

TPS-22

By Ken Smith

... I was a technician trained on (and worked on) the TPS-22 at Seymour Johnson AFB. I was in one of the half dozen TAC AC&W mobile units. As I recall, it was the only one with the TPS-22. If I remember correctly it was the 727th AC&W Det #1. The radar was a long range search system and part of a FD (Frequency Diversification) program the Air Force was working under. As far as I know, it was the only one in the Air Force inventory. (I vaguely remember the Marines having one at Cherry Point Naval Air Station.) Our main systems were the AN/MPS-11 (AN/FPS-8) and AN/MPS-16. The TPS-22 was an experimental system, along with CARTRACK(?) and several other the squadron had. Time wise this was around 1959

The basic set-up called for a mat to be laid out on the ground to seal out moisture. Next, the ground ring would be anchored down and then sections of the bubble would be laid in place. Somewhere between 1 and 2 dozen troops would then button the bubble sections to the ground ring and then each other until the bubble was assembled and ready to go. A couple of troops would be left inside when the last section was buttoned up. The blowers were kicked on at that point and the balloon started up. The troops inside had a rope attached to the center of the bubble and then held the center down so the bubble resembled a donut as it started up (if you didn't do this and a gust of wind hit before the balloon was all the way up it would catch the bubble and send it, and large sections of the ground ring, into the next county.) When they could no longer hold the center down, the troops inside released the rope and "popped" the bubble. Inside was by far the safest place to be since pliers, screwdrivers, and anything else left on the bubble surface during assembly slowly slid to the center. When the bubble was popped the tools were air-born and fell in a deadly circle all around the bubble.

The antenna was pretty much the same shape as any other long range radar antenna. It was in three pieces -- the back (reflector) was silver impregnated rubber material, the front (lens) just plain light weight rubber and holding the whole thing together was an inner tube. All of this setting on a rotating platform. The inner tube had its own blower (inside the bubble) and it held the assembly rigid. The antenna itself and the plain plastic/rubber front piece had another blower that held the antenna reflector in its proper shape as well as the transparent front material. The platform set on a pedestal about 6' or so off the ground and the whole assembly was made of extremely light material (magnesium?). As I recall, 2 or 3 people could pick up the entire pedestal and platform assembly.

When the system was shut down and the antenna stopped the favorite sport was running up the inside of the bubble as far as you could go and making a chalk mark. It seems like a broken leg put a stop to that before it became an Olympic sport. It took time for the antenna to get up to speed since the entire atmosphere in the dome had to achieve the same rotation speed. It took just as long for the antenna (and the atmosphere) to come to a stop. When the power was shut down the second favorite sport was grabbing onto the antenna base out near the bubble and sailing around the inside. This only worked as the

antenna was slowing down and getting ready to stop. It seems like someone coming in the airlock and getting a boot in the head put a stop to that sport.

All of the radar hardware came in easily moved units that were set in place and cable together in the bubble inside an enclosure. When the antenna was rotating the entire atmosphere in the bubble was rotating with it so the enclosure was needed to keep paper from blowing around.

I remember the FD (Frequency Diversification) bit us a few months after we started testing the system. Every Friday afternoon the transmitter would arc itself off the air. It took several weeks before anyone made the connection that it was in fact every Friday and only in the afternoon. Finally someone realized the "lawn" was being mowed outside the bubble. When they went out and shut off the big Toro power mower the radar was happy again. When the mower was running and it got to within 10' of the equipment area that was inside the bubble we had problems. That was the only thing on the site that the "all frequency" interference of the mower seemed to affect.

I also remember small vents up near the top of the bubble that need open a little to allow the air to blow out and hopefully control humidity inside. There was a rope looped through a center ring at the top of the antenna. A technician harnessed himself to one end of the rope while the other end was tied to a jeep. The jeep backed up till the technician reached the level where he could adjust the vent. Without moving the jeep the technician then walked around the bubble to the other vents and adjusted them before being let down.

I remember asking about rubber equipment being used in combat conditions and I was told the outside bubble had a substantial blower and would handle x number of xx mm holes (I don't remember the number of holes or the caliber/size of the holes anymore) before the bubble would start to come down. The antenna shape was maintained by very low pressure and would take a lot of hits since that blower was also fairly substantial. However, the inner tube that held the antenna material up was high pressure and a blow out from a lucky shot could bring the show to a close.

When I was there it seems like we had a lot of equipment that was in "test" mode and didn't appear to be intended for real combat. It seems like we had a radar data link for a short time - if my memory hasn't gone south it was a AN/GPA-29. We also had TACs answer to SAGE. It was AN/TSQ-13 and I believe it was called CARTRACK. We had some strange displays that had been surplus by the NAVY (at least the ones they didn't use as anchors). I don't remember the manufacture but the Philco tech rep maintained them for the most part and I believe they were called VGs. I couldn't believe something that crude was still around but, when I left the USAF and went over to the dark side (FAA) I found the VGs had found a home there too in all of their radar rooms.

I hope some of this has been of some use. I don't know when the TPS-22 went away. As I recall, it arrived sometime in late 1958 or early 1959 and was still there when I was

discharged in late 1960. If you have any questions, drop me a note. I might be able to answer them or at least point you to another guy that was in the squadron at that time.

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