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Air Shows of the U.K. Royal International Air Tattoo

Farnborough

Interview RADM John Ryan COMFAIRMED

> Orion 2000 Future MPA

> > 17.

FARNBOUGH

## **VP International Rendezvous '96**

The conclusion of the 30th anniversary reunion of VP International, Rendezvous '96, was marked with the departure of the last maritime patrol aircraft, rocking its wings at the crowd of on-lookers as it flew off into the setting sun.

VP International is an international brotherhood of flyers who have achieved more than 2,000 flying hours in maritime patrol aircraft. The VPI organization's 30-year history traces back to May 1966 and the

formation of the "P-

2000 Club." This club was originally suggested as a fellowship organization of Royal Canadian Air Forces #407 squadron personnel attached to RCAF Station Comox in British Columbia, Canada. The proposed organization was to have been established for the sole purpose of providing recognition to those in the unit who had achieved 2000 flying hours in the RCAF P-2 Neptune, while also creating an incentive to others to attain this prestigious goal. The club soon expanded beyond the 407 Squadron to include all MPA and all nations.

Today there are approximately 30 VPI chapters or "wings" worldwide with over 4500 active duty and retired members. In fact, during VPI Rendezvous '96, 30 new members were sworn in, and within a week after the reunion, another 105 have made application! There were even a number of senior active duty members of the organization recognized for attaining more than 8,760 flying hours in maritime patrol aircraft. That's one year's time in the air. Rendezvous '96 was patronized by over 600 serving members. Most were from active duty squadrons from the United States Navy, Canadian Forces, French Navy, Royal New Zealand Air Force, German Navy, Royal Air Force, Netherlands Navy, and Spanish Air Force. The remaining attendees were from other MPA related commands and



soring an ASW exercise. MPA crews who participated in this international

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event had been selected by competition at their national level. The exercise provided these aircrews the opportunity to con-

activities as well as personnel exchange programs. A number of the retired service members also attended, having traveled long distances — from as far away as New Zealand, and many from the United States and Canada.

### But the

rendezvous was more than just a

reunion. It was a forum for the MPA community to exchange new ideas and to share information and experiences in the ever changing world of the post-Cold War. An MPA seminar was held with presentations that covered maritime patrol, search and rescue, littoral ASW and reports on new sensor system technology providing enhanced mission capabilities in the near future.

VPI further supported the MPA community at Rendezvous '96 by spon-

duct ASW operations against a quiet Canadian diesel submarine in the littoral environment.

Besides the MPA seminar and the SUBEX, the schedule included an international night with food samples from participating nations, a champagne brunch and a formal anniversary dinner. Also enjoyed were a sports day, a static display of various Maritime Patrol Aircraft and industrial displays by a number of aerospace, sensor system, training and oceanographic companies.

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A VPI business meeting was hosted by president Maj. Bert Campbell. Each of the VPI wings gave reports on their status. Faced with the reality of the world-wide reduction in flying time, there was a lively debate on a suggestion to NAS Whidbey Island Washington was announced. Then a discussion was led by VPI founding member

Col. (Ret.) Herb Smale, in support of a proposed VP International Memorial Monument to honor crew members of land-based maritime patrol aircraft who have lost their lives in the performance

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was expected to be and more. As a reunion and as a professional conference, it served its members well. One retiree ran into comrades he hadn't seen in 25

years, and

lower the required 2000 hours flying time of regular memberships or conversely, to establish "associate memberships" with lower hour requirements.

The International MPA Symposium sponsored by the U. S. Navy and hosted by Wing 10 Commodore Carman at of their duties. It is estimated that more than 200 maritime aircrew have been killed during MPA operations in the last 30 years. A steering committee was approved to oversee the project and acquire funding to produce a monument and dedicate it by the fall of 1997.

Rendezvous '96 was everything it

one he hadn't talked to in 40! As an international meeting, major policy matters were addressed to help guide the future of the organization. And as for the MPA community, Rendezvous '96 provided a forum to further the exchange of knowledge and experience among the patrol fraternity in an effort to adapt to the ever increasing MPA tasks of the 21st century.

DAVID READE

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In Response to one of our readers ...

## P-3F, The Orion Left Out

BY VIC EHLERS, P-3 Flight Instructor

On 31 March 1975, the first three P-3Fs departed Moffett Field Calif. for Iran, with crews comprised of Lockheed and Iranian Air Force personnel. We arrived in Bandar Abbas on 10 April after lengthy stops in McGuire AFB, N.J. Lajes Field, Azores, RAF Lineham, Naples and three hours in Tehran for entry customs.

Our arrival at the Tehran Mirabad airport was rather exciting. Approximately ten miles out, Col. Houshmand, the squadron's commanding officer, contacted the tower and requested a low flyby to show off the Air Force's newest acquisition. He received clearance for the pass and we approached the airfield in a fairly decent "V" formation with Major Bardshiry, the Executive Officer on the left, and my student and I on the right. The Iranians were all flying in the left seat and the Lockheed instructors in the right. Approximately three miles out, and with the command to "follow me", the Colonel went to military power and dove for the deck. This all happened so fast that the two wing men were left far behind trying in vain to catch their leader. Their total concentration was on the Colonel's aircraft in spite of the other traffic in the area. This tended to create a slight bit of anxiety

"... I think your review of the Worldwide community is very good and accurate, but unfortunately incomplete. The country left out was Iran, which still operates at least three of the original six P-3F Orions, of which two were noted flying at the same time earlier this year out of Shiraz AB."

Jaap Dubbeldam, The Netherlands

Since the time that the US and Iran were staunch allies, the exact disposition of the P-3F Orions has remained a mystery. This and the Iranian change of government, leading to international political initiatives such as President Clinton's recent announcement on economic sanctions against Iran, sometimes causes industry to "wait until the dust settles" before making factual conclusions. But your point made us realize that the dust may never settle, so here's our story!



among the Lockheed instructors, especially when the airspeed pointer approached the Vne needle and the RAWS warning went off. With one hand under the yoke and the other resting on the power levers in the best traditions of the flight instructor, I was able to assist the student with a reduction in power and also in arresting our descent. Relief was only momentary, however. The flight path of our "almost formation", put the colonel down the center of the airport while Major Bardshiry's aircraft buzzed the Air Force F-4 ramp. My aircraft was lined up directly with the civil ramp in front of the main passenger terminal. I don't think the passengers walking out to their planes saw us coming, but I suspect they were diving for cover as we passed overhead.

After thrilling our unsuspecting audience, things got even better. What began as a dot on the far side of the terminal at our altitude, rapidly became a helicopter that just happened to be hovering directly in our path. This did nothing to lessen my personal anxiety level. I issued my first in-country "I've got it", yanked back on the yoke, successfully avoiding the little guy, and seized the opportunity to review the instructor/student relationship. I don't know what happened to the helo as we overflew it, but I imagine the pilot's life became very interesting for a few moments. Like us, he won't forget the day the P-3Fs arrived in Tehran.

For those of us who like flying low over the water, the flight operations out of Bandar Abbas were simply great! You take off over the beach, level off at 200 feet and

## **The P-3F Program**

BY DAVID READE



In the continuing development of the P-3 Orion by Lockheed, there have been many "firsts" and many derivatives produced. But when Iran placed an order for six P-3C Orions in early 1973, little did anyone know that these six aircraft would establish a number of production firsts, including a new derivative variant model and later, generate one of the most interesting stories about the Orion – full of twists and intrigue.

It all began back in 1973, when the Imperial Iranian Air Force made a request for six P-3C Orions and became the first foreign operator of the P-3C. The IIAF was in the middle of a modernization program to equip its Air Force with the most modern aircraft available. Besides the Orion, the IIAF had also ordered and subsequently received high-tech aircraft such as F-14A Tomcats, F-4 Phantom attack planes, and Boeing 707 air-to-air refueling tankers as well as various types of helicopters.

In the beginning, the Iranian Orions were to have been utilized for typical maritime patrol operations such as long range surface surveillance and ASW. But right from the start, the US Navy refused to let Iran have the sophisticated systems of the P-3C and any of those systems being developed for the Update I program. There was some discussion for a while that the Orion aircraft would be delivered without avionics. But in the end, the decision was made to provide the aircraft with the search capabilities of the P-3A/B Orion - save for the inclusion of an APS-115 search radar, LTN-51 inertial navigation system, ARN-84 TACAN and APN-153 Doppler, as well as a surveillance camera, fit common to the P-3C NUD. The airframe itself was a P-3C on the outspend the next five to seven hours rigging everything in the Persian Gulf. Tankers, freighters, fishing boats, oil platforms and whale sharks all received their appropriate amount of attention. The only threat we had at the time was from the many sea birds that inhabited the area. On one occasion, we took a healthy hit squarely in the radome. The hit pushed the center of the radome backwards into the antenna which conducted over the water for two reasons. During the summer (which seemed like most of the year) the haze level over the land would exceed 21,000 feet. Visibility in the haze was usually between one to three miles making it undesirable to conduct pilot/flight engineer training, as was the turbulence caused by the uneven orographic heating. Temperatures would occasionally exceed 120 degrees over land. Flight ancient Persian bird, and that the Shah's wife, Farah, had been the one to suggest the name, only several years before the P-3F program began.

The new group of Air Force specialists had their own distinctive ranking structure that somewhat paralleled the regular officers except they wore one to four large bars on their shoulders to show rank, with four bars being senior.



### Delivery of the first four Orions to Iran was celebrated with a formation approach full of surprises.

resulted in a terrible grinding noise, followed by electrical fumes in the flight station, the snap of a popping circuit breaker and a scream from the radar operator. Needless to say that strike ruined our mission so we headed home to show off our battle damage to our totally understanding maintenance team. The antenna turned out to be OK after all; the radome was probably the worst damage suffered by our aircraft from other flying obstacles. We experienced many bird strikes during our flights over the Persian Gulf.

A majority of training flights were

conditions, especially for training, were usually much better over the water.

The P-3F squadron was manned entirely by Iranian Air Force personnel. Although it may have been planned initially to augment the Iranian flight crews with Iranian Navy personnel, it never happened. The pilots, navigators and tactical coordinators were regular IIAF officers with a rank structure exactly like that of the U. S. Air Force. The avionics crewmen, and a majority of the flight engineers, were called "Homafars", or IIAF technical specialist officers. We were told that a "Homafar" was an Each of the four bar levels had sub-levels to further delineate seniority as it equates to the standard officer rank structure. A junior one bar Homafar might be similar to a Warrant Officer, while a senior four bar might be equivalent to a colonel.

Surveillance missions were considered as being training flights. As such, the Iranian pilots flew in the left seat. Returning from a surveillance mission one day, we noticed that the entire east end of the Persian Gulf was completely covered by clouds. Beneath the cloud layer, it was extremely clear, with visibility in excess of 20 miles. The Iranian shoreline, the coastal islands and the bases of all of the mountains in the vicinity could be easily seen. We climbed from rigging altitude to 400 feet as we approached the coast south of Bandar Abbas, and called the tower for clearance to enter downwind. The tower cleared us for downwind, stated that there was no other traffic in the area, and reported the ceiling at 800 feet.

Crossing the beach heading for a downwind, the student began to climb. Passing six hundred feet, I asked him where was he going and he told me that he was climbing to one thousand feet. I asked why, and he said that was the normal altitude for the downwind leg. I instructed him to level off and fly downwind at 700 feet. I explained that it would be better if we remained VMC in the VFR traffic pattern. He said that 700 feet was not the proper VFR pattern altitude and I admitted that yes, he was correct, however things are a little different than normal and I was willing to bet that the plane could fly downwind quite well at 700 feet. My next direction really had him doubting my sanity. I told him to not start his descent when turning off the 180, but wait until we intercepted the normal visual glide path. Somehow I could tell that he was having trouble understanding all of these radical changes, so I coached him through the process step-by-step. After reaching the point where 700 feet meets the normal glide path, we began our descent and, from that point forward, everything went normally.

The very next week I was with the same student, returning from a mission over the gulf. The weather over the water was beautiful, "CAVU to the moon" as they say. However, over the land there was a dust storm and from side including the underbelly sonobuoy chutes, but the interior arrangement was more a combination of the P-3A, B and C. There was the P-3A/B side-by-side tactical work stations for the acoustic sensor operator, TACCO and Sensor #3 operator with the navigator's position located in the P-3C's forward TACCO position (port side) and the radio operator-communications suite across the aisle on the starboard side. This unique configuration, spawned the need for a new model designation. The next letter available on the model / class list was F, hence the P-3F Orion was born.

There has been a rumor associated with the P-3F over the years, suggesting that the

aircraft had in-flight refueling receptacles installed in production. Despite previously published accounts, the P-3F Orions were never

equipped with an IFR capability. The US Navy didn't even begin to conduct in-flight refueling proximity test until 1979, let alone have this capability installed in Iranian P-3F in 1974-75. There may have been some discussion on the matter during the program or potentially initial requirements established by the IIAF, but the fact remains that the aircraft were not equipped with IFR.

Iran's strategic maritime patrol operational capability was of less interest to the US Navy than the country's location, right in the center of the Middle East. Iran is bordered on the west by Iraq and Turkey as well as Saudi Arabia across the Persian Gulf and Oman is separated by the Gulf of Oman. To the north is the former Soviet Union, with Afghanistan and Pakistan to the east. To the south lies the Arabian Sea and the vastness of the Indian Ocean.

Iran's strategic location could provide the US Navy a new operational Orion-compatible base in the Middle East from which to launch operations into the Persian Gulf, Arabian Sea, and Indian Ocean. It wasn't too long after the first P-3Fs arrived in Iran that the tempo of US Navy operations increased at Bandar Abbas, where the P-3F training took place.

The Iranian Orion program was



also important to Lockheed, who was contracted to provide flight training, ground maintenance training, and logistical services to the pro-

gram in-country. Approximately 80 Lockheed instructors, technicians and maintenance personnel, along with families, moved to Bandar Abbas. It became the largest and most extensive support effort with a foreign customer that the company ever undertook. There was also an early indication that more Orion aircraft would eventually be ordered by the IIAF, so the establishment of a solid support program was a sensible investment.

By February 1975, the first P-3Fs were delivered to NAS Moffett Field where VP-31 was in the process of training Iranian Orion



Skyline of Bandar Abbas seen over the wall behind residents on shopping spree

the surface to around 3,000 feet, visibility was literally down to nothing. As we approach the beach the student leveled off at 700 feet and prepared to penetrate the wall of dust. We couldn't see any terrain features so I don't know how he expected to find a VFR downwind position, let alone a runway. I strongly suggested a quick climb to 4,000 feet, and then to level off and orbit the area until the storm subsided. When I asked the student why he went to 700 feet, he replied that it had worked quite well the week before. Our delay gave us ample time for a discussion on adaptation to environmental changes as it relates to flying.

During the walk from the line to the hangar, I asked my student if he had benefitted from our experience that day. He admitted that he indeed had. But his "parting shot" to me, was that it would be much easier for a student to learn if the instructor would not change everything so often!

Except for the haze in the air, the weather at Bandar Abbas was usually free of clouds during the summer months. It was, therefore, difficult to get any actual IFR practice and we had to resort to trusting the student to not look outside the aircraft during simulated instrument training. As winter approached, clouds began to appear more and more frequently and instrument flying in actual IMC became the rule, rather than the exception. We could tell at that point, if the students had gained anything from their Summer practice.

Returning from a training flight one afternoon in early winter, the field was IFR. The ceiling was reported at 400 feet requiring an instrument approach. The student was doing a creditable job on the approach as we had made it to final without any errors - he was really concentrating! We broke out of the clouds at 400 feet and I noticed the student's eyes were now more outside than in, without having been told to go visual. I wasn't going to say anything until we reached 200 feet. The final transition to visual occurred at about 250 feet when, with great relief, he shifted his entire attention to the ground ahead. He had the strip of concrete ahead lined up perfectly and was almost going to call for land flaps when I said "take it around!" The slight tinge of irritation that registered in his face, having been called off a successful approach at the very last moment, increased when I asked the question "Where's the runway?" He defiantly pointed over the

nose of the aircraft and said "Right there!" I tried my best to prevent a sarcastic tone in my next question, "What is that over there?" (pointing to the left of the nose). It was indeed, the real runway; we had lined up on the taxiway.

The Lockheed maintenance instructor group initially performed all aircraft maintenance, using OJT to bring their Iranian counterparts up to speed. The maintenance capability that existed at the Bandar Abbas Air Base spanned all the way from operational level through some aspects of depot level. This allowed the P-3Fs to be almost completely independent of external assistance. Lockheed provided specialists in all maintenance fields resulting in a quasi-Navy maintenance department complete with a supply/material section and maintenance control coupled with a Navy AIMD, as well as an Air Force maintenance squadron. As a majority of the Lockheed personnel were ex-Navy, and the IIAF Maintenance Squadron was organized along the lines of the U.S. Air Force, there were some initial differences that had to be, and eventually were, worked out. The IIAF assumed total responsibility for their own maintenance by the middle of 1977, with Lockheed personnel acting mainly as observers.

Living conditions in the Bandar Abbas area definitely appealed to one's pioneer spirit. Although the Iranian equivalent to the chamber of commerce billed Bandar Abbas as the "Miami of the Middle East", the only similarity was sand. There were all kinds of strange things in the water like sharks and sea snakes, and the beach itself was egg laying ground for large sea turtles who preferred that you not be there.

Dealing with the locals was always lots of fun. Their ways are very much



distinctive camo paint scheme that has become synonymous with the P-3F. The camo paint scheme proved to be very effective. During the P-3F s training flights. At NAS Moffett Field, the control tower had a difficult time maintaining visual contact with the P-3Fs in the traffic pattern. Constant radio contact between the aircraft and the tower was necessary for position conformation.

After delivery to Iran in April 1975, the Lockheed training schedule began. Occasionally, the aircraft would be utilized operationally, taking off and heading out over the Arabian Sea and southeast over the Gulf of Oman or northwest across the Persian Gulf to accomplish some mysterious mission.

By 1977, the IJAF had begun negotiations toward the purchase of 12 more P-3C baseline airframes to increase its Orion fleet to 18. Three aircraft were actually ordered during this time frame. But tensions within Iran began to grow. Iran was a predominantly traditional Moslern state and the Shah, their imperial leader, had been making many western style changes. Religious factions began to gain more and more power. By the fall of 1979, the situation came to a head with the instigation of an Islamic Revolution to overthrow the Shah of Iran. The Shah fled the country and the Islamic Revolutionary council took over governing the country. Relations between Iran and the U. S. soon broke down with the eventual taking of American hostages at the American Embassy in Tehran.

During this time, all contact with the Iranian Orions was lost. A series of economic and military embargoes were imple-

mented, isolating Iran from the logistical supply of parts necessary to keep the P-3Fs flying.

Many changes occurred during this period. The Imperial Iranian Air Force gave way to become the Islamic Revolutionary Air Force and the P-3F operations were moved from Bandar Abbas to the tactical air base at Shiraz.

While at Shiraz, a P-3F crashed on 15 February 1985. This particular aircraft, BUNO 159343, had the distinction of being the only P-3F to have been modified by the US Navy and Lockheed with a Harpoon anti-ship missile capability. This crash decreased the number of available and flyable aircraft to five. For the next several years, no fewer than one or two P-3Fs were ever seen flying at any one time. The belief was that the other aircraft were used for parts. But recent intelligence reports have now indicated that after 1988, several P-3Fs were seen flying during the war between Iran and Iraq. It is rumored that a source of spare parts may have been provided during the Iran/Contra incident.

During the more recent Gulf War, two Iranian Orions were seen flying in the Persian Gulf. Only one has been seen flying since then. It is possible that the end of P-3F operations may be at hand. As recently as 1993, Iran bought five Dornier maritime patrol aircraft from Germany. There is also information to suggest that Iran plans to produce more of these aircraft for the Iranian IRAF domestically, in its aircraft production facilities. If so, the remaining P-3Fs could be withdrawn from service and thus bring to an end twenty years of service.

about everything. And, it coats the airframe like paint. It seems like the dust in that area has such an extreme attraction to airplanes, that unbelievable accumulations are possible. During the first several months of operations in Bandar Abbas, there was no means to wash the aircraft, as the local water was totally unsuitable. The aircraft began to change color from tie-dyed blue to tan, and later, orange brown.

On several occasions, during familiarization flight stall practice, an aircraft would begin to stall two to three knots faster than predicted. This indicated either an airspeed error, or an increase in drag and/or gross weight Calibration of the airspeed indicating system eliminated that as a possibility, and there had been nothing added to the aircraft to account for a weight or drag increase, except dirt! This proved to be the culprit when stall speeds returned to normal after the planes were washed. Even engine performance had begun to be affected. A periodic washing program was initiated requiring the aircraft to be flown to Shiraz, where the water quality was acceptable. When the wash rack schedule conflicted with the C-130s that were resident at the Shiraz Air Base, the P-3s went to Vadati Air Base, near the town of Dezful on the border with Iraq. The water was even better there, although the location close to Iraq was not. Relations between the two countries was not good, even then. A "ready alert" posture was always in effect at that base except during lunch.

The first indication that dust was a problem occurred earlier in the program. Dust just seemed to love the airplanes. It coated them like paint and made the windshields something other than transparent. To make matters even more interesting, no one at Bandar Abbas was assigned the task of washing windshields. A line crew was non-existent, and as all of the flight crew members were officers, they were not going to wash windshields. Soon, flying became like driving through Los Angeles during a third stage smog alert. Considerable discussions with the IIAF on this issue resulted in a

Illustration by Terry Hornsby

promise by the Lockheed instructors to ground the airplanes due to some strange desire to be able to see the outside world. In all honesty, it had become an unsafe operation to even try to taxi, let alone fly. Finally a solution was reached. A group of local civilians was hired to come on the base several times a week and wash P-3F windshields. These fellows appeared to take pride in their work, although it took more time to wash a windshield than what we were used to. Still, they were now being cleaned, allowing us to taxi and fly VFR for a change.

I was witness to one instance where a windshield washer solicited an opinion from one of our instructors on how well he had cleaned the windshield. I was standing at the door to the flight station as the Lockheed instructor flight engineer, a retired CPO, was briefing a student. He was distracted by tapping on the windshield. The civilian washer was attempting to get his attention to check on just how good the cleaning job was. (This American was obviously in charge of the airplane at that time.) The instructor looked at the windshield, then at the man, and gave the him the sign we consider as being universal for approval – the old "thumbs-up". The washer's

eyes opened wide, his face registered shock, and he fell backwards off of the ladder. We later found out that particular sign, the "thumbs-up", meant something entirely different there – it was among the highest of insults.

Another example of the problems we encountered with a student crew made up entirely by officers, was the matter of what happened to the contents of the receptacles in the

head after the flight. The toilet was not the problem as the rule, "you use it, you empty it" had been initiated from the outset. The problem was with the fluid container that everyone used during flight. Who was going to empty that? The officers were not going to take care of it, there was no one in the maintenance squadron who was going to take care of it, and no senior officer was going to order someone to take action it would be an insult and the person so ordered would loose face! On several occasions, I walked aboard an aircraft that had sat through a hot night without the fluid canister being emptied – and walked right back off! Once again the Lockheed instructors had to explain the facts of life, namely that unless the problem was solved, the planes would not fly!

Shortly thereafter, one of the Iranian crew men came up with a brilliant answer. Very simple really. Take a section of rubber tubing on the flight, and, during the descent, prior to final landing, hold one end to the head vent and the other into the urinal canister. The container is successfully drained while in the air and nobody has to worry about the unsavory duty of emptying it when back on the ground. These ingenious chaps decided to keep this procedure a secret, probably as a joke to their fellow squadron mates on other crews who were busily trying their own solution to this messy problem, and particularly to those crazy instructors who had caused this flap in the first place. Just let everyone think that the problem was being taken care of, and all is now well. It wasn't until the third or forth flight where the crew was using this new procedure, that it became public knowledge. A TACCO instructor happened to be passing the head, while the operation was in progress. He reported it to the flight engineer and pilot who in turn passed it on to maintenance control. Now, it turns out that there was one small problem with the operation. Uric acid does nothing to assist the longevity of metallic portions of the aircraft, especially the horizontal stabilizer, elevator, and vertical stabilizer and rudder. Those are exactly the areas that become saturated when liquid is siphoned out through the head vent. The Lockheed Chief of Maintenance went completely ballistic when he learned of what was going on and, needless to say, killed that practice immediately. I believe that it was not too long afterward that a permanent remedy was instituted and several of the air crewmen were given an opportunity to participate in some aircraft washing activities.

In early November, 1976, the Shah directed that every aircraft in his military would participate in a armed forces review in Tehran on 12 December. As I had some experience in formation flying, I received the dubious honor of instructing formation flight to our IIAF students and refreshing our Lockheed instructors. We practiced for a month until that day when we flew all six P-3Fs in the review. From his reaction as seen on TV, the Shah was definitely pleased with our showing.

Out of a fantasy short story written by one of our maintenance instructors, Mike Diacin, grew the "Dragon Masters of Lockinheed." Mike was an obvious fan of fantasy and science fiction, and in his bizarre way, he was simply asking for vacation. His story was about a barbarian warrior (himself), who had become very homesick living in a foreign land (Iran), taking care of Dragons (P-3Fs). All of the main characters in his yarn represented actual people, both Lockheed and IIAF, who were in Bandar Abbas. The tale made such a hit among the Lockheed personnel that he was encouraged to produce others after his return from vacation. Through his stories an entire mythology was created in which Dragon Lords managed the system while the STA Dragon Masters maintained and operated the Dragons. For the next two years, additional stories were writ-20 ten that depicted many of the Bandar Abbas group's trials and

Illustration by Terry Hornsby

tribulations in a humorous light as were the activities and antics of these Dragon Lords and Masters. Where did these Dragon personnel come from? They came from a place called "Lockinheed", by the "banks of the river Burr" (Burbank?).

These sagas provided a boost to the morale of our people, who had been existing for a long time under fairly arduous conditions. In short order they became the symbol of the Lockheed P-3F Bandar Abbas cadre. When management became aware of this they approved and adopted the symbol. Soon Lockinheed Dragon Master patches and certificates began to appear. They are now a collector's item.

I departed Bandar Abbas on 7 December, 1977 after 33 months on the program. It wasn't long before all of the less favorable memories faded and only the good ones remained. Even the really bad ones now seem humorous. There are so many stories from that period and only a few are related here. I am certain that there are many other episodes (of which I am not aware) about things that happened to the other instructors. We

> all agreed at the time that if these anecdotes ever got out, no one would believe them. In summary, the P-3F program was a "happening" that few people have the chance to include in their lives. I am very happy that I was able to experience it in mine! ☆

#### About the Author:

Vic Ehlers was with Lockheed Military Flight Operations for more than 16 years as a P-3 test pilot and instructor pilot. Almost seven years were spent overseas training foreign pilots as part of the Iranian P-3F, Canadian CP-140 and Portuguese P-3P programs.

# Not Just Over Water Anymore!

BY DAVID READE



CAST EYES on board a NAWC Point Mugu NP-3D Orion located in the starboard side aft observers station



In the years since the demise of the former Soviet Union and the evolution of the P-3 Orion's principle mission of ASW to that of maritime patrol, the P-3 has accumulated a number of additional mission taskings including UN/NATO embargo enforcement, maritime surveillance and intelligence as well as more non-traditional roles of counter-narcotics and special operations such as jumptraining support.

The latest evolution for Orion missions, demonstrates once again the multi-mission versatility of the P-3 by providing surveillance intelligence to U.S. Navy and NATO operations worldwide. The newest mission being added to the ever growing list is overland surveillance. In this role, the Orion provides real time images to command headquarters.

The overland mission is a strategic surveillance role that utilizes both existing and newly installed non-acoustic sensors aboard USN fleet Orions to gather intelligence data. The sensors employed the aircraft's Inverse Synthetic Aperture Radar (ISAR), it's Infrared Detecting Set (IRDS) and the Orion's newest sensor, the electro-optical system or EOS.

Electro-optical systems are stabilized airborne surveillance systems that provide high-resolution video imagery. They have the capability to detect and monitor objects during the day, in clear to light hazy conditions and at night from dusk to evenings, with a quarter to full moon illumination – well outside the range of hostile air defenses. The imagery can be recorded on tape aboard the aircraft or digitally transmitted back to command centers as it happens via line-of-sight tactical link networks (radios) or by satellite communications systems.

This ability to provide immediate

intelligence to the battle group commanders on the ground, speeds up reaction time. It eliminates the subjective intelligence information of voice reports based on the interpretation of various onboard sensors and offers faster, accurate, more concrete data. Because the images are current and accurate they are pictures "worth more than a thousand words."



Ranger rescue.

The overland mission today is centered over the republics of the former Yugoslavia. Images are relayed to UN Commanders in Sarajevo and NATO Commanders in Naples, Italy. During the conflict, overland P-3s were tasked with monitoring various troop movements within Bosnia, locating artillery emplacements and pinpointing other military targets in support of UN/NATO air strikes. The aircraft also provided battle damage assessments (BDA) after those strikes as well as conducting Adriatic Sea coastal patrol flights, monitoring the activities of coastal combatants and peering into local seaports for evidence of embargo violations.

It was a Navy P-3 that located where a Bosnian shell was fired from during an artillery attack on a Sarajevo market place. The information was immediately passed to UN commanders who condemned the attack and can use the evidence collected for any eventual war crimes tribunal. This is not the first time that P-3s have ventured over land. In 1991 in the Gulf War with Iraq, special P-3s equipped with EOS systems flew overland surveillance missions to define the threat posed by the Iraqi's air defense systems. Later, the P-3s provided realtime BDA on inland and coastal targets.

The overland mission took on added dimension in Somalia (1994), when over-

land P-3 provided real-time imagery transmission of the U.S. Marine landings. Each phase of the operation was watched by task force commanders as it happened. Later the aircraft were utilized to locate and track the Somali warlord General Hadid throughout the city of Mogadishu. The unique capabilities of the overland P-3s were further demonstrated by capturing imagery of the U. S. Army's Ranger Rescue ration as it happened

operation, as it happened.

Again in 1994, during operations in Rwanda, the special EOS P-3s provided non-military assistance to humanitarian relief aid organizations by locating and monitoring refugee camps in neighboring countries. This overland humanitarian operation later incorporated intelligence gathering flights on the warring tribes in Rwanda, due to fears that the tribes that initiated the civil war there would attack refugees returning to their homes.

At the same time, the special EOS P-3s were flying overland in Rwanda, other EOS equipped P-3s were supporting Caribbean based battle groups, gathering pre-invasion intelligence of Haiti during the crisis there in 1994-95. Although there wasn't any invasion of Haiti and the incident was resolved diplomatically, the UN peacekeepers and US troops coming ashore to restore democracy to the Caribbean nation could not have properly done so, without the intelligence collected by the overland P-3. The overland P-3 went on to support the peace keeping troops on the ground in Haiti.

Another recent development is the P-3 support of Marine amphibious

the same information through the longrange lens of the electro-optical systems. There is even data to suggest that eliminating the need to rig ships saves considerable amounts of fuel. level video technology. It was initially designed as a ground based system used to support various rolling airframe missile tests, close-in weapons tests, Seasparrow, and Sidewinder, Harpoon, and Tom-



assault exercises. They have been providing the task force commander with beach reconnaissance prior to amphibious assaults and real-time surveillance of the Marine landings in numerous exercises from the east coast of the United States to locations in Spain, Tunisia and Sardinia.

The new overland mission of the P-3 Orion is a natural extension of the capabilities inherent in the aircraft. The addition of the electro-optical systems onboard enhances existing ASW, ASUW, SAR and coastal surveillance missions. Even the Sharp Guard operation, supporting sanctions against the former republics of Yugoslavia, have been enhanced by the advent of EOS units into the aircraft. Sharp Guard operated out of the Naval Air Station Sigonella and monitored all surface traffic within the Adriatic Sea, with special attention to coastal seaports.

Instead of constantly changing altitudes to rig ships – the process by which an aircraft descends to near sea level to note identifying characteristics, name and registry of vessels – the Orions with EOS remain at comfortable altitudes collecting

Rwanda refugees.

### Electro-Optical Systems Development

Although the P-3 overland surveillance mission is made possible through the employment of a variety of nonacoustic sensors aboard the aircraft, its the utilization of electro-optical systems that is synonymous with this new mission. Electro-optical systems have been around for years, since the 1970's when the Pacific Missile Test Center (now NAWC-WD Point Mugu) developed an EOS program to improve their air-to-air photographic systems to capture imagery of missile tests. At the time, conventional ground-based equipment could not photograph these tests far out to sea, at high altitudes or over the large expanse of test range areas. Normal photographic systems were also insufficient at tracking test objects moving at great speeds and were further effected by such limitation as safety concerns.

In 1975, PMTC produced an EOS system called Cast Glance. Cast Glance was designed as a flexible tracking system that combined the best gyro-stabilized mirror engineering with that of low light ahawk missile launches and impact trials. The EOS system also provided imagery support to USAF satellite and MX missile launches at Vandenberg AFB. Cast Glance formed the basis of other EOS systems that are now utilized on LST surface vessels and submarines integrated through their periscopes.

But it was on April 2, 1979 that PMTC first took electro-optical systems into the air. An EOS system known as Cast Glance II was flight tested aboard a PMTC EP-3A Orion. The system was developed specifically for airborne optical range surveillance, engineering data acquisition and documentation coverage of aerial and ground target tests.

Cast Glance II was built very sturdily with gyro-stabilized optics and a gimbal mirror assembly. Other components include a 80 inch focal length telescope, video camera assembly, video recorders and various track handle selector controls to operate the unit. An acquisition sight mounted in the pilot's portside cockpit window, linked to the targeting control mechanism on the system located in the back of the aircraft. Cast Glance systems have also been utilized by the U. S. Air Force onboard C-130 Hercules, RC-135 and KC-135 aircraft as well as various military helicopters and chase jets. The PMTC EOS division has since improved Cast Glance, developing an enhanced electro-optical system called Cast Eyes.

Cast Eyes was the system, that in 1990, caught the eye of a young Navy commander assigned as operations officer to the staff of COMPATWING-SLANT. Now Captain John D. Roberts envisioned the utilization of electro-optical systems by maritime patrol P-3 Orions. He was instrumental in borrowing a

hybrid Cast Eyes unit from NAWC Point Mugu and with the cooperation of Commander Task Force Four in Key West, Fla. installed the EOS system aboard a VP-11 P-3C and deployed the aircraft for operational testing. This included the counter narcotics surveillance mission. The system was nicknamed Forecast, a metaphor for the potential use of EOS systems in maritime patrol environment in the future.

The Cast Eyes system is currently being utilized by NAWC-AD Point Mugu onboard their range NP-3D Orions. The aircraft are configured to house



Battle damage assessment – Bosnia

the EOS systems in both the forward and aft starboard observer stations. It was a NAWC Point Mugu Orion equipped with CAST EYES that caught footage of the 1986 Space Shuttle Challenger explosion. It assisted in locating wreckage of the spacecraft after the disaster. Point Mugu Orions often supported Space Shuttle launches, tracking the solid rocket boosters after they departed the spacecraft.

Having successfully proven the unique capabilities of electro-optical systems in the MPA role, the Cast Eyes / Forecast evaluation lead to greater inter-



Haiti – port scene

est among NAVAIR program offices. The most interested was the counter narcotics program, who had recently been autho-

> rized funds to acquire new surveillance sensors to give the fleet P-3C an air-to-surface anti-drug surveillance capability. The capabilities of an electro-optical system provided the means to fulfill those requirements and newly proposed requirements adding a air-to-air intercept capability to the aircraft. It was under this marrying of counter narcotics requirements that the P-3 Counter Drug Update program was formed and with it the establishment of further develop-ment of electro-optical system for the Orion.



Marine landing

In 1992, the then Naval Air Development Center (NADC) in Warminster, Pennsylvania began engineering the com-

> ponent package for the Counter Drug Update program. It would include devising an improved electro-optical system to the Cast Eyes / Forecast unit. NADC chose to develop a scaled down version of an electro optical system it had produced in the early 1980's called TOSS or Tactical Optical Surveillance System. The new system, dubbed mini-TOSS, was combined with a fire control radar and dual communications system to form a quick- installation (roll-on /

roll-off) package, which would form the heart of the update. The system was comprised of an operator station located at the starboard side aft observer station with an optical sub-system located in the TACCO station window flat modified for optical quality. After installation of this prototype, the mini-TOSS label was replaced with the new moniker of Cluster Ranger.

Cluster Ranger, now a component of CDU, was deployed to the Caribbean to begin operational testing in the counter narcotics role which included locating and tracking suspected drug smuggling aircraft, locating and monitoring suspected surface vessels and conducting longrange standoff overland surveillance for a number of government agencies involved in the drug war.

Besides being a major component of the CDU program, this prototype EOS system was simultaneously the operational electro-optical system for fleet MPA P-3 Orions. By mid 1993, funding for additional EOS systems was in progress. It wasn't until the announcement of the Navy's proposed Anti-Surface Warfare Improvement Program or AIP that the new Cluster Ranger electrooptical system could find the funding it needed. acquired with additional units to be purchased as modifications get underway.

As for the CDU program, production of some 18 kits started in January of 1995 with the first production AVX-1 Cluster Ranger system installed in a fleet P-3 during October 1995. Even before it had a chance of completing its operational evaluation, the prototype / CDU Cluster Ranger system was diverted from its counter-narcotics mission out of Panama and deployed to Puerto Rico and Cuba to provide pre-invasion intelligence gathering support to the UN's on-going Support Democracy operations in Haiti. The RAF is tentatively describing the sensor as a Electro-Optical Search and Detection System or EOSDS. Canada is another P-3 operator establishing requirements for an electro-optical system as part of its Aurora Life Extension Project. The ALEP upgrade program seeks to replace the CP-140 Aurora's existing OR-5008/AA forward looking infrared system with that of a multi-sensor electro-optical suite consisting of an improved FLIR, low light level television (LLLTV) and a laser illuminator for active gated TV. The EOS system hopes to be an integrated one with the optical sub-



The AIP program's goal is to improve the anti-surface warfare capability of existing fleet P-3C Update III's and includes the incorporation of the Cluster Ranger into the aircraft. Under AIP, Cluster Ranger's operators station is fitted into the starboard side aft observers station with the optical sub-system installed in to the TACCO station modified window and the addition of a defrosting device. The system also includes a target acquisition sight for the cockpit.

Of the 64 fleet P-3C Update III Orions to be modified under AIP, all the aircraft will be provisioned for the roll-on / roll-off Cluster Ranger system, recently designated AVX-1. Current AIP funding allows for 32 electro-optical units to be In search of Somalian Warlord General Adid

Electro-optical systems are fast becoming a mainstay of future MPA Operations. Potential P-3 operators are looking at EOS systems as part of future upgrades and the Orion 2000, has provisions for the new non-acoustic EOS sensor, with its open architecture. The proposed layout includes a Cluster Ranger operator station located in the portside side aft operator's station (just aft of the main cabin door) with the optical subsystem placed forward of the wing in the new portside observer station window.

In the currently on-going search for a replacement MPA aircraft, the United Kingdom has identified a requirement for an electro-optical system with long-range identification and stand-off capabilities. systems housed in a ball-turret pod similar to the aircraft's existing FLIR pod. Electro-optical systems are just now beginning to demonstrate their capabilities in service with US Customs. The Customs Airborne Stand-Off Surveillance System or CASOSS, is a production Cluster Ranger EOS system employed in the counter-narcotics role aboard USCS P-3A slick Orions. The US Coast Guard is also vying for EOS systems, to aid in their search and rescue operations.

The other aspect of the P-3's overland surveillance capability, encompasses the down-link transmission of EOS imagery to ground based battle group commanders. There are currently two devices that are used to transmit and receive EOS imagery from P-3s. The first is the Phototelesis, an off-the-shelf digital laptop transmission system capable of sending still video imagery over standard P-3 Orion radio link nets. The technology is likened to a fax machine, originally developed for the drug enforcement agency. This airborne surveillance system was called SIDS-RIT, short for Secondary Imaging Dissemination System-Remote Imaging Transceiver. The Phototelesis system was also a component in another airborne surveillance system utilized by S-3 Viking aircraft employed in counter narcotics missions. Known as TADCS for the Tactical Airborne Digital Camera System, the standoff tactical surveillance system comprised of a digital camera, the laptop Phototelesis transceiver and an antenna fitted into the aircraft's sonobuoy tubes.

The second transceiver for electro-optical systems is called Pioneer. Pioneer is a digital video downlink system that can transmit color video imagery in real-time, over standard VHF line-of-sight radios. The system is based on commercial, off-the-shelf computer and video technology. The transceiver system itself is borrowed from an existing US Army downlink unit utilized on pilot-less UAV reconnaissance drones. The Pioneer system, integrated with an encryptic guard, is compact (about the size of desktop computer) and encompasses a four foot dish antenna. The dish antenna is flexible enough to be setup at a ground based Tactical Support Center (TSC), onboard ship or remotely on the battle field. As for the future of electro-optical systems and the overland mission, EOS P-3 continue to be utilized in the current on-going operations in Bosnia and the Adriatic as well as participating in various amphibious exercises. As the CDU and AIP programs get underway, additional aircraft will be prepared to maintain a ready status towards future conflicts where the unique capabilities of the overland surveillance P-3 Orions are needed.☆

### **CLUSTER RANGER**

A stabilized optic / gimbal mirrored electro-optical system developed by NAWC Warminster specifically for maritime patrol applications. The system works by light from the target entering the aircraft's optical window (modi-



fied flat to optical quality) and being reflected into a 70 inch mirror – down to another mirror set at 45 degrees that redirects the light into a prism splitting the light between a dual field video acquisition camera and a 70 inch focal length telescope. The light is then reflected again onto a video camera to produce high-resolution color imagery on video tape or film. Cluster Ranger installations on the P-3 includes the operator station in the starboard side aft observer's station with the optical sub-system positioned in the portside aft observer's station window (modified flat) on the prototype / CDU test air-

craft and the optical sub-system located in the P-3C's TACCO station window (modified flat) on the production CDU aircraft and the funded AIP program aircraft. (these EOS systems are designed as a roll-on / roll-off package that takes three hours to install).

### **CAST GLANCE**

A gyro-stabilized optical / gimbaled mirror electro-optical system developed by the Pacific Missile Test Center – Point Mugu, California. The system works by light from the target entering through the aircrafts window (modi-



fied flat to optical quality) into an optical box. The light is then reflected down through the optical box and into an 80 inch focal length telescope to be redirected again onto the wide field of view of a video camera to provide high-resolution black and white imagery. Installations of the system into the P-3 includes the operators station positioned in the forward and aft starbard side observer's station on NAWC Point Mugu NP-3D range test aircraft and in the portside aft observer's station on USN fleet P-3C being utilized in the Adriatic. Optimal operation provides for the

EOS system to be located forward of the wing – staying clear of the engine exhaust. The current configuration requires the engine loitering for clear viewing.  $\overleftrightarrow$ 

### **GREECE JOINS WORLD WIDE P-3 FRATERNITY**

Refurbished P-3Bs Delivered to Hellenic Navy



Two refurbished P-3B Orions have been delivered to Greece as of June this year, and four more will follow. Further delivery is scheduled for one per month in August and September, and in February and March 1997 for a total of six operational aircraft. In addition, the Hellenic Navy has receive four P-3As for ground trainers and spare parts. The P-3 acquisition is an exchange for base rights, stemming from a 1990 defense co-operation agreement between the US and the Greek governments, allowing for the retention of the military base at Souda Bay, Crete, and a number of existing communications sites throughout the country. The Orions replace the Hellenic Navy's ageing fleet of HU-16 Albatross amphibious seaplanes.

The Greek P-3s are similar to light weight TACNAVMOD P-3Bs used by the Navy Reserve. The aircraft are being prepared by Raytheon E-Systems of Waco, Texas via a contract which allows the company to augment the NADEPs, the Navy's maintenance depots. Raytheon E-Systems will perform phased depot level maintenance, airframe rework and facilitate the overhaul of the engines and landing gear. This includes inspections of the airframes with emphasis on corrosion control.

The interior of the Orions are being fitted with new wall coverings (as required), curtains, floor boards and equipment bay doors. The overall habitability is also being enhanced by refurbishment of the galley table and bench. A standard allgray tactical paint scheme with darker Hellenic Navy markings is being applied.

The first finished P-3B was rolled out on 22 May 1996. The four P-3As were delivered last year. Two will be used for ground maintenance training and two will be disassembled by Hellenic Aerospace at Tanagra, Greece, for spare parts.

The Orions will be operated by No. 353 Squadron, under the 112 Wing at Elefsis Air Base located northwest of Athens. Hellenic Air Force pilots will do the flying, while the tactical compartment will be manned by Hellenic Navy personnel.  $- D_{AVID READE}$  be boarded and searched or diverted to an Italian port for inspection. By mission's end, patrol aircraft had screened and queried 54,600 vessels.

P-3C Orions and the other Maritime Patrol Aircraft proved vital to Sharp Guard's success by providing extended radar horizons, antisubmarine warfare support, anti-surface capability, and armed deterrence. While the ships were involved with boarding and searching vessel, patrol aircraft kept a constant watch over all shipping in the busy straits of Otranto. Over the course of the operation there were several ships which overtly attempted to violate the embargo and were successfully countered by the allied effort.

"Success stories like Sharp Guard further highlight NATO's ability to not only contain an armed conflict, but to create a solid foundation for peace," said RADM Ryan. "The professionalism and enthusiasm of the people who participated in Operation Sharp Guard will continue to add strength and experience to the NATO alliance for years to come." he said. - LCDR BILL SPANN.

TOMAHAWK TELEMETRY UPGRADE

As defense budget restraints continue, many military program managers have become experts at making do with less. This is the case at the Naval Air Warfare Center – Point Mugu, Calif. NAWC completed modification of two NP-3D Orions, which enables them to act as command and control platforms for the Tomahawk tactical land attack missile (TLAM) test program at remote ranges worldwide. Costly ground control stations can be eliminated.

The Tomahawk telemetry upgrade will be applied to the existing telemetry systems on board two Point Mugu NP-3D Orions, 150521 and 150522. These aircraft, equipped with telemetry phased array antennas housed in horizontal extensions of the Orion's vertical stabilizer, support a number of missile test programs that include Harpoon, Trident and Peace-keeper missiles. The aircraft can receive and track up to five missile telemetries simultaneously and down-link the data if desired. The new upgrade, an addition to the existing aircraft capabilities, provides for the command and control center to be located on board the aircraft, by incorporation of the mission test director, test conductor and data analyst.

The upgrade program consists of a number of hardware and software developments as well as structural and interior mechanical fabrications made to the aircraft. These include four commercial grade 486 computers, four serial data boards, four 17-inch situational displays and digital control-roomcompatible data displays. Additionally, two new Mk 12, sixteen-channel thermal data recorders referred to as "strip charts," have been installed as well as telemetry related hardware and a 486 computer-base mobile track system. It should be noted that the technical requirements and funding limitations were considerations in the equipment selections and overall system design.



The way it works is, the missile's telemetry data and positioning information is received by the aircraft's phased array "billboard" antenna. The data is processed and input to the Tomahawk thermal strip chart display for analysis and passed to the 486 computer display through software interfaces, to be displayed along with tracking information. The data base includes a variety of range boundary and world maps scaled to the geographic regions where the test is being conducted.

The installation and integration of the system onto the NAWC Orions by NAWC Pt. Mugu Weapons Division and a support contractor, was accomplished within a year of funding. The first aircraft has already provided mission support to Tomahawk tests in California, and the second aircraft has supported tests in Florida.

In the future, further improvements to the Tomahawk upgrade are planned, adding high power command/destruct signal transmitters (currently housed aboard chase aircraft) and an improved mission communications capability.

- DAVID READE