

Republic P-47N Thunderbolt was long-range culmination of the huge 21,000 lb. fighter. Over 1200 were completed in six separate models and with 556 gallons of internal fuel, plus wing sway braces for a pair of 300-gallon drop tanks under each wing (shown here carrying 1000 lb. bombs), the rugged T-bolt finally had the range to go with its immense firepower of eight .50 caliber machine guns and, in this photo, ten 5-inch rockets. Ability to lift heavy loads in a single-seat, single-engined aircraft made P-47 an ideal test ship for dropping water and fire retardant chemical-filled tanks on forest fires. During WWII it had dropped jellied gasoline or napalm-filled tanks to start fires. Now, in the summer of 1947, it would be dropping similar sized cannisters to determine if their contents could put fires out.



In a recent television segment on fire fighting shown here in the U.S., Eastern European countries, short on such vehicles, were re-working main battle tanks into fire engines. Refurbishing machines of war for peacetime purposes is nothing new. In the United States, a wide variety of military aircraft, from single-engined Grumman TBF naval torpedo bombers and twin-engined F7F Tigercat fighters, to four-engined Boeing B-17 bombers, have been used to battle forest fires. Augmented by flying boats and four-engined commercial airliners, these

aircraft have enjoyed rewarding secondary careers as forest fire fighters. But perhaps the most intriguing aircraft ever tested for flying a fire fighting mission were a pair of virtually unknown ten ton Republic P-47N Thunderbolts, equipped with weapons that had previously spread fire in solid sheets of roiling flame.

One of the most devastating tactical air weapons used by America's air forces in World War II was the searing napalm bomb with its jellied gasoline formula of bursting inflammables. Dropped from P-47s, Lockheed P-38s, Vought F4U Corsairs

FIRE FIGHTERS

Nearly Half A Century Has Passed Since The Air Force Attempted To Aid The U.S. Forest Service By Fighting Fire With Fire In The Form Of P-47 Thunderbolts Dropping, Of All Things, Napalm Tanks Designed To Put Out Flames!

By Warren M. Bodie

Photos courtesy U.S. Forest Service, Robert Forrest, Republic Aviation, Air Proving Ground, Eglin Field, USAF and author's collection.



1. During WWII, Thunderbolts and other Allied fighters flew with a number of weapons to drop on the enemy and several varieties of fuel tanks to reach him. When bombs or napalm were in short supply, these airmen from the 36th Fighter Gp. improvised. Some of their more exotic inventions were old German drop tanks filled with waste oil and released as incendiaries. Once dropped on a target they were then ignited by machine gun fire.

2. P-47Ns in the Pacific fill up their 165-gallon wing drop tanks. Among a wide variety of auxiliary tanks available to USAF fighters, and the P-47 in particular, the 150 and 165-gallon metal tanks were standard and widely used.

3. More unusual, particularly at the beginning of the war, was this bulbous 200-gallon ferry tank, adapted here for combat use by this P-47C from the 83rd Fighter Sqdn. In 1943, P-47 pilots with a combat radius of 400 miles could barely escort bombers to Eastern France. Revised ferry tanks like this one, with flush metal work to smooth out the air flow and a wooden wedge to force the tank away from the aircraft when it was released were, at first, fitted to the aircraft of mission leaders, extending their range and allowing them additional time in the air and greater flexibility in guiding their squadrons. Eventually, improved tanks were adopted to provide increased range for all pilots in the squadron.



4. P-47D-5s line up at Republic plant airstrip prior to being ferried across the Atlantic to England. They are equipped with 150-gallon wing tanks adapted from Lockheed's P-38 Lightning. In configuration shown here, pilot had 605 gallons of fuel available, 305 gallons of it carried internally. With advent of P-47N, internal fuel load increased by nearly 75 percent and external capacity was doubled.

5. Air Rescue Unit P-47 patrols over the English Channel with rubber dinghy pack under its wing and smoke markers under the fuselage. Fuel tank is 108-gallon paper and glue model, developed in England and put into limited production in early 1944, without stateside authorization. By the time Washington rejected it as unworkable, thousands were in use and full-scale production was authorized. T-bolts also flew with a 200-gallon variety of this tank.



6. Fifth Air Force T-bolt releases a 165-gallon P-38 type tank during a 1944 flight. When filled with napalm material, similar tanks became offensive weapons with very little modification and, after the war, when filled with fire retardant chemicals or water, proved to be valuable fire fighting aids.

7. In an effort to increase the P-47's range, a great deal of custom, if crude, metalwork was done by squadron armorers to fashion droppable auxiliary fuel tanks, while awaiting the arrival of mass produced standard types. This 215-gallon version was of welded steel and was fabricated when factory supplied tanks were scarce. The work done on them and a system of pylons and spring-loaded release mechanisms to insure that the tank separated cleanly from wing, paid big dividends when devising the first napalm bombs and, later, fire retarding tanks.



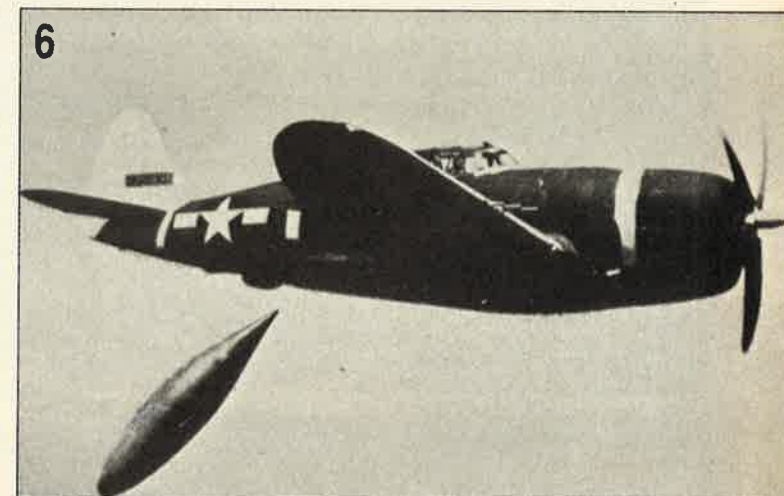
FIRE FIGHTERS

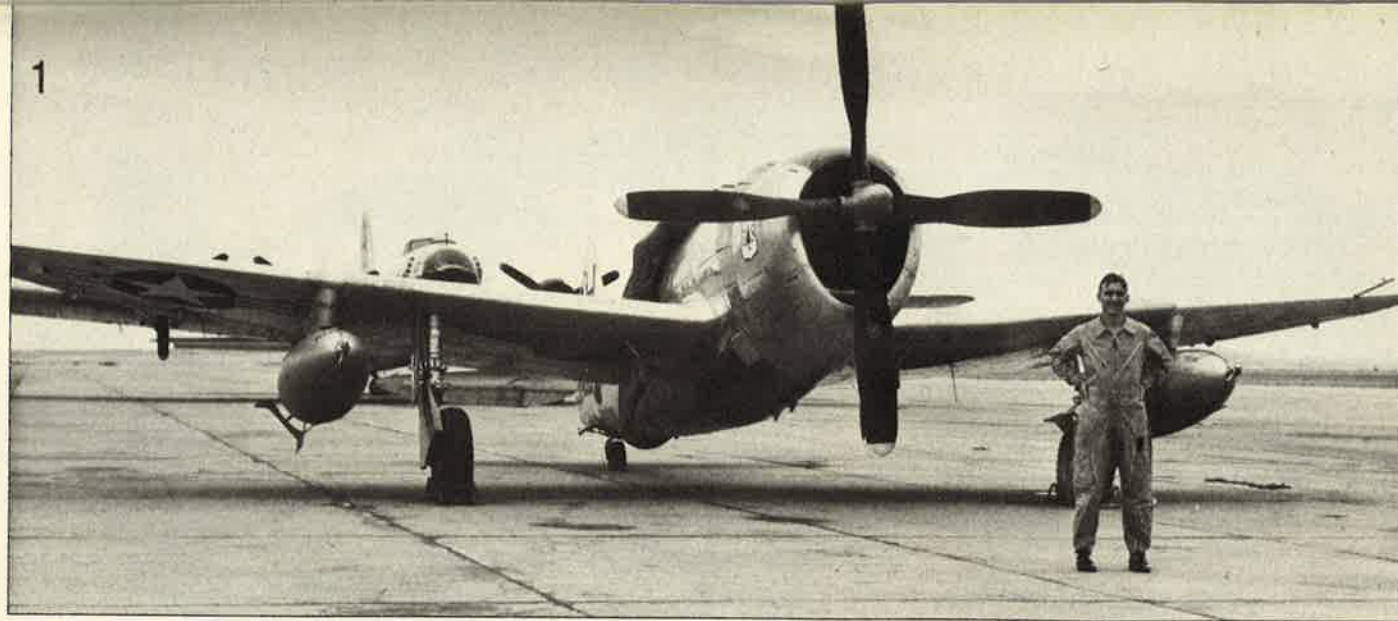
and Grumman F6F Hellcats, it produced a river of fire that swarmed over entrenchments in an irresistible blob of incendiary heat, flowing in fingers of flame to find and then drown well dug in troops and artillery in an all consuming conflagration. Utilizing fighters to carry this new brand of hell, which they dropped in dive bombing and glide bombing attacks, the jellied gasoline tanks tumbling from beneath the wings and belly of the aircraft, Army, Navy, and Marine Corps pilots literally devoured entire enemy units, particularly in the Pacific, where napalm use was prevalent. Thirty years later in Vietnam, the weapon's spectacular and horrifying results still could be seen on nightly television news broadcasts, burning out wide swaths of jungle. Consequently, it seemed a paradox when, in 1946, a major program was initiated by the Air Force and the U.S. Forest Service to attack forest fires with 165-gallon napalm style drop tanks, carried by P-47N Thunderbolts and Boeing B-29 bombers.

It all began when the Chief of the Air Staff in Washington D.C. ordered Air Proving Ground Command at Eglin Field, Florida, to assist the U.S. Forest Service in carrying out a program cryptically referred to as the "Container-Missile Project." Air Proving Ground was already experimenting with Air Rescue Service on a similar project, but both the Forest Service and Air Rescue at Morrison Field, Florida, were short on funds. As a result, David Gordon of the Agricultural Department's Forest Service requested additional Air Force aid and cooperation.

Although ideas for using aircraft to locate and assist in the battle against forest fires was nothing new - dating back at least to 1912 - progress had been limited by funding and technology during the quarter century that followed World War I. Attempting to involve either the Army or the Navy in 1912 was also

8. P-47D at Duxford, England, with 200-gallon flat belly tank. Japanese were first to introduce paper and glue impregnated auxiliary fuel tanks. But, like all tanks of this type, they had to be utilized as





1. During the summer of 1947 fire fighting air drop tests were conducted in Montana by Air Proving Ground and the Forest Service. Stabilizing fins, shown here, were appended to 165-gallon wing tanks, when the P-47 was utilized in a dive bombing mode, which required steep approach in tightly restricted areas, such as narrow canyons. Over generally open areas, the tanks - without fins - were released much like ordinary drop tanks. Of interest is U.S. Forest Service logo on cowl of this P-47N.



illogical since both only had a total of fifteen flimsy flying machines for training. Nevertheless, by 1919, the Forest Service was working closely with the Air Service arm of the Army Signal Corps and a young officer listed as a colonel (temporary WWI rank) by the name of Henry H. (Hap) Arnold.

As of 1928, the Forest Service used contracts with private firms to provide aircraft and flight services for locating and fighting fires from the air. It wasn't until 1938 that the Forest Service was able to purchase its first fire fighting aircraft, a single-engine cabin monoplane, but after the end of WWII, they bought several types, until their air arm numbered some sixteen aircraft in 1949.

Air Proving Ground Command planned to use a Boeing B-29 and two factory fresh Republic P-47Ns to drop 165-gallon napalm tanks (reworked from fuel drop tanks) and containing water or chemical mixtures, on large and small forest fires. For pinpoint attacks on fires in rugged, mountainous terrain, the Thunderbolts were to use dive bombing, tank salvo techniques similar to those operations employed during the war. For these dive bombing missions, the tanks were to be equipped with the same 2000-pound bomb fins that were to be fitted to all such tanks also dropped by the B-29 Super Fortress. When using glide bombing techniques that were likely to be effective where the terrain was not as difficult, the tanks dropped by the P-47s would not employ stabilizing fins. In this scenario, the tried and true wartime procedure, where the tanks were allowed to tumble to the ground, provided better water and/or chemical dispersion. Meanwhile, modifications to the B-29's bomb rack equipment permitted that aircraft to carry eight of the tanks at one time, which for the most part were fin-stabilized tanks employing M4 bursters and M166 fuses.

Air Proving Ground Project 1-47-3 was assigned to the 611th AAF Base Unit at Eglin Field on May 21, 1947, and got underway in Montana at the beginning of June. Flights were generally conducted out of Great Falls Army Air Base for action against fires in the Lolo National Forest of Montana. As

2. Same type of tanks, without fins, utilized by this wartime P-47D at Iceland refueling stop during course of long trans-Atlantic ferry flight. The 165-gallon Lockheed-type fuel tank devised expressly for the P-38, but also utilized by other fighters, is often referred to as holding 150 gallons. In military usage, the figure 165 stands for capacity, but 150 gallons was all that could reliably be expected to reach the engine while allowing for an extra margin of safety.

3. The Thunderbolt was a bona fide load carrier and some of its cargo was not particularly asymmetrical. Shown on this P-47D of the 310th Fighter Sqdn., 58th Fighter Gp., on Okinawa, from right to left starting under its port wing: a 300-gallon wing tank, a 150-gallon fuselage tank and a 1000 lb. bomb, under the starboard wing.

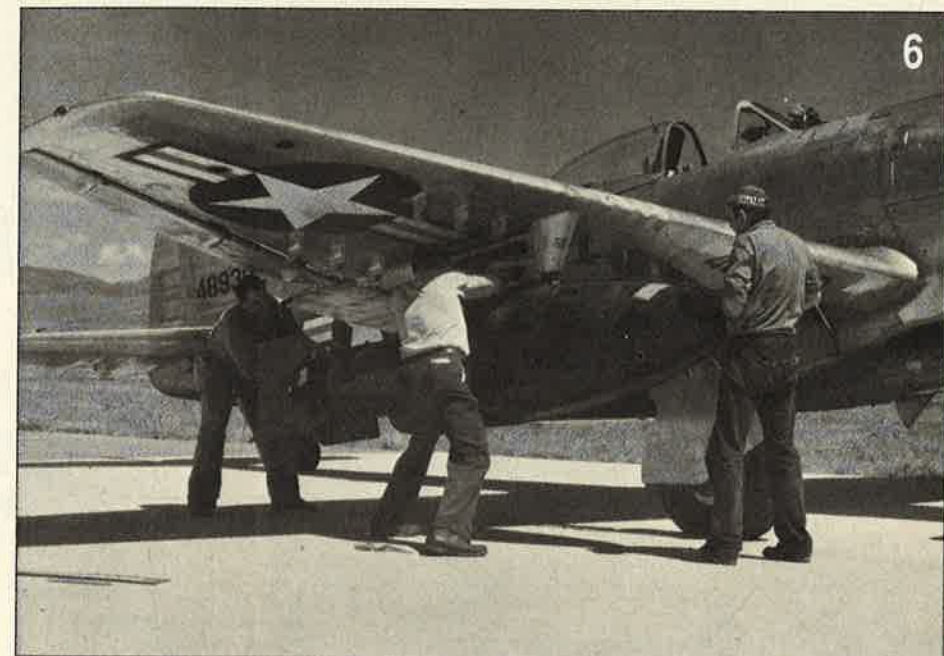


4. A P-47D with 200-gallon flat belly tank. Pilots always took off on main tank, then switched to drop tanks, as the sooner this fuel was drained away and the tanks dropped, the quicker their drag was reduced. In the Pacific on long missions, with 165 gallons in each wing drop tank and an additional 110 gallons in a belly tank, all the fuel in the belly tank was expended in the climb to 20,000 ft. and immediate forming for optimum cruise.

5. Support personnel prepare to mount 165-gallon drop tank on one of the two P-47Ns (AC-44-89308) at Great Falls, Montana. Thunderbolts utilized for these fire fighting tests were virtually brand new.

6. Bomb fins on tank indicate this was to be a dive bombing run for fires in steep ravines and other inaccessible areas. General, spread out sections of fire were bombed with finless tanks.

7. Close-up of one of 125 napalm-style tanks dropped during 1947 tests. Most were filled with water, although some carried fire retardant chemicals. A single B-29 was also employed in the tests and was rigged to

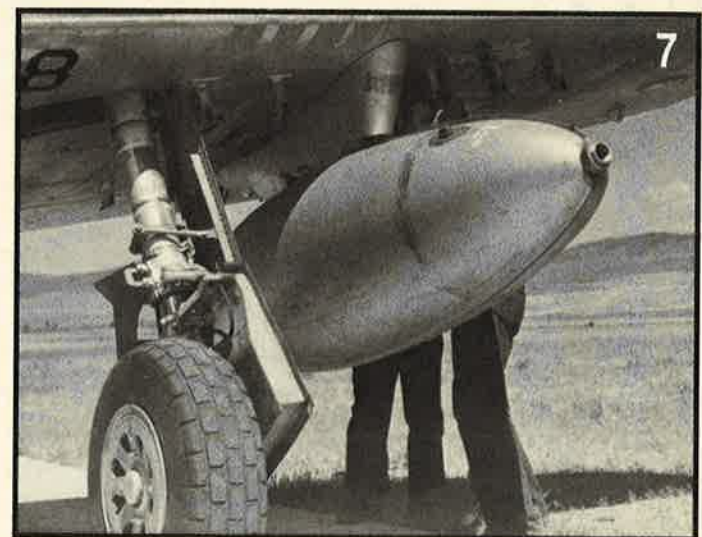


might be expected, the bomber teams encountered problems such as tanks colliding at various altitudes and variable intensity when they were dropped by the B-29. There were tank release failures, fuse or burster malfunctions and an entire assortment of minor failures, but good results were also achieved.

Republic P-47N drops ranged from 70-degree dive bombing attacks at 380 mph to 250 and 265 mph glide bombing drops at minimum altitudes, terrain permitting. The B-29 bombardier made most drops at 200 mph with terrain clearances of 1000, 1500 and 2000 feet, the first heavy bomber mission being flown on June 7, 1947.

Initial P-47N dive bombing missions were flown on June 18 in excellent weather by P-47N-25-REm AC44-89308. Although none of the reports generally identified the Thunderbolt pilots, 1st Lt. Charles G. Mathison was project officer and 1st Lt. Robert A. Duffy was test officer.

With the last P-47 flight test conducted on August 28, it was concluded that many benefits could be derived from aerial water bombing of fires, particularly in the early phases of





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1. Well known Republic test pilot, Joe Parker (center), is shown during war at company's Farmingdale plant with a P-47N-5-RE fitted with a pair of 165-gallon wing tanks and a small 75-gallon centerline model. Crew chief in coveralls is "Pop" Provo.

2. XP-47N in summer of 1944 at Air Proving Grounds test center with two 310-gallon wing tanks, not a very safe configuration. Nevertheless, the P-47's P&W R-2800 engine had power enough to carry such a load. Beautifully constructed, there were no internal seals between its power sections, the mating surfaces of which were lapped so well that oil seepage was rare.

3. After making its approach dive at 70 degrees, P-47N has released its napalm-type, water filled tank and zooms up over Lolo National Forest in Montana, as water bursts below.



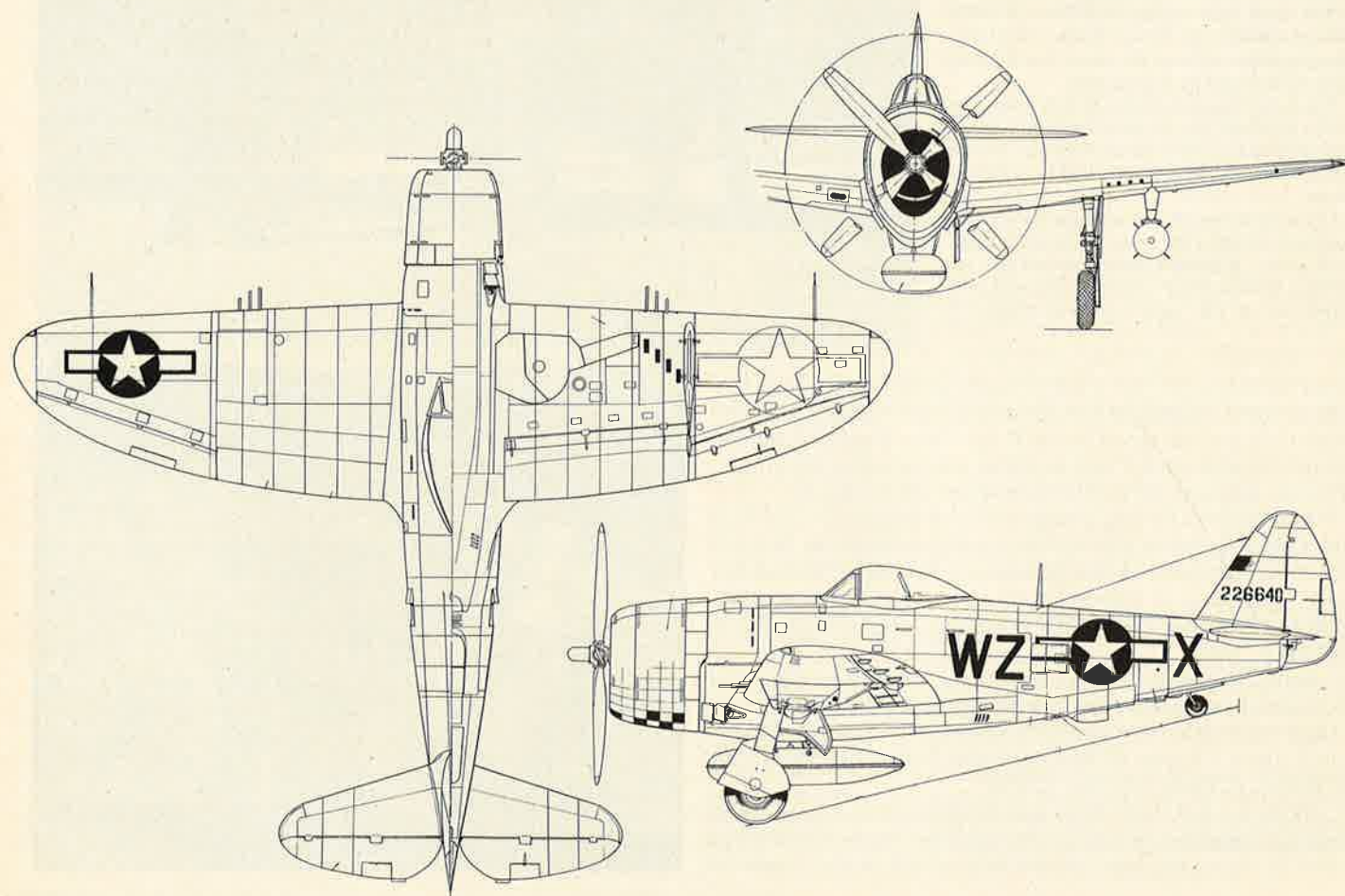
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isolated fires created by lightning strikes. Analysts considered fighters to be the optimum aircraft for attacking small fires, especially where the terrain was remote, cut up and difficult. The heavy bombers were more ideally suited to combating larger sector fires. Final reports recommended continuation of the water bombing tests, but no follow on reports came to light in the investigation process until after the Korean War, when borate bombing of the "gusher" drop variety was proven.

Despite the proven success of the P-47s, Lockheed P-38Ls might have been even more effective water bombers if more of them had remained in service in the late 1940s. With very little modification, they could have easily and safely carried two of the 310-gallon drop tanks inboard and without difficulty could have been retrofitted to carry another two 165-gallon tanks outboard. Without ammunition and with dry leading edge fuel tanks, there would have been no lifting problem.

Ironically, one thing that may have contributed to any failure to conduct further testing in 1947 was a shortage of napalm tanks. Close to 125 of the 165-gallon tanks were expended that summer. Those big drop tanks were of the exact design developed for Lockheed's P-38s in the months immediately following the Pearl Harbor attack. With concurrence of the Project Officer, Col. Ben Kelsey (who simply ignored official policy), C.L. "Kelly" Johnson's team designed and tested an entire family of drop tanks in a matter of weeks. Gen. Hap Arnold was hardly inclined to reprimand Kelsey for doing exactly the right thing, even if he had violated regulations, and the Lockheed 165-gallon and 310-gallon tanks were at the top of the list for best WWII drop tanks. However, during the years immediately preceding the Korean War, everything, including drop tanks, was in short supply.

Early on - in August, 1944, in fact - APGC at Eglin had tested the XP-47N with various drop tank arrangements, including two 310-gallon tanks. While P-38Js and Ls operated comfortably in combat theaters with either two 310-gallon



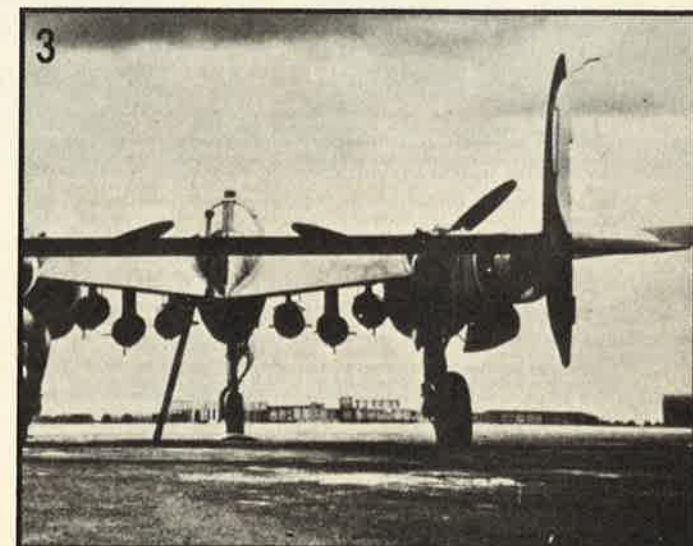
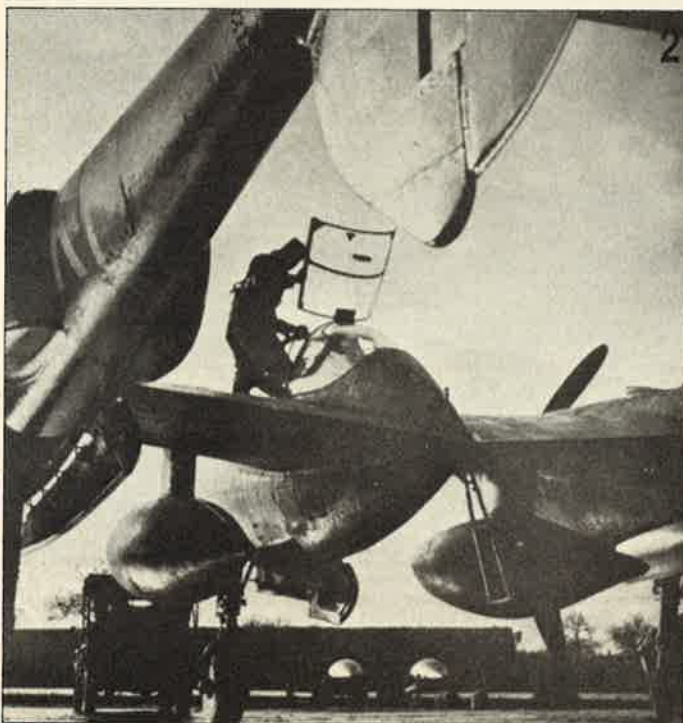
4. Bull's-eye! This P-47 has just scored a direct hit on a small fire, after salvoing both tanks. Borate mixtures were still in development stage in 1947 and, under certain conditions, live bombs were also used to fight fires.



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1. Champion U.S. load carrier of WWII was Lockheed P-38 Lightning, but by 1947, when fire fighting tests were run, there were not a great many of them available to the USAF. Lockheed pioneered drop tank pylons and external fuel tanks and was able to attach a great deal of ordnance to their classic twin-engine fighter. Here, a pair of torpedoes on a P-38F.



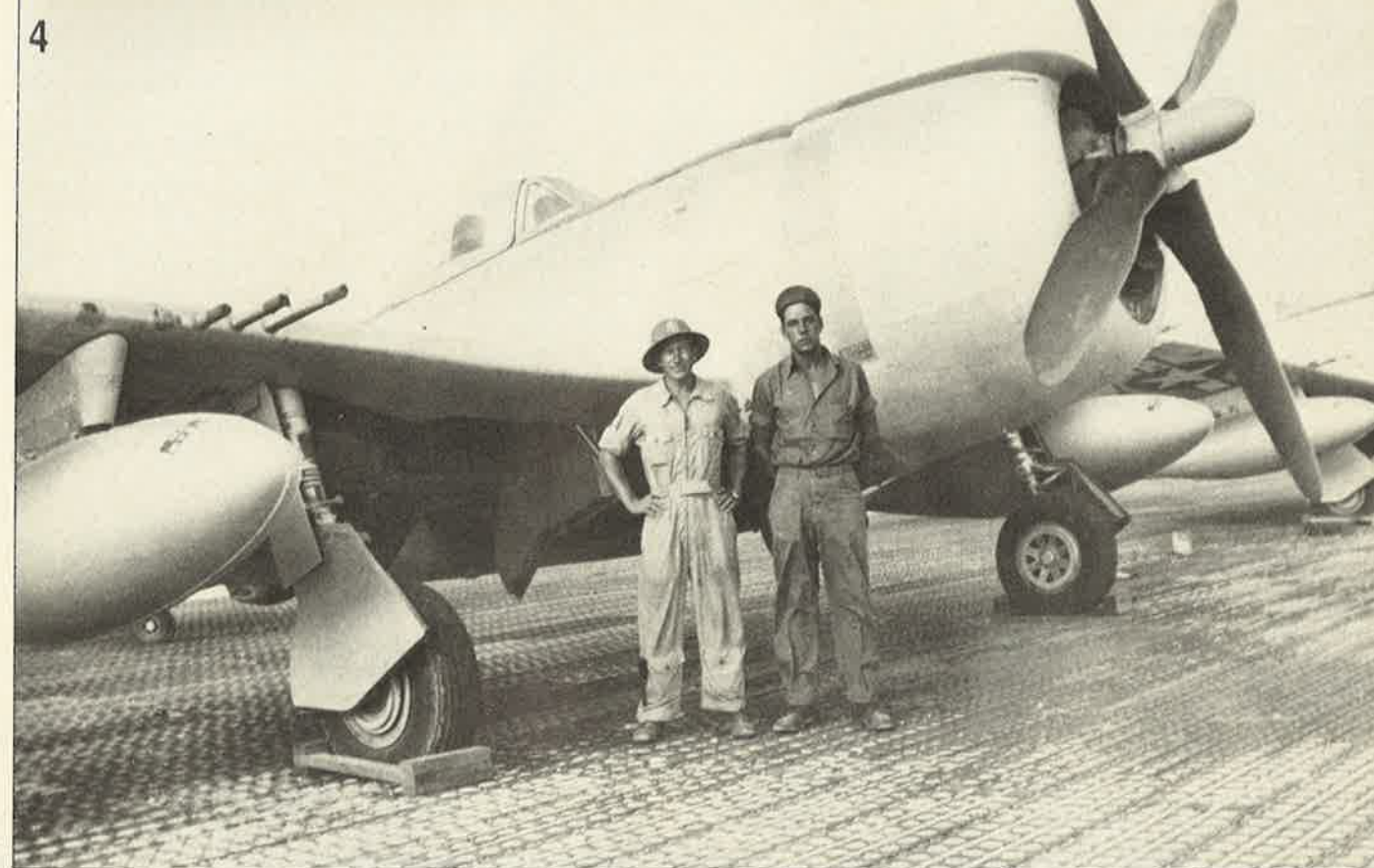
tanks or one each 310 and 165-gallon tanks, the Thunderbolt was considered to offer "severe operating limitations" with such a load. Although the P-47N could most certainly lift off with two full large capacity tanks, premature release of one, immediately unbalancing the aircraft, could be deadly to even the most capable pilots, and there were other problems as well. For the fire suppression tests, it was not possible to rework the B-29 to carry any of the larger tanks.

One little known sidelight of the test program, at least until the Korean War erupted, was an endemic shortage of aviation fuel that affected reserve training flyers. Under the parsimonious regime of Secretary of Defense Louis B. Johnson, budgets were so tight that flying time was severely curtailed, and during two weeks of August, 1947, the APGC fire suppression program involving the P-47s was shut down for lack of fuel. This, at a time when high test gasoline sold for just 27 cents a gallon.

With the coming of Labor Day weekend, an unpublicized but interesting project came to an end, having generally

achieved all of its limited goals. It was just another of those obscure projects that passed into history with hardly a nod from the public. Those two T-bolts soldiered on, however, but it is anybody's guess as to how long. By 1950, there were so few P-47s left that none were sent to Korea for ground support work, and this brings up even one more rare aside.

With Rolls-Royce Merlins becoming virtually extinct as far as USAF procurement was concerned, North American Aviation was awarded a contract to redesign P-51D/H airframes to accommodate the big Pratt & Whitney R-2800. The obvious intent was to remanufacture available airframes and substitute the well stocked and reliable radial engine for the Merlin. The resulting fighter still would not have been the potent weight lifter that the Thunderbolt had been, but the idea had promise. Nevertheless, by the time preliminary work was underway, most of the Air Force's stock of P-51Ds were already doing yeoman work in Korea and it was obvious that most new projects would be based on jet aircraft technology.



2. P-38 Lightning with two 300-gallon drop tanks. Modifications to these tanks also allowed the Lightning to evacuate two wounded men in each tank, and a special P-38 was revised to carry ten men or 4,000 lbs. of equipment. P-38 was also the first fighter utilized to pull gliders.

3. Another "Christmas tree" modification allows this P-38 to load six 500 lb. bombs.

4. Air Force pilot, John Fowler, left, poses with his P-47N and its crew chief at Eniwetok in 1945. These fuel tanks were usually replaced by napalm-filled versions for ground attack missions. By this period of the war, high manifold boost problems had been solved through correct use of throttle and propeller pitch and Republic's chief test pilot, Lowery Brabham, reported that with proper application, a P-47N could pull a continuous 3,500 brake horsepower.

5. Another view of P-47N utilized for fire fighting tests, shown at Missoula, Montana in 1947.

6. Unusual pre-war markings on this 56th Fighter Gp. P-47N photographed at Selfridge Field, Michigan, in October, 1946 by the author, where P-51s at base were similarly marked.

7. Auxiliary fuel tank clearance was minimal for loaded P-47Ns operating out of Ie Shima in August, 1945. Here, Captain Robert Forrest in Shell Pusher revs up to 53 inches of manifold pressure to get off coral strip.

