and expected to be funded approximately December 1979. Expected completion date February 1981. Full realization of this additional space will not occur until Project P-229 complete as approximately 50 percent of existing ramp will be cut up for installation of underground piping.

P-502(R) A-6E Night Carrier Landing Trainer Facility. FY 79. This project to provide a facility to accommodate Device 2F122, NCLT, which is expected to be delivered in November 1979. Expected to be funded in 1978 and completed in September-October 1979.

P-229(R) Aircraft Ramp Service Station. FY 81. This project is to provide utility service to aircraft on the parking apron at Hangar 122 in lieu of mobile Ground Support Equipment (GSE). Expected to remain in the MCON program.

Special Projects with possible impact on consolidation of Navy and Marine A-6E FRS training:

R-10-75 Structural, Electrical, and Mechanical Repairs to Hangar 122. This project expected to seriously reduce the utilization of Hangar 122 during the next 18 to 24 months, further reducing availability of aircraft squadron maintenance space during this period. Project should be completed prior to planning date for POM-81 referenced in CNO (OP-593) MEMORANDUM referenced in this report.

NAS WHIDBEY ISLAND

FACILITIES REQUIREMENTS FOR CONSOLIDATION OF NAVY AND MARINE A-6E FLEET READINESS SQUADRONS

Naval Air Station Whidbey Island supports 16 Regular and 3 Navy and Marine Reserve squadrons with approximately 150 aircraft of such types as the A-6E, EA-6B, P-3, UH-1N and several utility helicopters and aircraft. The predominant aircraft are the A-6E and EA-6B and the entire complex is uniquely equipped to support the maintenance and training for these types. The present population supported by NAS Whidbey Island including deployed squadrons is 856 officers, 6072 enlisted, 1300 civilians and approximately 11,000 active duty dependents. The military population is projected to increase to 7167 in 1981 and remain approximately the same in 1982 and 1983.

The present facilities available to support Navy A-6E Fleet Readiness Training and the adequacy of these facilities to support 40 percent or 100 percent consolidation of Navy and Marine replacement training are identified in this Appendix. Judgements concerning adequacy of present facilities and adequacy for consolidation requirements were furnished by the appropriate commands. Military Construction Projects that could impact on consolidation are also identified.

TABLE II

NAS WHIDBEY ISLAND, WASHINGTON

FACILITIES REQUIREMENTS FOR CONSOLIDATION OF NAVY AND MARINE A-6E FLEET READINESS SQUADRONS

FACILITY	SPACE AVAILABLE	SPACE REQUIREMENTS FOR 40 PERCENT OF MARINE FRS TRAINING	SPACE REQUIREMENTS FOR 100 PERCENT OF MARINE FRS TRAINING
Administration	22,100 square feet	Present space adequate	Present space adequate
Pilot/BN Classroom	2,500 square feet	" " "	" " "
Maintenance Shop Space	9,300 square feet	" " "	" " "
Hangar Space	21,900 square feet	" " "	" " "
Ramp Space	Adequate for 15 A-6E & 3 TC4C aircraft	*Adequate with adjacent spaces	*Adequate with adjacent spaces
Temporary Line Buildings			
Line Shack	Present facility used for Line Shack and Trouble Shooting personnel.	An additional temporary or portable structure would be required to provide a separate space for trouble shooting personnel.	An additional temporary structure or portable building would be required to provide a separate space for trouble shooting personnel.
Ordnance Shack	Adequate	A larger structure would be required to support additional Marine training.	A larger structure would be required to support additional Marine training.

* 61,222 square yards of space will be completed prior to end of Fiscal 78 for parking of Naval Air Reserve aircraft which will free ramp space presently used for parking these aircraft. A large ramp area immediately adjacent to VA-128 Hangar is used only for TC4C parking. This area has power and could possibly augment A-6E parking requirements.

TABLE II (Continued)
NAS WHIDBEY ISLAND, WASHINGTON

FACILITY	SPACE AVAILABLE	SPACE REQUIREMENTS FOR 40% CONSOLIDATION	SPACE REQUIREMENTS FOR 100% CONSOLIDATION
Target Facilities	Boardman Bombing Range 210 miles southeast of Whidbey is manned and has spotting towers. AMTI equipped.	Adequate	Adequate
	Admiralty Bay for mining, equipped for scoring.	Adequate	Adequate
	Spokane for radar bombing system. Excellent facility.	Adequate	Adequate
WST Facility	Facility complete awaiting arrival of A-6E WST & A-6E NCLT.	Adequate	Adequate
Ground Support Equipment (GSE)	GSE is included in IMRL.	Adjustments in aircraft requirements should be reflected in WSPD. IMRL for AIMD and VA-128 should be adjusted in accordance with requirements of AMMRL/ADMRL program. The small number of additional aircraft are not expected to significantly affect NAS Whidbey Island total GSE requirements.	
NAMTRADET	Facility equipped to support A-6E and EA-6B training.	Adequate for consolidation of Navy and Marine FRS training.	
Air Traffic Control Facilities	Adequate	Adequate	Adequate

TABLE II (Continued)
NAS WHIDBEY ISLAND, WASHINGTON

FACILITY	SPACE AVAILABLE	SPACE REQUIREMENTS FOR 40% CONSOLIDATION	SPACE REQUIREMENTS FOR 100% CONSOLIDATION
Bachelor Officer Quarters	Modern facility with 140 rooms can accommodate 250 at 2/room plus 79 at 1/room.	Adequate	Adequate
Married Officer Quarters	220 sets.	Adequate plus outside listings.	Adequate plus outside listings.
Bachelor Enlisted Quarters	2200 berths, occupancy close to 100% based on present rules for BEQ.	Expected departure of VMAQ-2 will free additional 100 plus berths. Approximately 50 of these would be required to support Marine EA-6B training. Adequate (not including FRAMP).	Adequate (not including FRAMP)
Enlisted Messing	Adequate	Adequate	Adequate
Married Enlisted Quarters	1020 quarters available.	No significant impact.	No significant impact.

Military Construction Projects with possible impact on consolidation of Navy and Marine A-6E FRS training:

P-008 Aircraft Parking Apron. (FY 77) Provides for an additional 61,222 square yards of parking. This will relieve some of existing parking problems particularly for Naval Air Reserve Aircraft. Completion date September 1978.

P-038 Aircraft Maintenance Hangar. (FY 79) Expected to be funded this year. This project expected to allow movement of EA-6B squadrons from existing obsolete wooden hangars.

P-017 Administration Building/Maintenance Hangar. (FY 78) 50,699 square feet of administrative and hangar space. Expected to provide movement from obsolete wooden structures.

TABLE II (Continued)
NAS WHIDBEY ISLAND, WASHINGTON

A-6E AND TC4C AIRCRAFT REQUIRED TO SUPPORT 40% AND 100% OF MARINE PILOT AND BOMBARDIER/NAVIGATOR TRAINING

Stated Requirement or Utilization Rate	Additional Aircraft Required to Support Training for 40% of Marine RP's and RBN's	Additional Aircraft Required to Support Training for 100% of Marine RP's and RBN's
VA-128 Stated Requirements	5 A-6E aircraft	11 A-6E aircraft
	*0 TC4C aircraft	*0 TC4C aircraft

* TC4C aircraft requirements are based on having 3 aircraft configured for A-6E BN position. At the present time only 2 aircraft are so configured.

WEAPON SYSTEM TRAINER REQUIREMENT/OPERATIONAL FLIGHT TRAINER (WST/OFT)

One Device 2F67A, an analog WST. This device scheduled for update to A-6E (2F67C) cockpit configuration and ready for training by January 1979.

One Device 2F114, A-6E WST scheduled for delivery March 1979 - expects to slip to approximately June 1979.

One Device 2F122, A-6E NCLT scheduled for delivery December 1979.

VA-128 stated requirement to support VA-128 and Whidbey Island based Fleet A-6E requirements would exceed available training time on one 2F114 if used 16 hours per day, 5 days per week. Conversion of Device 2F67 should provide training for a number of tasks concerned with A-6E transition.

TABLE II (Continued)
NAS WHIDBEY ISLAND, WASHINGTON

FACILITIES REQUIREMENTS FOR PROVIDING FLEET REPLACEMENT AVIATION MAINTENANCE TRAINING TO MARINE ENLISTED A-6E REPLACEMENTS

FACILITY	SPACE AVAILABLE	SPACE REQUIREMENTS FOR FRAMP 40 PERCENT OF MARINE FRAMP TRAINING	SPACE REQUIREMENTS FOR 100 PERCENT OF MARINE FRAMP TRAINING
FRAMP	Inadequate for present requirements, 4320 square feet (consists of 3 double wide trailers adjacent to hangar. Houses FRAMP and Aviation Training Support System.	1 Additional double-wide trailer required. This will alleviate present deficiencies and accommodate 40% of Marine FRAMP training requirements.	*Requires an increase in training space. Could be accommodated by the addition of one double wide trailer, and one single wide trailer.
	2 Additional classrooms are required for present load.	3 Additional classrooms are required.	5 Additional classrooms required. (See note below)
Bachelor Enlisted Quarters	2200 Berths, occupancy close to 100% based on present rules for BEQ.	Expected departure of VMAQ will free an additional 100 plus berths. Adequate for average on board 47 FRAMP students.	Not adequate for average on board 103 FRAMP students.

* Estimated cost of double wide trailers used presently to support A-6 training both at Whidbey and Oceana = $25,000 in 1977.

NOTE: Extensive space on Mezzanine deck of VA-128/Hangar is presently unused. COMMATVAQWINGPAC is investigating the engineering feasibility of utilizing this space to accommodate FRAMP requirements.

TABLE III

PERSONNEL ALLOWANCES AND ON-BOARD STRENGTH OF NAVY AND MARINE FLEET READINESS SQUADRONS

BILLETS	ALLOWANCE	ON-BOARD		GROUP IX/MOS 6000 SERIES Allowance	On-Board
VA-42 (4/22/78)					
Administrative	13	11			
Aviator	*27	*27			
NFO	22	22			
Enlisted	412	395		375	354
VA-128 (6/18/78)					
Administrative	15	10			
Aviator	*28	*29			
NFO	20	20			
Enlisted	417	380		371	337
VMAQ(AW)-202 (5/3/78)					
Administrative	6	3			
Aviator	18	12			
NFO	15	8			
Enlisted	313	#228	Squadron	216	131
			IMA	79	79

* Includes TC4C pilots in Navy squadrons.

\# Includes personnel furnished for support, e.g., compartment cleaners, etc. and personnel furnished to Intermediate Maintenance Activity (H&MS).

Note: Aircraft Intermediate Maintenance personnel and other station support required in support of Navy FRS are not charged to squadron allowance as in the case of VMAT(AW)-202. VMAT(AW)-202 does receive some support from other commands in the form of TC4C pilots and A-6E instructors.

There are differences in intermediate maintenance support in the Marine Corps from the Navy which results in a significant difference in the number of personnel furnished to support one squadron.

TABLE IV

PERSONNEL SUPPORT REQUIREMENTS TO SUPPORT A-6E USMC TRAINING AT NAS OCEANA

	Requested by VA-42/NAS Oceana		Furnished by NAVMMACLANT	
	60% Consolidation	100% Consolidation	60% Consolidation	100% Consolidation
OFFICERS				
by Designator				
1310	4	6	7	12
1320	3	5	7	12
TC4C Pilots	2	3		
Simulator Inst.	2	3		
	11	16	14	24
by Rank				
O-4	1	1	1	2
O-3	10	15	13	22
ENLISTED (Based on 6.58 aircraft for 60% consolidation and 11 aircraft for 100% consolidation.				
Organizational Level Maintenance	111	187	84	140
Intermediate Level Maintenance	22	38	8	14
Administrative Support	4	6	*6	*10
	137	231	98	164

* Includes administrative support for FRAMP.

Notes: In accordance with NAS Oceana Instruction 1110.1E, there are no requirements for Mess Specialists or Custodial Personnel for permanently assigned units such as VA-42.

Enlisted support requirements based on NAVMMACLANT data by rating and pay grade to support 60% and 100% consolidation are contained in Appendix E.

TABLE V

PERSONNEL SUPPORT REQUIREMENTS TO SUPPORT A-6E USMC TRAINING AT NAS WHIDBEY ISLAND

	Requested by VA-1287 NAS Whidbey Island		Based on Data Furnished by NAVMMACLANT	
	40% Consolidation	100% Consolidation	40% Consolidation	100% Consolidation
OFFICERS				
by Designator				
1310	3	6	5	12
1320	3	5	5	12
by Rank				
0-4	1	1	1	2
0-3	5	10	9	22
ENLISTED (Based on 5 aircraft for 40% consolidation and 11 aircraft for 100% consolidation.				
Organizational Level Maintenance	109	240	56	140
Intermediate Level Maintenance	22	37	7	14
Administrative Support	0	0	*4	*10
			67	164

* Includes administrative support for FRAMP.

Notes: VA-128 does not provide Mess Specialists or Custodial Personnel to NAS Whidbey.

Enlisted support requirements based on NAVMMACLANT data by rating and pay grade to support 40% and 100% consolidation are contained in Appendix E.

TABLE VI

COMPARISON OF PRESENT SQUADRON ALLOWANCES PLUS VMAT(AW)-202 BILLETS
WITH PRESENT ALLOWANCES ADJUSTED FOR NAVMMACLANT INCREMENTS

100 Percent Consolidation

	VA-42 Allowance	VMAT(T)-202 Allowance	Total USN/USMC Allowance	VA-42 Allowance	NAVMMAC Increment	Total USN/ NAVMMAG	Combined Billet Adjustment
Officer	62	39	101	62	24	86	Reduce by 15
Enlisted*	461	313	774	461	173	634	Reduce by 140
	VA-42 On-Board	On-Board	On-Board	On-Board			
Officer	59	23	82	59	24	83	Increase by 1
Enlisted*	415	228	643	415	173	588	Reduce by 57

* Enlisted strengths include both AIMD personnel and FRAMP instructors.

Note: NAS Oceana has not requested non-Group IX station support. OPNAV-1002 MPA presently 25 non-Group IX billets to NAS Oceana for support of VA-42.

APPENDIX B

BOMBARDIER/NAVIGATOR COMMONALITY ANALYSIS

Analysis of the various Bombardier/Navigator training syllabi utilized at the two Navy and one Marine replacement aircrew training squadrons presented some interesting problems. Initial review made it apparent that a flight-by-flight study would prove confusing and unproductive due to the subjective factors involved in the training of a BN as opposed to a pilot.

There were several philosophies observable in the content of the various syllabi. Essentially the same material is being taught in each squadron. (Notable exceptions are Mining techniques, being taught by the Navy, and the use of the RABFAC beacon bombing method, which is heavily emphasized by the Marine Corps.) However, differences do appear in the manner in which certain areas are covered. One approach is to present all of the aspects and ramifications of a particular subspecialty, say, systems navigation, and gradually increase the difficulty factors involved. This appears to be characteristic of the Navy approach (in general). The Marine unit displays a tendency to cover one or two phases of a given subject in depth and then move on to the next with scheduled reviews or reemphasis later in the syllabus. Consequently, an analysis on the basis of phase rather than flight-by-flight seemed more in order.

The results of that approach are contained in the next several pages. It is structured to permit comparisons between VA-128 and VA-42, as well as emphasizing VMAT(AW)-202's relationship to both the Navy units. Comparability of the flight training is based on a range of relevant factors. They are:

Number of Flights
Time per Flight
Students per Flight
Total Flight Time per Student
Actual Time on the Equipment per Student
Instructor Hours
Instructor Hours per Student

The categories are weighted equally, thereby permitting the user to manipulate the data according to his particular needs.

Overall, comparability was found to fall within the following ranges for Category I BN's:

VMAT(AW)-202 to 128		VMAT(AW)-202 to 42
From .917 to 1.222	and	From .889 to 1.124

It should be noted that five categories of training were excluded. They are: Visual Weapons, Aerial Refueling, TPQ, FMLP, and Carrier Quals.

Visual weapons flights are flown by both squadrons. VMAT(AW)-202, however, flies them with one student and one instructor while the Navy syllabus, which is lengthier in that regard, uses two students. The remaining four topics are unique to one or the other service – (TPQ and Air Refuel to the Marine Corps, and FMLP and CAR QUALS to the Navy). Their comparability is therefore zero.

Regarding the specific subjects covered within each syllabus section, there is almost total comparability even though the respective titles, order of presentation, and instructional technique vary considerably. Notable exceptions are, again, Mining and RABFAC training. This difference may be due to logistic factors more than anything else. Based on the historical precedent of Marine A-6's mining Haiphong Harbor, the opportunity to expose Marines to that particular type of attack (which consolidation would present) may be a minor, but none the less, relevant factor. Likewise, the Navy interest in RABFAC techniques has been rising steadily over the last few years and appears to have been held up more by the lack of availability of actual transponders than by any disagreement about its validity as an attack mode.

Finally, there are one or two points evidenced by the study which deserve further, more detailed consideration. There is more than one example of substantial differences in the perceived value of specific training methods among the three squadrons. The respective approaches to the System Weapons Phase (System Ordnance Phase for 202) illustrates the point. VA-128 employs 4 TC4C flights in this section while 202 uses a total of 6. VA-42, however, incorporates only 1 TC46 hop in their syllabus for this phase, preferring to rely on nine (9) A-6 flights. (VA-128 also specifies 9 A-6 hops while 202 has 6.) Assuming that all three squadrons

have been producing essentially satisfactory B/N's over the years, it becomes apparent that no one method is especially superior to another. This allows for maximum flexibility in the consideration of consolidated flight training.

TC4C FLIGHTS - VA-128

NAVIGATION PHASE:

NUMBER OF FLIGHTS -	8
TIME PER FLIGHT -	4 HRS.
STUDENTS PER FLIGHT -	2
TOTAL FLIGHT TIME PER STUDENT -	32
TIME ON THE EQUIPMENT PER STUDENT -	16
INSTRUCTOR HOURS -	32
INSTRUCTOR HOURS PER STUDENT -	16
TOTAL AIRCREW HOURS -	64
PLANE CAPTAIN HOURS -	32

SUBJECTS COVERED:

SEARCH RADAR OPERATION
SCOPE INTERPRETATION
COMPUTER STEERING
VISUAL NAVIGATION MODES
SYSTEM NAVIGATION PROCEDURES
RADAR PREDICTIONS
NAVIGATION IN MOUNTAINOUS TERRAIN
AMTI
LANDING MODE
NMATSZ/DNMATSZ
LOCK-ON PROCEDURES (FIXED AND MOVING)
FULL COMPUTER STEERING FUNCTIONS
TROUBLESHOOTING MALFUNCTIONS
CHECKRIDE

SIGNIFICANT DIFFERENCES FROM 128 OR 202: NO RABFAC PROCEDURES.

TC4C FLIGHTS - VA-42

NAVIGATION PHASE:

NUMBER OF FLIGHTS -	9
TIME PER FLIGHT -	3.5 HRS.
STUDENTS PER FLIGHT -	2
TOTAL FLIGHT TIME PER STUDENT -	31.5
TIME ON THE EQUIPMENT PER STUDENT -	15.75
INSTRUCTOR HOURS -	31.5
INSTRUCTOR HOURS PER STUDENT -	15.75
TOTAL AIRCREW HOURS -	63
PLANE CAPTAIN HOURS -	31.5

SUBJECTS COVERED:

SEARCH RADAR OPERATION
COMPUTER STEERING
MANUAL VELOCITY CORRECTS
AUTO VELOCITY CORRECTS
AMTI
FULL SYSTEM NAVIGATION
MALFUNCTIONS
SEARCH RADAR TRACKING
LANDING MODE
NAVIGATION PROCEDURES AND SCOPE DISPLAY SELECTION
USE OF RADAR PREDICTIONS
DEVELOPMENT OF FUNDAMENTALS AND SCOPE PROFICIENCY

SIGNIFICANT DIFFERENCES:

NO RABFAC PROCEDURES
THE LAST FLIGHT IN THE PHASE IS REQUIRED TO BE "DEMANDING"
BUT IS NOT SPECIFICALLY DESIGNATED AS A CHECKRIDE.

TC4C FLIGHTS - VMAT-202

NAVIGATION PHASE:

NUMBER OF FLIGHTS -	9
TIME PER FLIGHT -	3.5
STUDENTS PER FLIGHT -	3
TOTAL FLIGHT TIME PER STUDENT -	31.5
TIME ON THE EQUIPMENT PER STUDENT -	10.5
INSTRUCTOR HOURS -	31.5
INSTRUCTOR HOURS PER STUDENT -	10.5
TOTAL AIRCREW HOURS -	63
PLANE CAPTAIN HOURS -	31.5

SUBJECTS COVERED:

SEARCH RADAR TUNING AND OPERATION
INS ALIGNMENT
RADAR MALFUNCTIONS
COMPUTER STEERING IN THE D.R. MODE
COMPUTER READOUTS OF ADC, INS, AND DOPPLER
DEGRADED MODES
NMATSZ/DNMATSZ
ELEVATION LOCKS AND READOUTS
AZ-RANGE LOCKS AND NAV CHECKPOINTS
AMTI
RABFAC BEACON PROCEDURES
CHECKRIDE

SIGNIFICANT DIFFERENCES:

RABFAC INTRO.
TENDENCY TOWARD A MORE SPECIFIED CONTENT.

TC4C FLIGHTS - 128

SYSTEM WEAPONS PHASE:

NUMBER OF FLIGHTS -	4
TIME PER FLIGHT - Varies (2,3 & 4 hrs.)	
STUDENTS PER FLIGHT -	2
TOTAL FLIGHT TIME PER STUDENT -	12
TIME ON THE EQUIPMENT PER STUDENT -	6
INSTRUCTOR HOURS -	12
INSTRUCTOR HOURS PER STUDENT -	6
TOTAL AIRCREW HOURS -	24
PLANE CAPTAIN HOURS -	12

SUBJECTS COVERED:

SIMULATED ATTACKS - ALL PRIMARY AND SECONDARY
MINING ATTACKS
COMPLEX ATTACKS
SYSTEM NAVIGATION AND PRACTICE TO AND FROM TARGETS
SIMULATED ATTACKS ON THE SPOKANE RBS
CHECKRIDE INVOLVING DIFFICULT TARGETS, DISTRACTIONS, MALFUNCTIONS AND SIMULATED EMERGENCIES.

SIGNIFICANT DIFFERENCES:

AVAILABILITY OF SPOKANE RBS
MINING
EMPHASIS ON COMPLEX TARGETS

NOTE: EMPHASIS IS ON EXPOSURE TO THE TOTAL A-6 MISSION. ALL PRIMARY AND SECONDARY ORDNANCE DELIVERIES ARE COVERED. ACCORDING TO PREVAILING CONDITIONS AND CONSTRAINTS THE TC4C PHASE WILL ALSO INCLUDE AND PRACTICE CREW COORDINATION, COCKPIT AWARENESS (AIRMANSHIP), TARGETING, WEAPONRY AND DEGRADED SYSTEMS OPERATION. MINING, MOVING TARGETS, COMPLEX AND TERRAIN TARGET PROCEDURES ARE ALL COVERED. THIS REQUIRES THE USE OF AIMPOINTS, CHECKPOINTS AND SYSTEM PROCEDURES.

TC4C FLIGHTS - 42

SYSTEM WEAPONS PHASE:

NUMBER OF FLIGHTS -	1
TIME PER FLIGHT -	3.5
STUDENTS PER FLIGHT -	3
TOTAL FLIGHT TIME PER STUDENT -	3.5
TIME ON THE EQUIPMENT PER STUDENT -	1.17
INSTRUCTOR HOURS -	3.5
INSTRUCTOR HOURS PER STUDENT -	1.17
TOTAL AIRCREW HOURS -	7
PLANE CAPTAIN HOURS -	3.5

SUBJECTS COVERED:

FAMILIARIZATION WITH TARGET PATTERN AND PROCEDURES

DEMONSTRATE ATTACK PROCEDURES AND SYSTEM ATTACK MODES

SIGNIFICANT DIFFERENCES:

RAW TIME FACTOR UNDER THE DIRECT GUIDANCE OF AN INSTRUCTOR B/N IN THE ATTACK, OR WEAPONS SYSTEM ENVIRONMENT.

TC4C FLIGHTS - 202

RADAR TARGET IDENTIFICATION PHASE:

NUMBER OF FLIGHTS -	6
TIME PER FLIGHT -	3.5
STUDENTS PER FLIGHT -	3
TOTAL FLIGHT TIME PER STUDENT -	21
TIME ON THE EQUIPMENT PER STUDENT -	7
INSTRUCTOR HOURS -	21
INSTRUCTOR HOURS PER STUDENT -	7
TOTAL AIRCREW HOURS -	42
PLANE CAPTAIN HOURS -	21

SUBJECTS COVERED:

RADAR TARGET IDENTIFICATION
USE OF OFFSET AIMPOINTS (IMPLIED IN 128's)
TARGET COMPLEX BREAKUP
COMPLEX ATTACKS
SYSTEM MALFUNCTIONS DURING ATTACKS
CHECKRIDE

SIGNIFICANT DIFFERENCES:

NO MINING
NO SPOKANE RBS
EMPHASIS ON OVERALL ATTACK PROCEDURES AS OPPOSED TO COMPLEX ATTACKS.

NOTE: THE STUDENT IS INTRODUCED TO AND PRACTICES ALL PRIMARY AND SECONDARY ATTACKS. HE CONTINUES TO GAIN EXPERIENCE IN GENERAL AIRMANSHIP, TARGETING, USE OF THE WEAPONS SYSTEM AND DEGRADED SYSTEMS OPERATION. HE ENCOUNTERS AMTI, USE OF CHECKPOINTS AND AIMPOINTS. HE DOES NOT COVER MINING.

A6 FLIGHTS - 128

FAM STAGE:

NUMBER OF FLIGHTS -	2
TIME PER FLIGHT -	2
TIME ON THE EQUIPMENT (TOTAL) -	4
INSTRUCTOR HOURS -	4

SUBJECTS COVERED:

LOCAL AREA CHECKOUT
A6 FLIGHT CHARACTERISTICS
AEROBATICS
SINGLE ENGINE PERFORMANCE
TOUCH AND GO PATTERN
INSTRUMENT ROUND ROBIN
TACAN, GCA, FIELD PROCEDURES

SIGNIFICANT DIFFERENCES:

NO NIGHT WORK
NUMBER OF FLIGHTS

A6 FLIGHTS - 42

FAM STAGE:

NUMBER OF FLIGHTS -	1
TIME PER FLIGHT -	1.5
TIME ON THE EQUIPMENT (TOTAL) -	1.5
INSTRUCTOR HOURS -	1.5

SUBJECTS COVERED:

LOCAL AREA FAMILIARIZATION
A6 FLIGHT CHARACTERISTICS
FIELD APPROACH PROCEDURES

SIGNIFICANT DIFFERENCES:

NUMBER OF FLIGHTS
NO INSTRUMENT WORK
NO NIGHT WORK

A6 FLIGHTS - 202

FAM AND INSTRUMENT STAGE:

NUMBER OF FLIGHTS -	4
TIME PER FLIGHT -	2.5
TIME ON THE EQUIPMENT (TOTAL) -	10
INSTRUCTOR HOURS -	10

SUBJECTS COVERED:

LOCAL AREA FAMILIARIZATION
A6 FLIGHT CHARACTERISTICS
AEROBATICS
SINGLE ENGINE PERFORMANCE
STALLS
INSTRUMENT APPROACHES
LANDING PATTERN (TOUCH AND GO)
NIGHT ORIENTATION
INSTRUMENT FLIGHT PLANNING
DD 175 FILING
EMERGENCY ASSISTANCE TO THE PILOT
NIGHT INSTRUMENT FLYING

SIGNIFICANT DIFFERENCES:

NUMBER OF FLIGHTS
INSTRUMENT FILING AND FLYING (42)
NIGHT WORK

A6 FLIGHTS - 128

NAVIGATION PHASE:

NUMBER OF FLIGHTS (1 VISUAL-FORM, 3 SYSTEMS) - 4

TIME PER FLIGHT (2.5, 2.5, 2.5, 3) -

TIME ON THE EQUIPMENT (TOTAL) - 10.5

INSTRUMENT HOURS - 10.5

SUBJECTS COVERED:

FORMATION FLYING

VISUAL NAVIGATION - LOW LEVEL

HAND AND ARM SIGNALS

SYSTEM TURN POINT PROCEDURES

VOICE COMMUNICATIONS

AMTI

LANDING MODE

LOW LEVEL SYSTEM NAVIGATION

TERRAIN CLEARANCE USING SEARCH RADAR AND SRTC

OVERALL SYSTEM CAPABILITY AT LOW LEVEL

USE OF VTR

SIGNIFICANT DIFFERENCES:

NUMBER OF FLIGHTS

FORMATION FLYING

A6 FLIGHTS - 42

NAVIGATION AND RADAR TARGET IDENTIFICATION PHASE:

NUMBER OF FLIGHTS -	10
TIME PER FLIGHT - (1 - 2.0, 9 - 2.5)	
TIME ON THE EQUIPMENT (TOTAL) -	24.5
INSTRUCTOR HOURS -	24.5

SUBJECTS COVERED:

D.R. NAVIGATION
SYSTEM NAVIGATION*
IDENTIFICATION AND BREAKUP OF COMPLEX TARGETS
RANGING FROM EASY TO VERY DIFFICULT
LOW LEVEL/HIGH SPEED SYSTEM AND VISUAL NAVIGATION (COMBINED)

SIGNIFICANT DIFFERENCES:

NUMBER OF FLIGHTS
NO FORMATION (ANYWHERE IN THE SYLLABUS)

* NOTE: THE SYLLABUS IS UNSPECIFIC AS TO CONTENT BUT IT CAN BE REASONABLY ASSUMED THAT IT PARALLELS 128, AT LEAST ROUGHLY, WITH THE EXCEPTION OF FORMATION FLYING, WHICH ONE WOULD EXPECT TO FIND SPECIFIED.

A6 FLIGHTS - 202

FORMATION, VISUAL NAVIGATION AND SYSTEM TACTICS PHASES:

NUMBER OF FLIGHTS - (2 VISUAL, 2 FORMATION, 4 SYSTAC) 8

TIME PER FLIGHT - (2 - 2.0 and 6 - 2.5)

TIME ON THE EQUIPMENT (TOTAL) - · 19

INSTRUCTOR HOURS - 19

SUBJECTS COVERED:

FORMATION FLYING - DAY AND NIGHT

SECTION TACTICS

SECTION APPROACHES

HAND AND ARM SIGNALS

LOW LEVEL/HIGH SPEED VISUAL NAVIGATION

LOW AND MEDIUM SYSTEM NAVIGATION

ST. PATH ATTACKS

TERRAIN CLEARANCE

GENERAL ATTACKS ON COMPLEX TARGETS

USE OF OAP's

USE OF VTR

SIGNIFICANT DIFFERENCES:

NIGHT FORMATION

CONTINUATION OF ATTACK PROCEDURES

A6 FLIGHTS - 128

SYSTEM WEAPONS PHASE:

NUMBER OF FLIGHTS - 9

TIME PER FLIGHT - (1 - 2.0, 4 - 2.5, 4 - 3.0)

TIME ON THE EQUIPMENT (TOTAL) - 24

INSTRUCTOR HOURS - 24

SUBJECTS COVERED:

ALL SIGNIFICANT TYPES OF PRIMARY AND SECONDARY METHODS OF ORDNANCE DELIVERY

CONTINUED DEVELOPMENT AND EXPOSURE TO HIGH SPEED NAVIGATION, ALL WEATHER TERRAIN CONTOUR FLYING, CREW COORDINATION, AIRMANSHIP, SYSTEM EVALUATION, TARGETING, WEAPONRY AND DEGRADED SYSTEM OPERATION

MINING

AMTI (WITH ORDNANCE)

TERRAIN CLEARANCE AT NIGHT AND IN ALL WEATHER

SIGNIFICANT DIFFERENCES:

AMTI RANGE

SPOKANE RBS

MINING

A6 FLIGHTS - 42

SYSTEM WEAPONS PHASE:

NUMBER OF FLIGHTS -	9
TIME PER FLIGHT - (6 - 2.0, 3 - 2.5)	
TIME ON THE EQUIPMENT (TOTAL) -	19.5
INSTRUCTOR HOURS -	19.5

SUBJECTS COVERED:

ESSENTIALLY THE SAME AS 128 IN BOTH INTENT AND CONTENT.
NOTABLE EXCEPTIONS ARE: NO MENTION OF EITHER MINING OR AMTI,
AND THE INCLUSION OF SPECIFICALLY DESIGNATED, PLANNED
CONVENTIONAL AND SPECIAL WEAPONS DELIVERY STRIKES.
THIS SEEMS TO DISPLAY SOME OF THE PHILOSOPHICAL DIFFERENCES
IN INSTRUCTIONAL METHODOLOGY MENTIONED IN THE INTRODUCTION.
OVERALL COMPARABILITY STILL HIGH.

A6 FLIGHTS - 202

SYSTEM ORDNANCE PHASE:

NUMBER OF FLIGHTS -	6
TIME PER FLIGHT -	1.5
TIME ON THE EQUIPMENT (TOTAL) -	9
INSTRUCTOR HOURS -	9

SUBJECTS COVERED:

STRAIGHT PATH AND STRAIGHT PATH DIVE ATTACKS
COP CHECKS
STRAIGHT PATH USING RABFAC OR OAP's
GENERAL AND ROCKET ATTACKS
NIGHT ATTACKS
AMTI (SIMULATED)
STRAIGHT PATH RABFAC AT NIGHT

SIGNIFICANT DIFFERENCES:

HEAVY EMPHASIS ON THE USE OF THE RABFAC
NO MINING
AMTI

OTHER FLIGHTS:

VISUAL WEAPONS -	128	42	202
NUMBER OF FLIGHTS -	8	4	2
HOURS PER FLIGHT -	NA	NA	1.5
TOTAL HOURS -	12	6	3
INSTRUCTOR HOURS	NONE	NONE	3
SUBJECTS -	NA	NA	30 DIVE 30 RKTS.
AERIAL REFUELING -	NO	NO	SCHED BUT RARELY FLOWN 1 FLT - 1 HR
TPQ -			
NUMBER OF FLIGHTS -	NO	NO	1
HOURS PER FLIGHT -			1.5
TOTAL HOURS -			1.5
INSTRUCTOR HOURS -			1.5
TACTICS -			
NUMBER OF FLIGHTS -	5	1	NONE
HOURS PER FLIGHT -	NA	1.5	NONE
TOTAL HOURS -	6.5	1.5	NONE
INSTRUCTOR HOURS -	NONE	NONE	NONE
FCLP's -			
NUMBER OF FLIGHTS -	14	NA	NONE
HOURS PER FLIGHT -	1	NA	NONE
TOTAL HOURS -	14	5	NONE
INSTRUCTOR HOURS -	NONE	NONE	NONE
CARRIER QUALS -			
NUMBER OF FLIGHTS -	4	NA	NONE
HOURS PER FLIGHT -	2	NA	NONE
TOTAL HOURS -	8	8	NONE
INSTRUCTOR HOURS -	NONE	NONE	NONE

Note: NA = NOT AVAILABLE

TC4C FLIGHTS

NAVIGATION PHASE

	128	%	42	%	202	%/128	%/42
NUMBER OF FLIGHTS	8	.888	9	1.000	9	1.125	1.000
TIME PER FLIGHT	4	1.000	3.5	.875	3.5	.875	1.000
STUDENTS PER FLIGHT	2	1.000	2	1.000	3	1.500	1.500
TOTAL FLIGHT TIME PER STUDENT	32	1.000	31.5	.984	31.5	.984	1.000
TIME ON THE EQUIPMENT PER STUDENT	16	1.000	15.75	.984	10.5	.656	.667
INSTRUCTOR HOURS	32	1.000	31.5	.984	31.5	.984	1.000
INSTRUCTOR HOURS PER STUDENT	16	1.000	15.75	.984	10.5	.656	.667
TOTAL CREW HOURS	64	1.000	63	.984	63	.984	1.000
PLANE CAPTAIN HOURS	32	1.000	31.5	.984	31.5	.984	1.000

SYSTEM WEAPONS PHASE

NUMBER OF FLIGHTS	4	1.000	1	.250	6	1.500	6.000
TIME PER FLIGHT	V		3.5		3.5	Varies	1.000
STUDENTS PER FLIGHT	2	.667	3	1.000	3	1.500	1.000
TOTAL FLIGHT TIME PER STUDENT	12	1.000	3.5	.292	21	1.750	6.000
TIME ON THE EQUIPMENT PER STUDENT	6	1.000	1.17	.195	7	1.167	5.983
INSTRUCTOR HOURS	12	1.000	3.5	.292	21	1.750	6.000
INSTRUCTOR HOURS PER STUDENT	6	1.000	1.17	.195	7	1.167	5.983
TOTAL CREW HOURS	24	1.000	7	.292	42	1.750	6.000
PLANE CAPTAIN HOURS	12	1.000	3.5	.292	21	1.750	6.000

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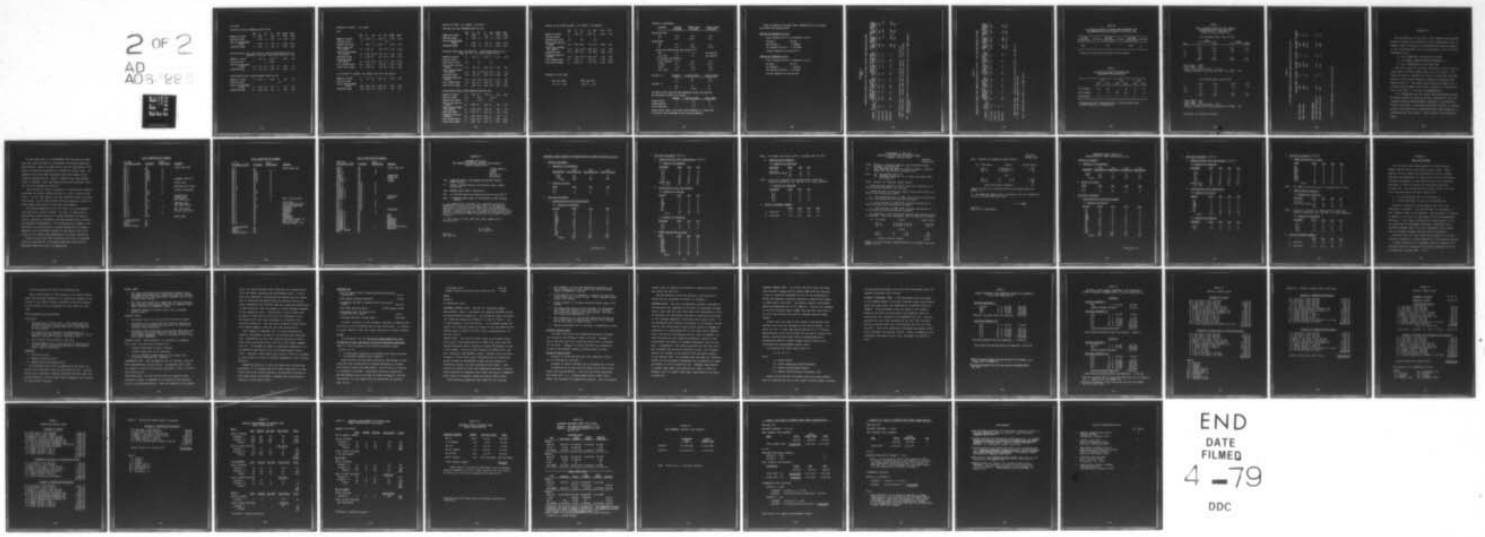

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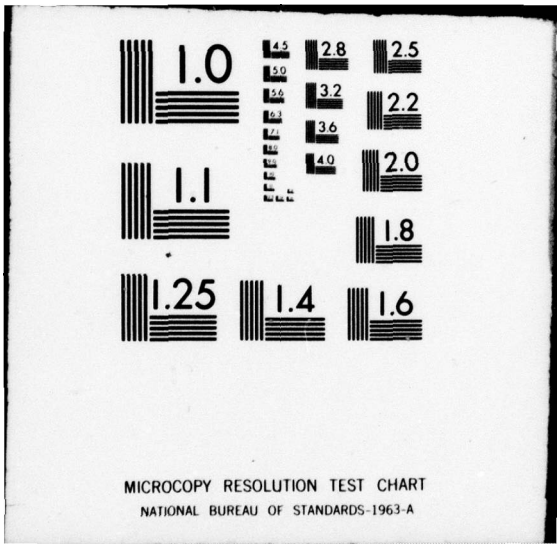
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NATIONAL BUREAU OF STANDARDS-1963-A

A6 FLIGHTS

FAM STAGE (FAM AND INSTRUMENT STAGE FOR 202)

	128	%	42	%	202	%/128	%/42
NUMBER OF FLIGHTS	2	1.000	1	.500	4	2.000	4.000
TIME PER FLIGHT	2	1.000	1.5	.750	2.5	1.250	1.667
TIME ON THE EQUIPMENT (TOTAL)	4	1.000	1.5	.375	10	2.500	6.667
INSTRUCTOR HOURS	4	1.000	1.5	.375	10	2.500	6.667

NAVIGATION PHASE (NAV. AND RADAR TGT. IDENTIFICATION PHASE FOR VA-42)
(FORMATION, VISUAL NAV. AND SYSTEM TACTICS FOR 202)

NUMBER OF FLIGHTS	4	.400	10	1.000	8	2.000	.800
TIME PER FLIGHT	V		V	Varies			
TIME ON THE EQUIPMENT (TOTAL)	10.5	.429	24.5	1.000	19	1.800	.776
INSTRUCTOR HOURS	10.5	.429	24.5	1.000	19	1.800	.776

SYSTEM WEAPONS PHASE (SYSTEM ORDNANCE PHASE FOR 202)

NUMBER OF FLIGHTS	9	1.000	9	1.000	6	.667	.667
TIME PER FLIGHT	V		V		1.5		
TIME ON THE EQUIPMENT (TOTAL)	24	1.000	19.5	.813	9	.375	.462
INSTRUCTOR HOURS	24	1.000	19.5	.813	9	.375	.462

ANALYSIS BY AIRCRAFT - ALL FLIGHTS

TC4C

	128	%	42	%	202	%/128	%/42
NUMBER OF FLIGHTS	12	1.000	10	.833	15	1.250	1.500
TIME PER FLIGHT	V		V		3.5		
STUDENTS PER FLIGHT	2	.952	2.1	1.000	3	1.500	1.430
TOTAL FLIGHT TIME PER STUDENT	44	1.000	35	.795	52.5	1.193	1.500
TIME ON THE EQUIPMENT PER STUDENT	22	1.000	16.92	.769	17.5	.795	1.034
INSTRUCTOR HOURS	44	1.000	35	.795	52.5	1.193	1.500
INSTRUCTOR HOURS PER STUDENT	22	1.000	16.67	.757	17.5	.795	1.049
TOTAL AIRCREW HOURS	88	1.000	70	.795	105	1.193	1.500
PLANE CAPTAIN HOURS	44	1.000	35	.795	52.5	1.193	1.500

A6 (EXCLUDES VIS. WEAPONS, AIR. REFUEL, TPQ, FCLP, CAR. QUALS.)

NUMBER OF FLIGHTS	15	.750	20	1.000	18	1.200	.900
TIME PER FLIGHT	V		V		V		
TIME ON THE EQUIPMENT (TOTAL)	38.5	.846	45.5	1.000	38	.987	.835
INSTRUCTOR HOURS	38.5	.846	45.5	1.000	38	.987	.835

ANALYSIS BY PHASE - ALL FLIGHTS - TC4C AND A6

FAM STAGE (FAM AND INSTRUMENT STAGE FOR 202)

	128	%	42	%	202	%/128	%/42
NUMBER OF FLIGHTS	2	1.000	1	.500	4	2.000	4.000
TIME PER FLIGHT	2	1.000	1.5	.750	2.5	1.250	1.667
TIME ON THE EQUIPMENT (TOTAL)	4	1.000	1.5	.375	10	2.500	6.667
INSTRUCTOR HOURS	4	1.000	1.5	.375	10	2.500	6.667

NAVIGATION PHASE (NAV. AND RADAR TGT., IDENTIFICATION PHASE FOR 42)
(FORM, VIS. NAV. SYS. TACTICS PHASE FOR 202)

NUMBER OF FLIGHTS	12	.631	19	1.000	17	1.416	.894
TIME PER FLIGHT	V		V		V		
STUDENTS PER FLIGHT	1/2		1/2		1/3		
TOTAL FLIGHT TIME PER STUDENT	42.5	.759	56	1.000	50.5	1.188	.901
TIME ON THE EQUIPMENT PER STUDENT	26.5	.658	40.25	1.000	29.5	1.113	.732
INSTRUCTOR HOURS	42.5	.759	56	1.000	50.5	1.188	.901
INSTRUCTOR HOURS PER STUDENT	26.5	.658	40.25	1.000	29.5	1.113	.732
TOTAL AIRCREW HOURS	74.5	.851	87.5	1.000	82	1.100	.937
PLANE CAPTAIN HOURS	32	1.000	31.5	.984	31.5	.984	1.000

SYSTEM WEAPONS PHASE (SYSTEM ORDNANCE PHASE FOR 202)

NUMBER OF FLIGHTS	13	1.000	10	.769	12	.923	1.200
TIME PER FLIGHT	2-4		2-3.5		1.5-3.5		
STUDENTS PER FLIGHT	1-2		1-2-3		1-3		
TOTAL FLIGHT TIME PER STUDENT	.36	1.000	23	.638	30	.833	1.304
TIME ON THE EQUIPMENT PER STUDENT	30	1.000	20.67	.689	16	.533	.774
INSTRUCTOR HOURS	36	1.000	23	.638	30	.833	1.304
INSTRUCTOR HOURS PER STUDENT	30	1.000	20.67	.689	16	.533	.774
TOTAL AIRCREW HOURS	48	1.000	26.5	.552	51	1.062	1.924
PLANE CAPTAIN HOURS	12	1.000	3.5	.292	21	1.750	6.000

ANALYSIS OF THE FLIGHT SYLLUBUS - ALL FLIGHTS - ALL AIRCRAFT

	128	%	42	%	202	%/128	%/42
NUMBER OF FLIGHTS	27	.900	30	1.000	33	1.222	1.100
TIME PER FLIGHT	V		V		V		
STUDENTS PER FLIGHT	1/2		1/3		1/3		
TOTAL FLIGHT TIME PER STUDENT	82.5	1.000	80.5	.975	90.5	1.096	1.124
TIME ON THE EQUIPMENT PER STUDENT	60.5	.969	62.42	1.000	55.5	.917	.889
INSTRUCTOR HOURS	82.5	1.000	80.5	.975	90.5	1.096	1.124
INSTRUCTOR HOURS PER STUDENT	60.5	.969	62.42	1.000	55.5	.917	.889
TOTAL AIRCREW HOURS	88	1.000	70	.795	105	1.193	1.500
PLANE CAPTAIN HOURS	44	1.000	35	.795	52.5	1.193	1.500

COMPARABILITY RUNS FROM:

202 to 128	202 to 42
.917 to 1.222	.889 to 1.500

CATEGORY II COMPARISONS

SQUADRON	SORTIES DAY/NIGHT	STUDENT HOURS DAY/NIGHT	AIRCRAFT HOURS DAY/NIGHT
NAVIGATION STAGE			
128	5/10	11/0	5/6
42	5/0	14.5/0	7.5/7
SYSTEM PHASE			
128	6/1	16/3	17/2
42	6/1	15/2.5	14/3.5
FMLP'S AND CARRIER QUALS ARE OPTIONAL IN 42			
FMLP	1/4	1/4	NOT CREDITED
CAR. QUAL.	2/2	4/4	NOT CREDITED
128 INCLUDES THE FOLLOWING:			
VISUAL WEAPONS	8/0	12/0	12/0
TACTICS	4/1	5.5/1	6.5/0
FCLP's	4/10	4/10	14/0
CAR. QUALS.	2/2	4/4	8/0

CATEGORY III -	SQUADRON	SYLLABUS HOURS	AIRCRAFT HOURS
	128	25	31.2
	42	22	27.5
CATEGORY IV -			
	128	16	20
	42	15.25	19

THE MARINE CORPS TRANSITION AND CONVERSION SYLLABI ARE IDENTICAL.
THE REFRESHER SYLLABUS IS AS FOLLOWS:

	SORTIES	TIME PER FLIGHT	TOTAL HOURS
SYSTEM TACTICS -	4	2.5	10
SYSTEM ORDNANCE -	6	1.5	9
AERIAL REFUELING -	1	1.5	1.5

CARRIER QUALS, FMLP's, AND TACTICS ARE INTRODUCED AT A LATER STAGE OF TRAINING AFTER ASSIGNMENT TO THE TACTICAL SQUADRONS.

USING 100 PERCENT AS THE BASE FIGURE, COMPARABILITY OF ALL FACTORS FELL WITHIN THE FOLLOWING RANGE:

VMAT(AW)-202 COMPARED TO VA-128:

From a Minimum of 91.7% to a Maximum of 122.2% -

The Mean = 104.96%
The Variance = 1.383864%
The Standard Deviation = 13.1523000%

Average Comparability equalled 95%.

VMAT(AW)-202 COMPARED TO VA-42:

From a Minimum of 88.9% to a Maximum of 112.4% -

The Mean = 102.52%
The Variance = 1.244376%
The Standard Deviation = 12.471848%

Average Comparability equalled 98%.

APPENDIX C
TABLE I

COMPARISON OF CURRENT USMC PILOT SYLLABUS TO USN SYLLABUS MODIFIED FOR USMC

CATEGORY	NO. OF TRAINEES	CURRENT USMC SYLLABUS				MODIFIED USN SYLLABUS				TOTAL AIRCRAFT HOURS ANNUALLY			
		SYLLABUS HRS		AIRCRAFT HRS*		SYLLABUS HRS		AIRCRAFT HRS**		USMC SYLLABUS		USN SYLLABUS	
		A-6E	TC4C	A-6E	TC4C	A-6E	TC4C	A-6E	TC4C	A-6E	TC4C	A-6E	TC4C
First Tour	30	59.5	3.5	80.3	4.7	78	3.5	97.5	4.7	2409	141	2925	141
Transition	2	59.5	3.5	80.3	4.7	78	3.5	97.5	4.7	161	9.4	195	9.4
Conversion													
Refresher	8	59.5	3.5	80.3	4.7	40.5	1.75	50.6	2.2	642	37.6	405	17.6
										3212	188	3525	168

* USMC aircraft hours = syllabus hours plus 35 percent (Source: CMC OTTF-21).

** USN aircraft hours = syllabus hours plus 25 percent (Source: VA-42 syllabus).

Note: Modified USN syllabus is less FMLP and CQ, one 2-hour A-6E sortie for RABFAC added to system weapons.

TABLE II

COMPARISON OF CURRENT USMC BOMBARDIER/NAVIGATOR SYLLABUS TO USN SYLLABUS MODIFIED FOR USMC

CATEGORY	NO. OF TRAINEES	CURRENT USMC SYLLABUS SYLLABUS HRS		CURRENT USMC SYLLABUS AIRCRAFT HRS*		MODIFIED USN SYLLABUS SYLLABUS HRS		MODIFIED USN SYLLABUS AIRCRAFT HRS**		TOTAL AIRCRAFT HOURS ANNUALLY USMC SYLLABUS		TOTAL AIRCRAFT HOURS ANNUALLY USN SYLLABUS	
		A-6E	TC4C	A-6E	TC4C	A-6E	TC4C	A-6E	TC4C	A-6E	TC4C	A-6E	TC4C
First Tour	23	41	17.5	55.4	23.6	45.5	17.5	40	22	1274.2	542.8	920	506
Transition	0												
Conversion	0												
Refresher	9	35.5	2.4	47.9	3.2	21.5	7.0	19	9.0	431.1	28.8	171	81
										1705.3	571.6	1091	587

* USMC aircraft hours - syllabus hours plus 35 percent (Source: CMC OTTF-21).

** USN aircraft hours supplied by CNO OP-593.

Note: Modified USN syllabus is less FMLP and CQ.

TABLE III

A-6E AIRCRAFT REQUIRED TO SUPPORT USMC REPLACEMENT PILOT AND BOMBARDIER/NAVIGATOR TRAINING TO VA-42 OR VA-128

40% USMC Aircraft Hours	A-6E Req*	60% USMC Aircraft Hours	A-6E Req*	100% USMC Aircraft Hours	A-6E Req*
1846	5	2770	7	4616	11

* Based on 35 flight hours per month for A-6E aircraft.

TABLE IV

A-6E AND TC4C AIRCRAFT TO SUPPORT USMC REQUIREMENTS FOR CONSOLIDATION

	40%		60%		100%	
	A-6E	TC4C	A-6E	TC4C	A-6E	TC4C
VA-42 Request	NA	NA	7	0*	11	0*
VA-128 Request	5	0*	NA	NA	11	0*
TAEG Estimate	5	0	7	0	11	0

*No additional TC4C's requested based on 3 system aircraft being assigned regardless of consolidation.

TABLE V

TOTAL AIRCRAFT HOURS FOR 100 PERCENT
CONSOLIDATION OF USN/USMC FRS
(USMC in Navy Categories)

A-6E Syllabus Hours Plus 25% OH

	NAVY		USMC	
CAT	P	B/N	P	B/N
I	2975	1000	3120	920
II	792	209	405	171
III	330	114	-	-
IV	78	-	-	-
	4175	1323	3525	1091

Total Navy: 5498
Total USMC: 4616
Total A-6E aircraft hours: 10,114
Percent increase A-6E aircraft hours for USMC: 84%

TC4C Flight Hours and 25% OH

I	125	550	150*	506
II	33	99	18	81
III	18	54		
IV	-	-		
	176	703	168	587

Total Navy: 879
Total USMC: 755
Total TC4C aircraft hours: 1634
Percent increase TC4C aircraft hours for USMC: 86%

*Includes two transition pilots.

TABLE VI

A-6E AIRCRAFT REQUIRED FOR USN/USMC CONSOLIDATION AT VA-42 OR VA-128

	A-6E 40% USMC	A-6E Req*	60% USMC	A-6E Req*	100% USMC	A-6E Req*
Navy Flight Hours	5498	13	5498	13	5498	13
USMC Flight Hours	1846	5	2770	7	4616	11
	7344	18	8268	20	10114	24
2F114/2F122 Impact						
10% Flight Hour Reduction	6610	16	7441	18	9103	22
20% Flight Hour Reduction	5875	14	6614	16	8091	20

* Based on 35 flight hours per month for A-6E aircraft.

APPENDIX D

The introduction of the 2F114, A6-E, Weapon System Trainer greatly increases the flexibility of the responsible units to complete their training in an efficient and effective manner. It can be incorporated into existing programs in one of three fundamental ways:

1) AS A SUBSTITUTE FOR SPECIFIED FLIGHTS
2) TO AUGMENT ALREADY EXISTING PROGRAMS, or
3) AS A COMBINATION OF THE FIRST TWO.

That the system, as currently specified, could be used to substitute for actual flight time is of little doubt. The extent to which it should be so used is a much more difficult question and one which deserves a separate, detailed cost/benefit analysis. The tables which follow are meant only to indicate those flights which could, feasibly, be substituted for in the 2F114. It is not a recommendation.

It is recognized that the unique and unpredictable nature of actual flight can never be totally simulated and that any squadron would be understandably reluctant to unnecessarily forfeit real hours. Given that constraint however, it remains possible to particularize those hops which lend themselves to simulation more than others. This is done in the following pages.

At the same time it is recommended that any plan to implement the 2F114 be based in the methods of flexible budgeting. Specifically, levels of substitution could be developed on the basis of projected availability of funds for flight time. For example, Level One might represent those few flights which would be substituted for, given a slightly less than optimal level of funding. Each succeeding level would represent plans for the next degraded possibility.

There should be obvious reluctance to sacrifice any flights involving the actual, graded delivery of live or practice ordnance. In this same regard, the more difficult areas of system utilization, such as Search Radar Terrain Clearance, should be given higher priorities in the actual environment.

The second suggested use for the 2F114 is as an augmentation device for current syllabi. As such, it would serve a particularly useful function in areas dedicated to familiarization, emergency procedures, and functioning under stressful and degraded circumstances. Its usefulness as an augment, and especially as a substitute in systems navigation and weapons segments, will be directly related to the quality and reliability of its system, and particularly its radar simulations.

Finally, it is felt that the device will find its maximum efficient utilization in a program combining those factors discussed under the first two suggestions.

2F114 SUBSTITUTION SUMMARY

VA-128 SYLLABUS FLIGHT	AIRCRAFT	2F114 COMPATABLE	REMARKS
NF-1	A6		LOCAL AREA FAM
NF-2	A6	X	
NN-1	TC4C	X	
NN-2	TC4C	X	
NN-3	TC4C	X	
NN-4	TC4C	X	
NN-5	TC4C	X	ASSUMING AMTI/LM
NN-6	TC4C	X	
NN-7	A6		VISUAL NAV.
NN-8	A6	X	
NN-9	A6		REQUIRES SRTC PRAC.
NN-10	A6	X	
NN-11	A6		TERRAIN CLEARANCE
NN-12	TC4C	X	
NS-1	TC4C	X	
NS-2	A6		ORDNANCE HOP
NS-3	A6		MINING/AMTI
NS-4	A6		AMTI WITH ORD.
NS-5	TC4C	X	
NS-6	A6		ORDNANCE HOP
NS-7	A6		ORD. HOP W/SRTC
NS-8	TC4C	X	
NS-9	A6		ORD. HOP W/TOT
NS-10	A6		ALL WX. LOW LEVEL
NS-11	A6	X	
NS-12	A6	X	
NS-13	TC4C		CHECK RIDE
VISUAL WEAPONS	A6		
TACTICS	A6		
FCLP	A6		
CARRIER QUALS.	A6		

2F114 SUBSTITUTION SUMMARY

VA-42 SYLLABUS FLIGHT	AIRCRAFT	2F114 COMPATABLE	REMARKS
NF-1	A6		LOCAL AREA FAM
NN-1	A6	X	
NN-2	TC4C	X	
NN-3	TC4C	X	
NN-4	TC4C	X	
NN-5	TC4C	X	
NN-6	TC4C	X	
NN-7	TC4C	X	
NN-8	A6	X	
NN-9	A6	X	
NN-10	A6	X	
NN-11	A6	X	
NR-1	TC4C	X	
NR-2	TC4C	X	
NR-3	A6	X	
NR-4	A6	X	
NR-5	TC4C		IBN's check on RBN
NR-6	A6	X	
NR-7	A6		SYS/VISUAL
NR-8	A6		SYS/VISUAL/ORDNANCE
NS-1	TC4C		TGT. PROCEDURE FAM
NS-2	A6		ORDNANCE
NS-3	A6		ORDNANCE
NS-4	A6		ORDNANCE
NS-5	A6		MINING
NS-6	A6		ORDNANCE
NS-7	A6		ORDNANCE
NS-8	A6		ORD/CONVENTIONAL SK.
NS-9	A6		SRTC LOW LEVEL
NS-10	A6		SPECIAL WEAPS. STK.
VISUAL WEAPONS	A6		
TACTICS	A6		
FMLP's	A6		
CARRIER QUALS.	A6		

2F114 SUBSTITUTION SUMMARY

VMAT-202 SYLLABUS FLIGHT	AIRCRAFT	2F114 COMPATABLE	REMARKS
FAM-1	A6		LOCAL AREA FAM
FAM-2	A6	X	
INST-1	A6	X	
INST-2	A6	X	
FORM-1	A6		FORMATION
FORM-2	A6		FORMATION
VISNAV-1	A6		VISUAL
VISNAV-2	A6		VISUAL
RNAV-1	TC4C	X	
RNAV-2	TC4C	X	
RNAV-3	TC4C	X	
SYSNAV-1	TC4C	X	
SYSNAV-2	TC4C	X	
SYSNAV-3	TC4C	X	
SYSNAV-4	TC4C	X	
SYSNAV-5	TC4C		CHECKRIDE
SYSNAV-6	TC4C		RABFAC
RTI-1	TC4C	X	
RTI-2	TC4C	X	
RTI-3	TC4C	X	
RTI-4	TC4C	X	
RTI-5	TC4C	X	
RTI-6	TC4C		CHECKRIDE
SYSTAC-1	A6	X	
SYSTAC-2	A6	X	
SYSTAC-3	A6		SRTC
SYSTAC-4	A6		SRTC
SYSORD-1	A6		ORDNANCE
SYSORD-2	A6		ORDNANCE
SYSORD-3	A6		ORDNANCE
SYSORD-4	A6		ORDNANCE
SYSORD-5	A6	X	AMTI RNG. NOT AVAIL.
SYSORD-6	A6		ORDNANCE
AERIAL REFUEL	A6		
TPQ	A6		

APPENDIX E

DEPARTMENT OF THE NAVY
Navy Manpower and Material Analysis Center, Atlantic
Norfolk, Virginia 23511

In Reply Refer To:
7:72:je
5310/2
Ser 996 /7
28 JUN 1978

From: Commanding Officer, Navy Manpower and Material Analysis Center, Atlantic

To: Director, Training Analysis and Evaluation Group, Orlando, Florida 32813

Subj: Manpower Impact Report; forwarding of

Ref: (a) Training Analysis and Evaluation Group ltr dtd 30 May 78

Encl: (1) Manpower Impact Report on Consolidation of USMC Training at VA-42

1. As requested by reference (a), manpower analysts at NAVMMACLANT conducted an in-depth study of the manpower implications of consolidating USMC pilot and bombardier/navigator training at VA-42. The study focused on manpower impacts in organizational and intermediate maintenance, pilot and B/N instruction, FRAMP instruction, and squadron administration.

2. The results of the study have been summarized in enclosure (1).

E. F. COX
By direction

Copy to:
CNO (OP-124)

MANPOWER IMPACT REPORT ON CONSOLIDATION OF USMC TRAINING AT VA-42

1. Officer Increment

a. Quantity by designator

DESIGNATOR	100% Consolidation	60% Consolidation	50% Consolidation
1310	12	7	6
1320	12	7	6
Total	24	14	12

b. Quality by Rank

RANK	100%	60%	50%
0-4	2	1	1
0-3	22	13	11

2. Enlisted Increment

a. Organizational Level Maintenance

(1) Quantity by Rating

RATING	100%	60%	50%
AD	13	8	7
AE	14	8	7
AK	2	1	1
AME	6	4	3
AMH	11	6	6
AMS	18	12	10
AO	10	6	5
AQ	14	8	7
AT	13	7	7
AZ	1	0	0
PR	2	1	1
APO	9	6	4
AN	27	17	14
Total	140	84	72

Enclosure (1)

2. Enlisted Increment (Cont'd)

a. Organizational Level Maintenance (Cont'd)

(2) Quality by Paygrade

PAYGRADE	100%	60%	50%
E-9	0	0	0
E-8	2	0	0
E-7	5	5	5
E-6	10	6	6
E-5	23	13	11
E-4	30	16	15
Desig Stkr	43	27	21
E-3 (AN)	27	17	14

b. Intermediate Level Maintenance

(1) Quantity by Rating

RATING	100%	60%	50%
AD	2	1	1
AE	2	2	2
AMH	1	0	0
AMS	1	1	0
AQ	2	1	1
AT	5	3	3
PR	1	0	0
Total	14	8	7

(2) Quality by Paygrade

PAYGRADE	100%	60%	50%
E-6	2	1	1
E-5	6	5	4
E-4	6	2	2

c. FRAMP Instructors by Rate

RATE	100%	60%	50%
AD1	1	0	0
AE1	1	1	1
AME2	1	1	0
AO1	1	0	0
AQ1	1	1	1
AT2	1	0	0
APO1	1	1	1
APO2	2	2	2
Total	9	6	5

NOTE: All FRAMP instructors have a secondary NEC of 9502

d. Administrative Support

(1) Quantity by Function

FUNCTION	100%	60%	50%
Clerical	8	5	4
Facilities Maint.	2	1	1
	10	6	5

NOTE: "Clerical" includes all administrative functions normally handled by YN's and PN's in a Navy squadron.

(2) Quality by Paygrade

PAYGRADE	100%	60%	50%
E-7	1	0	0
E-6	0	1	1
E-5	1	0	0
E-4	3	2	1
E-3	5	4	4

3. Billet Increment Summary

	100%	60%	50%	40%
a. Officers:	+24	+14	+12	+10
b. Enlisted:	+173	+103	+88	+71

DEPARTMENT OF THE NAVY
TRAINING ANALYSIS AND EVALUATION GROUP
Orlando, Florida 32813

TAEG:PGS
30 May 1978

From: Director, Training Analysis and Evaluation Group, Orlando, Florida 32813
To: Navy Manpower and Material Analysis Center, Atlantic (Code 72), NAS Norfolk, Virginia 23571

Ref: (a) CNO 061410Z April 78
(b) FONECON between Mr. P. G. Scott and LCDR Graff of 22 May 78

Subj: Request for Manpower Impact Report

1. TAEG has been tasked by CNO to study the feasibility of consolidating USN/USMC A-6E training.

2. Please provide the manpower impact which would result in case of the following actions:

a. One hundred percent of USMC P/BN training transferred to VA 42 utilizing the existing USN syllabus.

b. Sixty percent of USMC P/BN training transferred to VA42 utilizing the existing USN syllabus.

c. Fifty percent of USMC P/BN training transferred to VA 42 utilizing the existing USN syllabus.

As requested in the referenced telecon, the following data is provided. This data represents 100% of USMCA-6E training.

(1) A-6 Hours	Pilots	Yearly Hours
Cat I	32 Pilots @ 97.36	3,115.52
Cat II	8 Pilots @ 50.34	402.72
	B/N's	
Cat I	23 @ 40	920
Cat II	9 @ 19	171
Total A-6E Hours Yearly -		4,609

Number of A-6E aircraft required based on 35 flight hours per month = 10.97.

TAEG:PGS
30 May 1978

Subj: Request for Manpower Impact Report

(2) TC4C Hours	Pilots	Yearly Hours
Cat I	32 Pilots @ 5	= 160
Cat II	8 Pilots @ 3	= 24
	B/N	
Cat I	23 @ 22	= 506
Cat II	9 @ 9	= 81
Total TC4C Hours Annually -		771

Number of TC4C A/C required based on 80 flight hours per month = .8.

3. The manpower impact data is necessary for the completion of the A-6E consolidation study.

A. F. SMODE

Copy to:
CNO OP-124 (LCDR Huber)

MANPOWER IMPACT REPORT ON
CONSOLIDATION OF USMC TRAINING AT VA-42

1. Officer Increment

a. Quantity by designator

DESIGNATOR	100% Consolidation	60% Consolidation	50% Consolidation	40% Consolidation
1310	12	7	6	5
1320	12	7	6	5
Total	24	14	12	10

b. Quality by Rank

RANK	100%	60%	50%	40%
O-4	2	1	1	1
O-3	22	13	11	9

2. Enlisted Increment

a. Organizational Level Maintenance

(1) Quantity by Rating

RATING	100%	60%	50%	40%
AD	13	8	7	6
AE	14	8	7	6
AK	2	1	1	1
AME	6	4	3	3
AMH	11	6	6	5
AMS	18	12	10	8
AO	10	6	5	4
AQ	14	8	7	6
AT	13	7	7	6
AZ	1	0	0	0
PR	2	1	1	1
APO	9	6	4	4
AN	27	17	14	6
Total -	140	84	72	56

Enclosure (1)

2. Enlisted Increment (Cont'd)

a. Organizational Level Maintenance (Cont'd)

(2) Quality by Paygrade

PAYGRADE	100%	60%	50%	40%
E-9	0	0	0	0
E-8	2	0	0	0
E-7	5	5	5	4
E-6	10	6	6	4
E-5	23	13	11	9
E-4	30	16	15	12
Desig Stkr	43	27	21	18
E-3 (AN)	27	17	14	9

b. Intermediate Level Maintenance

(1) Quantity by Rating

RATING	100%	60%	50%	40%
AD	2	1	1	1
AE	2	2	2	2
AMH	1	0	0	0
AMS	1	1	0	0
AQ	2	1	1	1
AT	5	3	3	3
PR	1	0	0	0
Total	14	8	7	7

(2) Quality by Paygrade

PAYGRADE	100%	60%	50%	40%
E-6	2	1	1	1
E-5	6	5	4	4
E-4	6	2	2	2

2. Enlisted Increment (Cont'd)

c. FRAMP Instructors by Rate

RATE	100%	60%	50%	40%
AD1	1	0	0	0
AE1	1	1	1	1
AME2	1	1	0	0
AO1	1	0	0	0
AQ1	1	1	1	1
AT22	1	0	0	0
APO1	1	1	1	1
APO2	2	2	2	1
Total	9	6	5	4

NOTE: All FRAMP instructors have a secondary NEC of 9502.

d. Administrative Support

(1) Quantity by Function

FUNCTION	100%	60%	50%	40%
Clerical	8	5	4	3
Facilities Maint.	2	1	1	1
	10	6	5	4

NOTE: "Clerical" includes all administrative functions normally handled by YN's and PN's in a Navy squadron.

(2) Quality by Paygrade

PAYGRADE	100%	60%	50%	40%
E-7	1	0	0	0
E-6	0	1	1	1
E-5	1	0	0	0
E-4	3	2	1	1
E-3	5	4	4	2

3. Billet Increment Summary

	100%	60%	50%	40%
a. Officers:	+24	+14	+12	+10
b. Enlisted:	+173	+103	+88	+71

APPENDIX F

COST (OR SAVINGS)

Cost estimates have been compiled for those options deemed feasible within the context of this study. Consequently, no cost figures are provided for VA-42 at Oceana regarding the absorption of either 100% or 60% of the Marine training requirement as those possibilities are considered untenable in light of present and projected conditions through 1981. The options which have been found to be realistic and deserving of further analysis are:

A. VA-128 absorbing 100% of the Marines, or

B. VA-128 absorbing 75% and VA-42 absorbing 25%.

Option B is based on the assumption that VA-42 will experience a currently projected decrease in the number of Navy students input to the squadron. That decrease is expected to amount to a total of 17 Replacement Pilots and Bombardier/Navigators. That figure corresponds to approximately 25% of the annual Marine replacement personnel requirement and is therefore assumed that VA-42 could incorporate that element into its present program with only minor disturbances.

Relevant costs for this study are considered to be those increases required or savings permitted by the proposed options.

A third possibility is contingent upon the completion of projected military construction projects pertaining to VA-42 at Oceana by or during 1981. It is:

VA-128 absorbing 40% and VA-42 absorbing 60%

Due to the reliance of this option on the stated contingency and the high probability of significant changes in all or most of the other relevant variables during the interim, no cost figures will be attempted for that option at this time.

COST CATEGORIES AND DEFINITIONS

FACILITIES

1. The Total Cost of Facilities - the acquisition and refurbishing which are necessary for implementation, as well as similar savings realized by the adoption of the proposal.

2. The Annual Cost of Operation and Maintenance of Facilities Per Square Foot - includes operation, maintenance, janitorial service, utilities, etc.

3. Total Square Feet Occupied by the Unit.

4. The Replacement Cost - those facilities which do not involve readily estimable operations or maintenance costs, such as ramp space.

PERSONNEL

1. Instructor Costs

2. Support Personnel Costs

3. Administrative Personnel Costs

All personnel costs will be tabulated on the basis of billet costs associated with the particular option. Because billet costs inherently comprise substantially more than just pay and benefits, care has been taken throughout this section to avoid double counting.

TRAVEL COSTS

1. The costs associated with transporting student pilots and bombardiers/navigators from their point of initial training to the Fleet Replacement Squadron and to their ultimate duty station.

2. The costs associated with completing the Fleet Replacement Syllabus, such as per diem cost on Temporary Duty Under Instruction (TEMDUINS) orders.

3. Permanent change of station (PCS) costs including family travel.

AIRCRAFT COSTS

1. Investment costs for A-6E aircraft and TC4C aircraft.

2. The annual cost of operating the aircraft required to complete the stipulated training under the particular proposal being considered.

3. Personnel costs associated with aircraft operations and maintenance have been extracted from this section to avoid double counting. They are included in the billet costs under PERSONNEL.

ORDNANCE COSTS. Those increases or decreases in ordnance costs under the particular proposal are:

1. Ordnance dedicated to pilot training.

2. Ordnance dedicated to B/N training.

3. Cost of ordnance (taken from the 1975 study) plus 20 percent increase for inflation.

INCREMENTAL COST. The incremental cost (or savings) realized from implementation of the option. Incremental costs equal the change in cost for facilities, personnel, travel, aircraft and ordnance cost.

FACILITIES COST. All facilities costs are based on those projected savings or expenses to be realized from incorporation of the proposed options. They are composed of investment

costs (in those instances where additions are assumed necessary) and annual operating and maintenance costs. O and M costs are computed by multiplying the annual cost per square foot of operating and maintaining the specific facilities (this information was obtained from the respective authorities at each location) times the amount of square footage occupied by the respective units. Additionally, dollar values were assigned to ramp space on the basis of replacement costs, and acquisition costs were estimated in accordance with available expertise. The ramp space released at MCAS Cherry Point should negate a need for new ramp construction.

With respect to VMAT(AW)-202, all costs detailed are viewed as incremental savings to be realized from consolidation. Elimination of the A-6E training function at Cherry Point frees associated assets for use as the tenant command sees fit. No attempt was made to completely evaluate all of the possible opportunity costs which consolidation would allow. Instead, a more useful and realistic value is assigned to those assets in terms of savings chargeable to the training function.

Regarding Option B, as with all other cost calculations presented, it is assumed that VA-42 would experience no additional facilities-related expenses in training 25 percent of the annual Marine requirement, assuming that the projected decrease in Navy input occurs.

VMAT(AW)-202

Cost Per Square Foot of Operating and Maintaining Facilities -	$1.43
Total Square Footage Occupied -	36,640
Incremental Savings on Annual Direct Facilities Costs -	$52,395
Total Ramp Space Occupied -	18,000 Square Yards
Replacement Cost Per Square Yard (from the 1975 study) -	$30.00
Investment Savings on Ramp Space -	$540,000

An exact valuation of the equipment assigned to VMAT(AW)-202 facilities is not attempted due to time constraints. It should be noted, however, that this would constitute a further savings.

VA-128

In accordance with the Facilities Requirements for Consolidation of Navy and Marine A-6E Fleet Readiness Squadrons, Table II, VA-128 projects the following resource needs:

Option A or B:

1. An additional temporary or portable line shack structure
2. An enlarged ordnance shack capacity.

Conversations with pertinent sources at NAS Whidbey Island indicated that acquisition of a Butler Building or a double wide trailer would serve both needs. Cost of such a structure is estimated at $25,000. Associated facilities operations and maintenance costs are based on square footage of 1440 and the current cost per square foot of operations and maintenance, $1.01.

Investment Cost -	$25,000
Annual Direct Facilities Cost (1440 x $1.01) -	1,500

VA-42

Option B

No additional costs.

PERSONNEL SUPPORT COSTS. Section IV, Personnel Support Requirements, Table 7, presented the combined USN/USMC Billet Allowances/Onboard Comparison. The estimated annual personnel cost reduction based on allowances is shown in Table I and is approximately 3 million dollars. The estimated annual personnel cost reduction based on current VA-128 and VMAT(AW)-202 onboard count is shown in Table II and is approximately .85 million dollars.

TRAVEL COSTS. Two sets of travel costs are presented which could result from consolidation of USMC A-6E, pilot and bombardier/navigator (B/N) training at either NAS Whidbey Island or NAS Oceana. Option A costs consider all USMC pilots and B/Ns training at NAS Whidbey Island. Option B costs consider Category I (First Tour) pilots and B/Ns plus two transition pilots trained at NAS Whidbey Island and all Category II (Refresher) pilots and B/Ns training at NAS Oceana. Both options are based on pilots and bombardier/navigator training being conducted on Temporary Duty Under Instruction (TEMDUINS) orders while on Permanent Change of Station (PCS) orders.

The following assumptions were made for all costing:

1. All Category I pilots and bombardier/navigators are First Lieutenants on PCS orders from Corpus Christi, Texas or Pensacola, Florida.

2. Fifty percent of all Category I trainees are married, no children over 2 years of age. Their household goods weigh 2,500 pounds.

3. Single Category I trainees household goods weigh 1,000 pounds.

4. Two transition pilots and all Category II (Refresher) pilots/BNs are Captains, married with two children. Their household goods weigh 5,000 pounds. All are on PCS orders from Washington, D.C.

5. Sixty percent of all pilots and bombardier/navigators are on PCS orders to MCAS Cherry Point; forty percent are on PCS orders to MCAS El Toro.

6. Weapons deployment TAD is included in TEMDUINS per diem.

Option A Travel Costs

All USMC A-6E pilots and bombardier/navigator trainees are trained at NAS Whidbey Island by VA-128. Category I pilots and B/Ns plus two transition pilots are in training for 140 days. Category II pilots and B/Ns are trained by VA-128 at NAS Whidbey Island; training lasts 112 days.

Option B Travel Costs

Category I pilots and B/Ns plus two transition pilots are in training for 140 days.

Category II pilots and B/Ns are in training for 112 days.

In addition to the two sets of travel costs which could result from consolidation - a set of costs which represent the status quo, i.e., training USMC crews at MCAS Cherry Point, are included for comparison purposes. The total annual

travel costs for Option A are $220,171; Option B $219,541; and status quo $125,104.

The derivation of costs for Options A and B plus the Status Quo are contained in Tables III through V.

ORDNANCE COSTS. The cost of additional ordnance required by the proposals was computed on the basis of published syllabus levels, data from the 1975 study which was determined to still be relevant, and information provided by operations personnel at the training squadrons concerning actual usage levels. It was determined that inherent variations in the weapons syllabi (such as the several Navy flights which called for either an instructor or a replacement B/N in the right seat) combined with a variety of contributing factors (such as weather, aircraft availability and target availability) served to vary considerably the amount of ordnance expended by any one student. Consequently, the figures provided are the best available averages and should be analyzed as such. All ordnance figures are rounded to the nearest five and dollar amounts to the nearest $100. No allowance has been made for repeated flights as the available information was considered too vague and general to be of productive use. Ordnance requirements to support USMC under consolidation are shown in Table VI. Ordnance costs to support USMC under consolidation are shown in Table VII.

AIRCRAFT DIRECT COSTS. All direct aircraft costs are taken from the Navy Program Factors Manual OPNAV-90P-02A (Revised 31 Aug 77) which was designed for use in the estimating of dollar and manpower resources required to operate and support a single ship or aircraft. The factors reflect the Program Objective Memorandum for FY 79 (POM-79). Factors are computed by the Navy Resource Model (NARM) from the data base used in the Five Year Defense Plan and the Program Objective Memorandum.

Direct costs are used in this study as the Marine Corps indirect costs are not included in the factors manual. All costs are for a 1-year time period and are in FY 79 dollars. Modeled direct costs for aircraft are derived by taking basic factors received from other offices and mathematically manipulating them to produce broader factors such as air operations and replenishment spares costs.

The equation for Total Direct Cost is:

$$G = D + N + M$$

where

G = Total Direct

D = Direct Operations and Maintenance

N = Annual Replenishment Spares

M = Annual Direct Military Personnel, Navy

Annual Direct Military Personnel costs have been removed from the equation for use in this study to avoid double counting.

All associated personnel costs have been delineated under the separate Personnel Costs section.

AIRCRAFT INVESTMENT COSTS. A-6E investment costs are based on the reduced number of aircraft required under consolidation times the acquisition cost supplied by the NAVPRO Office at Grumman. TC4C investment costs are based on the reduced number of aircraft required under consolidation times the acquisition cost supplied by NAVAIRSYSCOM AIR 4131. Option A requires two less A-6E aircraft and two less TC4C aircraft. Option B requires four less A-6E aircraft and two less TC4C aircraft. Table VIII identifies investment and annual direct costs (savings) for Options A and B. Table IX summarizes the investment and annual direct costs (savings) for Options A and B.

TABLE I

ANNUAL PERSONNEL COST REDUCTION BASED ON ALLOWANCES
VA-128 AND VMAT(AW)-202

OFFICER DECREASE 15

LT COL	2	@	54,800	109,600
MAJ	8	@	60,200	481,600
CAPT	3	@	51,800	155,400
LT	2	@	72,500	145,000

*Officer Personnel Total Cost Reduction - 891,600

ENLISTED DECREASE 149

E-9	1	@	28,800	28,800
E-8	0			
E-7	5	@	23,025	115,125
E-6	11	@	19,468	214,148
E-5	27	@	15,620	421,740
E-4	35	@	13,839	484,365
E-3	70	@	12,064	844,480

** Enlisted Personnel Total Cost Reduction - 2,108,658

Total Officer and Enlisted Billet Cost Reduction - $3,000,258

*Officer Personnel Billet Cost Data provided by B-K Dynamics, Inc., 2 August 1978, via BUPERS 212.

**Enlisted Personnel Billet Cost Data derived from NPRDC SR78-14 July 1978.

TABLE II

OPTIONS A AND B ANNUAL PERSONNEL COST REDUCTIONS
BASED ON CURRENT ONBOARD COUNT VA-128 AND VMAT(AW)-202

OPTION A

OFFICER INCREASE 1				
MAJ	1	@	60,200	+60,200
Officer Personnel Increase*				+60,200

ENLISTED DECREASE 64				
E-9	1	@	28,800	-28,800
E-8	0			
E-7	2	@	23,025	-46,050
E-6	5	@	19,468	-97,340
E-5	12	@	15,620	-187,440
E-4	15	@	13,839	-207,585
E-3	29	@	12,064	-349,856
Enlisted Personnel Reduction**				-917,071

Total Officer and Enlisted Billet Cost Reduction - $856,871

OPTION B

OFFICER DECREASE 5				
LT COL	2	@	54,800	109,600
MAJ	3	@	60,200	180,600
Officer Personnel Decrease*				290,200

ENLISTED DECREASE 105				
E-9	1	@	28,800	28,800
E-8	0			
E-7	3	@	23,025	69,075
E-6	8	@	19,468	155,744
E-5	20	@	15,620	312,400
E-4	25	@	13,839	345,975
E-3	48	@	12,064	579,072
Enlisted Personnel Reduction**				1,491,066

Total Officer and Enlisted Billet Cost Reduction - 1,781,266

*Officer Personnel Billet Cost Data Provided by B-K Dynamics, Inc., 2 August 1978 via BUPERS 212.

**Enlisted Personnel Billet Cost Data derived from NPRDC SR 78-14 July 1978.

TABLE III

OPTION A TRAVEL COSTS

Category I Pilots

30 @ 10¢ mile x 2375 (CC-WI)*	7,125.00
18 @ 10¢ mile x 3016 (WI-CP)	5,428.80
12 @ 10¢ mile x 1237 (WI-ET)	1,484.40
9 Family @ 7¢ mile x 1563 (CC-CP)	984.69
6 Family @ 7¢ mile x 1461 (CC-ET)	613.62
15 x 241.50 Dislocation Allowance (M)	3,622.50
15 x 190.80 Dislocation Allowance (S)	2,862.00
9 @ 2500# (CC-CP) @ 877.75	7,899.75
9 @ 1000# (CC-CP) @ 523.15	4,708.35
6 @ 2500# (CC-ET) @ 851.50	5,109.00
6 @ 1000# (CC-ET) @ 515.65	3,093.90
30 @ 9.70 Per Diem 140 days	40,740.00
15 @ $1/day Separation Allowance x 140 days	2,100.00
	85,772.01

Category II Pilots and 2 Transition Pilots

10 @ 10¢ mile x 2765 (DC-WI)	2,765.00
6 @ 10¢ mile x 3016 (WI-CP)	1,809.60
4 @ 10¢ mile x 1237 (WI-ET)	494.80
6 Family @ 14¢ mile x 340 (DC-CP)	285.60
4 Family @ 14¢ mile x 2654 (DC-ET)	1,486.24
10 x 271.20 Dislocation Allowance (M)	2,712.00
6 x 5000# (DC-CP) @ 850.25	5,101.50
4 x 5000# (DC-ET) @ 2950.75	11,803.00
8 x $1 x 112 Days	896.00
2 x $1 x 140 Days	280.00
8 x $9.70 Per Diem x 112 days	8,691.20
2 x $9.70 Per Diem x 140 days	2,716.00
	39,040.94

Legend:

M = Married
S = Single
# = pounds
CC = Corpus Christi
CP = Cherry Point
DC = Washington, DC
ET = El Toro
PC = Pensacola, FL
WI = Whidbey Island

TABLE III - OPTION A TRAVEL COSTS (Continued)

Category I Bombardier/Navigator

23 @ 10¢ mile x 2750 (PC-WI)	6,325.00
14 @ 10¢ mile x 3016 (WI-CP)	4,222.40
9 @ 10¢ mile x 1237 (WI-ET)	1,113.30
7 @ 7¢ mile x 825 (PC-CP)	404.25
5 @ 7¢ mile x 1979 (PC-ET)	692.65
12 x 241.50 Dislocation Allowance (M)	2,898.00
11 x 190.80 Dislocation Allowance (S)	2,098.80
7 @ 2500# (PC-CP) @ 659	4,613.00
7 @ 1000# (PC-CP) @ 448.15	3,137.05
5 @ 2500# (PC-ET) @ 959	4,795.00
4 @ 1000# (PC-ET) @ 547.15	2,188.60
12 @ $1/day Separation Allowance x 140 days	1,680.00
23 @ $9.70 Per Diem 140 days	31,234.00
	65,402.05

Category II Bombardier/Navigator

9 @ 10¢ mile x 2765 (DC-WI)	2,488.50
6 @ 10¢ mile x 3016 (WI-CP)	1,809.60
3 @ 10¢ mile x 1237 (WI-ET)	371.10
6 Family @ 14¢ mile x 340 (DC-CP)	285.60
3 Family @ 14¢ mile x 2654 (DC-ET)	1,114.68
9 x 271.20 Dislocation Allowance (M)	2,440.80
6 x 5000# (DC-CP) @ 850.25	5,101.50
3 x 5000# (DC-ET) @ 1852.75	5,558.25
9 x $1/day Separation Allowance x 112 days	1,008.00
9 @ $9.70 per diem 112 days	9,777.60
	29,955.63

Annual Travel Cost Grand Total - $220,170.63

TABLE IV

OPTION B TRAVEL COSTS

Category I Pilots*	85,772.01
Category I B/Ns*	65,402.05
2 Transition Pilots	
2 @ 10¢ mile x 2765 (DC-WI)	553.00
1 @ 10¢ mile x 3016 (WI-DP)	301.60
1 @ 10¢ mile x 1237 (WI-ET)	123.70
1 Family @ 14¢ mile x 340 (DC-CP)	47.60
1 Family @ 14¢ mile x 2654 (DC-ET)	371.56
2 x 271.20 dislocation allowance (M)	542.40
1 x 5000# @ 850.25 (DC-CP)	850.25
1 x 5000# @ 2950.75 (DC-ET)	2,950.75
2 x $1/day Separation Allowance x 140 days	280.00
2 x $9.70 per diem x 140 days	2,716.00
Cost for Transition -	8,736.86
Total Cost: Category I P + B/N + 2 Trans. -	159,910.92
Category II Pilots and Bombardiers/Navigators	
17 @ 10¢ mile x 206 (DC-OA)	350.20
10 @ 10¢ mile x 193 (OA-CP)	193.00
7 @ 10¢ mile x 2670 (OA-ET)	1,869.00
10 Family @ 14¢ mile x 340 (DC-CP)	476.00
7 Family @ 14¢ mile x 2654 (DC-ET)	2,600.92
17 x 271.20 dislocation allowance (M)	4,610.40
10 x 5000# @ 850.25 (DC-CP)	8,502.50
7 x 5000# @ 2950.75 (DC-ET)	20,655.25
17 x 9.70 per diem x 112 days	18,468.80
17 x $1/day Separation Allowance x 112 days	1,904.00
	59,630.07
Annual Travel Cost Grand Total -	$219,540.99

*See Option A for breakdown of costs.

Legend:

M = married
# = pounds
CP = Cherry Point
DC = Washington, DC
ET = El Toro
OA = Oceana
WI = Whidbey Island

TABLE V

STATUS QUO TRAVEL COSTS

Category I Pilots

30 @ 10¢ mile x 1563 (CC-CP)	4,689.00
12 @ 10¢ mile x 2635 (CP-ET)	3,162.00
15 Family @ 7¢ mile x 1563 (CC-CP)	1,641.15
6 Family @ 7¢ mile x 2635 (CP-ET)	1,106.70
15 x 241.50 Dislocation Allowance (M)	3,622.50
15 x 190.50 Dislocation Allowance (S)	2,857.50
6 x 241.50 Dislocation Allowance (CO-ET)(M)	1,449.00
6 x 190.50 Dislocation Allowance	1,143.00
15 @ 2500# (CC-CP) @ 877.75	13,166.25
15 @ 1000# (CC-CP) @ 523.15	7,847.25
6 @ 2500# (CP-ET) @ 1064	6,384.00
6 @ 1000# (CP-ET) @ 585.65	3,513.90
	50,582.25

Category II Pilots & 2 Transition Pilots

10 @ 10¢ mile x 340 (DC-CP)	340.00
4 @ 10¢ mile x 2635 (CP-ET)	1,054.00
10 Family @ 14¢ mile x 340 (DC-CP)	476.00
4 Family @ 14¢ mile x 2635 (CP-ET)	1,475.60
10 x 271.20 Dislocation Allowance	2,712.00
10 x 5000# (DC-CP) @ 827.50	8,275.00
4 x 5000# (CP-ET) @ 1902.75	7,611.00
4 x 271.20 Dislocation Allowance	1,084.80
	23,028.40

Category I Bombardier/Navigator

23 @ 10¢ mile x 825 (PC-CP)	1,897.50
9 @ 10¢ mile x 2635 (CP-ET)	2,371.50
12 Family @ 7¢ mile x 825 (PC-CP)	693.00
5 Family @ 7¢ mile x 2635 (CP-ET)	922.25
12 x 241.50 Dislocation Allowance (M)	2,898.00
11 x 190.50 Dislocation Allowance (S)	2,095.50
5 x 241.50 Dislocation Allowance (M)	1,207.50
4 x 190.50 Dislocation Allowance (S)	762.00
12 @ 2500# (PC-CP) @ 659	7,908.00
9 @ 1000# (PC-CP) @ 448.15	4,033.35
5 @ 2500# (CP-ET) @ 1064.00	5,320.00
4 @ 1000# (CP-ET) @ 585.65	2,342.60
	32,451.20

TABLE V. STATUS QUO TRAVEL COSTS (Continued)

Category II Bombardier/Navigator

9 @ 10¢ mile x 340 (DC-CP)	306.00
3 @ 10¢ mile x 2635 (CP-ET)	790.50
9 Family @ 14¢ mile x 340 (DC-CP)	428.40
3 Family @ 14¢ mile x 2635 (CP-ET)	1,106.70
9 x 5000# (DC-CP) @ 827.50	7,447.50
3 x 5000# (CP-ET) @ 1902.75	5,708.25
3 x 271.20 Dislocation Allowance (CP-ET)	813.60
	19,041.75
Annual Travel Cost Grand Total -	$125,103.60

Legend:

M = married
S = single
# = pounds
CC = Corpus Christi
CP = Cherry Point
DC = Washington, DC
ET = El Toro
PC = Pensacola, FL

TABLE VI

ORDNANCE REQUIREMENTS TO SUPPORT USMC
UNDER CONSOLIDATION

MK-76

	NAVY	MARINE	ADD. ORD.	ADD. PILOTS	TOTAL
NAVAL AVIATORS					
Category I	185	140	45	32*	1,440
Category II	140	80	60	8	480
TOTALS	325	220	105	40	1,920
NAVAL FLIGHT OFFICERS				ADD. B/Ns	
Category I	90	70	20	23	460
Category II	75	60	15	9	135
TOTALS	165	130	35	32	595
					2,515

2.75 ROCKETS

	NAVY	MARINE	ADD. ORD.	ADD. PILOTS	TOTAL
NAVAL AVIATORS					
Category I	30	20	10	32*	320
Category II	30	20	10	8	80
TOTALS	60	40	20	40	400
NAVAL FLIGHT OFFICERS				ADD. B/Ns	
Category I	20	20	0	23	0
Category II	20	20	0	9	0
TOTALS					0
					400

MK-104

	NAVY	MARINE	ADD. ORD.	ADD. PILOTS	TOTAL
NAVAL AVIATORS					
Category I	1	0	1	32*	32
NAVAL FLIGHT OFFICERS				ADD. B/Ns	
Category I	1	0	1	23	23
TOTALS					55

*Includes 2 transition pilots

TABLE VI. ORDNANCE REQUIREMENTS TO SUPPORT USMC UNDER CONSOLIDATION (Continued)

MK-104 (Continued)

	NAVY	MARINE	ADD. ORD.	ADD. PILOTS	TOTAL
MK-80 SERIES (INERT)					
NAVAL AVIATORS					
Category I	15	0	15	32*	480
Category II	15	0	15	8	120
TOTALS	30	0	30	40	600
NAVAL FLIGHT OFFICERS					
NOT APPLICABLE					
MK-87 WSF					
NAVAL AVIATORS					
Category I	15	0	15	32*	480
Category II	10	0	10	8	80
TOTALS	25	0	25	40	560
NAVAL FLIGHT OFFICERS				ADD. B/Ns	
Category I	15	0	15	23	345
Category II	10	0	10	9	90
TOTALS	25	0	25	32	435
					995
MK-45 FLARES					
NAVAL AVIATORS				ADD. PILOTS	
Category I	5	0	5	32*	160
NAVAL FLIGHT OFFICERS					
NOT APPLICABLE					

*Includes 2 transition pilots.

TABLE VII

ORDNANCE COSTS TO SUPPORT USMC
UNDER CONSOLIDATION

ORDNANCE SUMMARY	AMOUNT	PER UNIT COST*	TOTAL
MK-76	2,515	$ 5.10	$12,800
2.75 ROCKET	400	65.00	26,000
MK-104	55	235.00	12,900
MK-80 (INERT)	600	235.00	141,000
MK-87 WSF	995	235.00	233,800
MK-45 FLARES	160	NOT AVAILABLE	NOT AVAILABLE
TOTAL (MINUS FLARES)			$426,500

Under Option A the entire additional cost of ordnance would be charged to VA-128. Under Option B the cost would be split on a 75/25 basis between VA-128 and VA-42.

*Derived from 1975 study with a 20 percent increase for inflation.

TABLE VIII

INVESTMENT AND ANNUAL DIRECT COST (SAVINGS)

OPTION A - 100% USMC RP/BN TRAINING AT VA-128
OPTION B - 75% USMC RP/BN TRAINING AT VA-128;
25% AT VA-42

INVESTMENT COSTS

ITEM	FACILITIES	A-6E# AIRCRAFT	TC4C## AIRCRAFT	FACILITY OPERATION
OPTION A				
VMAT-202	(540,000)	(97,340,997)	(2,000,000)	(52,395)
VA-128	25,000	82,365,459		1,500
NET CHANGE	(515,000)	(14,975,538)	(2,000,000)	(50,895)
OPTION B				
VMAT-202	(540,000)	(97,340,997)	(2,000,000)	(52,395)
VA-128	25,000	67,389,921		1,500
VA-42	NA	NA		NA
NET CHANGE	(515,000)	(29,951,076)#	(2,000,000)	(50,895)

ANNUAL DIRECT COSTS

ITEM	PERSONNEL	TRAVEL	A-6E AIRCRAFT	TC4C AIRCRAFT	ORDNANCE
OPTION A					
VMAT-202	(856,871)	(125,104)	(10,608,000)	(1,110,000)	--
VA-128		220,171	10,912,000		426,500
NET CHANGE	(856,871)*	95,067	304,000	(1,110,000)	426,500
OPTION B					
VMAT-202	(1,781,266)**	(125,104)	(10,608,000)	(1,110,000)	
VA-128		159,911	8,928,000		319,875
VA-42	NA	59,630	NA		106,625
NET CHANGE	(1,781,266)**	94,437	(1,680,000	(1,110,000)	426,500

*Difference cost based on onboard VA-128/VMAT-202 + 100% NAVMMACLANT increment.
**Difference cost based on onboard VA-128/VMAT-202 + 75% NAVMMACLANT increment.
#A-6E aircraft @ $7,487,769 NAVPRO Grumman figure FY 79.
##TC4C aircraft @ $1,000,000 NAVAIRSYSCOM AIR 4131 (Last Acquisition).

Dollars in ( ) indicate savings.

TABLE IX

COST SUMMARY, OPTION A AND OPTION B

	INVESTMENT COST	ANNUAL DIRECT COST
OPTION A	(17,490,538)	(1,192,199)
OPTION B	(32,466,076)	(4,101,244)

Note: Dollars in ( ) indicate savings.

DIRECT A-6E COSTS TO SUPPORT USMC UNDER CONSOLIDATION

VMAT(AW)-202

ASSIGNED AIRCRAFT: 13 A-6E

COST (DIRECT) PER AIRCRAFT:

USMC	TOTAL	TOTAL DIRECT OMN+	*APN
	816,000	646,000	170,000
TOTAL DIRECT COST	10,608,000	8,398,000	2,210,000

VA-128

REQUIRED ADDITIONAL AIRCRAFT:

OPTION A - 100%	11
OPTION B - 75%	9

COST (DIRECT) PER AIRCRAFT:

CINCPACFLT	TOTAL	OMN	APN
	992,000	793,000	199,000
TOTAL COST (11)	10,912,000	8,723,000	2,189,000
TOTAL COST (9)	8,928,000	7,137,000	1,791,000

INCREMENTAL COST (SAVINGS)

OPTION A - 100%

AIRCRAFT: 13 minus 11 = 2 A-6E

DOLLARS: 10,912,000 minus 10,608,000 = 304,000

OPTION B - 75%

AIRCRAFT: 13 minus 9 = 4 A6E

DOLLARS: 10,608,000 minus 8,928,000 = (1,680,000)

*APN dollars for annual replenishment spares.

DIRECT TC4C COSTS TO SUPPORT USMC UNDER CONSOLIDATION

VMAT(AW)-202

AIRCRAFT ASSIGNED: 2 TC4C

COST (DIRECT) PER AIRCRAFT:

USMC	TOTAL	TOTAL DIRECT OMN	APN
	555,000	555,000	0
TOTAL COST	1,110,000	1,110,000	0

VA-128

REQUIRED ADDITIONAL AIRCRAFT - TC4C

(Note: VA-128 requires three A-6E configured TC4C's to conduct training under either OPTION A or OPTION B. This requirement would entail only the transfer of VMAT(AW)-202's A-6E configured TC4C and would result in a net reduction of two TC4C's overall.)

INCREMENTAL SAVINGS:

OPTION A or OPTION B

AIRCRAFT: 2 minus 0 = 2 TC4C's

DOLLARS: 1,110,000 minus 0 = (1,110,000)

VA-42

Under OPTION B, VA-42 would be required to assume responsibility for training 25% of the annual Marine requirement. Since this corresponds to the current projected decrease in their required Navy output, it is assumed that this training could be accomplished without additional expense.

BIBLIOGRAPHY

Naval Personnel Research and Development Laboratory WOS 71-4, OFFICER PERSONNEL COSTS, by James N. Clary and John T. Creaturo, March 1971.

Training Analysis and Evaluation Group Report No. 16, A TECHNIQUE FOR CHOOSING COST EFFECTIVE INSTRUCTIONAL DELIVERY SYSTEMS, by Richard Braby; James M. Henry; William F. Parrish, Jr.; William M. Swope, April 1975.

Training Analysis and Evaluation Group Technical Memorandum 76-1, TRAINING RESOURCES CLASSIFICATIONS: DIRECT-INDIRECT AND FIXED-VARIABLE COST CATEGORIES, by William M. Swope and Curtis C. Cordell, June 1976.

OPNAV-90P-02, NAVY PROGRAM FACTORS MANUAL, Revision of; Ser 901M/580724, 16 August 1976.

Commander Naval Air Force, U.S. Atlantic Fleet letter 7M/099325: Ser 331D/5456 to Chief of Naval Operations (OP-593), Subject: Consolidation of A-6 Training, 21 August 1975.

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