Amplidynes Vs Altitude and Ants

If you were to ask what the heck is an amplidyne, then I would know you were not a radar maintenance repairman, but that's okay, because this story will help improve your knowledge bank, after all, one never knows when a conversation might include the working knowledge of one.

Simply put, an amplidyne is a large motor generator (MG) that provides voltage to control an electric drive motor. In this story it's the PU-293/G Motor-Generator/AN/FPS-6, which powered the AN/FPS-6 Height Finding Radar Set antenna azimuth drive motor. The MG controlled the antenna rotational speed and direction. This particular item of equipment weighed about 150-200 pounds and was approximately 15-20 inches in diameter and four feet in length. The original installation of the MG was directly under the antenna gear box. That was all right until the unit had to be replaced. The difficulty arose when the antenna structure was mounted on a temperate tower, think oil rig height! With all the foregoing in mind, on with the story;

In 1959 I was stationed at Killeen Air Force base, Texas, home of the 814th Aircraft Control and Warning Squadron. Came the day our MG failed, and a replacement required installation. The antenna deck was about 34 feet above ground level. A chain hoist was used to lift the MG to the first landing; an expanded metal grating in front of the enclosed equipment housing. From there it required hoisting to the top deck; unfortunately the design engineers did not include any top deck lifting apparatus. But being enterprising airmen we obtained a eight inch steel I-beam that was long enough, that when lashed to the steel structure of the antenna base, extended over the edge of the tower and provided a lift point for a block and tackle. From that point on, things fell apart, literally.

An amplidyne is composed of three major near-equally sized sections; on the top of each end piece is an eye-bolt. As it was later learned the eye-bolts are used during assembly to hoist the *individual* pieces, not the complete set. The Radar Maintenance NCOIC, not knowing the foregoing information, rigged the MG for lifting by inserting a chain thru the eye-bolts and then to the lift hook.

Hoisting the MG to the first level went smoothly. Using the tower chain hoist we lifted the MG to the landing in front of the tower door. With another repairman we slid the MG across the grating and placed it under the I-beam, attached the block and tackle hook to the lifting chain apex, and went up the access ladder to the top deck. We had an unobstructed view of the eight or so men straining on the haul rope of the block and tackle as the MG rose slowly to a point above the top deck. My partner and I were just on the verge of attempting to swing the MG inboard when the two eye-bolts snapped off! Several things seemed to happen at once, the men on the rope fell backwards, sprawled out on the ground; the MG struck the grating below and smashed its way through, and then about 20 feet down struck one of the tower legs sending pieces of metal flying. It then hit the ground, bounced toward the fallen haul crew and was finally still. I was weak-kneed, the thought had flashed thru my mind, when the MG hit the tower leg that the whole tower was going to fall. It didn't. The Squadron Commander had been

watching this fiasco from the shade of the nearby operations building. He ran over and inquired if any one was hurt and, then banished the Radar Maintenance NCOIC to the maintenance shop. An examination of the MG revealed the only damage was to its exterior cable junction box. We exchanged the damaged part with the one from the inoperative MG. Although I was a re-trainee three-level, I was the next ranking radar maintenance NCO on the scene (SSgt). The CO asked me if I could get that @#&%$ amplidyne installed. Having seen the wrong way to rig the MG for lifting I figured that I could, and did. The exchange went smoothly. Shortly thereafter Air Defense Command headquarters instructed that all AN/FPS-6 amplidynes be moved to the base of their towers and to install a second one for back-up purposes. I often wondered if our falling MG helped precipitate that directive.

While stationed at Nakhon Phanom RTAFB, Thailand in 1967, my room mate a fellow MSgt 30372 and I, were sharing radar maintenance experiences. He had me nearly rolling on the floor when he related the following tale: (No names or location will be used to protect the guilty [or the innocent]).

Following his assignment to a Nevada Radar Station he was assigned as NCOIC of the AN/FPS-6 Height Finder radar. As he was being familiarized with the equipment and facilities, he decided to check out the tower. As he started to climb the ladder to the equipment deck he noticed two cables that exited the cable trough and after a short distance appeared to disappear into the ground. Naturally that piqued his curiosity. When asked, the accompanying technician proudly explained that the maintenance crew had quite some time previously, dug a large pit, lined it with lumber and placed their two amplidynes in it. They then covered the pit over. Sand had drifted over the top and the pit was perfectly camouflaged. The technician was quickly dispatched to get help and told to un-cover the amplidaynes. Lo and behold, as the sand was shoveled and swept away, the pit was uncovered and daylight revealed the mother of all ant colonies. Millions of ants were swarming the equipment, how it remained operational will always remain a mystery.

Needless to say the MG's were properly relocated above ground level. The rational for putting them underground was to help keep them cool by keeping them out of the hot Nevada sun. A small cover erected over them did the trick.

We can't leave that particular radar work center without the rest of the story. Although not about amplidynes it deserves its place in the history of good intentions gone awry.

Shortly thereafter my friend was on the top deck of the FPS-6 tower and noticed that there were shards of red glass glittering in the bright Nevada sunlight. They formed a large circle around the radar tower with a radius of about 50 feet. The explanation concerned red aircraft warning lights on top of the antenna. An enterprising radar maintenance NCO (maybe the same one responsible for burying the amplidynes?) had installed a red double globe warning light at the top of the forty feet tall antenna because adjacent to the site was a military air base. The red glass shards? That was simple,

retaining set screws at the globe bases would vibrate loose and the antenna nodding action would hurl the globes to their death!

My roomie pointed out that since the nearby search radar tower was considerably taller then the height radar it seemed reasonable the light fixture was not needed. In short order the light fixture was removed and the nodding red lights were no more!

Sometimes the highway of good intentions is not paved with common sense.

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