



**Position and Comments on the *Third Further Notice of Proposed Rule Making (Third FNPRM)* in WT Docket No. 01-289, for 121.5 MHz emergency locator transmitters (ELTs) under Part 87 of the Rules.**

**Introduction**

Emerging Lifesaving Technologies (submitter) is one of the newest ELTs to be certified by both the FAA and Cospas Sarsat. Our ELT406GPS is the first ELT to incorporate an internal GPS engine. With encoded location data, we have decreased the amount of Search and increased the chances for rescue.

Extensive research was done on how the 406 system works and why the 121.5 technologies have become obsolete. We looked at all designs and found most to have room to improve the safety of the flying public. More importantly, we identified and corrected the most common failures of the current ELT 406 on the market today.

Emerging Lifesaving Technologies is the collaboration between two aircraft electronic companies which have extensive experience with manufacturing and maintaining aerospace components. We have also approached the problem with the pilot/aircraft owner in mind. At all times our goal has been aircraft safety and survivability of the product during a crash.

Emerging Lifesaving Technologies has been at the forefront of the 121.5 issue. We have done extensive research and developed our ELT keeping the FCC's Third report and Order dated June 15, 2010 in mind.

The submitter has also added comment (17 of 17) as to how new technologies should also be considered as the FCC makes its determinations. Each opinion is on a separate page so this document can be disassembled for ease of discussion.

**Comment Section**

The following is the official response to the proposed rule change by paragraph.

- A total of 17 positions will be noted.
- Each will be referenced; such as Position 1 of 17, Position 2 of 17, etc.
- Each will contain the following:
  - Highlighted proposed information from the (Third FNPRM) in WT Docket No. 01-289
  - The submitter's reasoning on the position
  - Conclusion

Thank you for taking public comments on the Third FNPRM in WT Docket No. 01-289. Please feel free to contact us if we can be of any further assistance.

  
Johnny Johnson

January 29, 2013  
Date

Received & Inspected

FEB - 6 2013

FCC Mail Room

No. of Copies rec'd 0+2  
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**Position and Comments on the *Third Further Notice of Proposed Rule Making (Third FNPRM)* in WT Docket No. 01-289, for 121.5 MHz emergency locator transmitters (ELTs) under Part 87 of the Rules.**

**Position 1 of 17**

Para 1. In the *Third Report and Order* in this proceeding, the Commission amended Section 87.195 of its rules<sup>3</sup> to prohibit the certification, manufacture, importation, sale or use of 121.5 MHz ELTs.<sup>4</sup> It adopted this amendment because, among other reasons, the international Cospas-Sarsat satellite system, which relays distress alerts to sea and rescue authorities, stopped monitoring frequency 121.5 MHz on February 1, 2009.<sup>5</sup>

**Position 1 of 17**

Cospas Sarsat ceased monitoring the 121.5 signal now for four years. The last year it was used, there was a 98% false reading on the system. TV, power generation, and transmission all put out a harmonic that was identified by the Cospas portion of the system. This was not a surprise to anyone. All the different US government agencies in the NSARC had agreed to “phase out” the use of 121.5 System in October of 2000. The US is a signatory on the International Cospas Sarsat Treaty.

The system, when it worked, had too much error in it to be anything other than a crash detector. The 121.5 notification system required a large scale land and airbase search to begin at a cost of sometimes millions of dollars per event. At last accounting, the average time for the Civil Air Patrol (CAP) is now over 30 hours.

**Conclusion**

Emerging Lifesaving Technologies supports the restriction of the certification, manufacture, importation, sale or use of 121.5 MHz ELTs.



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**Position 2 of 17**

Para 2. After the Commission released the *Third Report and Order*, it received a letter from the Federal Aviation Administration (FAA) asking that the Commission not implement the modification to Section 87.195.6 The FAA stated that 121.5 MHz ELTs can continue to provide beneficial means of locating missing aircraft even without satellite monitoring because the frequency is still monitored by the search and rescue community, including the Civil Air Patrol.<sup>7</sup> The FAA also expressed concerns about the costs and availability of replacements for the 121.5 MHz ELTs.

**Position 2 of 17**

The 121.5 MHz ELT system is no longer useful. No search and rescue can occur if you don't know an aircraft is down. The FAA mistakenly assumes several things to be true in order to activate the CAP to find aircraft in distress.

They are:

1. All aircraft that are in the air are using some type of ground control element such as:
  - a. Monitored control towers
  - b. Flight following
  - c. Filed flight plans
  - d. (Only a small number of flights under IFR or Restricted Space Use fall under this category)
2. All aircraft are dispatched or have non-government monitoring of flight plans.
3. Other aircraft operators monitor the 121.5 (from 35K ft the search area has a 600 mile radius).
4. Missing aircraft are reported by the public when they become overdue.
5. Conditions exist to launch the CAP effort (daylight and good weather).
6. CAP assets are always available and only have 121.5 DF equipment.

As to the cost and availability of 406 Elts the following considerations should be made:

1. **Cost:** On the market today there is a wide variety of ELTs available to the flying public. Uninstalled prices range from under \$600 to \$1600 depending on features and application. There are more than six manufacturers that specialize in the small-to-medium sized civil aircraft.
2. **Availability:** The industry has, in past, delivered in excess of 40,000 units. Since 2008, three other new 406 manufactures have come onto the market. Today because there is no US mandate, the industry is projected to produce 12,000 to 14,000 in 2013. Estimates of 60,000 to 75,000 units could be built a year. This would take four years to handle the 300,000 aircraft worldwide that have not been modified to date. This would require a mandate from the FAA before any of the manufacturers would "spin up" production.
3. **Consideration should also be made for installing the new equipment.** While there are no absolutes, the average time we have found to update basic non-pressurized aircraft with new equipment is less than four hours. This assumes the removal of the 121.5 beacon first. The cost will vary from locale to locale but it is estimated that it should be between \$250 and \$400 for labor alone. There exist a sufficient number of qualified, licensed mechanics or shops to handle 75,000 units a year. The FAA has reduced the paperwork requirements to update ELTs, so no additional FAA resources would be required.



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**Position 2 of 17 cont.**

**Conclusion**

Emerging Lifesaving Technologies believes the 121.5 MHz ELTs are no longer sufficient for the minimum of aircraft safety. The FAA has made numerous erroneous assumptions that would alert search and rescue teams that a 121.5 search is warranted. The CAP uses 1930's technology that is very expensive to operate and has a very low cost/reward benefit. The CAP is in the process of changing their Directional Finding equipment to look for the 406 signal.

It is also our position that the US civil aircraft fleet could be updated in five years. This assumes that it will take one year to accomplish the rule making needed. A date of Jan. 8 2018 is well within the reasonable timeframe.

The cost of upgrade is well within the average operator's budget. The cost and potential benefit to public safety is much less than mounting a search and rescue with only 121.5 MHz beacons.



**Position and Comments on the *Third Further Notice of Proposed Rule Making (Third FNPRM)* in WT Docket No. 01-289, for 121.5 MHz emergency locator transmitters (ELTs) under Part 87 of the Rules.**

**Position 3 of 17**

Para 3. Following its receipt of the FAA letter, the Commission determined that it would be in the public interest to stay its amendment to Section 87.195.9 The *Stay Order*, which was published in the Federal Register on the same day as the summary of the *Third Report and Order*, stated that no additional action would be taken regarding 121.5 MHz ELTs until further notice and an additional opportunity for public comment. This *Third FNPRM* requests such comment.

**Position 3 of 17**

Emerging Lifesaving Technologies believes the stay should be lifted and allow for the phase-out of all 121.5 MHz stand alone ELTs.



**Position and Comments on the *Third Further Notice of Proposed Rule Making (Third FNPRM)* in WT Docket No. 01-289, for 121.5 MHz emergency locator transmitters (ELTs) under Part 87 of the Rules.**

**Position 4 of 17**

Para 4. ELT distress alerts are relayed to search and rescue authorities by the international Cospas-Sarsat satellite system. In 2000, Cospas-Sarsat announced that it would terminate satellite processing of distress signals on frequency 121.5 MHz in February 2009, and urged users to switch to the more reliable 406.0-406.1 MHz (406 MHz) radio beacons. Cospas-Sarsat now monitors and relays only 406 MHz distress alerts. In addition to transmitting a distress alert to the Cospas-Sarsat satellite, 406 MHz ELTs transmit a lower-power homing signal on frequency 121.5 MHz to more precisely guide search and rescue personnel to an aircraft once they are in its vicinity. Frequency 121.5 MHz will remain available for homing, and our decisions in the instant proceeding do not affect this use of the frequency.

**Position 4 of 17**

All 121.5 beacons operate within the guidelines of FAA TSOs and the appropriate RTCA guidelines. It is not clear if the FCC ruling here is implying that there is a difference between a 121.5 beacon and a 121.5 homing device. They are, in fact, required to be one and the same. The FCC properly notes that this is a low power, (less than one watt) transmitter that transmits at least 90% of the time. This is an AM Omni-directional transmitter.

To locate a downed aircraft, a grid pattern search must be flow once a search is warranted. (See Position 2 of 17 for why these searches are hard to initiate.) 121.5 beacons have a failure rate of between 30-70%, depending on the reporting agency. Many use lead acid batteries and corrosion is normal. Battery failure is the #1 reason for ELTs not to work during an accident. It is also impossible to maintain a number of the older 121.5 beacons as parts and batteries are no longer available from the manufacturers.

121.5 transmissions are also problematic due to their harmonics. US Air Force Rescue Command Center (AFRCC) has reported looking for downed aircraft and being thwarted by 121.5 signals being "retransmitted" along the power grid. The detection devices cannot discriminate between the locations, as the power grid moves the signal up and down the grid.

**Conclusion**

Emerging Lifesaving Technologies believes the phase-out of all 121.5 MHz stand-alone ELTs is warranted for the safety of the flying public.



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**Position 5 of 17**

Para 5. In 2006, in the *Second Further Notice of Proposed Rule Making (Second FNPRM)* in this proceeding, the Commission requested comment on what actions it should take in light of the planned termination of satellite monitoring of frequency 121.5 MHz.<sup>15</sup> The Commission noted that 406 MHz ELTs were more expensive than 121.5 MHz ELTs, and that there appeared to be a “difference of opinion within the search and rescue and aviation communities as to whether 121.5 MHz distress alerting will remain a viable search and rescue tool” after February 2009.<sup>16</sup> Commenters to the *Second FNPRM* generally supported the phase-out of 121.5 MHz ELTs.<sup>17</sup> No commenter disputed that 406 MHz ELTs are more accurate and reliable than 121.5 MHz ELTs, and minimize false alerts.<sup>18</sup> The National Telecommunications and Information Administration (NTIA) and FAA stated that they generally supported the proposals in the *Second FNPRM*, but did not specifically address the issue of 121.5 MHz ELTs.

**Position 5 of 17**

It should be noted that since acknowledging the phase-out of the 121.5 beacons, the FAA has sent mixed messages to the aviation community.

- Cospas Sarsat has removed the 121.5 beacon requirement from the latest T.007 specifications guide.
- The RTCA 204a was changed to reflect approval to remove the 121.5 signal from the requirements.
- FAA changed the TSO requirements, removing the 121.5 from C126a
- Without comment to the public, they have within the past 90 days rewritten C126a to C126b and added back in the 121.5 for any new beacons being certified.
- One FAA official stated that without the 121.5 that the CAP could not justify their existence.
- Another FAA individual stated that they did not agree with Cospas Sarsat/FCC decision and was unwilling to look at better/modern technology to accurately pinpoint crashed aircraft.
- The FAA also gives too much weight to certain pilot groups when evaluating new technologies. These groups always oppose anything that will cost their members money. They always admit this is good for the flying public but reject any attempt to mandate safety.
- Submitter suggested that FAA hold public meetings to get the input of all concerned, especially in the light of new technologies and proposed changes to the Cospas Sarsat system. They have rejected that suggestion to date.

**Conclusion**

New technologies that are now available and monitoring by NASA and Cospas Sarsat due to come on line in the next 5 years are not being taken into account by the FAA and AOPA. Emerging Lifesaving Technologies believes the FAA sent mixed messages to the flying public and there is a lack of a coherent governmental policy between all parties.



**Position and Comments on the *Third Further Notice of Proposed Rule Making (Third FNPRM)* in WT Docket No. 01-289, for 121.5 MHz emergency locator transmitters (ELTs) under Part 87 of the Rules.**

**Position 6 of 17**

Para 6. In 2010, after Cospas-Sarsat had ceased monitoring frequency 121.5 MHz, the Commission determined in the *Third Report and Order* that, based on the record before it, the public interest would be served by amending Section 87.195 to prohibit the further certification, manufacture, importation, sale, or use of 121.5 MHz ELTs.<sup>20</sup> The Commission concluded that requiring a transition to 406 MHz ELTs would promote aviation safety, and that whatever residual safety value 121.5 MHz ELTs might retain was outweighed by the danger that aviators might mistakenly rely on them for satellite distress alerting.<sup>21</sup> The Commission acknowledged that aircraft owners and pilots still using 121.5 MHz ELTs would incur an expense, but concluded that the safety benefits outweighed the compliance cost, especially given that aviators had been on notice since 2000 that Cospas-Sarsat would cease monitoring the frequency.

**Position 6 of 17**

The commission is correct in its assumption that the general flying public feels a level of safety still exists with 121.5 systems. Common misconceptions are:

- The satellites still work and can be used when called upon.
- The beacons are still monitored by FAA personnel in control towers.
- Airliners are mandated to keep one radio tuned to 121.5 to provide a safety net.
- **If it weren't safe the FAA would change the rule.**

**Conclusion**

Emerging Lifesaving Technologies believes that the government should send a clear and concise message that the 121.5 system is unlikely to alert search and rescue to come to the aid of a downed aircraft.



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**Position 7 of 17**

Para 7. Before the rule amendments adopted in the *Third Report and Order* were published in the Federal Register, however, the FAA and the Aircraft Owners and Pilots Association (AOPA) asked the Commission to revisit the rules regarding 121.5 MHz ELTs. In response, the Commission stayed the effective date of the 121.5 MHz ELT rule changes, and stated that it would provide an opportunity for interested parties to augment the record.

**Position 7 of 17**

It should be noted that since acknowledging the phase out of the 121.5 beacons, AOPA has sent mixed messages to the aviation community.

- AOPA admits that the new Cospas Sarsat is vastly superior to the old 121.5 beacon.
- AOPA has told its members in publications that a 406 ELT should be considered as essential minimum equipment.
- The submitter knows of no opposition to technical changes required by Cospas Sarsat, RTCA 204a or FAA TSO 126a requirements made to beacon manufacturers.
- The FAA also gives too much weight to pilot groups when evaluating new technologies. These groups always oppose anything that will cost their members money. They have in the past opposed
  - Mode-C
  - Mode-S transponders
  - ELT improvements
  - The new ADS-B system.

They always admit these improvements to aircraft are good for the flying public but reject any attempt to mandate safety. The submitter has heard numerous comments that until AOPA suggests to its members the need to upgrade, and then their group will continue to oppose any mandates. Why should they spend on something they don't think they need?

**Conclusion**

Emerging Lifesaving Technologies believes that AOPA's opposition to the phase-out of all 121.5 MHz, while they feel is in the best interest of their members, is not best for the flying public as a whole. Recent conversations with AOPA leadership seem to indicate to the submitter that this organization is changing its public stance on 121.5 alone transponders.



**Position and Comments on the *Third Further Notice of Proposed Rule Making (Third FNPRM)* in WT Docket No. 01-289, for 121.5 MHz emergency locator transmitters (ELTs) under Part 87 of the Rules.**

**Position 8 of 17**

**Para8.** Based on the record to date, we continue to believe that a phase-out of 121.5 MHz ELTs is in the public interest. While nothing in the record disputes the conclusion in the *Third Report and Order* that 406 MHz ELTs are superior to 121.5 MHz ELTs, or that a transition to 406 MHz ELTs would promote aviation safety, we seek further comment on these tentative conclusions. We also seek additional comment to help us more closely consider the timing and implementation of any such transition. In addition, we propose to further modify the Part 87 Rules to defer for an additional period of time the date(s) on which prohibitions pertaining to 121.5 MHz ELTs will take effect. The rules adopted in the *Third Report and Order* prohibit five discrete actions pertaining to 121.5 MHz ELTs – certification, manufacture, importation, sale, and use. We tailor our proposals to the particular considerations that attend each prohibition. We seek comment on these proposals, and also on relevant developments with respect to ELTs since we released the *Stay Order*.

**Position 8 of 17**

From a pure technical standpoint, the 121.5 is significantly less capable than the 406

**406 MHz**

**121.5 MHz**

**POWER OUTPUT**

5.0 Watts - Easy to detect, punches through overhead cover and improves accuracy

**0.1 Watt** - Hard for SAR to detect and LOCATE

**COVERAGE**

Global via low-earth orbiting satellites

Ground station dependent; ground stations have an effective radius of about 30 nm. Ground station and beacon must be in a line of site to the beacon.

Between 70° North & South latitudes via geostationary satellites (provides nearly instantaneous detection)

**ALERTING**

First location alert warrants launch of SAR assets. Earlier launches puts assets on scene sooner - an average 3 hours saved in maritime, 6 hours saved in inland.

High false alert rate makes first-alert launch unfeasible. Absent independent distress information means RCCs must wait for additional alert information.

Average initial detection/alerting by orbiting satellites is about 45 minutes, maximum 90 minutes. Beacons equipped with GPS use a different format and can be detected within one (1) minute with accuracies of 100 meters.

Unknown. If beacon is picked up by passing aircraft or downed aircraft is reported missing a search can begin. Average search varies between 18 to 36 hours depending on location and availability of nearest CAP unit.

Beacon ID combined with registration data and point of contact information allows rapid verification and launch or stand-down.

121.5 beacons all sound the same. There is no way to determine the ID of the downed aircraft from simple harmonics.



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Allows false alert follow-up to continuously improve system integrity/reliability.

**RCC no longer monitors so SAR is left up to FAA to be alerted and then CAP to be activated**

Near instantaneous detection by geostationary satellites. Beacon ID combined with registration data and point of contact information allows potential for near real-time immediate launch of SAR assets even without beacon-derived location information.

**No geostationary satellite detection capability = no instantaneous detection.**

**POSITION INFORMATION**

1-3 nm (2-5 km) accuracy on average. Position calculated by Doppler shift analysis. Position information on first satellite pass.

**No satellite detection capability = no instantaneous detection. Off line since Feb of 2009.**

Better than 300 feet accuracy with GPS equipped beacons. GPS position processed with initial alert, near instantaneous via geostationary satellites.

**No GPS capability.**

**SURVIVOR LOCATION**

Position accuracy (non-GPS) limits initial search area to about 25 sq. nm (65 sq. km) or better.

**No satellite detection capability = no instantaneous detection. Off line since Feb of 2009.**

GPS equipped beacons reduce search area to virtually pinpoint area.

**No GPS capability.**

406 beacons with GPS information no longer requires search and locate. 121.5 MHz homing signal facilitates short-range survivor location by radio DF-equipped search units.

**121.5 MHz signal facilitates survivor location by radio detection finder equipped search units. Larger search area makes this more difficult and problematic.**

**FALSE ALERTS**

All alerts come from beacons. Satellite beacon transmissions are digital, coded signals. Satellites process only encoded data, other signals are rejected.

**Only about 1 in 5 alerts come from beacons. Satellites cannot discern beacon signals from many non-beacon sources. Beacons transmit anonymously with no unique identifier. Non-beacon interferers have included ATM machines, pizza ovens, and stadium scoreboards.**

About 1 in 12 alerts are actual distress. The rest are usually a result of operator error or improper testing.

**Fewer than 2 in 1000 alerts and 2 in 100 composite alerts are actual distress.**



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Position 8 of 17 cont.

Beacon-unique coding/registration allow rapid incident corroboration. Registration is mandatory since 1994. 90% beacons are registered. About 70% of false alerts are resolved by a phone or radio call to registration point of contacts prior to launching SAR assets.

Since 121.5 MHz beacons transmit anonymously, the only way to ascertain the situation is to dispatch resources to investigate - a costly disadvantage that puts SAR crews at risk unnecessarily..

High false alert rate makes first-alert launch unfeasible.

**THE FUTURE**

International standard for the foreseeable future.

Satellite processing ceased on February 1, 2009.

Next generation system (MEOSAR) already being fielded is 100% backward compatible and results in improved accuracy and shorter alert times with current available beacons. Initial location can be nearly instantaneous within 500 meters of actual location.

Use of 121.5 MHz EPIRBs by U.S. boaters is illegal effective January 1, 2007. These new MEOSAR don't have the ability to be used for 121.5 detection.

All the 406 equipment is being maintained by the original manufacturers and customer support is still available.

Many of 121.5 beacons are no longer supported by the original manufacturers and parts and maintenance can only be done by persons who do not have factory support of parts, training, or technical data.

Cospas Sarsat is an international agency with over 140 countries signed on the treaty; world-wide detection and reporting is available.

Some countries rely on the Cospas Sarsat system as there only SAR alert. No 121.5 monitoring is done.

**Other Concerns**

**Other Concerns**

406 beacons use only the latest, safest, approved battery kits. New TSO's requirements remove many of the old battery chemistries.

Most 121.5 use either lead acid or Ni-Cad batteries. These are unstable and have caused damage to equipment and aircraft. Off-gassing, corrosion, and fires are possible with some of the older 121.5 units power supply. New FAA guideline on batteries have been adopted.

Burst-type transmissions that allow for 100+ hours of transmission improving the chance of locating downed aircraft.

Continuous transmission that reduces battery life to under 36 hours. This is at the edge of some estimates for CAP to locate the aircraft.

New RTCA 204a environmental requirements take into account the various conditions found in actual aircraft crashes. Heat, cold, vibration, and fire resistance standards have increased.

Environmental testing on older TSO 91C was not as comprehensive as the current 406.



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Position 8 of 17 cont.

Some of this data was taken from Doug Ritter, who owns "Equipped to Survive". He is an expert in surviving aircraft crashes and is often a speaker at Aviation Safety programs. The submitter has added to additional information from this training that was given in 2007.

As to the timing of the change-out, several things must be considered:

1. **The size of the market.** No official survey has been done to see what is needed. Estimates range from 180,000 to 225,000 aircraft have yet to be updated in the US alone. Since the US sets the standards for world-wide aviation, an additional 200,000 require upgrade from the obsolete 121.5 system.
2. **Manufacturers' ability to produce.** The most ever produced was slightly over 40,000 when certain other countries mandated a change. Currently it is estimated that less than 15,000 will be sold this year. There are currently six 406 beacon companies in the general aviation market. The manufacturers could easily spin up to create 75,000 per year if needed.
3. **Industries' abilities to retrofit aircraft.** It is estimated that the average time to remove an old ELT and install a new 406 beacon is less than four hours. The average cost of maintenance is \$73.23 per hour across America. The additional cost to the customer should be less than \$300

To the submitter's knowledge, there is no one currently designing, testing, certifying or manufacturing stand-alone 121.5. Some of the older "stale" inventories are still being used; however, the FAA does not allow for a 121.5-only beacon to be installed at this time.

**Conclusion**

Emerging Lifesaving Technologies believes that the 406 beacons are vastly superior to the 121.5 system. We also submit that the industry can bring to market enough 406 beacons to satisfy demand within a three-to-four year period.

We also believe that without a mandate, the aviation community will not upgrade their aircraft. The FAA has had 13 years to devise some plan and to date they have not. They have actually re-enforced the use of 121.5 by adding in the last 90 days a requirement to reintroduce the 121.5 technology back into the latest TSO changes.

A planned phase-out of all aviation-based systems should be implemented and concluded within five (5) years.



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**Position 9 of 17**

.Para9. At this time, we see no reason to certify new models of 121.5 MHz ELTs. Not only has Cospas-Sarsat stopped monitoring frequency 121.5 MHz, but the FAA has ceased design or production approval for new 121.5 MHz ELTs in light of the superiority of 406 MHz ELTs.<sup>26</sup> As a result, there will be no new 121.5 MHz ELT devices for the Commission to certify. Consequently, while the prohibition on further certification of 121.5 MHz ELTs is currently stayed,<sup>27</sup> we propose to prohibit further certification of 121.5 MHz ELTs immediately upon the effective date of any 121.5 MHz ELT rule amendments adopted as a consequence of this *Third FNPRM*.<sup>28</sup> This would have the effect of lifting the stay on the prohibition against further certifications as of that date. Commenters who believe that we should allow continued certification of new 121.5 MHz ELT models should explain how such an action would serve the public interest, and why the immediate cessation of further certifications of such devices would adversely affect any party.

**Conclusion 9 of 17**

To the submitter's knowledge, there is no one currently attempting to certifying a stand-alone 121.5 beacon. Emerging Lifesaving Technologies agrees with the Commissioner, Cospas Sarsat, and the FAA that no new stand-alone 121.5 beacons should be certified.



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**Position 10 of 17**

Para 10. We further propose to prohibit the continued manufacture, importation, and sale of existing 121.5 MHz ELT models beginning one year after the effective date of any 121.5 MHz ELT rule amendments adopted as a consequence of this *Third FNPRM*. This would have the practical effect of continuing the current stay on Section 87.195's prohibition on the manufacture, importation, and sale of 121.5 MHz ELT models for one year after that effective date, though the stay itself would be lifted as of that date. We believe that there are sound reasons to provide a one-year transition period before we prohibit the manufacture, importation, or sale of 121.5 MHz ELTs, even if we provide no such additional period for the certification of such equipment.<sup>29</sup> We tentatively conclude that a one-year grandfathering period for the manufacture, importation, and sale of 121.5 MHz ELTs will enable manufacturers, importers, and distributors of 121.5 MHz ELTs to largely avoid any significant economic burden associated with stranded inventory, particularly since nearly two years have passed since we released the *Stay Order*. We seek comment on this tentative conclusion and on whether, and to what extent, a one-year grandfathering period would avoid or reduce the compliance burden on small businesses and other small entities compared to an immediate ban on the manufacture, importation, and sale of 121.5 MHz ELTs. We also seek comment on whether the transition period should be longer or shorter than the one-year proposal discussed herein, or in the alternative, whether there should be no transition period at all. In addition, we seek comment on the ramifications of the proposed one-year period (or any other transition) for aviation safety, as well as any associated costs. Further, we seek comment on whether, if we permit the continued sale of 121.5 MHz ELTs, we should enact additional requirements (such as labeling or point-of-sale disclosure) to ensure that purchasers are aware that 121.5 MHz ELTs lack satellite alerting capability.<sup>30</sup> We ask commenters to address the costs and benefits of any additional requirements as well.

**Position 10 of 17**

There is no manufacturer currently developing and trying to certify any 121.5 stand-alone transmitter. To the submitter's knowledge there is only one model for sale currently in the US that only has a 121.5 stand alone transmitter. Their largest distributor has not delivered any of those units since 2011 to US normal certified aircraft. Foreign sales are still being reported. There may be some stale inventory in other distribution networks inside the US may exist but they are unknown to the submitter.

**Conclusion**

Emerging Lifesaving Technologies believes that the 121.5 transmitters are no longer accepted by the FAA or flying public for new installation in certified N numbered aircraft.

We also submit that the industry would not be affected by the immediate removal of all new 121.5 beacons for installation in US certified N numbered aircraft. The period should be shortened to Jan. 8<sup>th</sup> 2013, the published order date. This will send a clear message to the aviation community of the decreased safety of using only 121.5 beacons.



**Position and Comments on the *Third Further Notice of Proposed Rule Making (Third FNPRM)* in WT Docket No. 01-289, for 121.5 MHz emergency locator transmitters (ELTs) under Part 87 of the Rules.**

**Position 11 of 17**

Para 11 We seek comment on whether we also should adopt a specific date to prohibit the continued use of 121.5 MHz ELTs in service. Information in the record submitted after the *Third Report and Order* was released suggests that permitting the continued use of 121.5 MHz ELTs, at least temporarily, may mitigate compliance costs, address a possible shortfall in the existing inventory of 406 MHz ELTs, and prevent an unintended grounding of general aviation aircraft.<sup>31</sup> We accordingly also request comment on the extent to which we should grandfather those 121.5 MHz ELTs already in use and the costs and benefits of doing so. Should they be grandfathered indefinitely so that they would need to be replaced only at the end of their useful life, or for a specific limited period of time?<sup>32</sup> We note that when the Commission phased out 121.5 MHz emergency position-indicating radiobeacons (EPIRBs), it grandfathered their use until a specific date.<sup>33</sup>

**Position 11 of 17**

The FAA has had 13 years since the NSARC agreement to approve the Cospas Sarsat removal of 121.5 monitoring occurred in 2000. At that time it was felt that the aviation community would voluntarily change to the new 406 beacons because of the obvious improvements to the flying public's safety. To date, it is estimated that less than 20% of the aircraft have upgraded. Only the mandate for new aircraft to have the 406 beacons installed account for the level of upgrades that have happened to date. The use of 121.5 systems alone is both costly and ineffective.

The FAA has given too much weight to several groups when contemplating the upgrade to the new technologies. They are:

- **AOPA** Aircraft Owners and Pilots Association, an organization that acts as a watch dog for the community. While they oppose any mandate to improve safety equipment, they do suggest to their members to make many of these improvements to their aircraft. Their first response has always been "no," and now after 13 years there seems to be a change in their attitude.
- **CAP** The Civil Air Patrol is the primary Search and Rescue for land-based distress signals. They use 1930's technologies of using Directional Finding (DF) radios similar to ADF receivers and fly a grid pattern search to locate a specific area and then send in ground rescue services. They can only be activated once they know a crash has occurred. Without Cospas Sarsat notification, this system is at best hit or miss. With the new GPS-enabled beacons and the next generation Cospas Sarsat' MEOSAR satellite system there will be no need for CAP in the Search and Rescue equation. They have opposed removal of the 121.5 beacons as this will eliminate one of the chief reasons for their existence. The submitter suggests that this is an attempt to justify renewed funding.
- **Certain groups within the FAA** have failed to appreciate the 406 benefits versus leaving the old 121.5 system. There is always an "institutional resistance" to change to new technologies. Just because this is how we did SAR in the 1930's doesn't mean we should continue to do so.



**Position and Comments on the *Third Further Notice of Proposed Rule Making (Third FNPRM)* in WT Docket No. 01-289, for 121.5 MHz emergency locator transmitters (ELTs) under Part 87 of the Rules.**

**Position 11 of 17 cont.**

Compliance of the fleet to upgrade can be done within the FAA existing system as follows:

- **Issue an AD.** An airworthiness directive (AD) is issued by the FAA to alert the flying community that a change in the interest of public safety must be made. It sets out the rationale and means for compliance and sets a time table for completion.
- **Timetable :** when it comes to safety, the flying community has not shown that voluntary compliance works. Many people will report that they don't need that equipment because *"they are not going to crash."* Therefore, the following plan should be implemented:
  - A phase-in should be made to require complete compliance within four years.
  - A goal of 25 % of the fleet should be set per year.
  - Selection can be made by lottery or tied to the renewal of AC airworthiness or registration records.
  - One year notification should be given before each group is required to upgrade so owners and operators can budget for upgrades.

**Useful Life**

The submitter suggests that the term "useful life" is somewhat ambiguous. Many of the 121.5 transmitters installed today were manufactured by companies that are no longer in business and no product support now exists. Third parties have taken up the manufacture of batteries and other parts but it is not clear if, without current tech data, the equipment is being maintained properly.

Annual test of the beacons FAA rule 91.207 are only functional checks of operation but do not check the quality of the signal, battery strength, or output power. If 121.5-only transmitters are going to continued in use, then the inspection should be removed from mechanics and assigned to only approved Certified Repair Stations that maintain the training, tech data, and tooling for complete testing. Mechanics, owners, or operators do not have the skills, training, or testing facilities to insure the 121.5 beacons are still within their "useful life".

**Aviation versus Marine**

The submitter suggests that there is no difference between the safety of the aviation community and that of the marine industry. Generally speaking, marine incidents occur much slower than an aviation crash and have more time to react and call for help. Many aircraft accidents occur with little or no warning and during an emergency the pilots work load is so great that it is important that certain safety equipment work automatically and with a high degree of reliability of alerting authorities so SAR can be activated. Downed aircraft are much harder to see than most can imagine. Visual searches rarely find an accident unless the aircraft starts a fire.

**Conclusion**

Emerging Lifesaving Technologies believes that the 121.5 transmitters are no longer accepted by the FAA or flying public for new installation in aircraft.

We also submit that the industry would not be adversely affected by the immediate removal of all 121.5 beacons. The period should be shortened in order to send a clear message to the aviation community of the decreased safety of using only 1215 beacons.



**Position and Comments on the *Third Further Notice of Proposed Rule Making (Third FNPRM)* in WT Docket No. 01-289, for 121.5 MHz emergency locator transmitters (ELTs) under Part 87 of the Rules.**

**Position 12 of 17**

Para12. We seek information on the costs associated with a mandatory transition to 406 MHz ELTs and our specific proposals to discontinue the certification, and prohibit the manufacture, importation, and sale of 121.5 MHz ELTs. Past AOPA and AEA filings in this docket suggest that a mandatory upgrade from 121.5 MHz ELTs to 406 MHz ELTs would affect approximately two hundred thousand aircraft, at an aggregate cost that FAA and AOPA estimated to be three hundred to five hundred million dollars.<sup>35</sup> We seek current data on the number of aircraft potentially affected by a prohibition on continued use of 121.5 MHz ELTs, and the cost per unit of 406 MHz ELTs (including installation). We also seek additional information regarding the costs to the search and rescue community of continuing to allow use of 121.5 MHz ELTs, including but not limited to the cost of responding to false alerts.

**Position 12 of 17**

To the submitter’s knowledge there is no definite data on the actual status of the fleet as to 406 upgrades. The following information is the best estimates by reviewing Cospas Sarsat data, GAMA records, general sales data from the three main ELT product distributors, and a survey of FAA approved Certified Repair Stations.

They are as follows:

- 18-22% compliance of all aircraft have 406 beacons installed.
- 180,000 to 225,000 US certified registered aircraft not yet upgraded with 406 beacons
- It is estimated that 210,000 aircraft without 406 Transmitters

Not all aircraft owners or operators are likely to buy the same equipment. There are low-cost units that meet only the minimum requirements. Other units have different features and will appeal to different clientele. We have broken that down into three tiers of customers. This information is a best estimate.

**Cost Analysis.** This is a projected total cost to owner operator including installation.

Class	Features	%	Aircraft affected	Cost per Aircraft	Total
1 <sup>st</sup> tier	Basic ELT with no extra features	40	84,000	\$925	77,700,000
2 <sup>nd</sup> tier	GPS or Helicopter Interface	50	105,000	\$1,500	157,500,000
3 <sup>rd</sup> tier	Cabin Class Twin and Higher	10	21,000	\$2,100	44,100,000
	Total to covert to 406		210,000	Total Cost	\$279,300,000

**Conclusion**

Emerging Lifesaving Technologies believes that the upgrading to the 406 transmitters has an average cost of \$1,330 per aircraft across the fleet.

We also submit that after 13 years, most owner-operators will invest in their safety at this level with a mandate to remove the 121.5 systems, and that GPS internal units greatly reduce the need for costly Search and Rescue.

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**Position and Comments on the *Third Further Notice of Proposed Rule Making (Third FNPRM)* in WT Docket No. 01-289, for 121.5 MHz emergency locator transmitters (ELTs) under Part 87 of the Rules.**

**Position 13 of 17**

Para13. FAA and AOPA also state that the inventory of 406 MHz ELTs is insufficient to accommodate all eneral aviation aircraft in the short term.<sup>36</sup> They are concerned, given that most general aviation aircraft are required to carry ELTs,<sup>37</sup> that immediately prohibiting use of 121.5 MHz ELTs would effectively ground many such aircraft.<sup>38</sup> We invite comment on these concerns, particularly in light of the amount time that has passed since we issued the *Stay Order*. We request data on the existing inventory of 406 MHz ELTs, and the capacity of manufacturers to meet increased demand. Commenters that contend that the current supply of 406 MHz ELTs is insufficient are asked to estimate how long a grandfathering period for the continued use of 121.5 MHz ELTs would be sufficient for manufacturers to meet projected demand for 406 MHz ELTs.

**Position 13 of 17**

As to the timing of the change-out several things must be considered:

1. **The size of the market.** No official survey has been done to see what is needed. Estimates range from 180,000 to 225,000 aircraft have yet to be updated in the US alone. Since the US sets the standard for world-wide aviation, an additional 200,000 require upgrade from the obsolete 121.5 system.
2. **Manufacturers' ability to produce.** The most ever produced was slightly over 40,000 when certain other countries mandated a change. Currently it is estimated that less than 15,000 will be sold this year. There are currently six 406 beacon companies in the general aviation market.
  - a. The manufacturers could easily spin up to create 75,000 a year if needed. The submitters suggest that all the units could be made in as little 18 months.
  - b. The problem arises that to build production facilities, to move faster than that is not economically feasible. Once the fleet has been modified the market will only need 10,000 to 15,000 units for new aircraft produced around the world.
3. **Industries' abilities to retrofit aircraft.** It is estimated that the average time to remove an old ELT and install a new 406 beacon is less than four hours. The average cost of maintenance is \$73.23 per hour across America. The additional cost to the customer should be less than \$300. There are a sufficient number of certified mechanics, certified repairs stations to convert 50,000 aircraft per year.

**Conclusion**

Emerging Lifesaving Technologies believes that the 406 beacons are vastly superior to the 121.5 system. We also submit that the industry can bring to market enough 406 beacons to satisfy demand within a three-to-four year period.

A planned phase-out of all aviation-based systems should be implemented and concluded within five (5) years. The FAA should be encouraged to issue Airworthiness Directives (AD) to have all US registered aircraft to be upgraded within the next five (5) years from the adoption of the (Third FNPRM) in WT Docket No. 01-289



**Position and Comments on the *Third Further Notice of Proposed Rule Making (Third FNPRM)* in WT Docket No. 01-289, for 121.5 MHz emergency locator transmitters (ELTs) under Part 87 of the Rules.**

**Position 14 of 17**

Para14. In addition, FAA and AOPA argue that the *Third Report and Order* undervalued the continued safety benefits of 121.5 MHz ELTs. We therefore request additional comment on the residual safety benefits of 121.5 MHz ELTs since Cospas-Sarsat terminated satellite monitoring of the frequency more than three years ago. We also ask interested parties to discuss whether, notwithstanding any such benefits, allowing continued use of 121.5 MHz ELTs could foster an unwarranted reliance on them, and whether this can be addressed by educational outreach efforts or other means.

**Position 14 of 17**

The FAA, in this rare case, does not have aircraft safety as the #1 priority. They have failed to hold any fact-finding groups or hearings on the effectiveness of the 121.5 beacons. They have relied on other groups to give input into the decision-making process without regard to any bias those organizations may bring. They have misreported some of the other government oversight groups like the NSARC, NTSB, NASA, Coast Guard, and others.

The FAA has given too much weight to several groups when contemplating the upgrade to the new technologies. They are:

- **AOPA** Aircraft Owners and Pilots Association, an organization that acts as a watch dog for the community. While they oppose any mandate to improve safety equipment, they do suggest to their members to make many of these improvements to their aircraft. Their first response has always been “no,” and now after 13 years there seems to be a change in their attitude.
- **CAP** The Civil Air Patrol is the primary Search and Rescue for land-based distress signals. They use 1930’s technologies of using Directional Finding (DF) radios similar to ADF receivers and fly a grid pattern search to locate a specific area and then send in ground rescue services. They can only be activated once they know a crash has occurred. Without Cospas Sarsat notification, this system is at best hit or miss. With the new GPS-enabled beacons and the next generation Cospas Sarsat’ MEOSAR satellite system there will be no need for CAP in the Search and Rescue equation. They have opposed removal of the 121.5 beacons as this will eliminate one of the chief reasons for their existence. The submitter suggests that this is an attempt to justify renewed funding.
- **Certain groups within the FAA** have failed to appreciate the 406 benefits versus leaving the old 121.5 system. There is always an “institutional resistance” to change to new technologies. Just because this is how we did SAR in the 1930’s doesn’t mean we should continue to do so.

**Conclusion**

The FAA has had 13 years since the NSARC agreement to approve the Cospas Sarsat removal of 121.5 monitoring occurred in 2000. At that time it was felt that the aviation community would voluntarily change to the new 406 beacons because of the obvious improvements to flying public’s safety. To date it is estimated that less than 20% of all aircraft have upgraded. Only the mandate for new aircraft to have the 406 beacons installed account for the level of upgrades that have happened to date. The use of 121.5 systems alone is both costly and ineffective.

Emerging Lifesaving Technologies believes that the 121.5 transmitters do not provide even the minimum protection to the flying public and should be permanently removed from all aircraft.

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**Position and Comments on the *Third Further Notice of Proposed Rule Making (Third FNPRM)* in WT Docket No. 01-289, for 121.5 MHz emergency locator transmitters (ELTs) under Part 87 of the Rules.**

**Position 15 of 17**

Para15. FAA and AOPA also argue that a rapid transition to 406 MHz ELTs is not warranted in light of other technology. They argue that many aircraft already carry EPIRBs or personal locator beacons (PLBs)<sup>40</sup> that transmit distress signals on frequency 406 MHz, or GPS-equipped mobile phones which transmit a signal that can be tracked.<sup>41</sup> AOPA also argues that the benefits of 406 MHz ELTs may be superseded by the advent of Automatic Dependent Surveillance – Broadcast (ADS-B) service, which provides superior flight tracking functionality.<sup>42</sup> We seek comment on whether the availability of alternative equipment reduces the importance of 406 MHz ELT carriage. Commenters should provide data on the extent to which such devices currently are carried, and describe how such devices can serve as reasonable substitutes for 406 MHz ELTs. We also seek comment on how the deployment of ADS-B may affect the need for 406 MHz ELTs. Interested parties may also suggest any additional factors they believe either support or militate against a rapid transition to 406 MHz ELTs.

**Position 15 of 17**

The FAA requires that all aircraft be equipped with an approved Emergency Locator Transmitter. With the exception of some air carriers, that is every US registered aircraft. Each ELT, whether certified by TSO 91 or 126, requires them to be an Automatic Fixed (AF) unit. The requirements are called out in RTCA 204a and Cospas Sarsat T.007 requirements.

ELTs are fixed to the aircraft and activate with a rate change of 4.5 ft-per-second deceleration. They must have an activation switch and annunciators installed within the pilot's control during normal operating parameters. They must have sufficient battery power to allow for SAR to locate and affect a rescue. The units must be survivable within the environmental envelope of aircraft operations as required under RTCA 204a.

These requirements are vastly different than for an ADS-B, EPRIB or PLB. There is no FAA standard for GPS cell phones during an emergency. The FAA and AOPA have made a false assumption that the of carrying this extra equipment meets the minimum requirements of Part 91, 21, 25 or any other FAA rule.

Aircraft accidents happen in very short order. In many cases the pilot is unable to activate even the minimum of safety alerts. The system as designed by the FAA 50 years ago required for automatic/fixed (AF) activation.

**Problems with ADS-B:**

- Cost per systems ranges for \$5,000 to \$16,000 per aircraft.
- The system still does not have all the minimum operation standards finalized.
- Current equipment is being installed with an ADS-B “compliant” rating.
- Less than 1% compliance with system.
- Ground-based system will not be completed until after 2021.
- No clear understanding how the system would alert to a crash.
- FAA has not required that output information be supplied in a crash situation.
- FAA has not required that an automatic activation feature be installed.
- FAA has not required that a battery backup to continue to operate without ship's power.



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- The ADS-B and all electrical equipment **MUST BE** turned off (as a safety measure) as the last thing on all emergency check lists before impact.

**Position 15 of 17 cont.**

**Conclusion**

ADS-B in particular is a major problem for the general aviation community. If people are unwilling to spend \$1,300 to upgrade an ELT why does the FAA think they will spend \$16,000 on full-up systems? This is a technology that has no support in this market place. This would represent a 30-40% of value of many of the aircraft that are currently flying. They have not designed the system to act as an ELT.

PLBs and EPRIBs can only work if activated and would require reengineering and recertification in order to be installed in aircraft. That would make them an ELT.

It is good to have cell phone, sat phone, flares, mirrors and other safety devices in case of an accident. Having cell phones as a primary alert device can give a false sense of security as there are large portions of CONUS that do not have cell coverage. Also, you have to be conscious to activate all these items.

Emerging Lifesaving Technologies believes that the solutions proposed by the FAA and AOPA are not feasible, practical, or legal. They have failed to put the flying public's safety in front of their own agendas.



**Position and Comments on the *Third Further Notice of Proposed Rule Making (Third FNPRM)* in WT Docket No. 01-289, for 121.5 MHz emergency locator transmitters (ELTs) under Part 87 of the Rules.**

**Position 16 of 17**

Para16. For reasons discussed above, we seek additional comment in this proceeding on the proper timing and implementation of a phase-out of 121.5 MHz ELTs and transition to 406 MHz ELTs. We ask that commenters address our proposals in this *Third FNPRM*, and otherwise provide their views on these matters.

**Position 16 of 17**

The aviation community has had 13 years since the NSARC agreement to approve the Cospas Sarsat removal of 121.5 monitoring occurred in 2000. There has been very little voluntary movement to the new safer-proven technology of 406 beacons. Less than 20% of the general aviation fleet has been updated.

Only a mandate for 406 beacons will bring the fleet into compliance. That mandate must have at its core the removal of all 121.5 stand-alone beacons.

The FAA, AOPA, and CAP have not put aircraft safety at the top of their agendas. It is left up to the FCC, who does not have the outside political pressure to maintain the status quo, to insure that aircraft in distress have a chance of rescue. The current system, most often, has now become a Search and Recovery. New technologies allow for first responders to be on the way in minutes, not hours or days.

The FCC should encourage the FAA to issue the appropriate ADs be issued and a timetable be set for the mandatory removal of all stand-alone 121.5 beacons.

A phase-in should be made to require complete compliance within four years.

- A goal of 25 % of the fleet should be set per year.
- Selection can be made by lottery or tied to the renewal of AC airworthiness or registration records.
- One year notification should be given before each group is required to upgrade so owners and operators can budget for upgrades.

**Aviation versus Marine**

The submitter suggests that there is no difference between the safety of the aviation community and that of the marine industry. Generally speaking, marine incidents occur much slower than an aviation crash and have more time to react and call for help. Many aircraft accidents occur with little or no warning and during an emergency the pilot's workload is so great that it is important that certain safety equipment work automatically and with a high degree of reliability of alerting authorities so SAR can be activated. Downed aircraft are much harder to see than most can imagine. Visual searches rarely find an accident unless the aircraft starts a fire.

**Conclusion**

Emerging Lifesaving Technologies believes that the 121.5 transmitters are no longer acceptable as a minimum safety device to alert of an aircraft in distress.

We also submit that the FCC should lead the way to safety by strongly encouraging the FAA to make the mandatory changes to the rule in order insure the safety of the flying public. The FCC can do this by banning all 121.5 beacons.

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**Position and Comments on the *Third Further Notice of Proposed Rule Making (Third FNPRM)* in WT Docket No. 01-289, for 121.5 MHz emergency locator transmitters (ELTs) under Part 87 of the Rules.**

**Position 17 of 17**

Technology is ever moving forward and there may be some developments that the FCC has not yet been made aware of. The submitter respectfully suggests that there are other technological changes that should be considered. These technologies will eliminate the need for any type of homing device to be installed in 406 beacons.

**New Cospas Sarsat monitoring (next generation) MEOSAR**

Currently Cospas Sarsat employs a LEO/GEO system to alert of an aircraft in distress. It takes up to four (4) hours to narrow the search area to under 5 nm or around 3700 acres. This is why the requirement for a homing system was necessary. Since the 121.5 and 243 beacons were known technologies in the 1980s, it was incorporated in the mix.

Cospas Sarsat, in conjunction with NASA and the USAF are now deploying the new GPS111f constellation. This is a MEOSAR (Mid Earth Orbiting Satellite) that will allow for a much faster detection of the 406 beacons. Currently the system is 35% complete and operational. Detection within all of the Western Hemisphere is now possible.

New beacons are now being planned, and minimum operating performance standards (MOPS) are being discussed by the Cospas Sarsat community. To use the new MEOSAR system will require the manufacturers to spend millions of dollars on R and D. It is doubtful that without a mandate the manufacturers are willing to invest in next generation beacons.

The new MEOSAR system will be able to detect the next generation beacons in minutes and will have an accuracy of 500 meters. This will eliminate the need for any 121.5 homer to be installed or any fixed assets to report or narrow the search site.

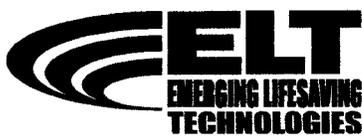
As previously discussed, Cospas Sarsat has identified the problems with 121.5 as being too indiscriminate and not reliable for aircraft in distress detection.

121.5 beacons also require long antennas. Antenna lengths of 15" are common for 121.5 transmitters. Antenna failures are the second most common problem causing as many as 70% of all 121.5 beacons failing during a crash.

**Other means of narrowing the search area:**

For years Cospas Sarsat has approved several different methods to transmit critical data. With the advent of a reliable GPS system the "Long Format" was approved. This allows information from a GPS source to actually encode the aircraft's position onto the message sent to the satellite and then processed by the RCC.

This type of transmission occurs within one minute of activation. The RCC handles it differently from a standard 406 beacon, as knowing a precise position (less than 100 meters), they contact first responders instead of SAR.



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**Position 17 of 17 cont.**

**There are two type of GPS interface:**

**External**

- In this system, an approved GPS signal is captured via a hard wire connection to the aircrafts GPS navigation system. It is routed through a decoder and then sent to the ELT through an RS 232 or similar port. The information is stored in temporary memory and in the event of system activation, either automatically or manually, the Latitude/ Longitude information is added to the long chain message and sent to RCC. This is a vast improvement over a homing device; however, there are several technical problems with using external GPS signals.

**Problems with External GPS information:**

- First, the system requires a working and accurate on-board GPS. Should a power supply be the cause of an aircraft in distress, the last known fix that could be encoded might be hundreds of miles off.
- To ensure this doesn't happen, the information is only fixed at the point of activation. Updates are only allowed by Cospas Sarsat rule every five minutes. This is to reduce redundant alerts at the RCC. If the plane is flying at 200 kts that means an error of a 25 nm search area would be introduced.
- Additionally, every emergency checklist has as its last function to turn off all electrical power before impact. This reduces the risk of fire; however, all the information is lost or corrupted in the buffer.

**Internal GPS:**

- Cospas Sarsat has long accepted internal GPS encoding in PLB and EPRIB. No 121.5 homers are required.
- Internal GPS encoding is now making its way into the ELT market.
- Cospas Sarsat has modified its testing program to allow for internal GPS encoding on 406 Automatic Fixed (AF) beacons.
- With internal GPS, data is stored on the ELT's microprocessor and is not affected by loss of aircraft power.

**Problems with Internal GPS information:**

- The main drawback has been the cost of internal GPS. However, this cost is most often offset by reducing the cost of installation of an external GPS system.
- The cost of installation of an internal GPS system is the same as a standard 406/121 system.
- This adds complexity to the ELT system; however, GPS receivers are now commonplace on many electronic components and their reliability is well known.



**Position and Comments on the *Third Further Notice of Proposed Rule Making (Third FNPRM)* in WT Docket No. 01-289, for 121.5 MHz emergency locator transmitters (ELTs) under Part 87 of the Rules.**

**Position 17 of 17 cont.**

**Conclusion**

Emerging Lifesaving Technologies wishes to thank the FCC for leading the way in aircraft crash detection. The 121.5 system has benefited many people over the years but with the recent changes to Cospas Sarsat, the system now gives a false sense of security to the flying public. The total ban on all 121.5 stand-alone devices is the only way to insure that when an aircraft and its passengers are in distress, that first responders can be deployed.

With the new technologies now available, the Search and Rescue response time can change from over 30 hours to an Alert and Recovery effort initiated in less than one minute.