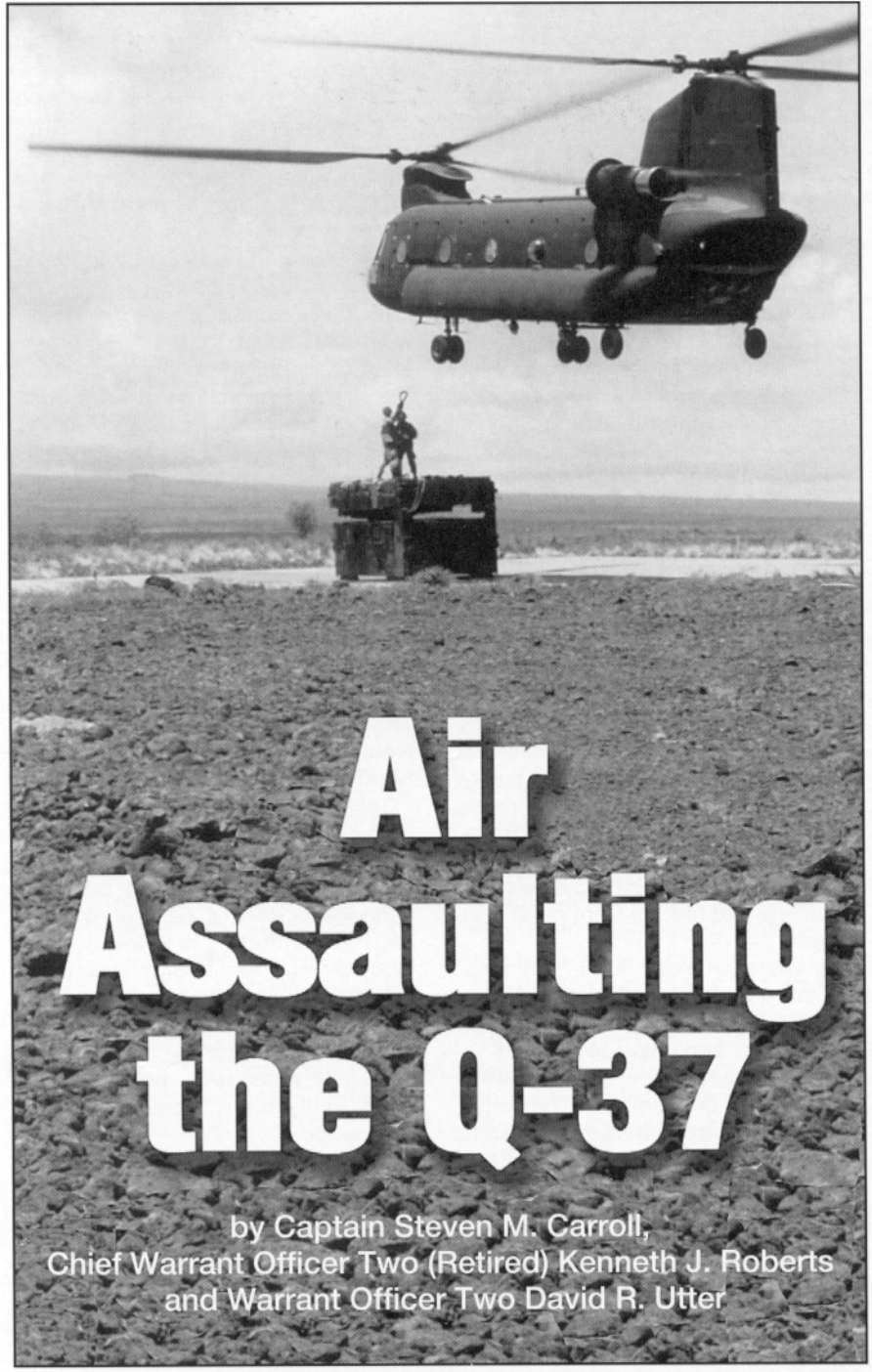

Air Assaulting the Q-37

by Captain Steven M. Carroll,
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In October 1996, the 25th Field Artillery Detachment (25th FAD), Schofield Barracks, Hawaii, air assaulted an AN/TPQ-37 radar section to a remote hilltop in the Koolau Mountain Range on the Island of Oahu. We emplaced and sustained our Q-37 Firefinder radar for 72 continuous hours.

The purpose of the exercise was to prove the system can be air assaulted to any location that meets the specifications for a radar site. Our rationale was simple: after conducting several Warfighter Exercises with the 25th Infantry Division (Light) Artillery, we realized that mountainous terrain offered few locations that optimize the Q-37's counterfire capabilities. Lack of adequate main supply routes (MSRs), congested roads and fast-moving operations demand radar positioning flexibility that air assault operations can provide. So, we set out to test methods of air assaulting the system.

This article discusses how we rigged the Q-37 for air assault operations, made preparations for the pickup zone (PZ), emplaced the radar at the landing zone (LZ), selected and prepared the LZ and conducted continuous operations after the radar was positioned.

Rigging the Radar. There were several disadvantages in the single-point hookup as prescribed in *FM 55-450-1 Army Helicopter External Load Operations*. Our primary concern was the advised limited air speed of 90 knots. Lower speeds create a higher risk from enemy air defense artillery (ADA) and limit the methods of flight available to aircraft pilots.

Using the single-point hookup, the antenna load was unstable, continually pivoting and oscillating, which proved quite labor-intensive for the pilots. The pilots found it difficult to position the equipment on the LZ properly; once the load was on the ground, the radar section had to "live with" the radar's position. (The radar crew normally prefers to have the antenna positioned on an azimuth line as it is emplaced so the crew can quickly site in on the far stake). Tactically, it wasn't feasible to hover and then stabilize and orient the load in the desired direction due to the time and risk involved. The dual-point hookup solved these problems.

There are several additional materials and procedural changes required with a dual-point hookup of the antenna-transceiver group (ATG). An additional 25,000-pound apex is required with the 25,000-pound sling set along with two 4 x 8-foot sheets of three-quarter-inch plywood and six air assault ratchet straps. We also use two 25,000-pound reach pendants as required by the 25th Division Air Assault standing operating procedure (SOP).

The antenna transport cover is removed and stowed in the antenna well to preclude the cover from tearing away when the aircraft reaches speeds in excess of 100 knots. Plywood placed on the face of the antenna (secured with a minimum of three ratchet straps for each sheet of wood) protects the antenna face from damage during hookup and sling release operations. The antenna tie-down bolt ratchet handles should be rotated to face out from the trailer to prevent them from being damaged or interfering with the sling legs. The link count for Rear Sling Legs 3 and 4 changes from 5 to 15 in the grab-hook while the link count of 68 remains for Front Sling Legs 1 and 2.

Because the antenna transport cover is not used, all vents and panels must be secured by permanent cord or tape. To prevent damage to the beam steering

unit (BSU) when the reach pendant is released by the crew chief, sandbags are secured over the BSU with strong ("100-mile-per-hour") tape. However, the best way to avoid damage to the BSU and antenna face during sling load cutaway is to instruct the air crew to move to either side of the load before releasing the slings.

These dual-point procedures for the Q-37 radar were certified by the Mobility Directorate, Systems Integration Branch, US Army Soldier Systems Command of the Natick Research, Development and Engineering Center, Natick, Massachusetts, on 1 January 1997.

The dual-point hookup stabilizes the load in flight, increases the airspeed to speeds in excess of 130 knots, reduces flight control work for the pilots and allows the aircraft to fly tactical "nap of the earth" and contour. Additionally, it facilitates positional control. The pilot hovers, pivots to establish positional control, sets the load down and clears the area quickly. We used one CH-47 helicopter to make four lifts for the entire operation; the advance party, ATG, S250 shelter and the 60-kilowatt-generator each was a single lift.

PZ Preparations. Shelter preparation by current methodologies requires nearly an hour on the PZ. To reduce time and eliminate the need for a crane to lift the ATG off the Eidal trailer, we examined the feasibility of lifting the antenna directly off its trailer with the aircraft.

We identified three key elements to lifting the ATG off the Eidal trailer via the helicopter. First the crew must ensure the shims are flush to the trailer and the ATG jacks are completely stowed. Second, the aircraft should lift the load straight up a minimum of two feet before flying forward to ensure the ATG does not drag across the Eidal trailer. (Fortunately, the aircraft naturally centers itself above the ATG as it takes on its weight.) Finally, the crew must ensure a crane or a 10-ton forklift (utilized by attaching sling legs to the forks) is available to restore the antenna to the Eidal trailer as its placement must be precise.

The lift was a complete success. Time on the PZ was reduced. The crew only had to stage, disconnect and prepare the trailer for separation. Rigging can be performed in a secure area such as the last radar site or a tactical assembly area (TAA) before moving to the PZ.

However, thorough preventive maintenance checks and services (PMCS) must be conducted on the ATG jacks to ensure they are in working order. Additionally, the spirit levels on the ATG must be aligned and operable (leveling the antenna is no longer done with the Eidal trailer transport jacks but with the ATG jacks).

LZ Emplacement. There is no certified dual-point hookup for either the shelter or the generator. In our emplacement, we prefer the S250 shelter positioned with the door facing the antenna, and the generator emplaced so the exhaust faces away from the enemy (see Figure 1).

To achieve this alignment, we made an arrow with masking tape on the top of each piece of equipment and informed the air crew of their positioning on the LZ. In lieu of masking tape arrows, we used infrared chemlites during night operations. They worked perfectly.

LZ Selection and Preparation. The technician must rely heavily on his map and aerial analysis skills and, once on the ground with the advance party team and force protection assets, select the best possible site to accomplish the mission. Several sites should be identified in case the primary location is untenable. Once the technician marks the actual ground location, the rest of the equipment is marked in accordance with the air mission briefing diagram shown in Figure 1.

The advance party establishes a far stake and obtains directional control by either the Hasty Astro program with the back-up computer system (BUCS) or a "Simo" (simultaneous observation of a celestial body) with the detachment survey party or division artillery (Div Arty) survey. Directional control is transferred to the radar once the ATG is emplaced and the sail raised. Accurate grid location for the ATG is obtained from the section's precision lightweight global positioning system receiver (PLGR).

The order of emplacement tasks also changes. The crew must dig beneath the jacks so the jack pads can be connected and the ATG leveled. Additionally, all cables must be connected and power applied before site survey is completed. The crew does not have to "de-rig" the shelter or the generator, but it must be careful to keep rigging equipment away from the exhaust on the generator and vents on the shelter.

Continuous Radar Operations. Fuel is the most critical logistical consideration for an air assaulted radar. By stacking fuel cans in the ATG aisle, the radar can operate for 24 hours radiating continuously (see Figure 2 on Page 18). (The fuel consumption rate is eight gallons per hour.)

One option to lengthen the time between resupply lifts might be to have a fuel blivet flown in during the initial

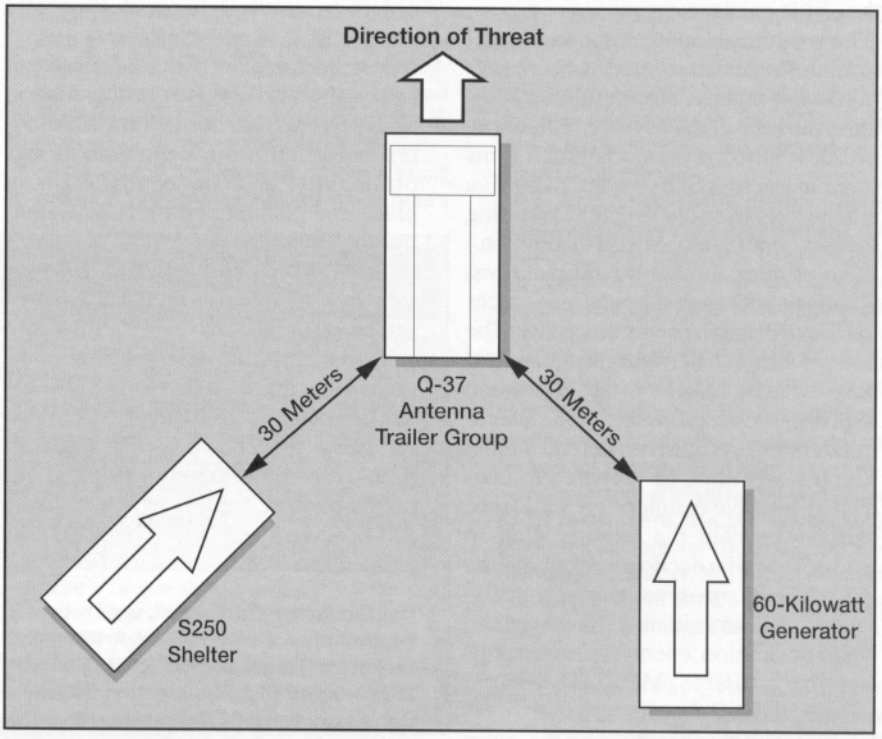

Figure 1: Q-37 Air Assault Site Layout. Arrows represent the markings (masking tape) on the equipment so the crew chief of the CH-47 can position the equipment correctly.

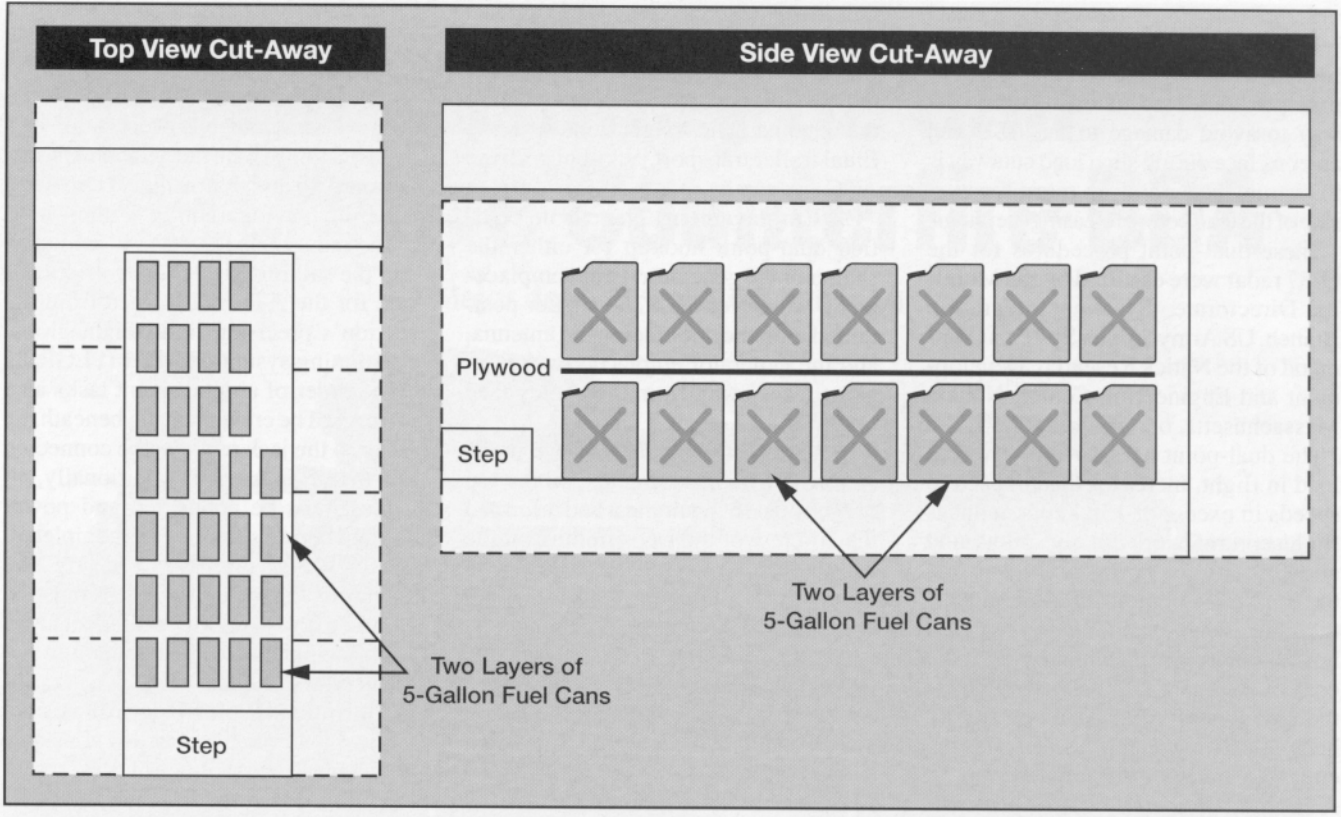

Figure 2: ATG Aisle Stacked with Fuel Cans. The most critical consideration for an air assaulted radar is fuel.

lift. However, we never solved how to feed the fuel from the blivet directly into the generator. Another option is to upload fuel cans on a cargo trailer or palletized load in a cargo net as part of the airlift package.

Survivability is another important consideration. An air assaulted Q-37 section is not mobile, so careful consideration must be given to force protection. We developed a joint/combined arms force protection SOP for the radar in a remote site. (See our article "Protecting the Q-37 Firefinder," also in this edition.)

Our primary threats are indirect fires, air attack and special operations forces (SOF) infiltration or sniper activity. The bottom line is the radar section must have at least a light infantry platoon with organic weapons and communications systems assigned to defend its site. The platoon must be prepared to conduct aggressive counterreconnaissance patrols. To help the infantry platoon leader, the radar section works with the Div Arty S2 to develop a reconnaissance and surveillance (R&S) plan, based on mission, enemy, terrain, troops and time available (METT-T).

The 25th FAD developed a map overlay or template that defines the outer limits of the noise signature produced by the generator in various types of terrain. This defines the minimum boundaries for the counterreconnaissance patrols. The protection force leader coordinates with the radar technician at first linkup and the two co-author operations orders to ensure personnel cooperate and the final plan is cohesive.

Conclusion. The Firefinder system can be air assaulted with no degradation to its performance due to its prime movers' being left behind. But with its loss of mobility, once the equipment is in place, the planning phase is key. Having the option to air assault the Q-37 radar outweighs a lack of mobility if careful consideration is given to force protection.

Air assaulting the radar gives the commander flexibility when long-range radar coverage is critical, yet untenable locations, inadequate MSRs and congested roads appear to limit his deployment options.

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