



ADSS Project No. 2009-DT-EPG-NOFED-D9044

## **COSPAS-SARSAT Certification for ACK Technologies INC. Model E04 ELT**

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Date of Issue: December 21, 2009  
Version: 3.0 DRAFT  
Dates of Test: 28 April – 03 December, 2009

Prepared for:

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## TEST ITEM

ACK Technologies Inc. developed an Emergency Locator Transmitter (ELT), Model E04 ELT, incorporating a 406-megahertz (MHz) Cosmicheskaya Systema Poiska Avaryynich Sudov-Search and Rescue Satellite-Aided Tracking (COSPAS-SARSAT) beacon and a 121.5-MHz homing transmitter. ACK requested the U.S. Army Electronic Proving Ground (EPG), Fort Huachuca, Arizona conduct COSPAS-SARSAT certification testing on the ELT. The following items were tested:

TEST ITEM	PART NUMBER	SERIAL NUMBER
Model E-04 ELT Beacon		98 and 99
Transmitter Assembly	E-04	
4-40X.5" Stainless Socket Head Cap Screw		
Remote Cable	E-04.10.5	
Coax Cable	E-04.10.4	
Cockpit Remote (RCPT) w/28L Lithium Battery	E-04.5	
Audio Alert Cable	E-04.10.3	
Audio Alert	E-04.7	
Whip Antenna	E-04.8	8T-3
Sensor Systems ELT Blade Antenna	S65-1231-1	#003
Lithium Battery Pack	E-04.0	

## FACILITIES

Testing was performed at the following EPG sites:

- (1) Technical/Environmental performance testing occurred at the Environmental Test Facility (ETF);
- (2) Antenna characteristic testing occurred at the Antenna Test Facility (ATF) the ATF is open and flat, free of any obstructions within the elliptical boundary [C/S T.007, figure B.1 (Encl 1, Ref 2)]. All electrical wires and cables were positioned under the ground plane. Reflections are minimized through the use of non-ferrous equipment, no trees, bushes or metal fences and all personnel were at least six (6) meters from the Beacon Under Test (BUT) during measurements. Testing was performed at ambient temperature; and
- (3) Navigational and Satellite Qualitative testing occurred at the Global Positioning System (GPS) Facility.

## INSTRUMENTATION

Instrumentation and calibration are contained in Enclosure 3.

## TEST OBJECTIVE

Determine whether the ELT meets the requirements specified in COSPAS-SARSAT specification C/S T.001 (Encl 1, Ref 1) and COSPAS-SARSAT (Encl 1, Ref 2) approval standard C/S T.007.

## DETAILS OF TEST

All testing was performed with the Lithium Battery Pack, Remote Cable, Cockpit Remote, Audio Alert Cable and Audio Alert attached to the beacon. The beacon does not have a Global Navigation Satellite System (GNSS); the external navigational device was connected during navigational testing.

## TEST DATA

Test data are presented in Enclosure 2.

## SUMMARY OF RESULTS

ACK's E-04 ELT met all COSPAS-SARSAT requirements. Test personnel conducted the following certification tests per C/S T.007 with the beacon transmitting 406MHz and one 121.5 MHz homing beacon with Standard Location Protocols.

a. **Electrical and Functional Tests at Constant Temperature.** Test personnel tested the ELT's transmitter power output, digital message, digital message generator, modulation, transmitted frequency, spurious output, and self-test mode at the specified minimum [-20 degrees Celcius (°C)], maximum (55 °C), and ambient (25 °C) temperatures. The Lithium Battery Pack, Remote Cable, Cockpit Remote, Audio Alert Cable, Audio Alert and navigation data emulator were operational and attached to the beacon during Current Measurements. The ELT met the requirements (Encl 3, Ref 2).

b. **Thermal Shock Test.** Test personnel measured the transmitted frequency, power output, and digital message for 2 hours after the ELT was powered on and simultaneously placed in an environment held at 30 °C offset from the initially stabilized temperature. The ELT met the requirements (Encl 2, Ref 3).

c. **Operating Lifetime at Minimum Temperature.** Test personnel tested the ELT for 24.42 hours at the minimum temperature (-20°C) with a battery pack discharged to its end-of-life condition. This test was conducted with the ELT transmitting the 406-MHz and the homing beacon. Test personnel verified the values and calculations used to determine the amount to discharge the battery pack to its end-of-life condition. The battery was discharged using two 50-ohm resistors in parallel discharging one-half (½) ampere per hour for four (4) hours thirty-six (36) minutes for a total of 2.306 ampere hours. The ELT met the requirements (Encl 2, Ref 4).