[redacted] **INFORMATION**

11 August 2017

Investigation of an ELT involved in a helicopter crash incident.

Product particulars:

Artex ELT model:	C406NHM Rev C
Part Number:	453-5061
Serial Number:	[redacted]
C/S TAC:	135
Hex ID:	2DC843A1CCFFBFF (As on the manufacturer label on the beacon)
Hex ID:	2DC7540094FFBFF (As on the C/S Registration label and programmed into the beacon memory which means this is the ID that would have been transmitted during activation)
Date of manufacture:	October 2007
Battery expiration date:	June 2018

ACR Electronics, Inc. was requested to do a second investigation on the above ELT, which did not activate during a crash landing.

The ELT was received by [redacted] at the ACR Electronics, Inc. Fort Lauderdale facility, from Select Control, on 6/23/2017. It was kept unopened in my office till the date of investigation. The package was opened in the FAR 145 Repair station and the investigation started at 9 pm on August the 11th, 2017.

Representitives:

ACR Electronics:

[redacted]	Technical Support Manager
	Chief Inspector FAR 145 Repair Station
	Vice President, New Product Development
	Director of Quality Control

NTSB:

Andrew Swick	Aviation Accident Inspector

The FAR 145 Repair station was utilized for the test and evaluation of the beacon.

The box was intact when received and opened. The unit was properly packed in bubble wrap.

ELT:

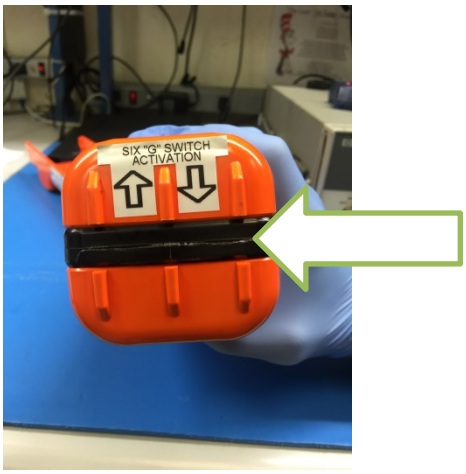
When the ELT was shipped from the manufacturer (Artex Aircraft Supplies, Inc., Aurora, Oregan), it was coded as follows:

Country code:	USA, 366
Protocol:	STD Location Serialized
Beacon type:	ELT
Aircraft ID:	N/A
Serial number:	04326
C/S TAC #:	135
UIN:	2DC843A1CCFFBFF
Freq:	406.025 MHz
TSO:	C19a & C126 ETSO

[redacted] (Chief Inspector) did the test and evaluation procedure. The following was in evidence.

Check physical condition:

- The top part of the mounting case is missing.
- The only damage is a cracked H-shield on the bottom end of the beacon and a fair piece was broken off.



- All connectors were in place and in good condition.
- All screws fitted to beacon.

Battery check-

1. Battery expiration date: June 2018
2. It is a replacement battery that was installed after the first 5 years.
3. Did a self-test of the beacon with a dummy load connected to the antenna. Self-test passed.
    - [redacted].

[redacted] information T: [redacted]

4. Check battery activity
    - 48 activations were found.
    - Total of 30.5 minutes total runtime.
5. Physical condition of battery cells and complete battery assembly is good.

Functional testing:

1. The ELT under test passed all specified criteria. The ELT transmitted per specification on all frequencies. Documents attached.
2. Measurements taken showed conclusive evidence that the 406 MHz and 121.5 MHz transmit at nominal power.
3. [redacted].
4. Measured **406.025 MHZ** at a power level of +[redacted] dBm
5. Measured constant current drain of ELT under standby condition (no self-test or activation commands initiated). The current drain was found to be [redacted] micro amp and stable, well within design specifications.
6. The activation current drawn was [redacted] mA. This is without 406 MHz transmission. When the beacon was turned off, the current reverted back to a steady [redacted] micro amp.

G-switch Centrifuge Test

G-switch info: 2014-20-000; Lot # 0703 (in-line unit)

The ELT was subjected to 1 centrifuge test. The unit in-line G-switch did not activate within specification.
The unit did not pass the manual in-line G-switch activation test.
[redacted]; normal activation frequency.
It did not turn on at [redacted] Hz.
The unit did not pass one of the Helicopter 5-way G-switch activations.

Open Visual Inspection and troubleshooting:

1. The unit transmitted the aircraft 24 bit address.
2. The beacon was reprogrammed after manufacture but the label was not replaced. The C/S registration decal has the re-programmed ID on.
3. The serial number of the unit matches the original manufacturing documentation.
4. The unit transmitted nominal frequencies at specified power levels.
5. The battery was replaced after manufacture.
6. Inspection showed that the beacon is in 100% original condition and no other work was performed.

Summary from the Investigation on the ELT:

The ELT under investigation passed all RF transmission and power output tests in the ELT Production Facility, as per original design specification.

ACR Electronics, Inc.
[redacted] information [redacted]

The ELT only passed none of the six G-switch activation directions.

Conclusion:

1. The battery has 30.5 minutes runtime as proven when the NVRAM memory was read.
2. The ELT performed to design specifications on all RF and self-test levels, when connected to the battery.
3. The In-line and 5-way G-switch did not pass within specification.

The ELT under investigation was returned to the NTSB representative after the conclusion of the tests, after the D cell batteries were removed. The in-line and 5 way G switches were removed and given to the NTSB Inspector.

All applicable results and documents pertaining to the investigation and the beacon are added as supplement to this report.

Signed:

_____ Date_____

[redacted]

Technical Support Manager

ACR / ARTEX - ACR Electronics, Inc.

Approved:

_____ Date_____

[redacted]

Vice President, New Product Development

ACR / ARTEX - ACR Electronics, Inc.