

## GUIDED MISSILE ATTACKS AGAINST RABAUL

Wars have always played an important role in the development of weapons. It provided a real life testing ground for the introduction of new and sophisticated methods of mass destruction.

Unknown to most was the development of America's first successful combat-tested guided missile, the Interstate TDR, which had its origin within the Navy Bureau of Aeronautics. Prior to the beginning of World War II, the Navy was toying with the idea of utilizing drone aircraft primarily for fleet gunnery practice. However, imaginative minds came up with the concept of a "Kamikaze" bomber minus the pilot, and this had enough merit to warrant further exploration. The advent of an airborne TV camera/transmitter made the TDR assault drone a reality.

The TDR, a small twin-engined mid-wing monoplane aircraft, capable of carrying a 2,000 pound bomb, was manufactured by Interstate Aircraft and Engineering Corporation of El Segundo, California.<sup>1</sup> Because of its expendable nature, it was assembled using welded steel tubing and plastic skin. It was nothing more than an oversized, radio-controlled model airplane, with a wing span of forty-five feet and length of thirty. Two inexpensive 220 hp Lycoming engines provided power. Although it had a pilot's cockpit, it had been faired over for pilotless use. It could be launched from a catapult aboard ship or from an airstrip, and was guided to its target by a director aircraft. One hundred and eighty nine TDR-1s were manufactured at DeKalb, Illinois during 1943-44.<sup>2</sup>

The Japanese were also conducting parallel research on a radio-controlled aircraft. Commander Tomoyoshi Hori, executive officer of the 105th Naval Base Air Unit, played a leading part in the development and test flights of such aircraft.

"At the start, the Japanese Navy also made radio-control planes intended for use as targets in fleet gunnery exercises. The fact is, the Japanese Navy had accomplished two pilotless aircraft of sorts, in early 1942. At that time, I was serving at the Naval Aero-Technical Arsenal in Yokosuka as a test pilot.

"The outline of the method was that a real Type 94 Reconnaissance Seaplane (Allied codenamed Alf), equipped with a radio control equipment, was to be launched by catapult and fly under radio control from a director aircraft and make a safe water landing. That aircraft had safety equipment which enabled the pilot to change from 'automatic' to 'manual' during the test flight.

"During the test flight of these aircraft, I took off from the water by manual control, and once in the air, changed to automatic, and I released my hands and feet. When I felt danger, I would change to manual control. The result of the test flight was good at the beginning, but water landings brought many problems.

"In the Autumn of 1942, the final experiment (real pilotless) came into effect in Tokyo Bay. At the opening of the bay at Tateyama, we launched by catapult off the battleship *Yamashiro*. In advance, I was in the director aircraft. In the first test, the No.1 plane was launched, but just after release, its engine failed and it crashed into the sea. It was the first time failure! The second time, our No.2 aircraft launched successfully and I directed its flight around the mouth of Tokyo Bay for about thirty minutes, then turned it back and it made a suc-



The Interstate TDR was nothing more than an oversized radio controlled model aircraft. (Credit: National Archives)

cessful water landing near *Yamashiro*. The experiment was a success in spite of our first failure.

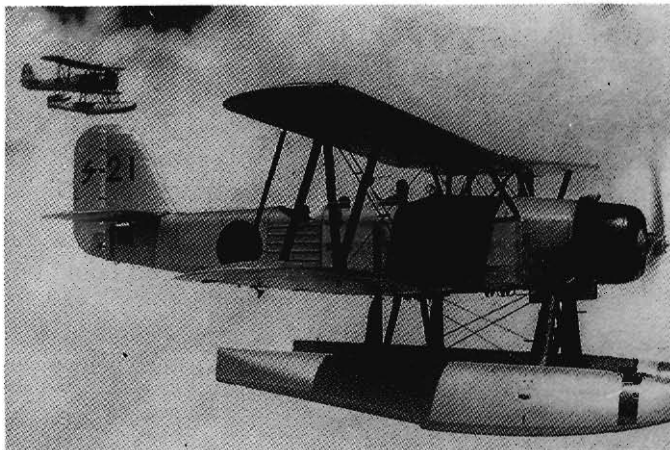
“At the time Japan was in war and the Japanese Navy did not have sufficient time and margin to produce a lot of such pilotless aircraft. I think now, if Japan had a lot of such equipment towards the end of the war, we might have achieved some successes in battle without having to resort to Tokko Tai (Kamikaze), the likes of a suicide mission!”<sup>3</sup>

The US Navy’s Special Task Air Group One (STAG-1), arrived in the Russells (Sunlight Field, Banika Island, northwest of Guadalcanal) on 12 June 1944. Armed with the TDR and full of confidence, they put on a demonstration for Admiral E.L. Gunther (Commander Air Forces, South Pacific) and Major General Ralph Mitchell (USMC), Commander of the Air Forces for the Solomon Islands. Two out of four TDRs demolished a beached Japanese merchant hulk near the northwest tip of Guadalcanal. Admiral Gunther was impressed.<sup>4</sup>

Admiral William Halsey, commander of the South Pacific Area, believed that the new weapon had merit and should be tested under combat conditions. However, “battleship admirals” in Washington had their eyes on disbanding the unit. While Commodore Oscar Smith, head of STAG-1 went to Washington to battle the enemies of the TDR program, Commander Bob Jones (acting commander) took the equipment into combat operations.

On 27 September 1944, the TDR received its baptism of fire. Squadron VK-12 sortied four drones against Japanese ships anchored one mile southwest of Kahili Airfield on Southern Bougainville. Three TDRs scored two direct hits and a near miss and destroyed an anti-aircraft battery.

Mission Two occurred on 1 October when eight TDRs were launched against anti-aircraft positions on South Bougainville. According to the official report: “One



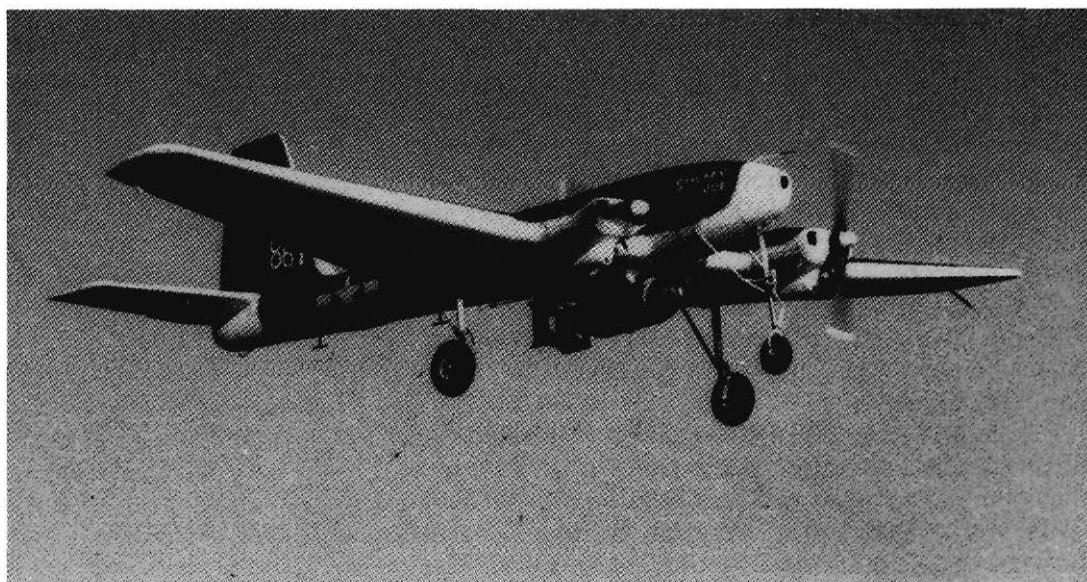
The Japanese Navy’s first drone aircraft was the Type 94, but the program was scrapped as the war progressed. (Credit: K. Osuo)

hit was scored on a heavy position west of Ballale, and one on an automatic weapons position NE of Kangu. One TDR fell 300 ft. short of heavy guns south of Ballale, and two landed on Poporang Ridge. There were two duds in the target area, and one equipment failure, resulting in explosion in the air four miles north of Moila Pt.”<sup>5</sup>

The initial attacks weren’t spectacular, but there were high hopes. On 5 October, four TDRs were directed against Rabaul from their new base on Green (Nissan) Island. They were led to the target area by Grumman TBM Avengers (one TDR for each TBM). Two were lost due to technical problems and the remaining two exploded onshore, far from their targets.

An early TDR attack was witnessed by Commander Hori. His headquarters was located on the central highlands about nine miles east of Vunakanau Airfield. The highlands were near the coast, jutting more than 900 feet above the sea, with a commanding view of Simpson Harbor and Rabaul.

A TDR test flight over Half Moon Bay, Calif. in March 1944. A 2,000 lb. bomb is slung under the belly. (Credit: National Archives)



"I usually visited various sites by car," recalled Hori. "Once, our car was strafed by an enemy fighter and was destroyed by fire on the way to the airfield. At that time, I would visit the HQ in Rabaul Town by car, once or twice a month. Then I encountered the TDR attack on the way to HQ.

"Due to my experience, when I saw the first TDR attack at Rabaul, at once I could understand what it was. I remember that I saw its attack at Rabaul about seven or eight times. Each time, our force suffered lightly and we didn't feel any sense of danger."<sup>6</sup>

Naval Lieutenant Minoru Shinohara also witnessed the TDR attacks, but had a different reaction.

"It was a very small plane the first time I saw it. We wondered what it was. It made a small noise. Then I saw a larger plane at the entrance to the bay and realized that it was the director aircraft. We would hear the sound, and then all of a sudden, it would stop. We were scared because we had no idea where it was going to hit."<sup>7</sup>

"Our headquarters gathered the wreck of the TDR," continues Hori, "and we investigated it. I selected the minimum important parts from the wreckage. These materials were sent to Japan on November 8, 1944 by *Gekko* (twin-engine reconnaissance plane), but the plane went missing on the way to Truk."<sup>8</sup>

While Commander Hori poked through the wreckage to see what could be salvaged of the cockpit instruments, soldiers were busy trying to recover the engines' spark plug/generator assembly. When two wires were crossed, it produced a spark to light cigarettes; matches were scarce. They did have a "cigarette lighter" made from Zero engine parts, but they were very heavy and cumbersome. The TDR's engine parts were smaller and lighter.

As criticism mounted back in Washington, STAG-1 needed a spectacular success. It was decided to take out the causeway bridge linking Matupi Island to Rabaul in Simpson Harbor. This demanded pinpoint accuracy. On 9 October, VK-12 launched four TDRs. Two drones were shot down by heavy anti-aircraft fire, one crashing into the harbor one-quarter mile north of the bridge and the second one also came down in the water. The third TDR landed 100 yards from an anti-aircraft position and the fourth failed to reach the target. The advocates behind the TDR program were beginning to sweat. The purpose of the program was not to provide Japanese anti-aircraft gunners with convenient target practice.

It was "go for broke" on 15 October. Once again, the bridge was targeted for destruction. VK-11 was given the honors. According to the official report: "Of four TDRs, one crashed and sank midway between Duke of York and Cape Gazelle; one passed through the saddle,

over the bridge, circled for nine minutes, and crashed on the west side of the harbor; one exploded on the southwest side of Hospital Ridge; and one hit a secondary target area." The three misses were attributed to TV failures.<sup>9</sup>

Roger Newton, a radioman with STAG-1, recalls that the TDR was controlled by a joy stick, much like the control mechanism on today's TV video games, with a function dial. The television screen was green tinted and around five inches in diameter. A movie camera mounted behind the operator's shoulder filmed the small TV screen to record results.<sup>10</sup>

The last TDR attack was launched against Rabaul on 26 October. Two drones actually hit some buildings close to the intended target. The third went into the ocean at the southwest tip of Duke of York Island. The fourth TDR, diverted to Cape St. George, demolished a lighthouse.

A total of forty-two TDRs were launched against targets at Rabaul and Bougainville (nineteen against the former). The results were somewhat underwhelming. Strong radio interference en route to Rabaul by friendly forces caused some to fly erratically and miss their targets.

Commander Hori comments on the effectiveness of the TDR:

"The TDRs came and went and I don't believe their attacks were very effective. I thought they were just testing it. We didn't throw much flak at them, although when they came down to lower altitude, soldiers fired on them with machine guns and small arms. The mother plane was always way out there and we didn't bother to waste our ammunition on them."<sup>11</sup>

W. Raymond Woolrich, a pilot in STAG-1, remembers the Japanese commenting on their attacks at Rabaul: "It is reported that Tokyo Rose announced this strike as follows: 'The Americans are now using a flying box. It must be radio controlled for there is no pilot in them. We have just captured one of them.'"<sup>12</sup>

The official US Navy report was hardly enthusiastic: "Obviously, in its present stage of development, the assault drone is far less accurate and effective than the more ordinary bombing methods."<sup>13</sup>

On 27 October 1944, one day after their final assault on Rabaul, the Navy decommissioned STAG-1 and the assault drone program was terminated.

Captain Robert F. Jones USN (Ret.), now of Cape Canaveral, Florida, was quite proud of his unit's achievement: "As you know, our television aimed missile project was Top Secret and had powerful opposition. In '44, we made 46 attacks, had 45.6% direct hits. No KIA, no MIA, no POWs, no injuries. No loss of central aircraft."<sup>14</sup>

In 1966, Steve G. Simpson, then a journalist with the Times Courier of New Guinea, stumbled upon a wreckage of a TDR in the jungles of Rabaul. He was led to the site by a local native, who as a boy, had worked



A television screen in the mother aircraft displays the approach of the TDR toward the experimental target ship off Guadalcanal. (Credit: Gary Nila)



The TDR is seen (above) just before it struck the target vessel, and (below) at the moment of successful impact. (Credit: Gary Nila)



as a mess servant at the Lakunai Airfield's pilot mess hall. Laying undisturbed about seventy-five yards away from the wreckage was the TDR's rusty bomb. Simpson took photographs of the wreckage and wrote letters to the US Air Force, inquiring about the strange aircraft. They initially professed no knowledge of any such aircraft. When Simpson returned to the crash site for further investigation, he was devastated. Fearing evil spirits, the natives had set fire to the wreckage and detonated the bomb; there was very little left.<sup>15</sup>

The only TDR in existence today is displayed at the Naval Aviation Museum in Pensacola, Florida. Today's ultra-sophisticated "smart" missiles can trace their ancestry directly to the crude but innovative Interstate TDR.

1. *Janes All World Aircraft*, 1947.
2. Kenneth Munson, *American Aircraft of World War II* Blandford Press, England, 1982, 94.
3. Correspondence from Tomoyoshi Hori, 1 March 1993.
4. Chronology of Special Air Task Force's Story, private writings of Captain Robert F. Jones (USN, Ret.), 1990, 12.
5. *Analysis of Pacific Air Operations*, October 1944, Serial 001883, 30 December 1944, Office of Naval Records and Library.
6. Correspondence from Tomoyoshi Hori, 1 May 1993.
7. Interview with Minoru Fujita, Rosemead, CA, 15 July 1993.
8. Hori.
9. *Analysis of Pacific Air Operations*, October 1944.
10. Telephone interview with Roger Newton, 24 October 1993.
11. Interview with Tomoyoshi Hori, Temple City, CA, 20 October 1993.
12. Correspondence from W. Raymond Woolrich Jr., 12 August 1993.
13. *U.S.S.B.S.*,
14. Correspondence from Captain Robert F. Jones, 24 July 1993. Captain Jones also sent the author a videotape made from films taken off the television transmission of the TDR demonstration attack on the *Yamazuki Maru*, 30 July 1944. Films were also made of the Rabaul attacks and some former members of STAG-1 have them.
15. *Flypast*, September 1982, "The Flying Bombs of Rabaul," via David J. Duxbury, 3 April 1993.