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June ♦ July 2012
Volume 3, Issue 4

The Magazine



- ✈ **TICO, El Centro, Yuma and Davis-Monthan Air Shows**
- ✈ **Onboard the Red Bull DC-6B**
- ✈ **International Aerospace Exhibition for Africa, Morocco**
- ✈ **Doolittle Tokyo Raiders 70th Anniversary**
- ✈ **The Space Shuttle over DC and so much more**



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Index page: Space Shuttle Enterprise arriving in New York City, photo by Dan Adams.



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Behind the Lens & to the point

By Laszlo

Welcome to our **Free and green** June – July 2012 on-line issue of *The Magazine* by www.AirShowsReview.com.

The air show season is now well under the way, and due to the world wide economic crisis, the shows are different than they used to be: many have cut back on the duration of display flight programs, and several of the static displays offer less aircraft to view. We especially miss the ACC's Demo Teams in North America! The economic crisis also affected us at ASR. We, had to cut back on our coverage of several air shows, due to the high fuel and other associated travel cost incurred attending these events.

On the brighter side, we had a chance to cover our first African event, the International Aerospace Exhibition for Africa, at Marrakech, Morocco. Another first for us being invited to fly on the Red Bull DC-6B, in Austria. We also have excellent images of the Shuttles Discovery and the Enterprise shuttled on the back of the specially modified 747 to Washington and to New York City respectively. You can watch the landing of the shuttle by clicking on the You tube link, courtesy of our contributor Dan Adams.

If you are interested becoming one of our contributors, have a DSLR camera, located on the West Coast of the USA or Canada, or located in the South-west USA, in Europe, Australia, Japan or Asia feel free to contact us: editor@airshowsreview.com



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IMPORTANT NOTE: *The Magazine* is interactive with invisible hot-links, by hovering over some of the images and advertisements, the cursor changes into a pointing hand and a small window will highlight the destination path to the web site that the reader can visit for further information.

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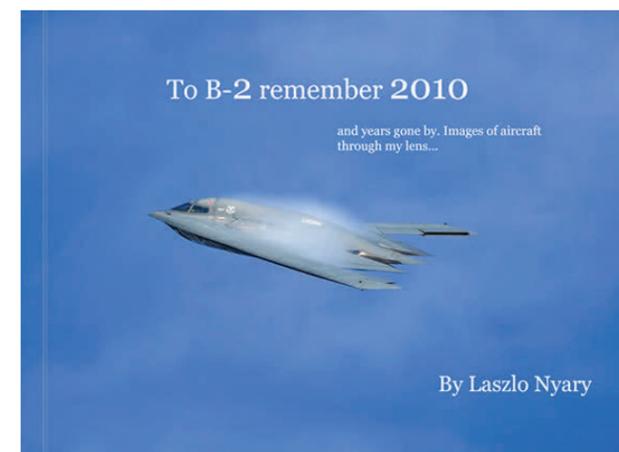


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2012 TICO Air Show

Report and photography by Dan Adams

The three-day TICO Warbird Air Show was held this year from March 9 through March 11, 2012. For the 35th consecutive year, the show was hosted by the Valiant Air Command Warbird Museum (also located at Space Coast Regional Airport across from the air show flight line). This year's theme was a celebration of the 70th anniversary of the Doolittle raid. In attendance was Lt. Colonel Richard Cole who was the co-pilot on Doolittle's B-25 during the raid.

All three days follow roughly the same schedule. Air show gates open at 8:30am and visitors are invited to walk the extensive flight line as well as the static and vendor areas. The packed flight line reflected the fact that this show puts a tremendous variety of aircraft in the air. Covering almost every decade of flight, this year's flight line had aircraft ranging from a "Red Baron" Fokker Dr.1 Triplane to an Aero L-39 Albatros. Of course, in keeping with this year's theme, there were also 4 B-25s in attendance. There were no fewer than 35 aircraft flying each day. For sheer variety, this show is hard to beat.

Unlike most shows, the crowd at TICO is given several hours to get up close and personal with the flying aircraft before the flying begins. The flight line is then closed around noon and the pilots and ground crews begin to ready their aircraft for the flying display, which begins about an hour later. So, while most shows begin with a flying display, this air show gives ample time for the spectators to walk around and take in the sights. If you are only interested in the flying events, you could consider arriving later to this show. However, the crowds for all 3 days totaled over 40,000 so the parking lots and prime seating areas do fill up.

In addition to the flying, there are several static displays at the show. Chief among them are the aircraft from the Valiant Air Command museum that are towed over from the other side of the airport. These aircraft include an F-14, F-8K, A-6, F4F Wildcat and many more. Active duty military aircraft represented at the show included an HC-130 from the USAF's 39th Rescue Squadron and an HH-60 from the 301st Rescue Squadron. While viewing the fascinating static displays or talking to one of the many museum volunteers on hand, most of which flew in the types of aircraft that are on display, one may hear the distinct pop-pop-pop of firearms. Not to be alarmed though, there are actually two possible sources for the noise. The Knight's Armament Company factory is right across the runway from the flightline. In addition, the TICO air show attracts a fair amount of WW2 reenactors that display their faithfully recreated uniforms and gear and then stage a mock assault for the crowd. Dressed as American Marines and soldiers facing off against Japanese and German troops, they sprint across the 'battlefield' while firing their weapons (blanks of course) and taking cover behind obstacles. When not engaged in the realistic battle, the reenactors are available to answer any questions visitors may have. Two jeeps with mounted machine guns and a firing artillery piece rounded out the display.



A B-25 with a British North African camouflage scheme looked stunning.



While the flying does not start until about 4 hours after the gates open, once it does start it is virtually non-stop through the end of the show. The show begins with a jump team flying in the US flag, using an AC-47 gunship as their jump platform. From there, the flying really "takes off" as a parade of aircraft through the different ages of aviation. The Air Boss does a phenomenal job making sure there is something going on in the air at all times. You are transported from a WW1 dogfight between a Fokker Triplane and a Sopwith Camel to T-6 Texan trainers, T-28 Trojan trainers and then to the launch of the WW2 B-25 Mitchell bombers. The four flying Mitchells this year included Panchito, Killer Bee, Barbie III and Wild Cargo. While not flying as part of the show schedule, the world's only flying B-29 was also present. The Commemorative Air Force's Fifi was available for tours and took paying customers for two flights daily. A P-51, P-40 and F4U Corsair rounded out the WW2 era of flight. Modern aircraft flying for the crowd included Doug Matthews' stunning T-33 and Dan Carr's A-4 Skyhawk. Mark Sorenson flew his amazing "Tumbling Tiger" smoke ring show in which the aerobatic pilot flew through smoke rings in the air created by his ground crew. Finally, the civilian Black Diamond Jet Team (known last season as the Heavy Metal Jet Team) wowed the crowd with astounding precision formation flying in their three L-39s and a T-33 (flown by the legendary Dale "Snort" Snodgrass). On Saturday only, a B-2 Spirit stealth bomber delighted the crowd with three passes.

Perhaps because it is spread over the course of three days as opposed to two as with most air shows, the crowds seem to be more spread out. This could also be because there are a lot of attractions throughout the venue that keep the crowd busy and moving around. The end result is that although thousands attend the show, it has the charm and vibe of a smaller show. Bathroom facilities were plentiful and vendors offered a wide variety of food, drink and souvenirs all of which were reasonably priced. For those photographers looking to attend, the show line is very close to the taxiway and active runway and the sun is at your back throughout the day.

This is a wonderful show that features something for everyone from a wide variety of flying aircraft and static displays, to authentic WW2 reenactors and classic cars. It is highly recommended whether you are in the area, or plan to travel there just for the show.

Special thank you to Colonel Terry Yon, USA (Ret.), Public Affairs Officer, for his invaluable assistance throughout the show.



The T-33 of the Black Diamond Jet Team, formerly known as the Heavy Metal Jet Team, top left. The B-2 Spirit stealth bomber flyby, top right. The A-4 Skyhawk, below.



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NAF EL CENTRO
REVIEW AND PHOTOGRAPHY BY NORMAN A GRAF

The 2012 North American Air Show season began in earnest on Saturday, March 10 in the sunny Imperial Valley of Southern California. NAF El Centro, the winter home of the United States Navy Flight Demonstration Squadron, the Blue Angels, held its annual air show, marking the end of the Blue Angels' training and the beginning of their show season. The show is small and intimate, drawing a crowd of around 35,000 and providing up-close and personal access to the performers and aircraft.

On Friday evening the base opened its doors to host an entertainment and food festival featuring food from local restaurants, live music, and an impressive fireworks display.

The gates opened promptly at 0800. Parking and security screening were both very efficiently conducted by base personnel. There is a very long and open flightline available for setting up chairs and staking out a spot to view the day's flying. There was then plenty of time to view the static aircraft. Pride of place just inside the entrance gate was a colorful MV-22 Osprey and CH-53E Super Stallion. An AH-1W Super Cobra rounded out the list of Marine aircraft. The Air Force sent one of their oldest, the B-52H, from Barksdale AFB, and newest, the unmanned MQ-1B Predator, along with its shipping box, from Creech AFB. The Navy was, of course, well represented. The ubiquitous Hornet was there from the colorful C model of the "Mighty Shrikes" (VFA-94), through the E & F models from VFA-122, to two EA-18G Growlers from VAQ-129. Two beautifully painted Goshawks and a T-34C Mentor were there to demonstrate the important role of trainers.

An aggressor F-5 from NAS Fallon looked great in its grey "lizard" camouflage, and one of only three S-3 Vikings left in the fleet showed up from NAS Point Mugu. A red-tailed Seahawk from NAS North Island completed the lineup of colorful Navy aircraft. Warbirds ranged the gamut from trainers (T-28 Trojan, T-34 Mentor, SNJ & L-29 Delfin), to transports (C-53D Skytrooper & C-45 Expeditor) to fighter (Mustang and Spitfire). A brightly painted HU-16 Albatross was also present, although in the markings of its current civilian employer.

The flying began right on time at 1000, with the takeoff of the C-2 Greyhound carrying the Leap Frogs for their opening jump. Veteran Bill Cornick then took to the skies for an amazing aerobatic demonstration in his Pitts S-2C "Big Bad Green".

He was followed by Spencer Suderman with a thrilling demonstration in his red and black Meteor Pitts. The next aerobatic demo featured a highly polished RV-8, flown by Joe "Rifle" Shetterley. Although this was his first civilian demo, airshow fans will recall that Capt Shetterley was the A-10 West demo pilot the past two years. It was good to see him back in the air and his flight was the perfect segue into the next performance, the Super Hornet tactical demonstration. It was time to put in the earplugs and get ready for some noise as the F/A-18E from VFA-122, NAS Lemoore, taxied out. It was an awesome display of power and control as the Super Hornet tore up the sky. After the demo jet landed, another one took off along with an F8F Bearcat from the Commemorative Air Force for the Navy Tailhook Legacy Flight. This flight pairs an active duty aircraft with a warbird in tight formation as they make several fly-bys, culminating in a pass from behind over the crowd. A Search and Rescue (SAR) mission was then simulated by the "Longhorns" from NAS Fallon flying a hi-vis MH-60S Seahawk. New to the demo this year was two rescuers being lowered simultaneously, something not possible with last year's Foxtrot model of the Seahawk. Then it was time for the Leap Frogs' full parachute demonstration. Jumping once again from the C-2, the Navy parachutists performed a number of amazing acrobatic maneuvers including joining up in twos and threes and hurtling face-first to the ground, separating seemingly at the last moment and landing directly on target. Bill Cornick and Spencer Suderman then engaged in their Acro-racing performance, where the two race head-to-head to complete a series of aerobatic maneuvers faster than the other. This demonstration was pioneered by them several years ago here at El Centro and is now spreading throughout the air show community as an exciting new addition to the air show repertoire. A short break allowed people to visit the many vendor stalls, get a bite to eat or enjoy a refreshing beer.

The second half of the show started off with an aerobatic demonstration from Tim Weber, debuting his new airshow plane, the bright blue and gold GEICO MXS, featuring the gecko on its tail. Although just barely finished in time to appear at the airshow, Tim flew it as if it had been his long-time mount, but clearly enjoying the increased performance over last year's Extra 300. Torrey Ward then flew the final civilian aerobatic demonstration in his Glasair III. The Blue Angels' usual C-130 support aircraft is undergoing maintenance, so the all-Marine crew of "Fat Albert" flew a borrowed Hercules nicknamed "Ernie". Their spirited demonstration clearly exhibited the amazing capabilities of the 50+ year-old aircraft design. Then it was time for the main event: the Blue Angels in their first appearance of the 2012 season. The pilots march out in formation as they are being introduced, breaking off to board their aircraft as their name is called out. The system checks reveal a problem with the #5 jet, bringing the support crews back out to attempt a repair. Even replacing an electronics unit in the cockpit fails to resolve the issue, so lead solo LT C.J. Simonsen is quickly shuttled to the waiting replacement aircraft as the diamond takes off. Despite the excellent maintenance, the F/A-18A model is showing its age. Finally all six aircraft are in the air, performing their routines with precision honed by 120 training flights during the past several months.

The lighting is perfect to photograph the blue and gold Hornets as they fly through the beautifully clear and cloudless skies over the Imperial Valley. Following a short debrief after the flight, the pilots made their way over to the flightline to sign autographs and answer questions from the crowds of fans. Then it was time to head for the parking lot, stopping off to take a few more photos of the aircraft on static display. The traffic moves quickly and soon NAF El Centro recedes in the rear-view mirror. The perfect start to the 2012 Air Show season.



A Search and Rescue (SAR) demo by the "Longhorns" from NAS Fallon flying a hi-vis MH-60S Seahawk, left. The Navy Legacy Flight with an F-18 and a F8F Bearcat, top right. The Blue Angels, below right.





- Tim Weber, in his GEICO MXS, top left.
- Joe "Rifle" Shetterley in his RV-8, bottom left.
- The Navy Blue Angels #7, above.

FLYING WITH THE FLYING BULLS DOUGLAS DC-6B

ARTICLE AND PHOTOGRAPHY BY WOLFGANG JARISCH



THE FLYING BULLS



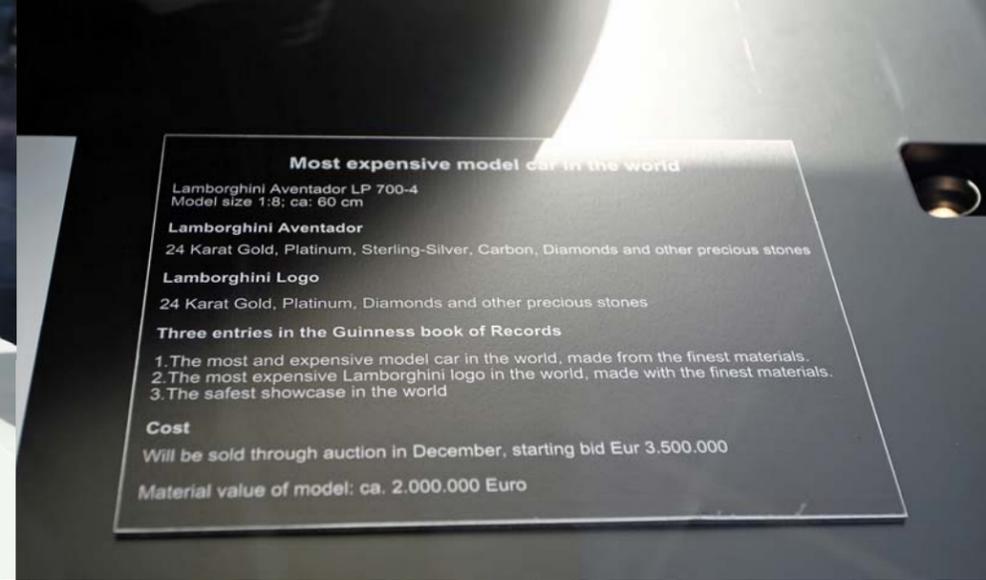
As a photo journalist, not often does one receive a call from an organization such as the Flying Bulls with an invitation for a flight in their flagship. Just imagine the surprise when on March 12th I received a call from Mrs. Sylvia Pichler, the Assistant to the General Manager & Flight Operations, informing me that on Friday March 16th, there was a seat reserved for AirShowsReview, and would I be available if I had the time? I accepted her kind offer immediately, of course! Let's face it, there is no chance to buy a flight on Europe's last flying Douglas DC-6; it is possible by invitation only.

"A dream that came true," I thought to myself! The first thing I did after her call was to look anxiously at the weather forecast for March 16th. The weather forecast couldn't have been any better: warm, sunny, with no clouds. This was one of those rare moments in life when everything lines up so perfectly, and I needed a bit of time for all to sink in. As a representative of AirShowReviews, I felt proud that we were offered such an opportunity.

On Friday morning I drove from my hometown in upper Austria to Salzburg, the home of the "Flying Bulls' Hangar 7. <http://www.hangar-7.com>

To enter Hangar 7 is to step into another world. It's simply amazing! Hangar 7 exudes performance; full of immaculately kept winged aircraft, helicopters, Formula 1 racing cars, NASCAR racing cars, racing motorcycles and the most expensive model car in the world, a 1:8 scale replica of a Lamborghini Aventador LP 700-4. The model is more expensive than the real car, as it is made from 24K Gold, Platinum, Sterling-Silver, Carbon-Fibre, Diamonds and other precious stones. The model will be auctioned off in December, with a starting bid of € 3,500,00.00 That is 3.5 Million Euro!! Apart from the wondrous machines, the art work are dominantly displayed in the ongoing exhibit. <http://www.hangar-7.com/en/art/hangar-7/> If the feast for the eyes were not enough, one can visit the famous "Ikarus" Restaurant to enjoy some gastronomy delights <http://www.hangar-7.com/en/ikarus/restaurant-ikarus/> or if one is a bit more subtle, there is a bar and a café inside the building. <http://www.hangar-7.com/en/day-night/concept/>

I was personally greeted by Mrs.Pichler and I was given a bit of time to take pictures from the tarmac prior to boarding the DC-6. She personally escorted me to the tarmac where the flight preparations had already begun. It was amazing just how much of the sunlight was reflecting back from the highly polished surfaces of the DC-6. The famous old lady sparkled. I talked to the technicians as I took as many images as I could. Time flew fast and it was time to board.



- Inside the Hangar 7, above.
- The most expensive car model for a mere 3.5 million Euros, top center and right.
- The Lockheed P-38L Lightning surrounded by several Formula 1 race cars, right bottom.

Prior to boarding, the flight crew welcomed us, explained the route of our flight and the history of the DC-6B. She was not your ordinary lady. She was the former personal aircraft of Marshall Tito of Yugoslavia. In essence, this was his “Air Force One.” Built in Santa Monica, California in 1958, it was the second to the last DC-6 ever built. Delivered to the Yugoslavian airline, JAT, it passed to the Air Force as President Tito's aircraft before being donated to President Kuanda of Zambia in 1975. In 1994 it went to a civilian operator in Namibia and was bought by Red Bull in 2000. We were given some technical information about the aircraft and we were asked to be careful with the interior, and not to scratch the windows with camera lenses, as the Boss of Red Bull sometimes flies with this aircraft.

Upon boarding, I was truly impressed by the fine interior onboard of the DC-6B. One almost could feel the past and imagine how Marshall Tito would approve of how the “Flying Bulls” restored the aircraft to such perfection. The guests were given safety instructions by our pretty flight attendant, reminding us just how it felt to travel in the late 50's and early 60's, when it was a pleasure to travel. Passengers then, were treated with dignity and friendliness. The good old days!





Flight briefing prior to our boarding.





It was time to start the four Pratt & Whitney R-2800-CB17 18 cylinder “Double Wasp” radial engines rated at 2,500 hp each, one by one. Between the start and the ignition, a bit of oil is injected into the bottom cylinders, and during the start, a bit of smoke can be seen as the engine fires up. If there is no smoke, there is something wrong. Thus with engines on, smoke on, everything was okay. It takes 15 minutes per engine to warm up the 120 liters of oil per engine to the normal operating temperature and pressure.

Slowly we started to taxi to runway 16, then full throttle was applied and we took off with ease into the best weather one could wish for, climbing higher and higher. There was little engine noise inside the cabin. Our destination was Schladming, where a sky world cup race was happening. Our altitude was not very high. We flew along the Dachstein massif (mountain range) to our first destination. During the whole flight, we were allowed to move around inside if we chose, including access inside the cockpit. What a fantastic way to enjoy the flight. For me, this was a first class way to travel!

The Red Bull DC-6B is one magnificent looking aircraft on the outside as well as inside as these photos do testify. The people left to right are: Flight Attendant Anette Blüthl, myself, Mrs. Sylvia Pichler, Pilot Raimund Riedmann, Flight engineer Andy Chamber, and Copilot Frederic Handelmann.

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The flight path from Salzburg to Innsbruck and back offered an enchanting view of the Austrian Alps.



As we approached Schladming, we descended between the mountain peaks to make a low level pass over the Schladming ski area where thousands of people watched us.

Next we flew in a westward direction to Innsbruck. This second destination brought us beside the Grossglockner, (Austria's highest mountain 3798m) but we flew below the peak of the mountain. The view and my feelings were beyond words; utterly fantastic. I spent a long time in the cockpit watching the crew working. Indeed, this was hard work, to fly the DC-6B aircraft through the Alps and not above. The flight engineer had many things to do during the whole flight. There was no time for a break. It was interesting to see how the pilots maneuvered so close to the mountain sides. From the cockpit it appeared sometimes as if we were about to fly into the mountain sides, only a white wall in front of us, and then suddenly pull up. Whoooow!

We approached Innsbruck, which is one of the most challenging airports in Europe. Situated in a narrow valley, the pilots need separate training for this airport. We flew in a tight curve, flying sharply down the valley and crossing the runway at a low altitude at around 270 knots. During this maneuver I was in the cockpit behind the pilots, with both hands on the co-pilot's seat to hold me, otherwise I would have fallen. Two people onboard didn't feel so good after this maneuver, if you understand what I mean...

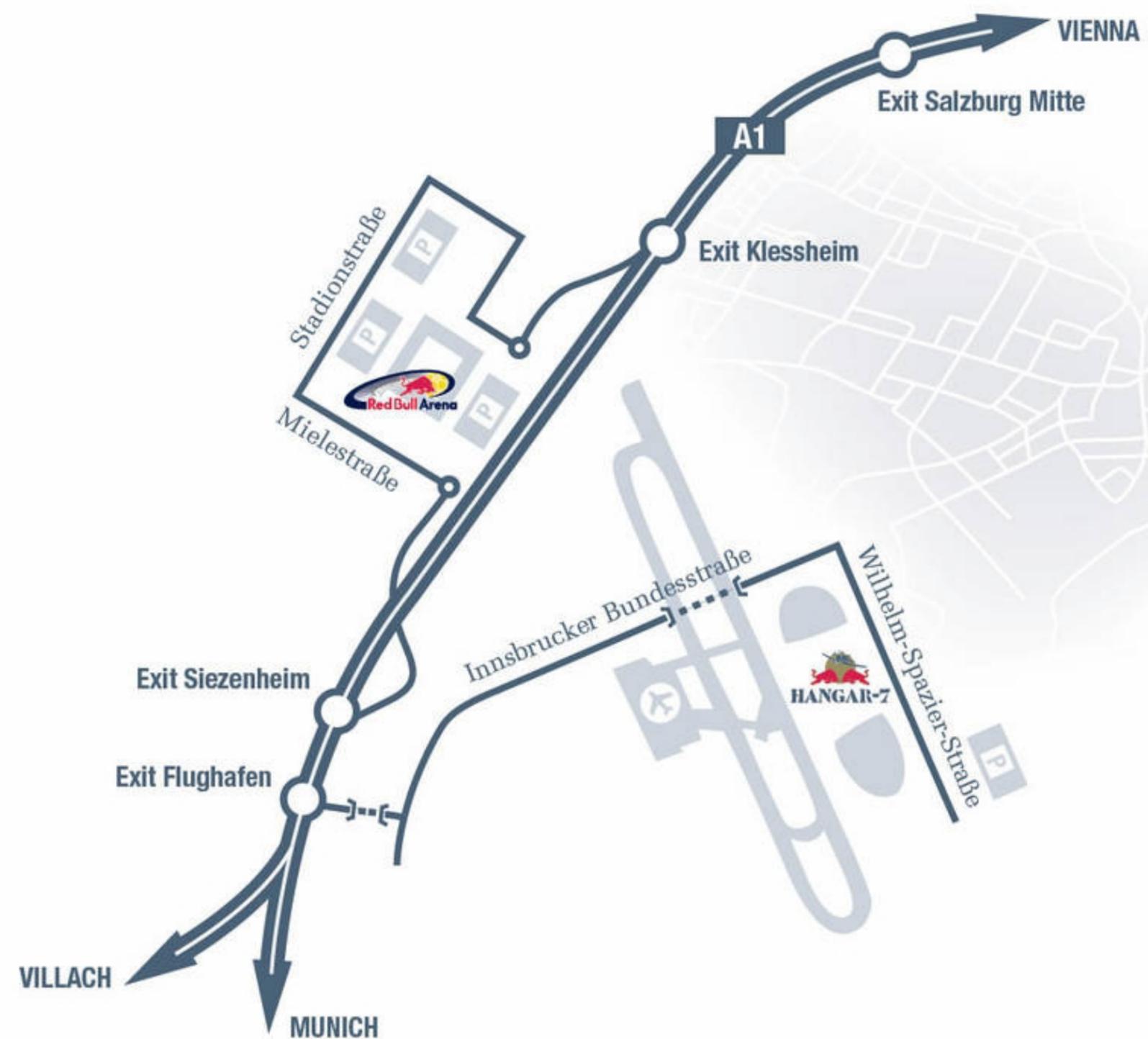
In Innsbruck we did basically the same thing as we did in Schladming. Hundreds of people watched the DC-6B and most might have wondered how would it feel to be in it right then. I know this feeling as I have often wondered myself when spotting and photographing such events. Except today. I was lucky, now I knew exactly just how it felt!

After our spectacular performance in Innsbruck, we climbed high over the valley for the last destination, Hangar 7 in Salzburg. During our return journey we had lots of time to enjoy the ride with this aircraft: listening to the music of the double row radial engines, watching the wonderful snowy landscape over Austria. During a flight like this is the best way to discover just how beautiful my country, Austria, truly is.

After landing, I took one more image of the flight crew and flight attendant. The flight engineer immediately had the DC-6B put into maintenance, to keep her in optimum flying condition. All of the maintenance technicians, with the exception of one, are from Great Britain. The one member is from Germany. After taking a quick peek of Hangar 8 (Maintenance Hangar), I started my walk back to Hangar 7 for the last view of the fascinating collection of the "Flying Bulls." There were many visitors with children, looking with wide open eyes, observing and dreaming of what it would be like to fly in one of those aircraft...

I was very impressed by the majestic flight, especially the friendly hospitality I received from all the persons involved with the "Flying Bulls." Austria should be very proud of such a world class organization, just as I was. I felt very lucky to do this report for AirShowsReview and I am sure that I'll never forget the positive impressions and joy this flight has given me.

On the behalf of AirShowsReview I would like to thank Mrs. Sylvia Pichler, who made this flight possible, and the crew of the DC-6B; Pilot Raimund Riedmann, Copilot Frederic Handelmann, Flight Engineer Andy Chamber and Flight Attendant Anette Blühtl.



If you are visiting Austria, especially the Salzburg area, and are interested in aviation we highly recommend that you visit the Red Bull Hangar 7, located by the Salzburg Airport.



5 TH ANNIVERSARY AIR SHOW

REVIEW AND PHOTOGRAPHY BY NORMAN A GRAF

MCAS Yuma held its 50th Annual Air Show on March 17. This was the first Marine aviation event of 2012, kicking off the celebrations honoring the Centennial of Marine Aviation. The expectations were high, and the air show did not disappoint. Highlighting the show was the USAF Air Demonstration Squadron, the Thunderbirds. Their performance capped a day filled with aerial demonstrations from World War II vintage aircraft through to the latest addition to the Marine Aviation arsenal. The weather was uncharacteristically cool and overcast, but the rain and high winds predicted for this Saint Patrick's Day thankfully failed to materialize.

After passing through security, visitors passed by an extensive array of static aircraft and vehicles. Representatives of almost the entire current inventory of USMC aircraft were on display: AH-1W Super Cobra, AV-8B Harrier II, CH-46E Sea Knight, CH-53E Super Stallion, F-5N Tiger II, F/A-18B Hornet, HH-1N Huey, KC-130J Hercules, MV-22 Osprey, UC-12B Huron and UH-1Y Huey. The Navy had two F/A-18E Super Hornets on display and the Air Force was represented by the B-52H Stratofortress bomber, the C-17 Globemaster III transport, F-16C Fighting Falcon fighter and HH-60G Pave Hawk helicopter. The two hours between the opening of the gates and the beginning of the air show left ample time to view the statics, set up chairs along the long and open flightline, or purchase seats in the bleachers or box seats in the preferred seating areas.

The flying began with a formation composed of an F6F Hellcat, F8F Bearcat, F4U Corsair and a P-51D Mustang. John Collver flew his usual impressive routine in "War Dog", an SNJ painted in markings from MCAS El Toro. Tora! Tora! Tora! then commemorated the Battle of Wake Island with replica Kates, Zeros and Vals, complete with pyrotechnics, culminating in their signature "Wall of Fire." There was also a well-executed Search and Rescue demonstration featuring the venerable Huey helicopter. Four F-5N "Adversary" aircraft from the "Snipers" of VMFT-401 made two passes in tight formation, each aircraft painted in a different color variation of the aggressor "lizard" camouflage.





"War Dog", an SNJ painted in markings from MCAS El Toro.



The Marines AV-8B Harrier above and below.



The afternoon started off with the first full tactical demonstration of the MV-22 Osprey at MCAS Yuma. The crew did a great job of demonstrating the amazing capabilities of this tilt-rotor aircraft. Then it got loud as the F/A-18E Super Hornet demo took to the skies. A dirty roll on takeoff was followed by several high-speed passes and the minimum-radius turn; the full afterburners glowing brightly against the by-now leaden skies. After several more maneuvers, including the final photo pass, it was time for the Navy Tailhook Legacy Flight. This program, established in 1999, pairs today's state-of-the-art fighters with warbirds flying in close formation to display the past and present of Naval and Marine Aviation. At Yuma the F/A-18E Super Hornet was joined by an F6F Hellcat and an F8F Bearcat for the formation pass and a flight from behind over the heads of the spectators, followed by a split. Then it got *really* loud as the AV-8B Harrier II took off for its tactical demo. A long-time standard at the Yuma air show, it continues to impress the audience with its combination of high speed and hovering capabilities, transitioning between the two with amazing ease. The Harrier swayed, bowed and pirouetted in front of the crowd, descending slowly for a landing, then just as quickly taking off vertically and screaming into the distance.



Navy Tailhook Legacy Flight: F/A-18E Super Hornet, F6F Hellcat and an F8F Bearcat, above. The F8F Bearcat with the F6F Hellcat and an F4U-1 Corsair in formation, below.





Then, for the first time since 1997, the USAF Thunderbirds took off to perform at MCAS Yuma. Their presence as the headline performers certainly enhanced the attendance, estimated at a record 60,000, and they clearly pleased the crowd with their tight formations and thrilling opposing passes. Prior to the show, a short induction ceremony was performed, welcoming the newest recruits to the US Air Force. After the show and following a short debrief the team members came to the flightline to sign autographs and answer questions from the audience.

Frank Kingston Smith did a great job of announcing the show, and the air boss did an excellent job of keeping the performers on time and on schedule. Offsite parking was provided as an option for the first time this year. This, combined with the record number of attendees, led to some delays in shuttling people to and from their cars. I'm certain the Marines will learn from this experience and improve the service next year.



- MV-22 Osprey Tactical Demonstration, VMM-561 "Pale Horse" top left.
- Four F-5N "Adversary" aircraft from the "Snipers" of VMFT-401, mid left.
- USAF THUNDERBIRDS above and on next page.



I would like to express my thanks and sincere appreciation to the Public Affairs Office for their hospitality and assistance during the Airshow. Captain Reidinger did an excellent job of setting up and organizing the media access, and Gunnery Sergeant Dunk, Corporal Bopp and Lance Corporal Waterstreet provided invaluable assistance during the day. I was very impressed by their professionalism and commitment to excellence.



2012 AIRPOWER OVER THE MIDWEST

Featuring the *Thunderbirds*

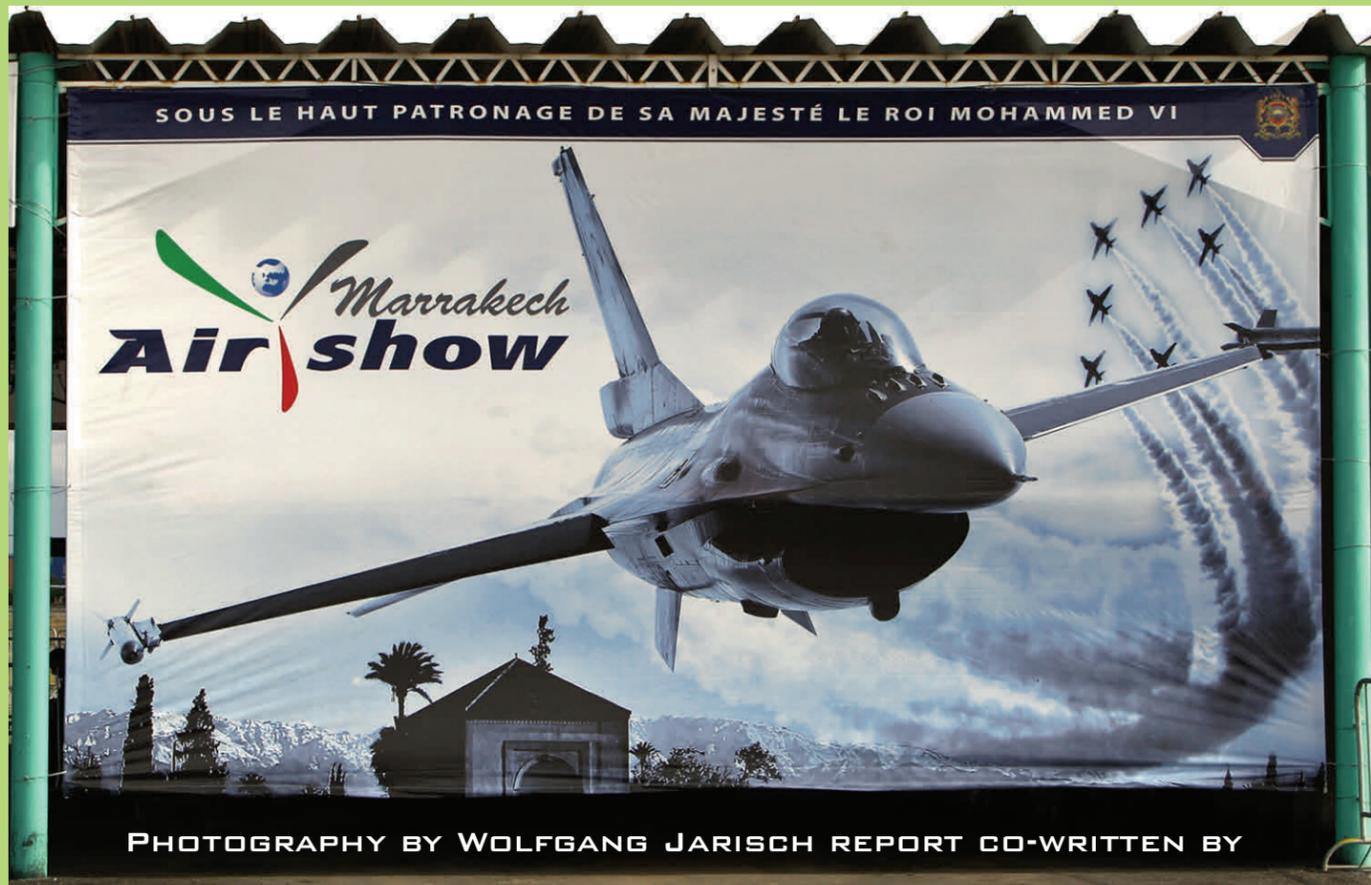
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We are at the International Aerospace Exhibition in Morocco, held at the FRA (Forces Royales Air) Military Base Marrakech/Ménara (GMMX). This event was held under the High Patronage of His Majesty King Mohammed VI. This is our first report from Africa!

The Ménara AFB is home of the Ecole de Pilotage (pilot school). Students fly the Hawker Beechcraft T-6C Texan II. The base is also home of Royal Moroccan Air Force aerobatic display team, "Marche Verte" (Green March) with the Mudry CAP 232, and the Ecole de Technique (technical school).

The International Aerospace Exhibition for Africa, as Marrakech Air show advertised itself is Africa's foremost trade show for civil and military aviation and it is a relatively new event. For 2012, their third event, it was their largest exhibit by far with more than 12 countries attending among them: China, Bahrain, Bulgaria, Belarus, Switzerland and Turkey. We at AirShowsReview thought it would be an interesting event to attend. We graciously want to thank Mr. Frédéric Le Henaff and Mrs. Amal Zeriouh, for their efforts, in helping us obtain media accreditation. (By clicking on the image above, the reader will be taken to the Official Website for the Marrakech Air Show)

Our correspondent flew in with Royal Air Maroc from Munich to Marrakech. The weather forecast didn't look too promising with rain in forecast for the entire event.

Upon arrival to the base's main entrance, all journalists received a warm welcome and then we were shuttled by a bus to the airfield, after going through the usual security checks, we could walk freely around the base and the exhibition.

The show started off by the official welcome of the military delegations and high ranking official guests, and a small air display to kick off the four day long affair.





After seeing the flying display we wondered just where all the foreign aircraft were and why weren't they flying too? But after all this was more of a Trade Fair than truly an air show.

The foreign military static selection was relatively small; one Beechcraft 200 King Air for maritime patrol from Malta (which is definitely a rare aircraft, because they are only two of this type in service by the armed Forces of Malta). From the United States one UH-72A Lakota, two F-15's from Lakenheath, UK, and one C-130J from Ramstein, Germany. This was it, but after all we are in Morocco, and we will see a wide range of aircraft of the Moroccan Air Force and from the Gendarmerie Royale (police). The Gendarmerie Royale has several different helicopters in service. All of which should be interesting enough. Due to the rainy weather many had covers on them, which didn't help much when it came to photographing them.

The Moroccan government has spent a lot of money for the modernization of their aging aircraft fleet, and they bought many new aircraft for the FRA such as the Bombardier Canadair CL-415 water bomber, F-16C/D Block 52+ fighters (unconfirmed disclosures says 24 twin seaters, 12 single seaters) and unknown quantity of Hawker Beechcraft T-6C Texan II.

The Gendarmerie Royale also received many new helicopters. Some of these were on display: Aerospatiale Alouette II, Eurocopter EC-135 T2+, and the Eurocopter AS-355F Ecureuil II. From the Royal Moroccan Navy a Eurocopter AS-565MB Panther was also on static display.

Aircraft displayed by the FRA (Royal Moroccan Air Force) included the: Lockheed Martin F-16C Block 52+, Lockheed Martin F-16D Block 52+, Northrop F-5E Tiger II, Mudry Cap 232, Lockheed C-130H Hercules, Beech B.200C Super King Air, Alenia C-27J Spartan, Agusta-Bell 205, Agusta-Bell 206B, Aerospatiale SA. 330F Puma, Aerospatiale SA. 342L Gazelle, AMD Mirage F.1EM-VI, Dornier-Breguet Alpha Jet H + and another special Alpha Jet called Al Ghait used for cloud seeding.

To see the diversity of aircraft types displayed by the Moroccan segment alone was worth the visit. The pilots and crew were present by their aircraft and were happy to answer questions if asked.

Every day there was a flying display but with only the FRA performing towards the late afternoon. It was difficult to take good images due to the orientation of the runway and from our designated area, as the sun was in front of us.





Helicopter demo with Aerospatiale SA SA 342L Gazelle with a SA 330F Puma in the background.



Air-to-Air refueling demo with the KC-130H and fighters: two F-5E on the chute, two Mirage F-1EM-VI and two F-16D



The Canadian built Bombardier CL-415 water bomber showing off its capabilities.

The daily flying displays were relatively short, compared to large international events such as Fairford in the UK, however they were excellent. It started off with the CL-415 water bomber, followed by helicopters and by Hercules KC-130H with different aircraft behind in a four to six ship formation of Mirage F-1's, Northrop F-5E Tiger II's or with F-16's, and sometimes a C-130H as a water bomber, and paratroopers jumping from a C-27J. The downside was that they all only made one pass. The actual air show on the public day was no different. However this was only their third show, we hope that in 2014 they will expand the flying a bit more, and as noted Marrakech 2012 was definitely a trade fair more than just an air show.

Africa is a growing market for civil and for military aviation. There were many potential customer, and many companies looking to sell. Not only global players like Dassault, Eurocopter and Lockheed Martin, but several smaller companies from France, Belarus, UK and Austria, just to name a few, with interesting niche products represented on their exhibit booths. The exhibits were very interesting; all the people were very friendly and professional. The Royal Moroccan Air Force, exhibition, which featured the history from the past to the present, was truly excellent. One could see films, pictures, flags and aircraft models in various scales and with friendly air force personal available to answer any questions, simply it was Perfect!

Over all, our impressions were very good of the International Aerospace Exhibition in Morocco. It was interesting to see so many static aircraft and helicopters in desert camouflage of different types. The event was well organized. The Military personal were very friendly and helpful, as long as their instructions were followed, and if not one could get into issues, which is nothing unusual at AFBs. The flying display duration were short and no foreign countries participated which we missed.



The trip to Marrakech was a journey in a mystic oriental world, where we only met friendly people. The food in the hotel, in the restaurants nearby was incredibly good and offered a dazzling variety. Certainly not the place for dieting!

We cannot wait to return in 2014!

- Northrop F-5E Tiger II, top left.
- Mirage F-1EM-VI, mid left.
- F-16D Block52+ bottom left.
- Display team "Marche Merte" with Mudry Cap 232, right above.



Sgt. Julian Spiteri, Lt. Pierre Carabez, Sgt. CJ Psaila, left to right in front of the Beechcraft King Air B200 from Armed Forces of Malta.



- Eurocopter AS 565MB Panther from the Moroccan Marines, top right.
- From France, Eurocopter AS 550 C3e, mid right.
- From Austria, Diamond 42 DA MPP Guardian surveillance aircraft, with special exhaust modification that leaves no infra-red signature, bottom left and center.



- Dornier-Breguet Alpha Jet H of the Royal Moroccan Air Force, top left.
- Eurocopter EC 135T2+ of the Royal Moroccan Police, bottom left.



THUNDER & LIGHTNING OVER ARIZONA

Report and photography by Norman A Graf





“Thunder & Lightning over Arizona” was the theme for this year’s biennial Open House at Davis-Monthan AFB in Tucson, Arizona. The weather on Saturday came close to making that a reality as the day dawned cold and rainy with high gusty winds. Nevertheless, the gates opened promptly at 08:30, and those who braved the weather were treated to an enormous expanse of tarmac filled with an impressive array of military aircraft on static display. The first day’s flying, scheduled to begin at 11:00, was delayed slightly since the Flag Jump had to be cancelled due to the high winds. Thereafter it was non-stop action except for a short break when a mercy-flight helicopter needed the airspace and a roughly half-hour break caused by the cancellation of several acts due to the high winds. Then it was time for the headline act, the USAF Thunderbirds, to take to the skies. By then the clouds had mostly cleared and the crowd enjoyed a high show with crystal clear blue skies. Sunday dawned bright and clear and the 100,000+ spectators (with some repeat visitors from the 30,000 the day before) were witness to a full schedule of performers.

Parking this year was on-base, so the problems encountered with public transit and shuttles during 2010’s “Aerospace and Arizona Days” were not an issue. Inbound traffic was halted around 2PM. Visitors were warned beforehand to expect to do a lot of walking, but pedicabs were available for those who tired. The very long flightline was open to visitors except for the Flight Line Club Chalet, the Air Boss’ and Announcers’ area, and the adjacent media pit. Unlike most airshows, folding chairs were not allowed through the gates, but chairs were available for a \$5 fee. Some small bleachers were available free of charge, and shade was available either under the wings of the larger aircraft on display or under the protective ramadas for the smaller aircraft. A large “Kid’s Zone” featured a climbing wall and multiple bounce houses, plenty of portable toilets were distributed throughout the area, and free water was also available from military “Water Buffaloes.” Lots of souvenir and food vendors were distributed throughout the grounds, along with a number of rides, including flight simulators.

There was an incredible number of aircraft on static display. The “heavies” were arrayed on the north end of the field, and the first aircraft to meet most people was the Airborne Laser Test Bed YAL-1. This modified 747-400 was equipped with a megawatt class laser and was developed to test the concept of destroying tactical ballistic missiles in flight. The airframe has numerous infrared sensors to detect missile launches, and a large steerable turret in the nose contains adaptive optics which aims the main laser at the target. Despite successfully downing two missiles in flight, it was deemed not to be operationally viable and the program was cancelled in 2011; the final flight of YAL-1 occurring earlier this year. This was the first public appearance of the ALTB, and most likely the last, as it was already sealed and ready for transport to the 309th Aerospace Maintenance and Regeneration Group (AMARG). Looming large, even next to a 747, was a C-5 Galaxy recently arrived from Wright-Patterson AFB; it too is destined for “The Boneyard.” The very rarely seen EC-130H “Compass Call” was also on display. Based at Davis-Monthan, the antenna-strewn Hercules provides an offensive electronic attack capability to the USAF. Other esoteric electronic warfare aircraft on display were the E-8C “J-STARS” and TC-135 “Rivet Joint”, both based on the Boeing 707. An EA-6B Prowler from VAQ-129, stationed at NAS Whidbey Island, represented the Navy’s electronic warfare capabilities. A number of helicopters from the various branches of the armed services then followed: US Army AH-64 “Apache”, USMC CH-53 “Super Stallion”, and USAF HH-60 “Pave Hawk.” Another very unusual large aircraft on the ramp was NASA’s Super Guppy, designed to transport large spacecraft components. Last of the big jets was a B-52 Stratofortress from Barksdale AFB.

South of show center, and located under shade (and rain) ramadas, were the many tactical fighter jets and warbirds. Interspersed with the USAF F-22, F-16s, A-10s and Navy F/A-18s was a pair of RAF Tornados, training in the desert Southwest in preparation for deployment to Afghanistan. The crews seemed to be enjoying the British weather. The often-overlooked trainer aircraft were well represented by several T-38 Talons from Beale, Holloman and Laughlin AFB. Laughlin also sent along a T-1 Jayhawk and T-6A Texan II. Accompanying the Talons from Beale was an immaculate MC-12 Liberty, the newest intelligence, surveillance and reconnaissance aircraft in the USAF inventory. Warbird fighters included a P-51D Mustang, TBM-3 Avenger and a Hawker Hunter, and the trainers in attendance were a T-28C Trojan, a pair of T-34C Mentors and a beautiful TA-4J. A brightly colored HU-16B Albatross looked right at home on the wet tarmac Saturday morning.

In addition to the aircraft on static display, a number of booths and hangars gave various groups the opportunity to inform the public about their mission and capabilities. The USAF Pararescue unit had a particularly nice display featuring mannequins dressed in full gear. One of the hangars was used by the weapons crews to demonstrate the loading of armament on an A-10.

But of course the main attraction of the Open House was the air show, and it opened with a rare treat. High winds had cancelled the flag drop, but by 11:30 the skies to the north had cleared just in time for the arrival of the B-2A stealth bomber out of Whiteman AFB. Celebrating the centennial of Arizona statehood was the "Spirit of Arizona." The crowd was treated to three very nice passes, including a steep bank clearly showing the bat-shaped outline. Following almost immediately was the B-1B Lancer from Dyess AFB. Its three passes nicely demonstrated the swing-wing capabilities, transitioning from extended wings for slow flight to the fully swept configuration for its final fast pass with full afterburner. It was very interesting to see both aircraft in the clear blue skies to the north and then silhouetted against the dark and threatening skies to the south. The grey skies actually worked to their advantage as the details of the B-2 were visible, and the four afterburners of the B-1B glowed bright orange before the plane was completely swallowed up by the clouds. Neither bomber had been listed on the show schedule so the flybys were very pleasant surprises.



The Desert Rats Formation Team then took to the skies, performing a series of tight flybys in their four Nanchang CJ-6s.

The Combat Search and Rescue (CSAR) demonstration began with a convoy of heavy vehicles from the Marine Corps' Bulk Fuel Company Alpha driving down the runway. They soon came under attack, suffering casualties and calling for assistance by popping purple smoke. Four A-10s from the 357th FS scrambled and two HH-60G Pave Hawk helicopters from the 55th Rescue Squadron passed over, simulating an in-flight refueling from an HC-130P Hercules from the 79th RQS. In an amazing bit of synchronicity, the demo had to be abruptly interrupted to clear the airspace and allow a mercy flight helicopter to pass through on its way to a local hospital. The action resumed with strafing and bombing runs from four A-10s and a pair of F-16s from the AZ ANG.



The pyrotechnics were provided by the Blastards of the Commemorative AF and the timing of the explosions to the passes of the aircraft and the matching of the effects to the type of offensive actions was very impressive. With the attacking "technicals" destroyed and the area secured, the two rescue helicopters flew in low and fast, flared to a stop and hovered as the rescue team fast-roped to the ground. On Sunday the action was obscured by vast clouds of dust, but the wet ground on Saturday turned out to be an advantage. The four A-10s remained to provide top cover, flying an impressively choreographed series of clover-leaf patterns over the rescue area. The victim was quickly attended to, loaded into a litter and hoisted by cable into the lead Pave Hawk, the second ground team climbing a ladder back into their helicopter. A pass-in-review by the A-10s ended with a very precise two-second series of breaks-to-land.

The Heritage Flight featured the A-10 Thunderbolt II flown by Maj John "Beercan" Collier in tight formation with the P-51D Mustang "Live Bait" flown by Vlado Lench. The results of the training and familiarization flights flown during the Heritage Flight Conference in March (see review [here](#) and in the [April-May issue of The Magazine](#)) were clearly in evidence.

Marcus Paine's comedy aerobatics routine in the Super Cub caught most of the audience members by surprise, wondering how they had missed the raffle for the free flight, and provided an entertaining interlude between the serious CSAR demo and the following high-speed car chase scene down the runway, in which the Customs and Border Patrol demonstrated how a suspected smuggler would be apprehended. The agile Eurocopter paralleled the speeding automobile at almost ground level, causing its driver to lose control and abandon the vehicle. The UH-60 Blackhawk then arrived on the scene, with officers fast-roping down to apprehend the suspect and turn him over the police officers who had been in fast pursuit in their squad cars.

Another unannounced, but quite welcome, large aircraft soon came into view. The C-17 "Globemaster III" of the 452nd Air Mobility Wing arrived from March ARB. The full tactical demonstrations are not being supported at air shows this year, so it was an unexpected pleasure to see the flyby and a steep descent landing, even though there was a very stiff cross wind. Coming to a stop in less than 1500 feet, the large cargo plane proceeded to engage its thrust reversers and backed up to park.

The sequence of civilian aerobatic performances then resumed with Greg Colyer ripping through the sky in his T-33A Shooting Star "Ace Maker." His new smoke system performed well against the by-now spectacularly blue desert sky, and added a new dimension to his routine by allowing spectators to follow where he had been flying. The strong crosswind thankfully cleared the skies quickly. Then it was back to propeller aircraft performing amazing aerobatic routines: Jeff Boerboon in his Extra330SC and Matt Chapman in the CAP 580 sponsored by Arizona's own Embry-Riddle Aeronautical University. Both of these pilots used the experience they gained flying in professional aerobatic competitions to develop routines which left the crowd gasping in amazement, especially Jeff's inverted flat spins and Matt's rolling Harrier sequence.



The MV-22 Osprey tactical demonstration was performed by a crew from VMM-166 "Sea Elk" stationed at MCAS Miramar and they did a superb job of demonstrating the capabilities of this tilt-rotor aircraft. The Osprey is a recent addition to the USMC aviation inventory and is scheduled to replace the aging CH-46 Sea Knight. Its appearance at air shows in the past few years has been mostly limited to flybys or participation in MAGTF demonstrations, so seeing the Osprey performing vertical take-offs and landings, hovering in helicopter mode or making a fast pass with the nacelles rotated fully forward was a first for Davis-Monthan. Thankfully the ground had not yet dried out during Saturday's show, sparing the crowds the enormous dust clouds usually kicked up by the Osprey. The crew clearly enjoyed the opportunity to impress the audience, displaying their esprit de corps by flashing their "antlers" as they departed.

The next aerobatic demo was unique in that it featured a home-built kit airplane, a Van's Aircraft RV-8, flown by Joe "Rifle" Shetterley. Air show fans will recall that Capt Shetterley was the A-10 West demo pilot in 2010-11. It was a real treat to see him perform before the home-town crowd, putting the highly polished natural-metal airframe through a series of graceful rolls and loops.



The final, and best, civilian aerobatic act of the day was Kirby Chambliss, flying the Red Bull Edge 540. Without detracting from the previous pilots' performances, it is fair to say that Kirby took it to a new level. To the surprise of everyone in the crowd, he didn't even wait to get on the runway to start his routine. Instead, he performed his signature Cobra takeoff from the taxiway perpendicular to the main axis of the show box. It was an absolutely amazing start to an incredible show filled with snap rolls, loops, tumbles, sliding horizontal rudder turns and other flawlessly-executed routines.

The high winds had forced a number of acts to be cancelled on Saturday, including all three of the parachute jumps (the USAF Pararescuers Flag Jump, The Red Bull Jump Team and the USAF Academy's Wings of Blue Parachute Team), Dan Buchanan's Hang Glider routine, Chuck Aaron's Red Bull Helicopter demonstration and the Tombstone Riders wing-walking duo of Carol Pilon and Melissa Pemberton. The resulting short break in the flying gave attendees an opportunity to visit the vendor booths for souvenirs, grab a bite to eat or something to drink, or view some more of the aircraft on static display.



Following a brief induction ceremony for the newest USAF recruits, the Thunderbirds began their aerial demonstration. Normally, the Thunderbirds would open their season at the Davis-Monthan Open House (or at Luke AFB in alternating years), but this year's Centennial of Marine Aviation took them to the MCAS Yuma Air Show first (see review on page 32). The skies had cleared sufficiently for the Thunderbirds to put on their high show and they were in fine form, crisply executing their synchronized maneuvers and crossing exactly at show center. Shooting directly into the sun makes photography difficult, so many of the spectators put down their cameras and simply watched in amazement. After the show and following a short debrief the team members came to the flightline to sign autographs and answer questions from the audience.

I would like to express my thanks and sincere appreciation to the 355th Fighter Wing Public Affairs Office for their hospitality and assistance during the Airshow. 1stLt Godfrey and 2ndLt Ruckriegle did a good job of setting up and organizing the media access, and Airmen Cook and Washburn provided assistance during the day.





70TH ANNIVERSARY REUNION - DOOLITTLE TOKYO RAIDERS, DAYTON, OHIO. REPORT AND PHOTOGRAPHY BY RICARDO VON PUTTKAMMER





The National Museum of the United States Air Force, near Dayton, Ohio, once again was the host of the anniversary reunion of the Doolittle Tokyo Raiders. April 18, 2012 marks the 70th anniversary of that eventful day when the United States showed the Japanese that it could wreak havoc in their mainland.

On December 7, 1941 Pearl Harbor was attacked by the Japanese. Two weeks later President Roosevelt informed the Pentagon that he wanted as soon as possible to bomb Japan in order to boost America's morale. Four months later, 80 men and 16 B-25s, after spending 3 weeks of specialized training, were ready to launch their secret mission from the USS Hornet. The original plan called for the aircraft to take off about 450 miles off the coast of Japan, but the plan was changed once it was discovered that the American ships had been sighted by the enemy. The planes took off earlier and about 200 miles farther away from the Japanese coastline. The mission was a success. The bombs were dropped on target. Although they did not cause too much physical damage, it damaged the psyche of the Japanese people who had been told that the Americans could not bomb the Japanese mainland!

Because of bad weather in China and low fuel, they could not land safely. From the 16 aircraft that participated in this heroic mission, 4 crash landed; the crew bailed out from 11 B-25s and one landed in the Soviet Union (an ally) and the crew was kept captive for over a year. 64 crewmen were helped by the Chinese. Of the 8 Raiders that were captured by the Japanese, 3 were executed after a mock trial, one died in prison and the remaining 4 were prisoners of war until released after Japan surrendered. Two died when their B-25 ditched off the Chinese coast.

The 70th anniversary brought together four of the five surviving raiders: Lt. Col. Richard E. Cole (96), co-pilot of aircraft number 1; Major Thomas C. Griffin (95), Navigator of aircraft number 9; Lt. Col. Edward J. Saylor (92), engineer-gunner of aircraft number 15; Staff Sgt. David J. Thatcher (90) Engineer-gunner of aircraft number 7. There were also 2 crew members from the USS Hornet present: Retired Navy Chief Petty Officer Allen Josey, an electrician and Retired Navy Aviation Machinist's Mate Elmo Wojahan. Twenty B-25s participated in a formation flight over the Museum prior to the Memorial Service on April 18.

The B-25s spent the weekend prior to the reunion at Grimes Field in Urbana, Ohio. On Tuesday morning, April 17, around 7 AM, one by one landed in the airfield behind the National Museum of the United States Air Force. After parking they were available for public viewing for the rest of the day.

The following B-25's were present:

1. B-25J Axis Nightmare
2. B-25H Barbie III
3. B-25 Champaign Gal
4. B-25J Betty's Dream
5. B-25 Devil Dog
6. B-25 Executive Sweet
7. B-25 Grumpy III
8. B-25J Maid in the Shade
9. B-25A Miss Hap
10. B-25J Miss Mitchell
11. B-25 Old Glory
12. B-25J Pacific Princess
13. B-25J Pachinto
14. B-25 Russian to Get Ya
15. B-25J Show me
16. B-25 Special Delivery
17. B-25J Take Off Time
18. B-25 Tondelayo
19. B-25D Yankee Warrior
20. B-25J Yellow Rose

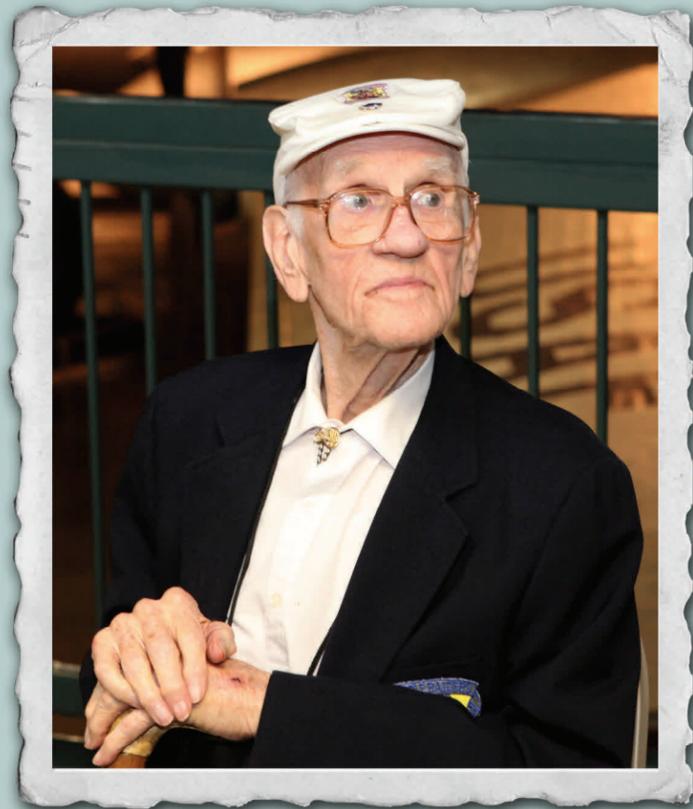




The B-25s lined up on the tarmac at Dayton: this view is from the first towards the last..

while this view is from the last towards the first.





Major Thomas C. Griffin, 95 years old



Lt. Col. Richard E. Cole, 96 years old



Lt. Col. Edward J. Saylor, 92 years old



Staff Sgt. David J. Thatcher, 90 years old

Four out of five surviving raiders and two crew members from the USS Hornet aircraft carrier were present at Dayton in 2012.



Retired Navy Chief Petty Officer Allen Josey and Retired Navy Aviation Machinist's Mate Elmo Wojahn, both served on the USS Hornet at the time of the raid.



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Homecoming of Discovery

Report and photography by Stefan Seville







One of engineering's greatest feats brought traffic to a standstill and crowds from across the globe on April 17th, as Space Shuttle *Discovery* was delivered to Washington Dulles International Airport atop NASA's modified 747. *Discovery* now has replaced *Enterprise* as the centerpiece of the space wing of the Udvar-Hazy branch of the Smithsonian's Air and Space Museum. The event drew thousands of spectators, many of whom lined up well before the 8am opening of the gates.

The Shuttle was mated with the Shuttle Carrier Aircraft a few days prior at the Kennedy Space Center, after undergoing months of preparation for this day. Much of the orbiter's inner workings, such as rocket motors, control systems and avionics were removed for other application and preservation. The shuttle was then cleaned and lifted via the mate/de-mate device at the Shuttle Landing Facility. Tuesday at approximately 7 am, the SCA's 4 Pratt and Whitney JT9Ds spun up and the final flight of *Discovery* was underway.

Aerodynamic stresses on the joints that connect the orbiter to the 747 limit the duo to less than 250 knots, and less than 15,000 feet in altitude. The 4 crew members of "Pluto 95 heavy" have to avoid rain and clouds, as the moisture would cause expansion and loss of the exterior layer of the orbiter. This means that what would be an ordinarily short jaunt in a normal jet is now about twice as long.

Favorable winds, however, brought the combination of air and spacecraft into the DC area just before 10am on Tuesday morning. She initially circled south of Dulles airport to rendezvous with one of NASA's T-38 chase planes, then made her way north on a modified approach to runway 1R. NASA and airport officials coordinated this approach specifically, as the final approach to the runway takes the aircraft a few hundred feet from the parking lot of the Udvar-Hazy center, where everyone had gathered.

The pair's first pass over the airfield was lined up directly over the parking lot, much to the delight of the many spectators. After the low pass, the crew directed her east for a photo shoot over such landmarks as the Washington Monument, Mall and Reagan National Airport. After about a half hour of eating sky, she returned for a lined-up low pass over 1R again, this time making a left turn for a widened traffic pattern to land. This time lower, slower and dirty (gear and flaps extended), *Discovery* ended her airborne career. With a few corrections for the 18 knot wind, the SCA touched down and used every bit of available runway to slow to a stop. The T-38 playing chase then made an expedited right pattern to land on Runway 1C, as he was reporting a critical level of fuel.

Thus comes to an end the illustrious career of Space Shuttle *Discovery*. After orbiting the earth thousands of times, spending 365 days in space, and returning America to space after both Shuttle disasters, she will rest peacefully under the cover of the Udvar-Hazy center. While no longer traveling at 17,000 miles per hour, *Discovery* will continue to inspire generations of current and future explorers, fostering the spirit of adventure and (pardon the pun), discovery.







PIGGYBACK RIDE TO THE BIG  PPLE
Space Shuttle Enterprise Makes her Debut in New York City
REPORT AND PHOTOGRAPHY BY DAN ADAMS



The Enterprise about to land at JFK, New York City.



The Enterprise over Toronto, in 1979. ©1979 Laszlo Nyary.

New Yorkers are a peculiar bunch (myself among them). It takes a lot to get our attention. Perhaps because the City itself is so big and awe-inspiring to begin with we find ourselves immune to things that would excite others. Celebrities pass unnoticed, tremendous skyscrapers ascend upward without a passing glance from those that walk underneath, even a massive blackout left most New Yorkers more concerned with whether the local bars were open than anything else. It takes a lot to get our individual attention, let alone when we come together collectively as a city to take notice of something. It was just such an event that occurred on April 27, 2012 that got New York City looking upward towards the sky, as one, to take in a once-in-a-lifetime event – the arrival of the original NASA Space Shuttle.

The buzz had been building ever since NASA announced it was awarding Enterprise (OV-101) to the Intrepid Sea, Air & Space Museum. At the time, Enterprise was on display at the Smithsonian's Udvar-Hazy Center. Set to be replaced with Space Shuttle Discovery, the Enterprise relinquished her spot in the museum and was attached to the Shuttle Carrier Aircraft (SCA), a modified 747, and prepared for her flight to New York. Originally set for April 23rd, the flight was delayed twice due to weather and was finally set for April 27th.

Although the terms 'space shuttle' and 'orbiter' are used to describe her, they are a bit of a misnomer. In fact, Enterprise never flew in space at all. Construction began on Enterprise on June 4, 1974. Interestingly, she was originally slated to be called Constitution, however, an unrelenting letter-writing campaign by fans of the sci-fi television show Star Trek ultimately led President Gerald Ford to order NASA to change the name to Enterprise, the name of the starship featured on that show.

First used for ground vibration tests, Enterprise made her official debut as she was rolled out of Rockwell's plant on September 17, 1976. In 1977, approach and landing tests were carried out at NASA's Dryden Flight Research Center. Enterprise was first carried atop the SCA on February 18, 1977 and on August 12, 1977 Enterprise was released from the SCA for the first time and glided to a safe landing.

In 1979, Enterprise was mated to an external fuel tank and solid rocket boosters for launch configuration testing at Kennedy Space Center. When testing was complete and other orbiters began their space missions, Enterprise was retired. She was flown on an international tour of several countries including Canada, the UK, Italy, Germany and France before finally being given to the Smithsonian in 1985.

Despite becoming a museum exhibit, Enterprise's service to the United States space program was far from over. After the Challenger disaster, NASA considered refitting Enterprise to replace

the destroyed orbiter, but it was decided that building a new shuttle (ultimately Endeavour) would be more cost effective. After Columbia was destroyed on reentry in 2003, NASA used part of Enterprise's wing to conduct testing into the cause of that tragedy.

Finally, in what is likely to be the final chapter of Enterprise's career, NASA announced that Discovery would be awarded to the Smithsonian and Enterprise moved to the Intrepid for permanent display. Ownership was transferred to the Intrepid on December 12, 2011.

Just over four months later, tens of thousands of New Yorkers flooded the banks of the Hudson River and surrounding areas to catch a glimpse of the lumbering SCA carrying Enterprise to her new home. Taking off from Washington, DC around 9:30 AM, Enterprise slowly made the short trip North as crowds continued to grow wherever there was a chance for a sighting. Roofs of buildings, parks along the river, pretty much any open area with a view of the flight path quickly filled with people. Office workers, tourists, police officers, old and young alike stood shoulder to shoulder, each smiling in anticipation. There was a tangible excitement around the crowd. In many instances, parents let their children miss school in the hopes of seeing the historic flyover, perhaps inspiring a new generation of space enthusiasts and explorers.

Finally, at around 10:30 AM Enterprise entered the local air space and all eyes gazed skyward. Enterprise's flight path took her up the Hudson River at an altitude of 1,000 feet where she made a u-turn at the Tappan Zee Bridge. She returned back down the Hudson River (flying once again past her future home, the Intrepid) and looped around New Jersey, from Newark Airport North to Teterboro Airport, then back over the river, past the Statue of Liberty and lower Manhattan, through Brooklyn and Queens and over JFK for a flyover before finally coming around to land on JFK's runway 31L.

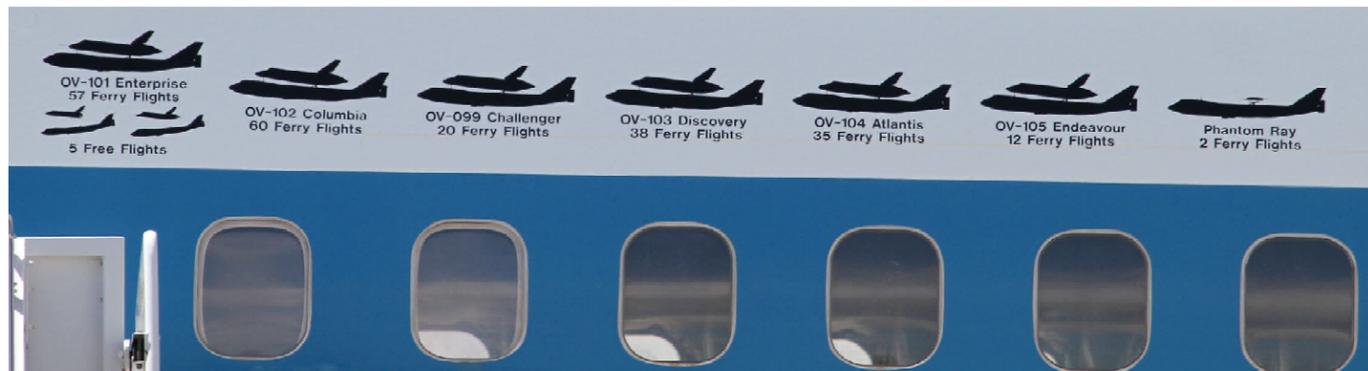
Her generous flight path delighted untold thousands across the area and some were even moved to tears by the sight. Upon landing at exactly 11:23 AM, the JFK air traffic controller noted, "Welcome to New York, and thanks for the show." What a show it was indeed. World-renowned for their skepticism, stoicism and (maybe, just maybe) being slightly jaded, New Yorkers united with their brethren across the river in New Jersey to welcome Enterprise to town. It was one of those unforgettable moments when everyone came together, families, friends and strangers alike, to marvel at something spectacular. Cameras of all shapes and sizes recorded the moment in what must have been the most photographed flyover in New York history. Enterprise was welcomed at JFK with a ceremony that featured New York Senator Chuck Schumer and Star Trek actor Leonard "Spock" Nemoy. *(continues on page 88)*







The Intrepid Museum's welcoming ceremony about to start, above. The mission accomplished marks on the side of the NASA's SCA a highly modified Boeing 747, below.



(continued from page 83)

The Enterprise has been moved to a sheltered area at JFK (usually used for de-icing operations) where she will remain for several weeks before she is demounted from the SCA and moved by barge to the Intrepid.

This will give New Yorkers another chance to gawk at their newest citizen, this time as she floats by. It is expected that Enterprise will begin the 2-day journey to her new home on June 4th and that the Space Pavilion, where she will be displayed, will open to the public on July 19th. No doubt she will get as gracious a welcome then as she did when she first graced our skies.

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We will be reviewing the following air shows and several others in the next issue of *The Magazine* by AirShowsReview:

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