

Airborne Radio Direction Finding (ARDF)

Locating the enemy radio transmitters for tactical advantage...

U.S. Army RU-8 ARDF



The U.S. Air Force and ARDF

In response to the increased tasking for Army ARDF coverage, Air Force Chief of Staff General Curtis E. LeMay was determined to get the USAF involved in this airborne mission to locate enemy low-powered tactical radio transmitters. In April 1962, LeMay ordered development of an ARDF system using the electronic principles of the VHF omni directional radio range (VOR) air navigation system. Sanders Associates of Nashua, New Hampshire, was selected to design a "phase angle discrimination" (PAD) high frequency direction finder for the C-47D aircraft. On September 26, 1962, Warner Robbins Air Material Area began modifying a C-47D, tail number 45-0925, with the Sanders PAD equipment. This was named project HAWKEYE.



ASA Emblem

The Army Security Agency (ASA) fielded the first tactical ARDF systems in Vietnam with the U-6 Beaver and RU-8 Seminole aircraft using an airborne "aural null" technique for homing in on enemy radio transmitters



U.S. Army U-6 ARDF



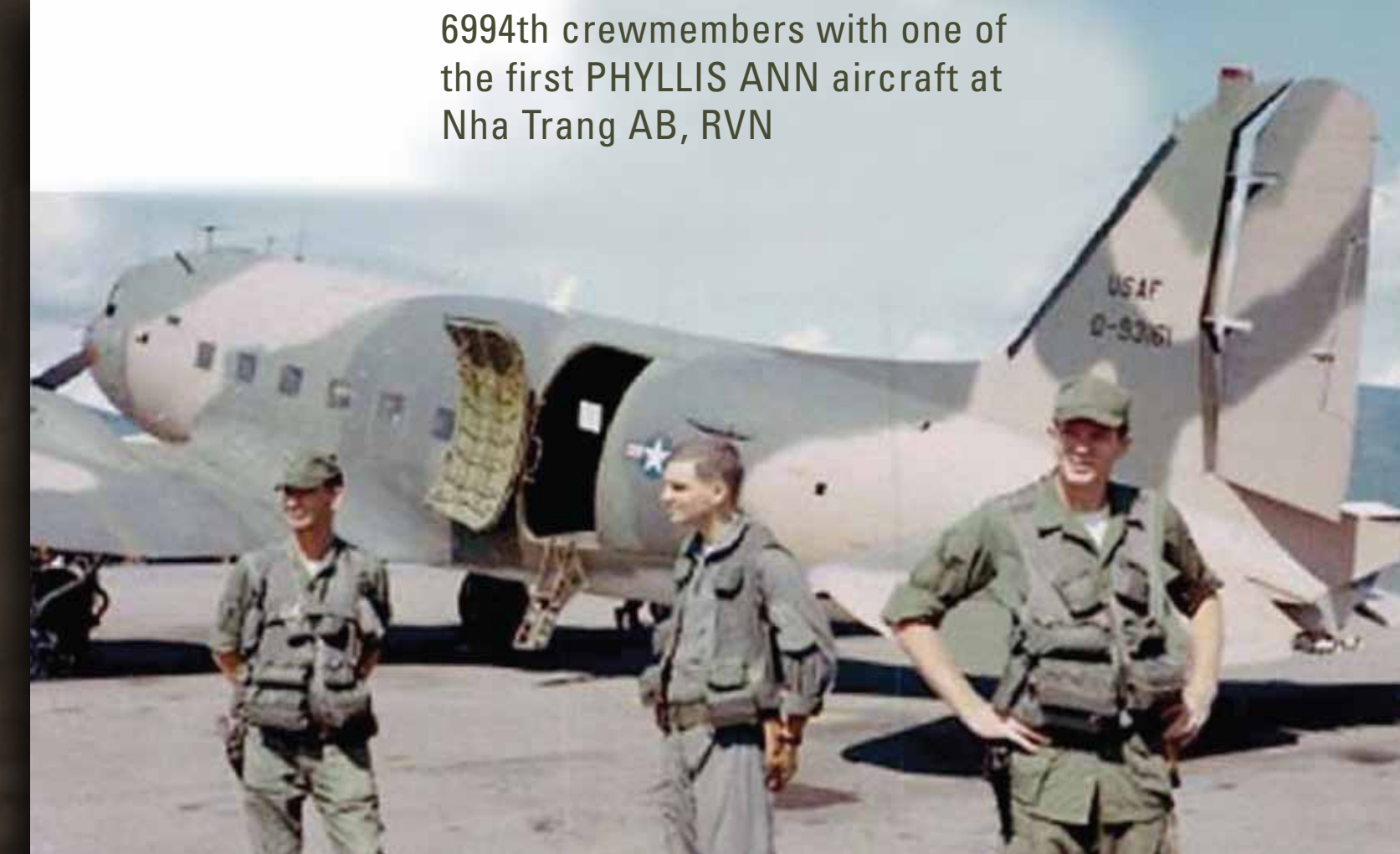
ARDF fix information was often the sole source of intelligence about enemy forces...and the combatant commanders continually wanted more daily hours of ARDF support. The Army and Air Force raced to meet these requirements with more aircraft, but competition for funding was fierce. To establish the EC-47 effectiveness compared to the Army program, a "fly-off" competition was staged at Ramey AFB, Puerto Rico, in January 1967. The Army RU-8 and Air Force C-47 aircraft systems worked ARDF coverage of "enemy" communications generated by the U.S. Army 7th Special Forces using jeep and backpack mounted tactical radios. Test results verified that the HAWKEYE system produced the most ARDF fixes more quickly than the Seminole. History records indicate that the Air Force did not wait for these "fly off" results and had vigorously pushed forward with the EC-47 production ARDF systems under the project name PHYLIS ANN.

During early testing in Vietnam in 1964, the HAWKEYE prototype ARDF equipment was operated by Morse systems operators on temporary duty from other USAFSS state-side and overseas squadrons. Following the first 120-day testing, the HAWKEYE aircraft returned to the CONUS for further AN/ALR-34 equipment upgrades. It returned for additional testing in October 1964 and the results were so good that MACV and 7AF extended the test period into full operational tasking. More aircraft would follow in 1966 under project PHYLIS ANN.



The Production Model: PHYLIS ANN

General John P. McConnell, CSAF, fully supported a "crash program" to meet the increased MACV requirements by further improving the HAWKEYE prototype with an initial fleet of 35 C-47s under the nickname PHYLIS ANN. These aircraft, designated as RC-47s, were to be deployed to RVN by December 1966. This next generation PHYLIS ANN aircraft was equipped with a new side-angle calibration which made it possible to fix enemy transmitters in any direction without turning the aircraft. In May 1967, these aircraft were redesignated as EC-47s and production was increased to 47 aircraft.



6994th crewmembers with one of the first PHYLIS ANN aircraft at Nha Trang AB, RVN

This painting of "Phyllis Ann" may have been considered as possible nose art, but this practice (nose art) was quickly negated by one of the senior commanders.

The PHYLIS ANN program changed to COMPASS DART in 1967. It changed again to COMBAT COUGAR, and then to COMBAT CROSS in 1968. SENTINEL EAGLE was the nickname for the additional 10 EC-47D models with VHF DF capability that were fielded in September 1968. COMMANDO FORGE was the nickname for the program in Thailand. A total of sixty-eight EC-47 ARDF aircraft were deployed to Southeast Asia. The 6994th Security Squadron personnel, flying as the back-end crews with the outstanding 7th Air Force Tactical Electronic Warfare front-enders, produced thousands of actionable fixes and unprecedented sole-source signals intelligence (SIGINT) in direct tactical support to the U.S. and allied ground forces fighting throughout the Indo-China war area.

"Limitations of short range Army aircraft and lack of all weather capability of aircraft and crews point up the need for USAF to enter this special area of aerial reconnaissance as a proper role for USAF."

LtGen Joseph H. Moore, 2d Air Division Commander, December 1965.