Docent Crib Notes
for
Select Air wing completed and ongoing major restoration projects

General Electric J-85

The J85 augmented turbojet is a powerplant for high performance trainers and tactical aircraft. With more than 75 million flight hours experienced on military and commercial aircraft types, the J85 offers the highest thrust-to-weight ratio of any production engine in its class. The J85 has powered more than 60,000 students to their wings in NATO and non-aligned air forces, world-wide. J85 engines first entered service in 1960. More than 6,000 engines are in active service, in a variety of applications and airframes in 35 countries. Current plans for the USAF call for J85-powered aircraft to be in service through 2040.

The museum's engine is representative of the definitive afterburning version of the J85, the J85-GE-5, which was installed on the first production T-38 Talon USAF jet trainer aircraft, which began flight testing in January 1960. The -5 produced 2,850 lbs. of thrust dry, and 3,850 lbs. of thrust in afterburner. In all, 1,187 T-38s were produced. Our engine is a J85-GE-5L, with 2147.7 total hours. It was overhauled in 1978 at Hill AFB and then placed in storage.

Quick MFHS J-85 Engine Facts

- **Type:** J85-GE-5L with 2147.7 total hours
- **Introduced:** 1960
- **Number built:** 2,826
- **Used on:** T-38
- **Thrust Range**: 2,850 - 5,000 lbs.

Chance-Vought F8U-1 (F-8A) Crusader cockpit section

F8U-1 (F-8A) – first production version, J57-P-12 engine replaced with more powerful J57-P-4A starting with 31st production aircraft, 318 built.

Our cockpit section is from BuNo. 145399, and was the mount of Capt. Gordon Hodgson, Commander, Air Group 19, (CAG) on the USS Bon Homme Richard, and who also served as CO of VF-191, "Satan's Kittens". She was in service from 1961 to 1969, and was acquired by the museum in February of 2014, where she's had intermittent attention until now.

Vought F8U-1 (F-8A) Crusader/Bu. 145399 Timeline

- VF-124.
- 1961: VF-191 as NM-100.
- 1964: VF-191 as NM-100.
- Have information on pilot, Gordon Hodgson (CAG, Air Group 19) and Larry Kelly, plane captain.
- 1964-1969 USN Reserves (Unit(s) unknown).
- 8/1969: 145399 to MASDC as 2F0115 Aug 25, 1969
- 5/1976: Salvaged.
- 2/5/2014: Purchased by MFHS from Jim Underwood for $14,000

Performance

- **Maximum speed:** 1,066 kn (1,227 mph, 1,974 km/h) at 36,000 ft (10,973 m)
- **Maximum speed:** Mach 1.8
- **Cruise speed:** 268 kn (308 mph, 496 km/h)
- **Combat range:** 394 nmi (453 mi, 730 km)
- **Ferry range:** 1,507 nmi (1,734 mi, 2,791 km) with external fuel
- **Service ceiling:** 58,000 ft (18,000 m)
- **Rate of climb:** 19,000 ft/min (97 m/s)

Armament

- **Guns:** 4× 20 mm (0.79 in) Colt Mk 12 cannons in lower fuselage, 125 rpg
- **Hardpoints:** 2× side fuselage mounted Y-pylons (for mounting AIM-9 Sidewinders and Zuni rockets) and 2× underwing pylon stations with a capacity of 4,000 lb (2,000 kg), with provisions to carry combinations of:
    - **Rockets:** 2× LAU-10 rocket pods (each with 4× 5 inch (127mm) Zuni rockets)
    - **Missiles:**
        - 4× AIM-9 Sidewinder
        - 2× AGM-12 Bullpup air-to-surface missiles
    - **Bombs:**
        - 8× 250 lb (113 kg) Mark 81 bombs *or*
        - 8× 500 lb (227 kg) Mark 82 bombs *or*
        - 2× 1,000 lb (454 kg) Mark 83 bombs *or*
        - 2× 2,000 lb (907 kg) Mark 84 bombs

Vultee BT-13 *Valiant*

Moffett Field was a training base for US Army Air Corps cadets from 1940 until 1942. The aircraft they flew were Basic Trainers, BT-13 *Valiants*, 11,537 of these aircraft were built by the Vultee company of Southern California with a goal of training 30,000 pilots per year. These aircraft were used by all services: U.S. Army, Navy, Marines and Coast Guard. Today, less than 50 are flying, none in Government service, and most are only seen at airshows.

This story begins when Moffett Field Historical Society Director John Mascali got word of a World War II vintage BT-13 *Valiant*, the type flown by Corporal, and subsequently Lieutenant, Jimmy Stewart here at Moffett Field, and maintained by a young mechanic, Private First Class (Pfc.) Chuck Yeager.

In late 2014, the Society purchased a BT-13, in pieces cobbled together from multiple aircraft, and painted with latex house paint, at a cost to the Moffett Field Historical Society of $32,000. It was delivered in January 2015. Serious work began in August 2015, under the direction of Leo Steffen, the Project Manager, the aircraft came together slowly. First, the assembly of major components – mounting the center wing section was undertaken, and then the installation of the vertical and horizontal stabilizers and assembling and installing the landing gear. Given that the larger assemblies were obtained from various sources, the restoration demanded a variety of methods to source and obtain parts, including fixing some parts, buying, or trading for replacements, and in many instances manufacturing them ourselves. The restoration was completed in 2018.

General characteristics

- **Crew:** 2
- **Length:** 28 ft 10 in (8.79 m)

- **Wingspan:** 42 ft 0 in (12.80 m)
- **Height:** 11 ft 6 in (3.51 m)
- **Wing area:** 239 sq ft (22.2 m²)
- **Empty weight:** 3,375 lb (1,531 kg)
- **Gross weight:** 4,496 lb (2,039 kg)
- **Powerplant:** 1 × Pratt & Whitney R-985-AN-1 nine-cylinder air-cooled radial engine, 450 hp (340 kW)
- **Propellers:** 2-bladed Hamilton-Standard 2-position

Performance

- **Maximum speed:** 180 mph (290 km/h, 160 kn)
- **Range:** 725 mi (1,167 km, 630 nmi)
- **Service ceiling:** 21,650 ft (6,600 m)
- **Time to altitude:** 9.2 minutes to 10,000 ft (3,000 m)

ZPK "K"-class blimp, K-22

One significant project now well into its third year at the Moffett Field Museum, is the restoration of the control car or "gondola", from a WW II-era "K" class antisubmarine warfare (ASW) blimp, K-22, BuNo. 04372. She was built at the Goodyear Airship Dock in Akron, Ohio, and delivered to the NAS Lakehurst, New Jersey on November 4, 1942. She arrived at NAS Santa Ana on November 11, 1942, where she was assigned to Fleet Airship Wing Three, (FAW-3), as part of Lighter Than Air (LTA or "Z") Patrol (P) Squadron 31 (ZP-31), as the first K-type to enter service on the West coast. 9 days later she was accepted by ZP-32 at NAS Moffett Field, where she began her operational career in earnest.

K-22 had a short, somewhat ill-fated operational life. K-22's war started on November 22, 1942, when, commanded by LT. H. R. Hobensack USNR, her crew located a downed Army P-38 at sea, and stood-by until the pilot was rescued by the Coast Guard. Later, on January 21, 1943, while moored in Moffett Field's Hangar One airship dock for maintenance, K-22 was damaged when a passing storm dislodged several of the hangar's skylight windows. Struck by falling glass, her large envelope was ripped and deflated, requiring a complete envelope replacement. After her rebuild, she was returned to ZP-32, where she would remain until her eventual demise. In addition to her Hangar One incident, K-22 was also involved in two more airborne mishaps. The first mishap occurred on January 23, 1943, when K-22 struck a hilltop near Hollister, California, resulting in yet another rebuild. Three months later, on April 13, K-22 struck a hill in the fog at Chittenden Pass near Gilroy, California, while returning to base. Once again, the entire envelope was deflated and this time, nine of the crew aboard were also injured and the control car damaged beyond economical repair. As a result, the control car was scraped in place, and the remains trucked back to NAS Moffett Field. Thus, with 828.2 flight hours, K-22 was stricken off the Navy LTA rolls after only 5½ months of service.

Fast forward to 2014, where the environmental remediation of Hangar One is now underway, including the removal of all the corrugated steel outer structure and asbestos undercladding. During this removal process, all sorts of interesting items were found tucked away in the recesses of this iconic structure, including the salvaged fore and aft sections of K-22's control car. These salvaged sections were then offered to the Moffett Field Museum, who, after considerable deliberations, committed to restoring the control car to its original 1943 configuration. This restoration project is a significant undertaking, incorporating not only repairing the original crash-damaged sections, but also fabricating from scratch, all 6 of the control car's missing middle internal skeletal frames. Bright Light Welding of Santa Clara, CA, as

our prime contractor, has been instrumental in providing customized welding and fabrication capability in this complex reconstruction, most of which requires sheer welding artistry. Blimp construction during the war was very much like building fire trucks; no one control car was built exactly as another, which also adds its own unique restoration complications.

In tandem with the car's restoration, the museum has also undertaken an ongoing sourcing effort to acquire all the original cockpit, crew workstation fittings and instrumentation, and other internal fixtures contemporary with K-22's operational life, including a complete, 1943 anti-submarine warfare, radar, and communications suite. The museum has had extensive help from the New England Aerospace Museum (NEAM) in Windsor Locks, CT, who have provided invaluable photographs, drawings, and other support. NEAM has restored the control car from K-28, a sister to K-22, although not from the ground-up, as is the case with our restoration. We have also obtained the complete Goodyear blueprints from the Smithsonian's National Air and Space Museum, along with photos and other archival materials from a variety of sources, including our own archives. Further posts will highlight specific phases of the project, including the fabricating the floor truss and keel, as well as applying the car's external skin.

General characteristics

- **Crew:** 9–10
- **Length:** 251 ft 8 in (76.73 m)
- **Diameter:** 57 ft 10 in (17.63 m)
- **Volume:** 425,000 cu ft (12,043 m^3)
- **Useful lift:** 7,770 lb (3,524 kg)
- **Powerplant:** 2 × Pratt & Whitney R-1340-AN-2 radials, 425 hp (317 kW) each

Performance

- **Maximum speed:** 78 mph (125 km/h, 68 kn)
- **Cruise speed:** 58 mph (93 km/h, 50 kn)
- **Range:** 2,205 mi (3,537 km, 1,916 nmi)
- **Endurance:** 38 hours 12 minutes

Armament

- 1 × .50 in (12.7 mm) M2 Browning machine gun
- 4 × 350 lb (160 kg) AN-Mk 47 depth charges