



THE CHINA LAKER

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Newsletter of the China Lake Museum Foundation

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China Lakers Introduce Sidewinder to NATO

Editor's Note: Five years after the first combat firings of Sidewinder by the Republic of China in the 1958 crisis, China Lake was actively supporting the introduction of the new, innovative missile in the air forces of NATO allies, as well as getting production support in selected countries. The trip report below shows some of the difficulties in accomplishing the objectives of such efforts, and the tough conditions suffered by China Lake travelers to Europe.

31 July 1963

From: E. S. Romero and W. L. Underwood, Code 3011

To: Head, Test Department, Code 30

Via: Head, Project Engineering Division, Code 301

Subj: Trip to Europe to assist in NATO SIDEWINDER Flight Test Program; report of (U)

I. Background:

a. NATO has set out on a program to arm its fighter aircraft with SIDEWINDER I-A missiles. The missiles for this program are being fabricated entirely within the complex of NATO nations in Europe and Scandinavia. The NATO SIDEWINDER Program Office (NSPO) was established to administer this program and a United States Liaison Office (USLO) was established to provide technical advice, consultation, and assistance.

b. The prime contract for the missile program was let to a German company, Bodenseewerke, in Uberlingen, West Germany. The Bodenseewerke established a separate facility to handle the job and named it Flugeratewerke (FGW). It, also, is in Uberlingen. NSPO and USLO both maintain offices in Uberlingen. Subcontracts for various missile components and subassemblies are scattered among the various NATO nations. Flugeratewerke manufactures the optics, assembles the G&C unit, and rides herd on all the subcontractors.

c. It was determined that it was desirable to perform the flight tests of NATO-produced missiles in Europe. A survey by NSPO of available test ranges in Europe indicated the most suitable and readily available one to be the French Naval Test Base, Centre Essais et Recherches Engins Speciaux (CERES) at Ile du Levant, a small island off the coast of Toulon, France, in the Mediterranean. A contract was negotiated between NSPO and the French Government for the French to handle the flight testing as a package deal, receiving a fixed price for each missile fired under specified conditions. Spokesman for the French Government in the negotiations pertaining to the preparation and signing of the contract was LTCOL Andre' Graveret, Armee de l'air. LTCOL Graveret has management responsibilities in an office called Direction De Recherches et Moyens D'Essais, in Paris. This office is roughly equivalent to a Bureau office managing RDT&G programs.

d. It was established that flight test operations were to be conducted and controlled by the French Navy at CERES. Pilots, aircraft, and flight support were to be provided by the French Air Force, namely, the 5^eme Escadre de Chasse, Base Aerienne, Orange-Caritat, located some 85 air miles from CERES.

Data processing was to be accomplished at the Naval Data Center, Groupe Technique Engins Speciaux (GTES), in Toulon.

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China Lake Museum Foundation

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President's Report by Bob Campbell

Our May 30th dinner auction was a great success, thanks to our many donors and major sponsors, along with everyone who attended and participated in the auctions. The entire community was represented and provided a good networking and social opportunity which is one of our goals for the event. As of this writing we netted about \$90K. A list of the major donors and sponsors is shown elsewhere in the newsletter.

The auctioneer, David O'Shaughnessy, was very complimentary to the support he sees from this community as compared to other auctions in which he works. During the dinner we enjoyed the music from the Burroughs High School String Quartet. Next year

we will have the dinner auction during the Memorial Day weekend and hope you will all mark your calendars. We believe the theme of our Museum is to preserve and share history, and fits neatly with the Memorial Day theme of remembering and honoring those who have defended our country.

With the support of CACI we are embarking on an effort to record and retain the words of our docents who provide tours. The docents bring life to the exhibits, especially as they share their experiences during the design phases, and we want to capture this little bit of history.

(Continued from page 1)

e. Since CERES did not have a ground telemetry receiving station capable of handling the SIDEWINDER PDM telemetry, NOTS was given responsibility to construct a ground receiving station and two TM check-out stations similar to the ones in use at NOTS. These equipments were constructed, assembled and tested at NOTS and then shipped to Europe; the ground receiving station at CERES, one check-out station to FGW, and the other to Orange.

Representatives of NOTS, Messrs. John Weber and Herbert Hood, followed the equipment to Europe in order to reassemble it on site, make it operational, train French personnel in its operation and assist in these operations during the first test period scheduled to begin in 13 May 1963.

f. In addition to the assistance by NOTS mentioned above, NSPO requested that the undersigned project engineers, E. S. Romero and W. L. Underwood, come to Europe to be present during the first test period and to provide NSPO and operational personnel at CERES with technical advice and assistance in the areas of test planning and preparation, test operations, and flight analysis.

2. We departed China Lake on 21 April 1963 and arrived in Uberlingen, Germany the afternoon of 22 April after some 25 hours of travel with no sleep. We checked in at USLO where we met the OinC, CDR Anderson, who was about to leave for a meeting at one of the subcontractors in Ankara, Turkey. We had a brief discussion with him and Mr. K. Powers regarding our proposed activities and travel schedule so that our further travel arrangements could be made. It was decided we should remain in Uberlingen for two days, spend one day visiting the Air Base at Orange, and then go to Toulon, which would be our "home base" while on duty at CERES.

3. The following day we visited the offices of NSPO and paid our respects to COL Hammer and COL Sorlie, both of whom we had met during their visits to NOTS. We met a new member of the NSPO team, MAJ N.B.O. Peterson, of the Danish Air Force and currently on leave and employed by NSPO as the engineer to be NSPO's primary representative at CERES and the person generally responsible for cracking the whip over the flight test program. We had a lengthy meeting with MAJ Peterson reviewing background, correspondence, current plans, and schedules applicable to the flight test program. We read over the contract between NSPO and French Government. For the most part, it appears to be an agreement favoring NSPO with the possible exception of Section III, Article 12, Item (3) which states that no charges will be paid for a firing "if the firing is unsuccessful, or if the results obtained are of little value owing to faults or defects or for other reasons for which the Republic of France is responsible". The hooker here is that an unsuccessful firing and results of little value are in no way defined. This may lead to considerable disagreement, after a firing, as to the success of the firing, the value of the results, and the responsibility for non-success if it is unsuccessful.

4. In the afternoon we visited FGW and were taken on a tour of the plant and facilities by Mr. Albrecht, whom we had previously met at NOTS. We obtained a favorable impression of the plant, which is relatively small, new, fairly modern, and is devoted exclusively to the production of the SIDEWINDER optics and gyro and the final assembly of the entire G&C unit. There are also offices for a small staff of engineers and technicians. As a general observation, the employees appeared to be enjoying what they were doing. We did notice, however, the presence of some hostility and professional jealousy between several members of the engineering staff.

5. The day of 24 April was spent at the USLO office discussing with Mr. Powers various aspects of the test program and test operational procedures. At the request of Mr. Powers we prepared for his use a "checklist" of facilities, hardware, and actions required at FGW and Orange in preparation for the first test series, and an outline of a typical test procedure and countdown as accomplished at NOTS.

6. We departed Uberlingen on 25 April and arrived in Orange, France, the evening of the same day. The following morning we were met by MAJ Petersen to discuss with him the plan of the day. Messrs. Weber and Hood arrived later in the morning from Toulon. It was arranged that we should go to the Air Base in the afternoon and contact MAJ Peneau. MAJ Peneau has been assigned responsibilities as chief pilot for the test program, and has visited NOTS. A French Air Force bus picked us up in the afternoon and took us to the base. Included in our party at this time was Mr. Karl Simon, of FGW. At the main gate to the base we were stalled for about 30 minutes due to a breakdown in communications: the officials at the gate apparently had not had word of our coming. In fact, incredible as it may seem, the official at the gate even stated that there was no one by the name of MAJ Peneau on the base. Word finally leaked through, however, and we were permitted to enter after which we met MAJ Peneau in his office. At this time we first encountered the French attitude toward their own language. Only two persons in our party of seven could speak French, although all seven

spoke English. Both French officers with whom we met could speak English quite well, but throughout our meeting, business was discussed in French, with Mr. Simon having to translate everything for our benefit. This made every discussion complicated, tiresome and time consuming.

7. The remainder of the afternoon was spent in inspecting the facility being prepared on the field for missile assembly and checkout in preparation for loading on the aircraft. The facility consisted of two metal buildings being erected over an asphalt decking. The shell of the buildings was up, but the interiors were still being worked on. From what we were able to observe, the facility appeared adequate. During the afternoon, the NOTS-built telemeter check-out stand was uncrated, assembled, "fired up", and performed satisfactorily

8. Communications between CERES Fire Control and the missile assembly building will be by radio to Orange Operations and from Operations to assembly building by phone. This is not the most desirable system but may work satisfactorily if radio communications are good.

9. We discussed with MAJ Peneau the possibility of the missile aircraft dumping fuel to make smoke as a visual acquisition aid for camera trackers. It appears that those aircraft do not have the capacity of dumping fuel in flight. MAJ Peneau also stated it was not possible to install and try on one of their aircraft a fuel dump valve which had been provided by NOTS. In fact, they have no visual acquisition aids.

10. We departed Orange on 27 April and arrived in Toulon, France, the same afternoon and established our headquarters in the Hotel de l'Amiraute. We were met at Toulon by Mr. Verney of GTES. It was arranged that transportation to and from Ile du Levant would be provided us by GTES car from the hotel to the harbor, and by CERES boat to the island.

11. On 29 April we made our finest visit to CERES in the company of MAJ Petersen, who speaks some French. Our reception at CERES was surprisingly cool. As a matter of courtesy, MAJ Petersen introduced us to Commandant Estienne, the commanding officer of CERES. Estienne speaks fluent English but condescended to favor us only with a limp handshake and a grunt which constituted both our greeting and dismissal. This possibly might have set a record as the rudest reception of NOTS representatives anywhere ever. Thus commenced a four-week period during which we firmly believed we could have been of considerably more assistance than we were permitted to be, and during which we were treated with complete indifference by the French naval officer operational personnel at CERES. We received the distinct impression that the French felt that they knew all there was to know about SIDEWINDER flight test operations and had no use for our assistance. There was no conscious effort to make use of our knowledge and experience professionally or to offer any hospitality or conviviality socially. It did not take us long to come to the conclusion that Messrs. Romero and Underwood were not particularly welcomed, that the French possibly resented our presence, and that we were in for an uncomfortable period. With these facts accepted, we did our best to meet our responsibilities to NSPO as gracefully as possible.

We made a tour of the facilities which would be used for the flight test programs.

a. Ground Telemetry Station: This station, assembled by Messrs. Weber and Hood is in very good shape. With excellent help from the French technicians, they repaired a Sanborn Recorder badly damaged during shipment. The station is ready to go. We stressed the need for continuous and good communications, during a test, between Fire Control and T-Pad. This is of extreme importance in order that T-Pad operators be kept informed as to the progress of the test, position of aircraft, TM on and off commands, countdowns and aborts. It is also necessary that Fire Control have continuous and immediate information as to the suitability of the received TM signal. There is available a light signaling system in which T-Pad indicated suitability of TM to Measurements Control by switching on or off appropriate light. These lights appear on a board in Measurements Control along with similar lights from optical tracking stations. Measurements Control evaluates all this information and switches into Fire Control a red or green light indication GO or NO-GO on basis of total measurements system. T-Pad also has a radio to hear pilot communications, and a squawk box from Fire Control to hear countdown. In our opinion these systems did not permit the continuous, two-way flow of communications needed, and we recommended that an open phone line be available between T-Pad and Fire Control officer. It was agreed that this could be accomplished.

b. Optical Tracking Stations: There are four tracking stations in the system. Each one has three Askanias and two Tracking Cameras. In addition, it was hoped to have four new Contraves Cinetheodolites in operation when the flight

tests started. The Askantias have a target acquisition system that feeds from radars to old fire-control computers to cameras, and gives needle indications of where to point. There is also supposed to be a coarse input to a servo system to automatically point the Askantias in the generally desired direction. We did not see this work. However, the optics stations, although limited in number, look good. Tracking Cameras are mounted on pedestals and tracked manually. They have a mount similar to our M-45, but it has tracking errors and they do not use it. We were informed that the computer program for processing Askantia trajectory data will only accept a two-camera solution, so they will use the best two of the acquiring stations. This, and the fact that all stations are on one side of the flight line means, of course, that their accuracies will not be as good as NOTS. What the accuracy will be the French will not even say.

c. Fire Control: The Fire Control setup looks quite good. Plenty of radars for surveillance and control purposes. The plotting board used for aircraft vectoring operations is a vertical glass board with plots and targets appearing as lighted lines and spots, and looks very good with one exception; the scale of the plot is about 5 KM per three inches. This amounts to about 5-K yards per inch as compared to a scale of 3-K yards per inch at NOTS. This may make it difficult to accomplish the plane-target intercept within the specified limitations of range and angle-off.

d. Target System: The CT-20 is a small, ground-launched turbojet target which looks like a very good target for the flight test programs. The only deficiency of any consequence is that it carries only four flares, of which two must be ignited at a time to maintain aerodynamic stability. This limits the target to two useful passes per target flight. Unless the French can launch several targets during a test period, they will not be able to take advantage of a day of exceptionally good conditions to get more than two missiles fired at a CT-20 in any one day. This possibly can result in not getting off the prescribed number of firings in the time allotted for a test series.

12. We attended the final test-planning meeting on 6 May at CERES along with representatives of NSPO, CERES, FGW, and GTES. On that day we were informed that there would be a number of captive practice flights on 7, 8, and 9 May which we and MAJ Petersen would observe. On the morning of 7 May, however, we were informed that there would be no practice flights the rest of the week—in fact, no SIDEWINDER operations at all. There was offered no explanation for this change of plans, and an aircraft was provided to fly us back to the mainland. We utilized the afternoon of 7 May to visit Mr. Verney and GTES. The data center at GTES can be compared somewhat to a small-scale version of NOTS, Codes 3061 and 3033. There is equipment for processing film, printing and reproduction of film, film reading, and punching data on cards, and programming through an IBM 650 Computer. At present, they are limited to processing black and white film, but are installing equipment for color. As far as we could see, there was only one film reader available for reading and punching data on cards. This probably will prove the limiting factor on the speed with which miss distance and trajectory data will be forthcoming. It may turn out to be a slow job.

13. During the week of 13 May, we returned to CERES and witnessed fire control operations for target-rocket training flights, intercept pattern flights, a target-rocket and captive-TM-missile operation for checkout of the telemeter ground station, and then several attempts at firing NATO missiles with warheads at target-rockets. There were three attempts to fire a target-rocket during a training mission. The target-rocket failed to fire each time. During the intercept pattern flights, where a piloted aircraft acted as the CT-20 target, operations looked quite good. Voice vectoring of the carrier aircraft was performed very well and it looked like there should be no problem in making the desired intercepts except for the previously mentioned inaccuracies due to plot board scale.

14. We participated in the target-rocket launch for TM station checkout. On this occasion, we manned the telephone link between Fire Control and T-Pad. Mr. Romero was at the Fire Control Station and Mr. Underwood was at the T-Pad. During this operation there was one aborted pass, two passes during which it was attempted, unsuccessfully, to fire the target-rocket, and a final pass during which the target-rocket was fired. It was obvious at once that the telephone link to T-Pad was necessary, but we are not certain the French appreciated this. They may have. There was considerable confusion regarding turning on and off of missile TM. They had established -1 minute as the time to turn on TM. This is not enough time to synchronize and check the TM signal. We advised -3 minutes as a more desirable time. This was accepted. However, since the TM business is somewhat new to their operations, there was a tendency for the control officers to forget to call for TM on at -3 or TM off after the pass. They had to be reminded each time. Also, the communication between control officer and pilot got mixed up several times so that TM stayed on when ordered off, and then turned off when ordered on. This, however, is a matter of familiarization and training. Even so, without the direct communication line to T-Pad, Mr. Weber would never have known what was going on. The French technicians paid no attention to the squawk box or countdown and, of course, Mr. Weber could not understand those communications. In

spite of this, we achieved a good checkout of the station and ran some tape. A point of interest is that when the target-rocket was fired there was observed no change in the TM signal carrying the Pilot's Intercom. It would appear from this that the pilot never acquired the target with the missile, and the missile saw no signal.

15. Two more attempts were made to fire two target-rockets for two NATO missiles with warheads. The target-rocket on the first aircraft failed to fire and that test aborted. The target-rocket on the second plane fired about 2 seconds after the pilot picked. The missile was launched about 7 or 8 seconds later, but did not intercept the target and self destruct action occurred at about +25 seconds. The pilot stated he had signal when he fired.

16. The week of 20 May started off none too well. Two aircraft made 11 passes attempting to fire warhead missiles at target rockets. All were aborted because cameras did not acquire due to haze. Acquisition aids may have helped. Visibility appeared to be improving with time, however, so a CT-20 was launched for two TM missile firings at 15 K feet and, about 20° - 30° off-angle. Both were fired. Visual reports of miss distance varied from 20 meters on the first shot to 5 meters on the second, but these were observer's guesses and have not yet been verified. Mr. Romero was on TM phone in Fire Control and Mr. Underwood was at the other end in T-Pad. Due to no recognizable countdown beyond -30 seconds on the first shot, the raw signal camera, which was to be turned on at -5 seconds, was not run. However, tape and Sanborn recordings were obtained. On the second shot the -5 second warning was estimated by Mr. Romero and raw signal was recorded, as was the Sanborn. However, the tape record was not obtained, due possibly to personnel error. Mr. Weber, who was operating the station with no help was very rushed.

17. Sanborn records of both firings were carefully scrutinized and the only conclusion one could come to, assuming the records are valid (and they appear so) is that both missiles were fired without any target signal.

18. On 21 May, two warhead missiles were fired against target-rockets at 25 K feet altitude. Both guided well, intercepted the target and good warhead action was observed. Success!!! An attempt was made to launch a CT-20 target for two TM missile shots. However, the target popped its recovery chute on launch and that ended the day's operation. Operations on 22 May were postponed due to poor weather.

19. Thursday, 23 May, was the final day of operations in the first test series. On this day it was arranged for MAJ Petersen to man the telephone in Fire Control and Mr. Powers to man it at T-Pad and relay information on adequacy of Pilots Intercom signal level as monitored on the raw signal scope. Two aircraft were aloft, each with one missile onboard. Two targets were launched during the afternoon. After several passes which were aborted because of lack of sufficient signal, the first missile was fired. Again, the pilot reported he had signal on firing, but the Sanborn records and monitoring of raw signal scope refuted this. At any rate, the missile apparently failed to guide. In fact, the pilot reported that it made a very erratic maneuver shortly after launch. This, also, is not verified by the TM records.

20. For the second firing, it was requested of the French that the maneuver be made a simple tail-on intercept at co-speed. The intercept was made tail-on to increase the opportunity for the pilot to line up and acquire the target. However, the French said they could not make it co-speed. The reason for this is not quite clear. At any rate on the firing pass the raw signal scope indicated intermittent rise and fall in the signal level. It looked good in the few seconds before firing but appears to have dropped to an insufficient level at the instant of firing. The pilot reported he had two signals - one from target and one from clouds. He believed that he had a cloud signal when he fired. The missile did not appear to have guided.

21. To summarize our observations, it is our opinion that:

- a. The Fire Control facilities at CERES are satisfactory and the French are experienced in the required control operations.
- b. The optical facilities at CERES are limited in quantity but of good quality. The geometry of the camera arrays is such that trajectory and position accuracies are degraded as compared to those obtained at NOTS. An attempt should be made to determine what accuracies will be obtained.
- c. The TM ground receiving station erected at CERES by NOTS is in good operating condition. The French technicians seem to be getting the hang of the operation of the station.
- d. The Facilities at GTES for reducing optical data are satisfactory but may be limited on a load-capacity basis due to the limited number (at most two) of film readers available. This may show up as time delays in reducing data.

- e. The question of the "black box" for reducing telemetry data from tape is not resolved and we have an intuitive feeling that it will not be in the very near future, or possibly at all.
- f. The French Air Force pilots appear to be lacking in experience in firing SIDEWINDER missiles. We believe they need more captive-flight training to assure that they can recognize the differences between proper, improper, or no signal at all. They should definitely have more such training prior to the start of the next test series.
- g. The general attitude of the naval officer personnel at CERES, the personnel services rendered, and the spirit of cooperation and teamwork, which is necessary part of an operation such as this, was very poor and stands in need of much improvement if a good working relationship is to exist in the future. In this case, we refer to the attitude displayed toward NSPO and the SIDEWINDER flight test program in general, and not to their attitude toward us specifically, which can possibly be explained (not excused) in terms of nationalistic pride.
22. On 26 May, we returned to Zurich, Switzerland, enroute back to Uberlingen. At the invitation of Mr. Gerber, manager of the European office of Beech Aircraft Company, we visited that office in Zurich on 27 May. The office is the central point of sales of Beech aircraft and drone target throughout Europe. As it turned out, the gentleman responsible for target sales and operation was on a sudden trip to the USA and we did not meet him. Nevertheless, we had an interesting meeting with Mr. Gerber.
23. We had expected to be picked up by USLO car for the rest of the trip to Uberlingen the next day, 28 May, but received a phone call to the effect that the driver had to make a trip to Stuttgart that day and would come for us on 29 May. We took the extra time to prepare, at the request of Mr. Powers, a preliminary draft of our trip report, containing in less detail, most of the information presented herein. The purpose of this was to permit USLO and NSPO to take immediate advantage of our observations and comments.
24. We returned to Uberlingen on 29 May, turned in our report, and completed the remainder of our travel arrangements for our homeward trip. We were informed that LTCOL Graveret had requested that we return via Paris in order to brief him on our observations.
25. We departed Uberlingen on 30 May and arrived in Paris that afternoon. We met with LTCOL Graveret on 31 May and 3 June during which time we discussed in detail our experiences, observations, and recommendations.
26. We departed Paris on 4 June and arrived in China Lake on 5 June, concluding a trip both interesting and frustrating.

E. S. Romero

W. L. Underwood

Where They Are Now

Ed Romero graduated from USC with an Electrical Engineering degree in June 1941. He spent 3 years in industry and was drafted into the Marines in 1944 in time to see combat action on Okinawa. For him combat included throwing satchel charges into occupied caves. Before coming to China Lake in 1953, he spent 6 years at Dahlgren VA., where he met and married his wife Gean. Ed worked at China Lake for 23 years, mostly in the Test Department, including 6 years as Head of the Sidewinder Branch, Project Engineering Division. He retired in 1976 and spent the next 20 years concentrating on his love of theater. He is a founding father of CLOTA and starred in many of their productions. In 1976 with failing eyesight, Ed and Gean moved to Kaneohe Hawaii, where his daughter Vicki lives. Gean died in June of 2008 after a long illness. Ed's younger daughter Marti continues to live with her family in Palmdale, CA.

William 'Bill' Underwood was raised in Sacramento Ca. He attended Sacramento State College

graduating in 1956 with a degree in Mathematics. Shortly thereafter he accepted a Junior Professional position at NOTS China Lake. He spent the next 36-1/2 years at China Lake supporting all aspects of weapon testing and range instrumentation. His positions included: Sidewinder data reduction and Sidewinder test engineering; Electronic Warfare Range testing and instrumentation development; Management of north range instrumentation operations and modernization; Two one-year Pentagon assignments supporting Navy range sponsors; Senior advisor to the T&E Director on matters relating to management of institutional funding for the ranges. Bill met his wife Barbara at China Lake where they were married in the old All Faith Chapel located in a Quonset hut. They celebrated their 50th wedding anniversary 2 years ago with their four children and 10 grandchildren. Since retirement in 1993 Bill and Barbara have spent most of their time traveling around the US and Canada in their motor home. They have spent many spring breaks taking the grandkids motor homing.

Commemorative--Memorial Brick Program

The China Lake Museum Foundation has a brick purchase program. We have several donors who have purchased bricks as part of this program. We are currently working to place our first order and proceed with the display of the purchased brick at the Museum. The bricks are an excellent way of lasting recognition. They will be moved

to the new museum once it is in place. Prices for the bricks are \$100 for a 4x8 brick with three lines of inscription. For \$250 one can purchase an 8x8 brick with more lines of inscription. Please contact the Museum Office or details.

New Memberships received since Winter 2009 Newsletter**Business Members (\$500.00 Annually)**

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Dake, Robin - Ridgecrest CA
Gallinetti, Jon A. - Virginia Beach VA
Goedecke, Walter & Margaret - Ridgecrest CA
Lane, Rita A. - San Diego CA
Peterson, "Pete" & Rita - Yuma AZ
Spiegel, Arthur & Judy - Ridgecrest CA
Takayama, Steve - Huntington Beach CA

THE F3D BU. NO. 127074 STORY



Austin (Audie) R. Ball, a retiree from the old Aviation Ordnance Department (Code 35), is shown presenting a model of his project plane, the F3D/TF-10B Douglas Skyknight. Bob Campbell, on the left, accepts the model from Audie. He provided the following history of the aircraft and some of the projects flown on it at NOTS.

From mid-1950s to the mid-1960s, the aircraft was configured as a standard F3D. From the beginning the aircraft was primarily a flight test bed for projects developed by the Naval Avionics Facility/Indianapolis. These tests were all related to the radar designated for the A-4D aircraft. The A-4D was first just a jet attack dive bomber using a MK-10 Computer. The AN-APG-53 radar was first designed to provide accurate slant range information only. Over the years the radar evolved to also provide in addition to slant range, search mode, manual terrain avoidance and manual terrain clearance modes. Once in the fleet as part of the A-4 weapons delivery system, along with the CP-741, became unreliable. A long flight test program ensued to test modifications and improved maintenance procedures, and many flights were flown.

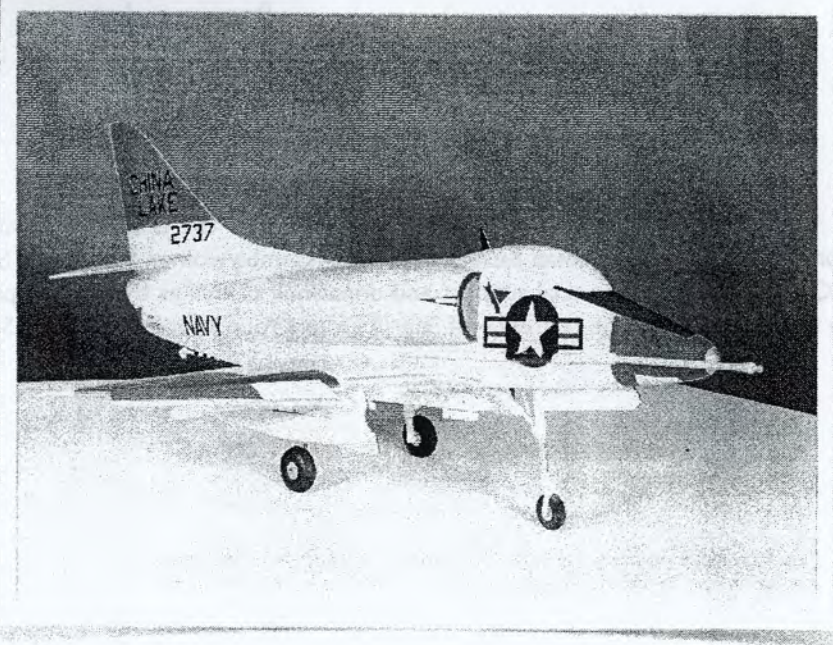
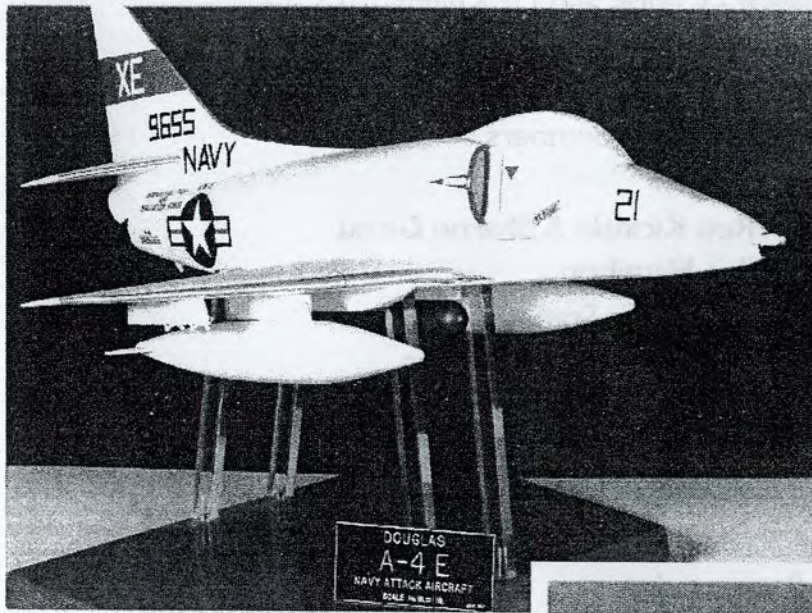
During the early 60s flight testing was done on a NAFI developed grand speed and drift angle Ka band Doppler navigation set (APN-137). Forty four flights were flown (NOTSTP- 3376). The aircraft nose and radome were later modified to allow the installation of a Ka band forward looking radar, the APQ(XAN-1), also NAFI developed. These tests were done in conjunction with two other F-3Ds, one radar from T.I. and one radar from Autonetics. Essentially this was a shoot-out for a future radar for the A-7 aircraft. A flight test course was established for future testing of systems using automatic terrain clearance. Eighty one flights were conducted, with the results published in NOTS TP-3943.

The final flight tests conducted into the early 70s were for evaluation of an all weather radar head for the Condor missile. This was again a NAFI-developed Ka band radar with four-lobe monopulse, track-while-scan system. A total of 103 flights were conducted before the Condor program was canceled. During all this time the aircraft was also utilized by other programs on a short term basis. Audie then signs off with, "Was this a great job or what!?"

HAS ANYONE SEEN THESE MODELS?

Back in the halcyon days of the "Eye" weapons (SNAKEYE, SADEYE, GLADEYE, BIGEYE, WETEYE, WALLEYE, PADEYE, et al), Jack A. Myers was a senior engineer making major contributions to these development programs. Jack was also an expert model maker. He built the two models of the A-4 SKYHAWK pictured below – one in the VX-5 (now VX-9) colors, and the other in the NOTS NAF paint scheme. These models, 1-to-16 scale, were so precise that models of the developmental weapons to the same scale were used on the models to conduct preliminary fit tests on the aircraft with the wide variety of bomb racks and launchers of the day, including the TER, MER, and MBR.

What happened to these models? One may have hung for many years in the main stair well in the Administration Building (Building 1). If readers know where the models are, or where they went to, Jack Myers would like to know, and if they are in storage somewhere not being used, the Museum is interested in displaying them. Call 760 -939-3530 if you have information about Jack's models.



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