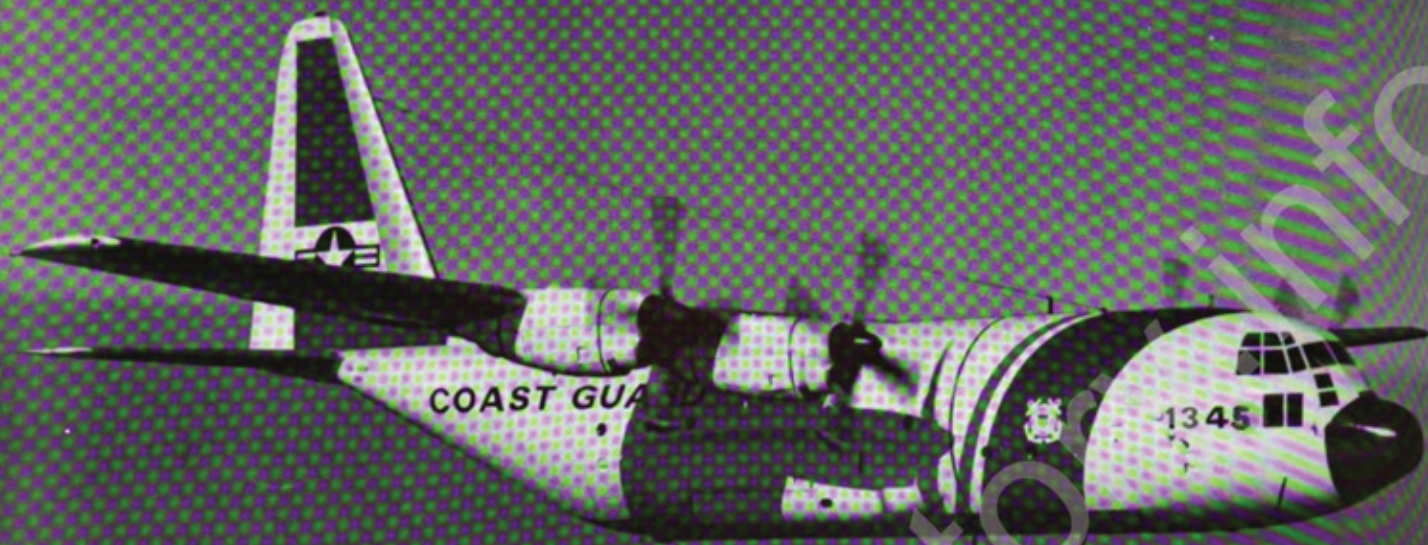


In the cold Arctic winds, professional skills, trained ingenuity, and constant perseverance of Coast Guard aviation maintenance personnel led to the successful.....



## RECOVERY AND SALVAGE OF

HC - 130B 1345

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Coast Guard aviation maintenance personnel are occasionally called upon to perform their tasks in unusual locations and under trying circumstances. Such was the case in the recovery and salvage of HC-130B 1345 from Cape Christian, Northwest Territories, Canada.

While on a routine logistics and inspection trip to northern Loran Stations, the aircraft was damaged on landing at Cape Christian. The left rear main landing gear had been torn from its track and shelf bracket, the torque strut connecting the two left

main landing gears had fractured, both wheels were deformed and the bottom of the fuselage was holed in several areas from the ADF antennae aft to the ramp.

The day following the mishap, a C-130 from CGAS Elizabeth City, the home station, departed for Goose Air Base enroute to Cape Christian. On board were key maintenance personnel consisting of the Engineering Officer, LCDR R. E. WHITLEY, the maintenance officer, CWO (AVI) E. N. SAWYER, ADC J. N. MATHEWS, and AM1 R. R. LEWIS and a myr-

riad of equipment. Arctic clothing, a "Herman Nelson" portable heater, two built-up wheel assemblies, torque strut, wing, nose, and axle jacks, landing gear struts, and numerous other articles were packed aboard, for actual needs could only be estimated until a thorough inspection was performed. Delays for lack of parts would be excessive due to the remote location, 550 miles south of Thule, Greenland.

Between noon, 26 October 1971 and noon, 28 October, the aircrew assigned to the 1345 successfully removed the aircraft from mid



Figure 1. Aircraft after landing.

point of the 3500 foot runway (essential if other aircraft were to land). Figure 1 shows the aircraft after landing.

On arrival at Cape Christian on 28 October, it was immediately apparent that the salvage was to be a formidable undertaking. The ground was frozen solid, covered with snow, and uneven. Temperatures of 15°F to -3°F, strong winds, heavy snow squalls and short periods of daylight coupled with major structural damage would tax the personnel to their limits.

Despite almost intolerable conditions, with the airstrip more than 1/2 mile from the nearest warmth or shelter, the aircraft was jacked, wheels removed and a thorough inspection commenced by noon of the 29th. Although wing jacks could not be used because of the winds and terrain, axle jacks permitted adequate lifting. A complete T.O. 1C-130B-6 Hard Landing Inspection was performed in addition to a de-

tailed inspection of damaged area. The results were not encouraging. The hull had been holed in several places, severing two major frames. The landing gear to wing root beam was cracked and fractured in several places. The shelf bracket bushings had disintegrated, and the landing gear tracks were badly mutilated where the strut shoes had torn loose. Both main landing gear wheels had been deformed by the impact. It was obvious at this point a decision must be made whether to attempt salvage with available resources or to request repair teams and supplies. The fast approaching permanent darkness period, deteriorating weather conditions and unacceptably long logistic support pipelines indicated immediate one-time flight repairs were necessary.

Working under the meager output of the Herman Nelson, the crew was able to winch the strut into an approximately normal

position and replace the fractured torque strut. However, there was no longer any means by which the strut could be retained in position.

It was decided to use cargo tie-down chains, and a complex pattern was devised as shown in figure 2. The pattern was calculated to be capable of withstanding at least a 2g landing. Because of the high winds and frozen ground, no work was accomplished under the aircraft. In the meantime, a search of the Loran Station was being made for any available repair materials. Structural steel of a workable size for splicing severed fuselage frames could not be found. However, the cargo floor was basically intact with only minor cracking near the left chine and calculations indicated that if cargo was not carried, splicing would not be necessary.

It would be necessary to trim and patch the large holes in the fuselage if for no other consideration than aerodynamic drag. Galvanized tin stove pipe sections were found in the Carpenter Shop. The sections were cut open and rolled flat for repair sheets. Metal screws and household vinyl sealant would complete the repair. To patch the holes, it was necessary to gain access beneath the aircraft. Jacking the aircraft in the high winds and on a slippery surface was uncomfortable to say the least. With a small axle jack on the left side, the rear ramp was lowered to the ground and used to raise the rear of the aircraft. Large plywood panels were dropped against the fuselage to ward off the wind and the Herman Nelson output directed beneath the fuselage.

Drilling holes with a hand drill proved to be almost impossible with limited access and gloved hands. What was needed was a

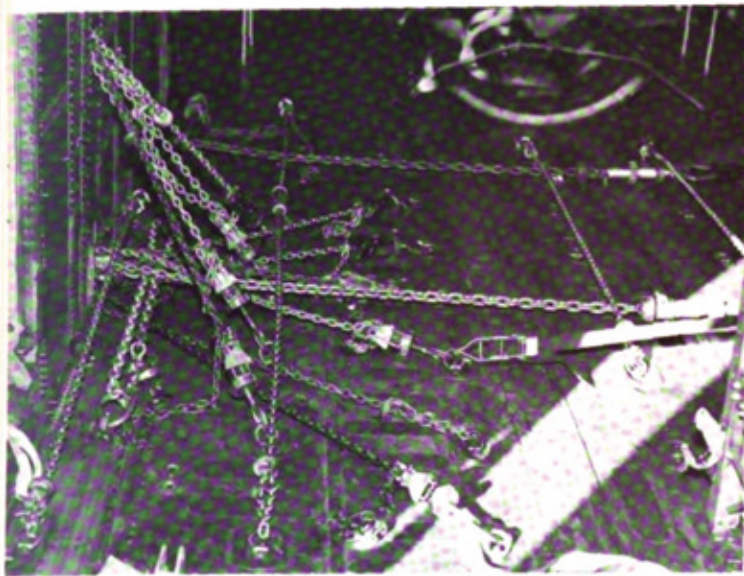


Figure 2a. A complex pattern of tie down chains was devised to retain the strut in position.

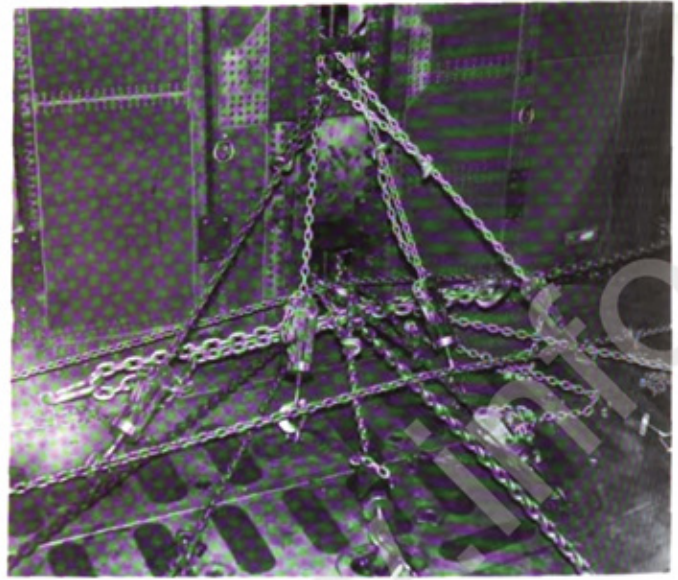


Figure 2b.

power drill. Although a portable generating plant was not available, a 400 pound semi-portable electric arc welder was, and it was wired to provide the necessary output. The welder was muscled into the rear of a 4 x 4 truck and carried to the repair site where it was coaxed to life. For the next day and one half, the welder was man-handled in and

out of the truck in order to keep its exposure to the elements to a minimum. The finished patches are shown in Figure 3 after landing at Elizabeth City.

Repair materials for the fractured landing gear to wing root beam could not be located. It was decided to deflate the rear strut to place minimum load on the beam and proceed as planned.

By the evening of the 30th, all was ready for a try at the one-time flight to Thule Air Base, Greenland, the nearest facility with decent weather. The station engineer bulldozed a large circular path from the parking spot to the end of the runway and the aircraft was taxied under its own power along this rough, circuitous route. While taxiing, the chained strut action was monitored and little movement was noted.

The morning of the 31st dawned clear with little wind, but with a temperature of  $-3^{\circ}\text{F}$ . The snow and ice accumulation atop the wings, empanage and fuselage had to now be removed. Bleed air from the GTC was fed to the leading edges while the "mop brigade" swabbed the upper surfaces with isopropyl alcohol, thoughtfully brought along for just such use.

With an escorting C-130 orbiting overhead, the preparations were completed and all engines were successfully started with the exception of number one, which failed to light off. The feather pump circuit breaker was pulled and the emergency T-handle cycled to reset circuits. Another attempt at start ended with

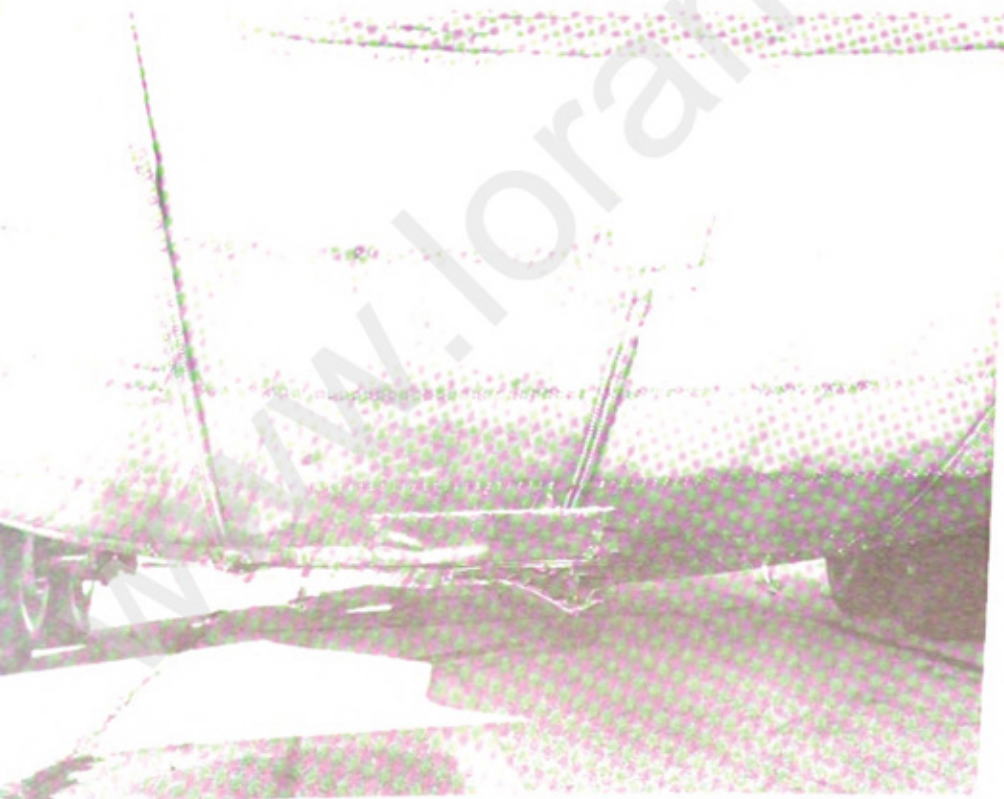


Figure 3a. Completed patch.

the propeller in the feather position from which it could not be removed. Fifteen minutes of applying heat to the valve housing failed to have any effect and the orbiting C-130 returned to Thule.

The heat was left applied to the propeller housing while trouble shooting took place over the noon hour. Exhausting all possibilities, it was felt that the feather solenoid and feather valve were stuck in the feather position due to congealed oil. This proved to be correct as two hours later the engine lit off and a normal start was attained.

Again, on 1 November, with the orbiting C-130 in position, three engines were started, but number one failed to respond. Five more heart-breaking attempts at starting were made, but to no avail. On-board fuel would soon be critical. One more attempt was decided upon and to a resounding chorus of cheers, the engine lit off and came on speed.

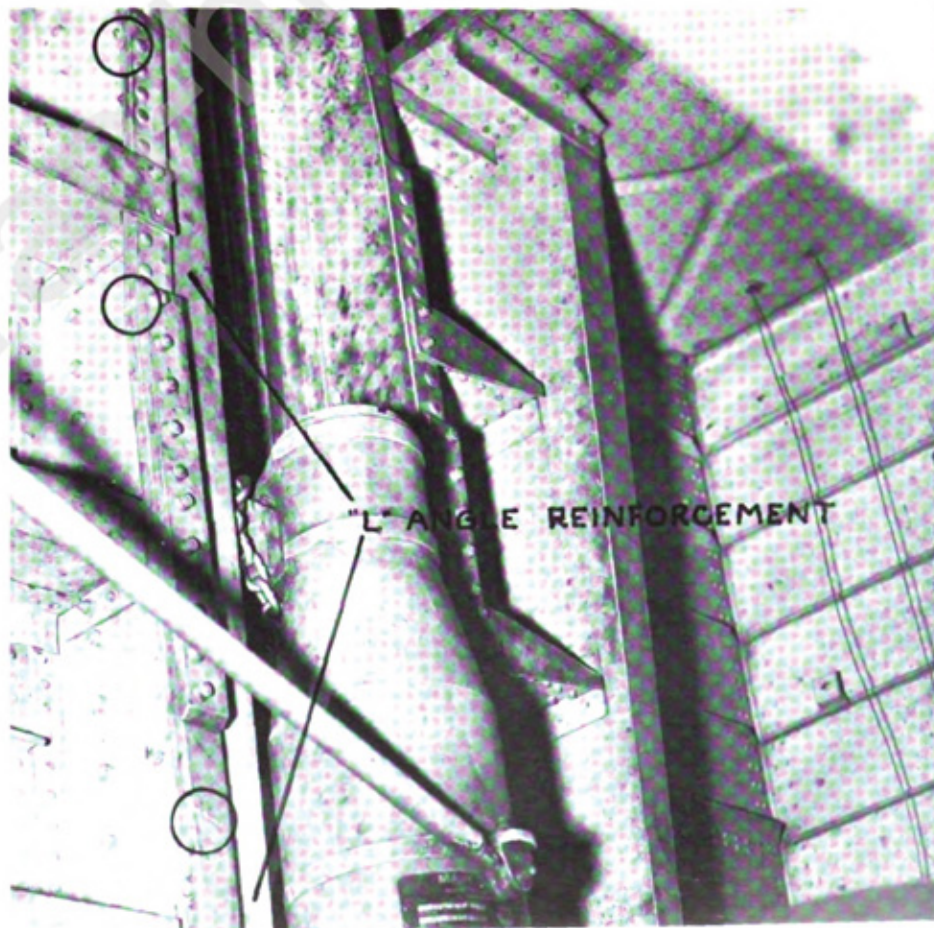
An almost anti-climatic normal take-off ensued and an uneventful gear-down, unpressurized flight to Thule was made.

Close inspection of the aircraft while hangared at Thule revealed that the cracks in the landing gear to wing root beam had widened somewhat, and strengthening of the beam would be required. A 48 inch long steel "L" angle was located, and using jet engine turbine casing bolts, it was attached to the rear of the beam as shown in Figure 4.

On 3 November, HC-130B 1345 departed Thule for Sondstrom Air Base enroute to the depot level repair facility at Warner-Robins Air Force Base, Georgia, with planned stops at Goose Air Base and CGAS Elizabeth City. The flights were without incident and the aircraft arrived safely at WRAMA on 6 November.



Figure 3b.



## Commandant's Comments

As pointed out in the article, aviation maintenance personnel are sometimes called upon to work in remote locations under very uncomfortable conditions. In this particular instance, however, the lack of proper working facilities, equipment and spare parts did not deter the assigned personnel from overcoming hardship conditions and temporarily fix-

ing the aircraft in order to safely fly it to an overhaul facility for repair.

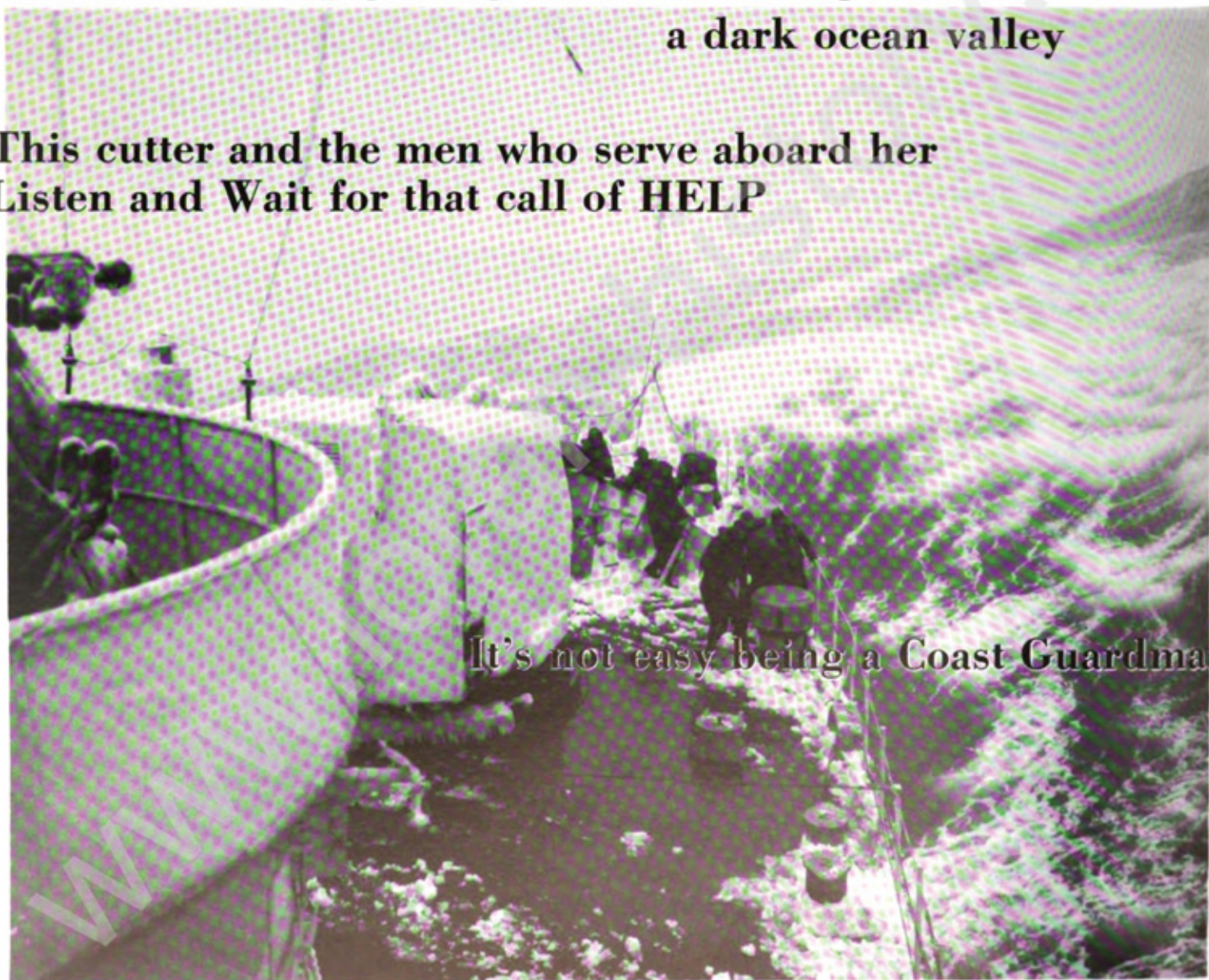
## ABOUT THE AUTHOR

CDR Wagner graduated from the Coast Guard Academy in 1956. He completed flight training in 1958 and was assigned to CGAS Elizabeth City, North Carolina. In 1962 after completing the Maintenance

Officer's course at Chanute AFB, he was assigned as Engineering Officer at CGAS San Francisco. He was later transferred to CGAS New Orleans also as Engineering Officer. Upon Graduation from the Air Force Institute of Technology in 1969 where he earned a M.S. in Aerospace Engineering, he was assigned to his present position, Chief, Engineering Division at the Aircraft Repair and Supply Center, Elizabeth City, North Carolina.

**Like a white chip gliding down a towering wave into  
a dark ocean valley**

**This cutter and the men who serve aboard her  
Listen and Wait for that call of HELP**



*It's not easy being a Coast Guardman*

**Yours is a proud tradition of service to HUMANITY**

