Soviet Antonov An-22 at Le Bourget
Military Jet Teams Dominate Paris Flying

By Herbert J. Coleman

Paris—Flushing tactics of military jet teams again dominated the traditional flying display which closed the 26th International Air and Space Show at Le Bourget Airport here—although an added fillip came from Soviet participation for the first time.

For sheer Bore and showmanship, the flying honors, in what was a generally tepid display, went to two famed teams from the United States, the Air Force Thunderbirds, flying North American F-106s, and the Navy's Blue Angels, flying Grumman F-13 Tigers.

In fact, the verve and technique showed by the Blue Angels drew the only spontaneous burst of applause from the 100,000 persons watching the show, and this was in spite of the fact that both the U.S. teams had to edit their performances to fit a new French requirement.

Keynoting the helicopter display was one of the most impressive entities symbolic of U.S. technology in this area, the Lockheed XH-51A rigid rotor Aerogrycopter. While making part of a series of high-speed passes in excess of 150 knots, the XH-51A was able to fly at about 200 feet for a sharp turn around the show area.

The Aerogrycopter is the first rigid-rotor helicopter to fly in Paris.

Show promoters limited each national air force to a total of 13 min. and thus the Thunderbirds and the Angels had to work out a combined presentation quickly, as did the Royal Air Force Red Arrows team and its companion team, the RAF Lightnings.

Even so, for bravura and originality of maneuver, the British teams ran a close second to the American teams as show openers, despite being forced to cancel seven different formations specially worked out for the Paris Air Show.

Another French edict limited jet team demonstrations to the closing day only—instead of permitting two consecutive days as has been past practice. The unofficial reason was to lessen pressure on Le Bourget control facilities since more than 130 aircraft were scheduled to takeoff and land with precise timing.

Generally speaking, the control tower moved the show off with little schedule slippage, but there were pilot complaints of tedious and fuel-wasting delays after getting the order to start-up. One example: North America's Bob Hoover, who flew a civilian-owned F-51 Mustang, waited nearly 15 min. before being allowed to taxi. A classic delay was suffered by the crew of the Lockheed C-141 Star Lifter and a large group of hapless passengers.

The reports were invited by Lockheed to the demonstration flight and were taken to the airplane and strapped into seats. Meanwhile, crew members filed the clearance, got approval, and started up the taxi. Thirty minutes later, Le Bourget tower advised that the clearance had not been received by the tower operators, and 10 min. after that the C-141 was ordered back to its parking spot. Le Bourget later protested.

Because of a reported shortage of parking space, the USAF Thunderbirds team was based at Evreux AFB, near Paris, although the Blue Angels were at Le Bourget, and briefing for join-up and maneuvering was finally accomplished by a complicated interchange between Le Bourget and Olyr control.

All commercial traffic into Le Bourget was canceled for the June 19-20 weekend, since flying started at 9 a.m. and closed at 6:30 p.m. on each day of the last weekend.

In the combined American demonstration, the Blue Angels taxied to position for a basic diamond-four formation followed by the two solo airplanes, both
of which rolled at about 200 ft. after takeoff before joining up.

As the Angels climbed out, the Thunderbirds arrived in arrow formation—the cutback in time did not allow for their usual T-formation opener—and performed the opening bomb burst across Le Bourget. While the group re-formed, the solo pilots, trailing smoke, completed a head-on pass, using Le Bourget east-west runway as a reference point.

Solo pilots, in remarkable timing, climbed sharply out to rejoin the Thunderbirds within the field boundaries for a loop, breakaway and another head-on pass, as the main formation went into another loop.

Much of the Thunderbirds’ success is marked by precise timing by the solo airplanes. In every case, when the main formation completed a maneuver and went to altitude to re-form, solo pilots dominated the action in inverted head-on passes and, in one case, gear-down rolls, until return of the main group.

In one climbing bomb burst, the slot man rolled upwards within the center of the maneuver for nine complete rolls, trailing smoke for a more dramatic effect. The Thunderbirds closed with a high-speed crossover, formed into a diamond for a formation roll and left the stage to the six Blue Angels, who closed the show.

Starting with vertical rolls from formation, followed by a four-plane crossover from each cardinal compass point, the Blue Angels solo members did an inverted head-on pass down the east-west runway, joining the main group for a Cuban eight in which the team pulled negative g in recovery.

While two solo airplanes performed the head-on maneuver, the rest went into a diamond barrel roll, sliding into left echelon before the leader rolled towards his wingmen who then dropped into line astern.

With precise timing, the Angels moved into a V formation for a loop as the solo airplanes joined up. At the bottom of the loop, the group went into line abreast for a roll and then back to a diamond for a bomb burst, during which a slot airplane rolled downward, again trailing smoke.

The solo aircraft returned for a formation landing in which wing and slot airplanes touch down first, and leader last. It was at this point that the large crowd burst into cheers and applause.

For the British contingent, the Lightning formation did its new familiar and still spectacular vertical climbout from takeoff after the Red Arrow Gnats of Central Flying School had made formation takeoff in two Vs of five and three.

The Gnats’ newly arrived in the formation of seven airplanes as the primary maneuver and then work into a rhombus formation and, perhaps most impressive, a formation the pilots call a “big T” in which five airplanes fly abreast, with two following in line astern. Because of the time restriction, the Gnats eliminated more ambitious maneuvers, such as the Vixen, in which formation takes the shape of a de Havilland Sea Vixen, and the king’s cross, with five abreast following a leader and a solo airplane forming the bottom of the cross.

The Gnats work with nose landing lights on, although this lost some of its effectiveness because of the bright sunlight. Using the basic diamond, the Gnats looped, leaving the runway clear for a head-on pass by the solo pilots, a maneuver the team calls “playing roulette.” In the downward bomb burst, which has become a Red Arrow specialty, the two solo airplanes cross straight through the burst, also trailing smoke and rolling.

As the Gnats re-formed from the burst, the solo pilots performed one more head-on pass, and the Lightnings took over for afterburner runs and fast rolls by wingmen. The Gnats re-formed in a V to loop and bomb burst downward into the traffic pattern, leaving the two solo members to land last with smoke still on.

The Italian air force jet teams’ performance in Fiat G-91s, was, as usual, an elegant affair with complex maneuvers from a T formation into a diamond at the top of a loop, and an upward barrel roll. The team went into a downward burst from the top of the roll and when the group left field boundaries to re-form, a solo airplane made a low pass, literally 10 ft. off the runway, from an individual loop. The main group trailed smoke in the Italian national colors—green, white and red—on a low-speed pass in a diamond, then broke left to land.

A sharp, graceful performance by the French air force team, flying Potez CM-190 Magister jet trainers, and trailing red, white and blue smoke to represent the tricolor of France, featured the lead airplane inverted in a V-formation pass as an opener.

On lead recovery, the formation went smartly into line astern for a loop, to meet a solo plane head-on down the runway on the bottom of the maneuver.

Rejoining, the group did six-airplane rolls as an entity, again using the solo airplane for contrast in opposite approaches at low altitude.

A brilliant maneuver by the French, and one new to the Paris Air Show, was to form a V, once at center field, with the leader flipping to inverted position and wingmen staying level. A second later, the two tip pilots rolled into inverted position also. At the field boundary, all three returned to level position for climbout.

The Soviet Union flypast was impressive, although the overall impression was ponderous, probably because of the enormous size of the MiI series of helicopters. The leadoff machine was the
Mi-10 Harke crane, carrying a Moscow bus (empty) before the show president's enclosure.

The crane was followed by the Mi-6 and Mi-8 in a slow circle before the enclosure and then in a line along the spectator and chalet area, both pulling up at the field boundary and returning to the landing site across the airfield from the show.

Meanwhile, the Harke landed at the far end of the field to unload its bus, which was then driven away by a ground crew. The crane took off for one more pass before joining the other helicopters.

The Russians decided against flying the Antonov An-22 turboprop heavy logistics transport and the Iljusin Il-62 four-jet transport, probably because of the intense interest of general public in the static display of the aircraft, along with problems of time scheduling.

The Vickers VC.10 transport, to which the Il-62 bears a remarkable resemblance, did not appear at the show. The only available airplane belongs to Ghana Airways and that was being used at Shannon for crew training, which the airline did not wish to interrupt. Nor did British Aircraft Corp. show its BAC 111 twin-jet transport, because of delivery commitments to user airlines. These have been delays in production and export to the decision.

The Russians flew the Aeroflot Tu-134 a-mounded jet in the display despite a traffic control edict to limit the flight to 5 min. The airplane used about 20-deg. flap on takeoff—flaps are inboard and outboard of large wheel pod in center wing section—and showed sharp rotation in comparatively short takeoff.

The Tu-134 has a curious profile in landing configuration, because of engineered dog in the main landing gear which permits the forward bogies to touch down first, absorbing the initial shock as they rotate to permit rear bogie touchdown. Russian technicians said this facilitates landings on grass and improved surfaces. The rugged construction of the main gear struts bears this out.

Another jet transport which made short flyby was Sud Aviation's Super Caravelle, which is powered by two Pratt & Whitney JTSD-1 turbopfan engines. In the military transport field, a Lockheed C-141 StarLifter, using nearly full flap, made a sharp climb to pattern altitude, using less than half the available runway.

In the civil jet transport field, General Aeronautique Marcel Dassault entered three of its Mystere 20s, which Pan Amnerican, as the major customer, is marketing in the U.S. as the Pan Jet Falcon. The aircraft flew in loose formation; in an earlier practice run, Chief Test Pilot Rene Brugand rolled the airplane after a high-speed pass, repeating a maneuver he made at the 1963 show.

DASSAULT MIRAGE 4A, core of France's Force de Frappe, carries a dummy atomic bomb during a demonstration flight at the Paris Air Show. Note the recessed mounting of the weapon and the flat radome on the underside of the fuselage.

One of the Mystere 20's main competitors, the Hawker Siddley 125 was flown the first day by the Royal Air Force, which has purchased 20 for navigation training.

The first Lear Jet to be shown in Europe was flown by W. P. Lear, Jr., and his demonstration was followed by a flight of the prototype Piaggio-Douglas PD-808, with Angelo Ferretti at the controls. The Morane Saulnier Paris 3 executive jet, flown by Potez Chief Pilot Jacques Grangent, also was displayed, as was the second prototype of the Hamburger Transport flights HPB 320 Hansa, now sporting a new color scheme since it was first shown outside Germany at Gatwick Airport (AW&ST June 14, p. 295). The Aero Commander Jet Commander made its first European appearance. It was piloted by Harry Wallace.

Each jet was allowed 5 min. of flying time, including both takeoff and landing.

Other jets flying at Paris for the first time were the Saab 105 two-seat jet trainer, which eventually will have a civil application, and the Czech Ompol L-29 Delfin jet trainer.

In a short flight, the Saab 105 took off directly into a loop over the field, rolling at the top into a negative-g pullout and then breaking left for a runway pass and roll before a chandelle into the traffic pattern.

The Delfin showed a series of loops, capped by rolls at the top and an inverted pass before thestands.

Another jet new to Paris was the Hispano HA-200D Saeta trainer/strike fighter from Spain. The airplane, which also is being produced in Egypt, confined its flight display to tight turns and loops.

The Moynet 360 pushpul business plane, shown first at static display at the 1963 Paris Air Show and now in production by Sud and Engins Matra, participated in the flying, as did the Beagle 242 light twin, which appeared in Paris for the first time.

Another first for the Paris flight demonstration was the Argentine Guaraní 2 twin turboprop business aircraft, the first South American-built aircraft to fly the South Atlantic.

Two vertical takeoff and landing aircraft, both of which first appeared at Paris in 1965, repeated their debuts. The Dassault Balzac prototype, flown by Jean-Marie Saget, took off from its grilled mobile platform across from the main salon and, after transition to level flight, joined a Dassault Mirage 4 which made several sweeps.

Its counterpart, the Hawker P.1127 flown by Hawker-Blackburn Div. Chief Test Pilot A. W. Bedford, uses vectoring nozzles from its Bristol Siddeley Pegasus 5 engine, rather than the bank of Rolls-Royce RB.162 pure-boost engines used in the Balzac.

The P.1127 took off from grass in front of the spectators and almost immediately transitioned to level flight for a high-speed pass. The aircraft which is going into production for the Royal Air Force, returned to hover and fly backward before landing, again on the grass surface.

British research aircraft which took part in the show were the Hunting 126 boundary layer control aircraft, and the Handley Page 115 Delta which is being used to explore low-speed aspects of the Concorde supersonic transport program. Sud and British Aircraft Corp. decided not to take the BAC 221 oqva supersonic aircraft, which is testing the high-speed end of the Concorde wing, out of an accelerated test program being conducted in England.

Sud and the French army again participated in a joint helicopter display, keyed by two Sud Super Frelons surrounded by 15 army Aouette 2 helicopters and seven Sud Alouette 3s. Britain's Westland Aircraft also displayed its line of service helicopters, but canceled an in-flight refueling demonstration because time was short.
Russian Cosmonaut Yuri Gagarin (left) shakes hands with Gemini-4 Astronauts Edward White and James McDivitt, as Vice President Hubert Humphrey looks on. The visiting Americans had at first been refused a meeting with Gagarin, but later met him at a luncheon.

**Astronauts Seek to Boost U.S. Image at Show**

Vice President and Mrs. Humphrey, followed by the Whites and McDivitts, leave the presidential Boeing VC-137 transport at Le Bourget.
Last-minute decision to hurriedly dispatch the Gemini-4 Astronauts, Majs. James A. McDivitt and Edward H. White, to the Paris Air Show at Le Bourget Airport during its final stages did much to restore a previously anemic American image. It had been overshadowed by the Soviet space exhibit plus the array of large Russian transports and helicopters on display (see pp. 32-33). McDivitt and White were escorted by an array of U.S. officials, headed by Vice President Hubert Humphrey and including National Aeronautics and Space Administration Administrator James Webb. The group was met by French Foreign Minister Maurice Couve de Murville, and Humphrey later met with President Charles de Gaulle in an atmosphere improved at least temporarily by the astronauts’ visit. After landing, McDivitt and White, accompanied by Humphrey, Webb and top French industry officials, presided over a packed press conference at Le Bourget. On the following day, the two astronauts were surrounded by hundreds of French civilians, held at arm’s length by an energetic gendarmerie, as they toured the exhibits and aircraft on display at the show. In photo above, McDivitt and White meet the French press at Le Bourget. Standing, left, is Bruno Vallieres, president of the French aerospace industry association, with James Webb seated on his left. Humphrey is at right. A group of French civilians surrounds the Whites, Humphrey and the McDivitts (right, center) as they tour aircraft at the show. Vertical fin of Soviet An-12 turboprop transport can be seen in background, and tail of British Hawker Siddeley HS-125 business jet transport is visible in foreground. Right, bottom, Vice President Humphrey and Astronaut White are in center as McDivitt explains the performance of France’s Dassault Mirage 3C fighter. Russian officials rebuffed an American suggestion that the astronauts meet with Soviet Cosmonaut Yuri Gagarin, but the three later met when French Prime Minister Georges Pompidou and astronauts had them seated side-by-side at a luncheon (opposite page, top).
Russian motion picture photographer (above) shift equipment to obtain a different camera angle of the afterburner section of a USAF/Republic F-105. Scene typifies intense Russian interest in U.S. aircraft at Paris Air Show. McDonnell F-4 is in background.

Russians Scrutinize Western Equipment At Paris Air Show

Russians at the Paris Air Show displayed an intense interest in military aircraft and exhibits of the U.S. and other nations of the West. Motion picture and still cameramen, each usually guided by a note-taking technician, extracted every available bit of information. One Russian photographer was found completely inside a Pratt & Whitney JT3D powerplant filming details with a flash camera. The Russians also made a special effort to show their civil airplanes and helicopters to U.S. technical personnel. Although they provided more data...
than they have in the past, it amounted to less than what is usually provided to customers for airline equipment. They were willing to discuss prices. The Russians quoted a price to the Indian government of $2,200,000 for a Mil Mi-6 helicopter and said the Western price of the Tupolev Tu-134 would be about $2 million. Occasionally, the Russian photographers and technicians blanketing the U.S. exhibits confused mockups with real aircraft. One Soviet photographer, after he worked his way over a Douglas T-4E trainer, was invited to pound the aircraft’s skin. When a hollow, wooden sound identified it as a mockup, he slammed his hat to the ground in disgust. The photo at far left shows two Acrobolts pilots examining a Kaman HH-43 helicopter as two U.S. Air Force pilots stand nearby. At right, a Russian kneels while discussing the Kaman HH-43 with a U.S. Air Force officer. Also kneeling (left, below) is a Russian cameraman photographing the speed brake and wing slats of a USAF/North American F-39 Sabreliner utility jet transport. The same photographer (right, below) moves on to film the nose section of the same aircraft.