

ANC10MA068  
Aleknagik, Alaska  
August 9, 2010  
~ 1442 ADT  
DeHavilland DHC-3T, N455A  
GCI Communications Corp.

**Survival Factors Group Chairman's Factual Report**

**Attachment 6**

**Artex ELT Post-Accident Analysis Report**

**3 pages**



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**Reference: Artex ELT Post Accident Analysis Report**

Model: ME406AF  
Part#: 453-6603  
Serial#: 08345  
Cospas-Sarsat TAC: 152

Teardown performed on 25AUG10. ELT was hand carried by NTSB personnel to repair facility. ELT mounting tray was shipped via priority UPS and received on 24AUG10; NTSB seals on package were undisturbed prior to NTSB investigator arrival.

**The ELT was visually inspected:**

- Mud / dirt was observed on unit. No major structural damage to ELT housing, only minor scrapes / scratches. Overall, unit was physically intact.
- BNC coax connector was still attached to ELT, however the coax cable had been forcibly removed. Evaluation of post-accident pictures and the BNC connector indicates that the shielding severed as a result of forces pulling the cable from the connector. The center conductor pin was observed to be still attached to the cable per photographs provided by the NTSB investigator.
- DB15 electrical connector was not present on the unit, however the strain relief screws for the connector were still present in the mounting holes. By appearances the DB15 connector had been forcibly removed – shearing the securing screws and leaving stubs still attached.
- Internal components and battery pack showed no signs of damage or wear.

**The ELT was then given an electrical analysis IAW CMM 25-60-01 Rev. A:**

- 121.5MHz frequency and power levels examined; found to be within normal operating parameters.
- 406MHz frequency and power levels examined; found to be within normal operating parameters.

- Battery voltage within normal operating parameters (6.23Vdc). Battery NVRAM discovered blank. Under normal conditions, this NVRAM stores total activation time and number of activations of the ELT; in this case it was completely blank. No discernable cause apparent at this time. No physical or electrical damage observed on the battery pack integrated circuit.
- G-Switch activated correctly at 215Hz (xxx G's); within normal operating parameters.
- 406MHz programmed message found to match as marked on ELT product label. ELT transmitted programmed message per normal operating parameters. 15 digit identification number matches NOAA registration.

## **ELT mounting tray was visually and physically inspected:**

- Composite tray intact. No major physical damage. Minor scratches / dirt present. No warping of plastic tray was detected. The NTSB photographs showed that the ELT and its mounting tray were installed on a vertical wall of the airframe and not horizontally mounted. It is not known if this could have contributed to the ELT being ejected from its tray.
- Velcro securing strap was observed to be reversed. Confirmed with a new production tray from the manufacturing facility. The NTSB provided pictures of ELT mounting tray installed in aircraft post impact. Velcro strap was observed to be oriented correctly in the photographs, however appeared to be slid towards the aft section of the tray; out of its molded groove. Under normal conditions, this strap should not be physically able to do this unless a gap is present between the bottom of the mounting tray and aircraft mount plate. It is conceivable that the ELT mounting tray may not have been secured tightly to the mount plate, but the photograph was inconclusive. It is also conceivable that the ELT was impacted or forced from the front (coax end) which in turn forced the Velcro back and out of its intended position and allowing enough slop in the strap to allow the ELT to come free of the tray.
- Test fit ELT and tray; secured Velcro strap. Attempted pull test to remove ELT from tray. ELT had 2mm of separation from tray; within normal operating specifications. Duplicated test with a factory new ELT and accident tray. Same results. Duplicated test with factory new tray and accident ELT. Same results.

## **Summary of results**

The ELT had minor exterior physical damage and no chemical or moisture intrusion to the unit. Physical marks and abrasions had no impact on unit's ability to function. Electrically the ELT transmitter components were completely functional.

Of concern is the battery pack NVRAM status. Without knowing specific environmental details surrounding the accident there is no plausible explanation available at this time for this condition; testing will be performed on factory new units to attempt to duplicate this condition.

The ELT mounting tray was functional. Concern lies in the photographs of the tray while

it was still mounted in the aircraft. The strap was pulled back from its groove toward the aft end of the tray. This positioning indicates that the ELT was not secured correctly in the tray, potentially allowing the forward section of the ELT to slide out of the tray during an impact of sufficient force. The strap physically cannot move out of its groove if the ELT tray is securely mounted to the aircraft mounting plate.

In the absence of further detailed photographs or in-person inspection of the mounting methods utilized, it is inferred that the ELT tray was either not fastened securely to the mount plate, or that external forces (vibration, impact) had allowed a gap to form. Either condition could cause a gap to form between the ELT tray and the aircraft mounting plate.

### **Authorizations, Certifications and Chain of Custody:**

The ELT and tray remained in possession of the NTSB via its representative present on site for the duration of the investigation. Seals on packaged components were not broken until observed by NTSB personnel.

All tests performed by a FAA certificated Repairman at FAA Certified Repair Station, AAC # W7LR1060, IAW FAA approved CMM 25-60-01 Revision A. Unit is contained on the Repair Station's Authorized Capabilities List approved by the FAA with no limitations.

Unit is a TSO'ed article under TSO C126a and conforms to such. TSO holder at time of production was: Artex Aircraft Supplies, Inc. located at 14405 Keil Road NE, Aurora, OR 97002. Current TSO Holder is: Chelton Avionics, Inc. d/b/a Wulfsberg Electronics Division located at 6400 Wilkinson Drive, Prescott AZ 86301.

If there are any questions or concerns regarding this report, or for additional supporting documentation regarding the ELT or Repair Station, please contact the undersigned.

  
**Nick Fosgate**

Field Service Representative

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