SILICON
SIGNALS
Inception To Adaption

Your Next
Design **Partner!**

XB-70 & XB-70 Pro - An Advanced Aviation Device

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Revision History

Revision History			
Date	Revision No.	Description	Prepared By/ Revised By
12-Apr-2025	A0-01	Initial Draft for Internal Review	Rutvij Trivedi

Agenda

- Overview
- Reference Device look
- Silicon Signals suggested approaches
- Technical Specifications
- Architecture
- Scope of Work
- Intended Silicon Signals Participants
- Tentative Schedule
- Commercials
- Deliverables
- Out of Scope, Assumptions, Dependencies, Constrains
- Devlopment infrastructure
- Delivery approach
- Escalation Hierarchy

Overview

- Customer is looking for a Design partner to Design & Develop of Handheld Avionics Tool/Device.
- Scope -: Silicon Signals scope of work is to Design , develop , prototyping Hardware, Firmware/BSP development, Application, Mechanical design and deliver xx prototypes to customer
- Current scope includes XB-70 Pro device, 2nd device's XB-70 efforts will be considered later stage as most functions will inherit

Project	Portable flight computer
Customer	AIRMAN AERONAUTICS
Contact Person	Sudersan GB (ceo@theairman.org)
Project Code	

Overview

XB-70 (Standard Version)

- Pre-flight Calculations
- In-flight Monitoring
- Post-flight Analysis

XB-70 Pro (Advanced Version)

- Includes all features of XB-70
- Advanced In-flight Navigation
- High-Precision GPS (WAAS capability)
- Integrated Communication & Enhanced Connectivity (Wi-Fi, Bluetooth)
- ADS-B IN & OUT, VOR, DME, ILS capabilities

Reference device look

Silicon Signals Suggested approach

- **Approach – 1** – Build around Mecha comet - https://mecha.so/comet
  - No hardware design, Only BSP/Application
  - Cost and Time effective
  - Extension board design and software design only

- **Approach - 2** – Build it from the scratch i.e., strip down hardware
  - Product price, Logistics, regulatory, feature, IP, in our control
  - Time & Effort will be higher

- **Approach – 3** – SOM off the shelf – carrier board design as per req.
  - 30-35% reduction in the time and cost compared to Approach-2
  - Form factor wise SOM finding, SOM dependent

Technical Specifications (customer preferred)

Specification	XB-70	XB-70 Pro
Processor	NXP i.MX 8M Nano Lite (Single/ Dual-core 1.4GHz)	NXP i.MX 8M Nano Quad-core 1.4GHz with GC7000 Vivante GPU
RAM	512MB - 1GB	2GB
Type	MIPI DSI LCD	MIPI DSI LCD
Size	4" (Min 640 x 480 resolution)	4" (Min 640 x 480 resolution)
Touch Functionality	Non-Touch	Capacitive Touch
Type	Li-Po Prismatic	Li-Po Prismatic
Capacity	2500 - 3000 mAh	4000 - 5000 mAh
Voltage/Current	3.7V, 5A	3.7V, 5A

Technical Specifications (customer preferred)

3.4 Sensors

Common (XB-70 & XB-70 Pro)

- IMU: Bosch BMI088
- Magnetometer: Bosch BMM350
- Barometric Pressure Sensor: Bosch BMP390
- Temperature & Humidity Sensor: Sensirion SHT45-AD1F

Additional Sensors (XB-70 Pro only)

- Ambient Light Sensor: Texas Instruments OPT4041
- Carbon Monoxide (CO) Sensor: Figaro TGS5042
- High-Precision GPS: Ublox NEO-F9P (WAAS capable)

3.5 Radio Navigations (XB-70 Pro only)

- VHF & UHF Transceivers
  - ADS-B IN & OUT
  - VOR/DME, & ILS capabilities
- Antenna coverage up to 20 Nautical Miles (NM)

3.6 Connectivity

Specification	XB-70	XB-70 Pro
USB-C ports	1 or 2 (Charging & Data Transfer)	1 or 2 (Charging & Data Transfer)
Wireless Connectivity	None	Wi-Fi & Bluetooth

3.7 Enclosure & Physical Design

- Similar dimensions to Anbernic R36S Game Console
- Thickness: ≤ 15mm
- Material: High-quality, durable ABS Plastic
- Perforations for sensor exposure (Baro, Environment, CO sensor)

Technical Specifications (customer preferred)

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3.8 Keypad Design

- Toggle Keys (Up, Down, Left, Right)
- Xbox-style Quad key (Select, Back, Menu, Home)
- Dedicated keys:
  - Power Button
  - Recalibrate (R)
  - Altitude (ALT)
  - Navigation (N)
  - Instrument Landing System (ILS)
  - VOR
  - Weather (W)
  - Settings (S)
  - Basic arithmetic (+, -, ×, ÷)
  - Numeric keypad (0–9)
- Optional Backlight (XB-70 Pro only)

Technical Specifications (customer preferred)

4. Software and Operating System

- Operating System: Embedded Linux (Yocto Project)
- Navigation Software: MapTiler integration
- Flight Data Encryption: AES-grade encryption (secure firmware updates)
- UI/UX:
  - Minimalistic design
  - Clear readability and responsive interaction
  - Multiple themes (fonts, backgrounds)

5. Storage Capabilities

Specification	XB-70	XB-70 Pro
Flight Data Storage	Up to 4 hours of flight data	Up to 6 hours of flight data
Additional Storage	N/A	Embedded aeronautical charts (Ref: Foreflight App)

Architecture (TBD)

Scope of Work – Approach – 1

- Technical Product Requirement Document(PRD)

Hardware Design

- Extension board design, Ass/Feb , validate

Software Design

- Software Architecture Design
- Firmware/BSP Development/Modification
- GUI based Application development (Frontend, back end)
- Algorithm integrating/Writing
- 3rd party source/library integration
- Testing and Validation
- Bug Fixing
- Test report and release Documentation

Mechanical Design

- Mechanical design for Extension

QA Testing

- Test Case define.
- Application Testing

Scope of Work – Approach - 2

- Technical Product Requirement Document(PRD)

Hardware Design

- Hardware Architecture Design
- Components Selection (some are customer preferred)
- Schematic Drafting, PCB layout and Gerber generation
- Complete BOM Finalization
- Component Procurement
- Fabrication & Assembly of Prototype PCB
- Prototype Building
- Board Bring Up & Validation
- Testing and Delivery

Software Design

- Software Architecture Design
- Firmware/BSP Development
- GUI based App development (Front end, Back end)
- SW Bring-up, Testing and Validation
- Bug Fixing
- Test report and release Documentation

Mechanical Design

- Mechanical ID Design
- Mechanical Architecture Design
- Designing of Mechanical Housing
- Prototype Building / CNC
- Design validation & testing

QA Testing

- Test Case define.
- Device Testing and Bug report.

Scope of Work – Approach - 3

- Technical Product Requirement Document(PRD)

Carrier board - Hardware Design

- Hardware Architecture Design
- Components Selection (some are customer preferred)
- Schematic Drafting, PCB layout and Gerber generation
- Complete BOM Finalization
- Component Procurement
- Fabrication & Assembly of Prototype PCB
- Prototype Building
- Board Bring Up & Validation
- Testing and Delivery

Software Design

- Software Architecture Design
- Firmware/BSP Development
- GUI based App development (Front end, Back end)
- SW Bring-up, Testing and Validation
- Bug Fixing
- Test report and release Documentation

Mechanical Design

- Mechanical ID Design
- Mechanical Architecture Design
- Designing of Mechanical Housing
- Prototype Building / CNC
- Design validation & testing

QA Testing

- Test Case define.
- Device Testing and Bug report.

Intended Silicon Signals Participants

Resource	No of Resources Approach-1	Bandwidth Utilization Approach 1	No of Resources Approach-2	Bandwidth Utilization Approach 2	No of Resources Approach-3	Bandwidth Utilization Approach 3
Project Manager	1	20%	1	20%	1	20%
Hardware Lead	1	5%	1	80%	1	50%
Hardware Engineer	1	5%	1	100%	1	100%
Layout Engineer	1	5%	1	100%	1	100%
Firmware Lead	1	5%	1	20%	1	20%
Firmware Engineer	3	100%	4	100%	4	100%
Mechanical Lead	1	5%	1	50%	1	50%
Mechanical Engineer	1	5%	1	100%	1	100%
QA Engineer	1	50%	1	50%	1	50%
Total	**11**		**12**		**12**	

Tentative Schedule

	Week
Approach - 1	14/16
Approach - 2	28
Approach - 3	22

NOTE :

- These are tentative ballpark schedule, we do have a phase called PRD, where we list the features in technically deatil and map the bandwidth, according to that we will have accurate timelines in place

Commercials (Cont.)

NOTE :

- GST excluded if paid in INR.
- NRE charges does not include logistics, material charge, customer duty, Certification cost, travel, Assembly & PCB FAB, Design Tool cost, SDK from chip vendor. Those will be planned as actual.
- In the event of unforeseen circumstances where further milestones are not pursued by customer, payment for the next immediate milestone shall still be applicable.
- If Silicon Signals handles material procurement, an 8% handling charge will be applied and paid by the customer.

Out of scope, Assumptions, Dependencies, Constraints (TBD)

Out of Scope:
Assumptions:
Dependencies:
Constrains:

NOTE –

- More & in-details will be captured at the time of PRD phase which will be finalized version

Deliverables

Parameter	Specification
User Manual & Guides	.doc
BSP	Default
Source changes	.patch
Yocto recipe	.bb
Build scripts	.sh
Schematic	. Pdf/.sch
Layout	.brd
PCB Fab & SMT file	Gerber file & .pnp
Mechanical	Step file, 2d drawing .pdf

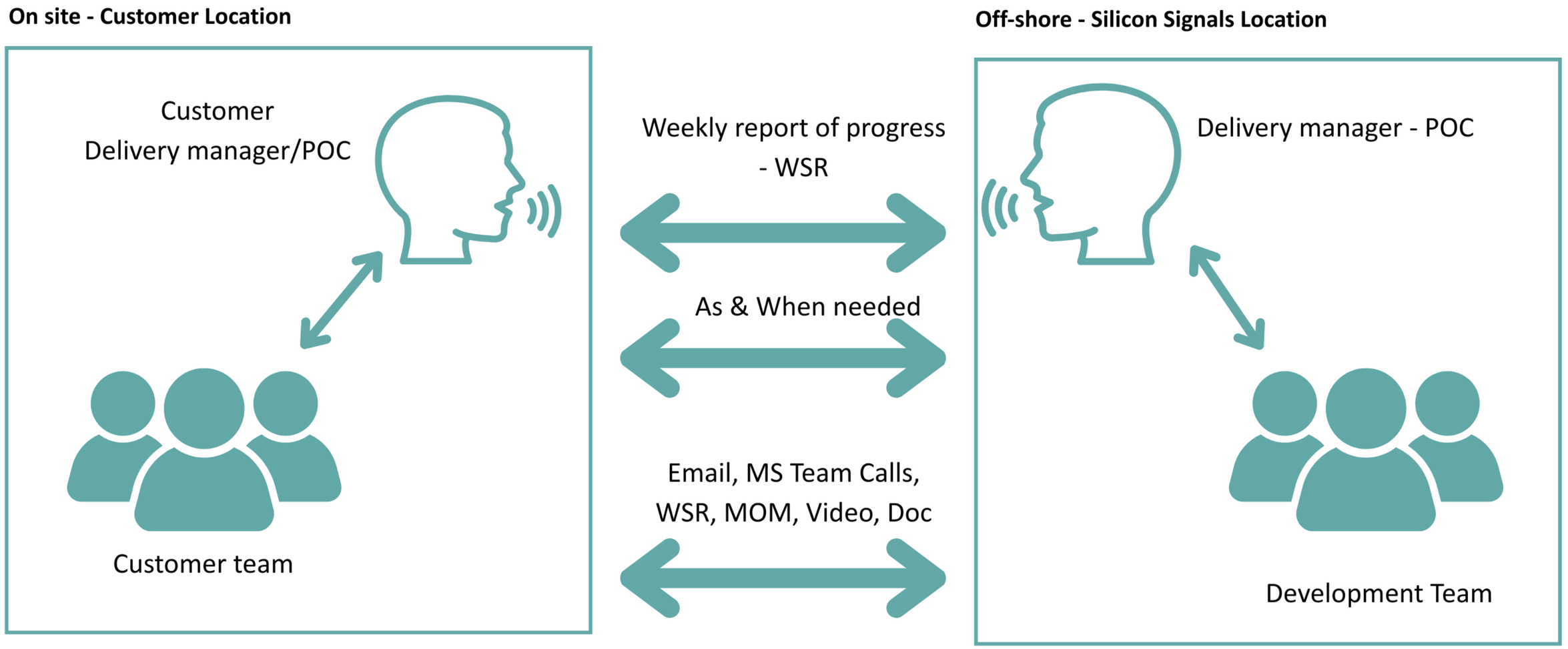
NOTE –

- More & in-details will be captured at the time of PRD phase which will be finalized version
- Final product IP right will be submitted to customer upon full and final settlement

Devlopment infrastructure

Resource	Tools	Logo
Code Maintenace	Gitlab	GitLab
Email communication	Outlook365	Outlook
Quick chats/Calls	Microsoft Teams	
Code development	In house server – 48/65 core	N/A
Hardware design Tool	TBD	N/A
Mechanical Design Tool	TBD	N/A
Firewall/Data security	Sophos firewall	SOPHOS Firewall

Delivery approach



Escalation Hierarchy

First Point of Contact	Mitul Tank (POC- point of contact)
Escalation Level 1	Prashnatsinh Parmar
Escalation Level 2	Rutvij Trivedi

Thank You

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