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| Artifact ID:  REQ-001 | Artifact Title:  Requirement Justification Breakdown | | |  |
| Revision:  1.1 | Revision Date:  28 SEPT 2019 | | |
| Prepared by:  Garret Gang | | Checked by:  Joe Hansen | |
| Purpose:  The purpose of this artifact is to explain the reasons for each of our market requirements. | | |  | |

# Revision History

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| Revision | Revised by | Checked by | Date |
| 1.0 | Garret Gang | Jesse Krage | 13 SEPT 2019 |
| 1.1 | Garret Gang | Joe Hansen | 28 SEPT 2019 |

# References

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| --- | --- | --- |
| Artifact ID | Revision | Title |
| RM-001 | 1.7 | Requirement Matrix |
| NOTE-001 | 1.0 | IMSAR 1st Visit |
| NOTE-002 | 1.0 | Design Review Notes |

# Requirement Breakdown

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| **Requirement** | **Breakdown** |
| System tracks in-flight vehicle | The goal of this project is to help IMSAR to replace their current (out of production) gimbal with a new gimbal, and to expand the functionality of their current positioning system.  Their current positioning system is capable of keeping a drone/airplane in it’s field of view once the target has been acquired. Our system must be capable of doing the same if it is to replace their existing system. |
| System computer communicates through Ethernet | IMSAR’s current antenna system sends received information via Ethernet. For compatibility with their existing control system, we will design a system to be able to receive GPGGA messages from the existing antenna. In addition, our designed control system will need to send its status update messages through Ethernet so that the turret’s functionality can be monitored from a downstream server. |
| System provides frequent status updates | These status update messages exist to let the user know that our positioning system is still functioning. Important statuses include antenna pointing position, relative drone location, current selected radar unit, and status of other equipment. |
| User interface (UI) is intuitive and requires minimal training | One of the expected use cases for this positioning system is that the user will setup the positioner and leave it running at length without any further configuration.  Because the user will rarely need to interact with the UI, it is important for the UI to be simple, intuitive, and complete. IMSAR’s current user interface is not user friendly and requires additional software that they are forced to distribute so that their system can be used. Our design will eliminate the need for this additional software.  By changing how users connect to the device and making it easier to use, the user will have a much better experience, and be more inclined to use this positioning system in the future. |
| On-board computer fits in existing housing | The expected use case for the communication link positioner is that the system will be placed outside, configured, and left out year-round.  With this market requirement in mind, our hardware needs to be entirely weather-resistant. IMSAR currently has a weather-resistant case that they use to house the hardware for the current design. It would simplify our design to select an onboard computer that fits in IMSAR’s existing weather-resistant case.  This is not a critical design feature. We will design a larger weather-resistant case if necessary. |
| System is resistant to power outages | One of the problems this system will face is an unexpected loss of power due to potential power outages or unintentional unplugging of the system.  Our control system needs to recover from a power outage without requiring additional setup. The faster it can recover the better. |
| Camera can be mounted to antenna mount | IMSAR has asked us to design a camera mount that would allow us to place a camera onto the positioning system to make validating the performance of our positioning system simple. |