



Paro "RC1" User Manual

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1 - Introduction

The **Paro** device, short for "**Personal Autonomous Reconnaissance Observer**," is a tool designed to observe its surroundings and provide insights. At its core, Paro relies on a combination of reconnaissance algorithms, sensors, and autonomous functionality to autonomously sense and report observations.

Incorporating a discreet black box design, Paro minimizes interference with its environment, ensuring that its presence goes largely unnoticed while it carries out its observation tasks. The unobtrusive exterior conceals its technology dedicated to enhancing your awareness.

Within the Paro device lies a robust set of reconnaissance algorithms designed to process data from a variety of sensors. These algorithms empower Paro to make precise observations about its surroundings, whether it's identifying objects, tracking movements, or calculating geographical coordinates. Continuous efforts in algorithm development, including work on convolutional neural networks for processing vertical aerial imagery, ensure that Paro delivers reliable and insightful information. These algorithms are integrated into the device's firmware, ready to operate in conjunction with its hardware.

Beyond its autonomous observational capabilities, the Paro device boasts practicality and versatility. Configurable for specific reconnaissance missions, it functions independently and self-sufficiently, making it suitable for deployment in diverse environments, from remote and challenging locations to everyday situations. Paro's lightweight and cost-effective design render it a dependable companion for a variety of applications, and its durability ensures a long operational lifespan.

To navigate the world effectively, the Paro device can be combined with protective enclosures and adapters. These accessories enable Paro to be worn, carried, or securely affixed to a range of platforms, including vehicles and robots. Whether integrated with solar panels for extended power autonomy, enhanced for protection in demanding environments, or adapted for seamless conveyance via drones or aerostats, these enclosures and adapters play a pivotal role in extending Paro's reach and functionality.

This user manual provides guidance for setting up, operating, and maintaining your Paro device effectively. Our commitment to innovation and user-centric design is intended to ensure that Paro stands as a valuable tool ready to augment your awareness and enhance the way you interact with your surroundings.

2 – Paro RC1 Beta Program

The Paro Beta Program for this “Release Candidate 1” (RC1) device offers an opportunity for early adopters to actively engage in the final stages of Paro's development. By purchasing and participating in the Paro RC1 Beta Program, you become an essential part of our journey towards creating a refined and robust product. This program is designed to provide participants with a hands-on experience, allowing them to contribute valuable feedback and insights that will shape the future of Paro.

As a participant in the Paro Beta Program, you enjoy several key benefits. First and foremost, you receive the Paro RC1 hardware, which represents a release candidate version of the device, and you become part of our testing community in the "real world." This means you get to explore the capabilities of Paro firsthand. Additionally, you gain the right to exchange your Paro RC1 for any future release candidate devices (RC2, RC3, RC4...) as they are released, ensuring that you stay up-to-date with the latest advancements. Moreover, participants receive a 15% "beta tester" discount on accessories related to Paro when they become available. You'll also gain access to a dedicated "Paro" Discord server during the Beta program, allowing you to connect with fellow enthusiasts and the Paro development team. Lastly, you have the option to have your name physically imprinted on the inside case of the final Paro release, as well as an acknowledgment in Paro's firmware.

To maintain a focused and effective testing environment, participation in the Beta Testing Program is limited to a maximum of 50 "at large" participants. In addition, participation is subject to your agreement with the [Paro Beta Testing Agreement](#). This agreement outlines the terms and conditions of your participation, including responsibilities, confidentiality, and data usage policies. We encourage participants to actively engage in the program, providing feedback, reporting issues, and sharing their experiences to help us refine and enhance the Paro device for the benefit of all users. Your involvement in the Paro Beta Program plays a crucial role in the ongoing development of this technology, and we sincerely appreciate your support!

2.1 – Paro Beta Discord Server

As part of the Paro Beta Program, we're pleased to offer you access to an exclusive Discord server dedicated to the community of beta testers. Discord provides an interactive platform where you can connect with fellow participants, share experiences, discuss observations, and interact with the Paro development team in real-time. This collaborative space is designed to enhance your beta testing experience by fostering communication, feedback sharing, and mutual support.

To access the Paro Beta Program Discord server, follow these steps:

- **Create a Discord Account:** If you don't already have a Discord account, you'll need to create one. Visit discord.com to sign up for free.
- **Install the Discord App:** While you can access Discord through a web browser, we recommend downloading the Discord app for a seamless experience. You can find the app for your preferred device on the Discord website.

- **Join the Paro Beta Program Server:** Once you have a Discord account and the app installed, please use the following invite link:

<https://discord.gg/559vStdxvp>

- **Engage and Connect:** You're now part of the Paro Beta Program Discord server! Explore the various channels, introduce yourself, and start connecting with other beta testers. Feel free to ask questions, share your experiences, and participate in discussions related to Paro.

We encourage active participation in the Discord server, as it serves as a valuable platform for sharing insights, troubleshooting, and collaborating with the Paro community. Your feedback and interactions on Discord will contribute to the overall success of the Paro Beta Program. We look forward to seeing you there!

2.2 – Bug/Issue Reporting and Feature Requests via GitHub

If you're participating in the “**Paro Beta Program**” or if you're just interested in helping refine the design of Paro devices, please report any bugs or issues that you notice with respect to Paro hardware, software, or documentation via the GitHub Paro repository:

<https://github.com/cpknight/Paro/issues>

Please add *Labels* to your issues that correspond to the bug/issue that you're reporting (eg. “**Paro RC1**”) and the *type* of issue that you're reporting (eg. “**bug**” or “**documentation**”). If you're requesting a new feature or making suggestions about how to change an existing aspect of Paro, please feel free to submit an issue with the “**enhancement**” label.

If you're new to creating issues and reporting bugs using GitHub, please check out this article:

Rewind.com: [Best Practices for using GitHub Issues](#)

2.3 – Exchanging Paro Devices

Participants in the “**Paro Beta Program**” are entitled to return their Paro RCx devices back in exchange for newer Paro release candidate devices (eg. “RC2”, “RC3”, etc...). To exchange your device, please send a message to **@cpknight** on Discord and then pack up your Paro into the existing packaging and send it to:

CP Knight Paro Device Exchange
400 – 909 17 Ave SW
Calgary AB T2T 0A4
Canada

Once your exchange device is received, a new device will be shipped to your original shipping address via FedEx.

3 – What's in the Box?

Inside the Paro device package, you'll find:

- **The Paro Device:** The primary component, your Paro device, is enclosed in the box. This unassuming black box is the core of your autonomous reconnaissance observer, ready to assist you in expanding your awareness and making valuable observations.
- **A USB-C Power Cable:** Included is a USB-C power cable for convenient device charging. Ensuring your Paro device has adequate power is a fundamental step in getting started.
- **The Quick Start Guide:** For a straightforward setup, refer to the "quick start" guide. It outlines the basic steps to activate and configure your Paro device, making it ready for autonomous operation.
- **Packaging Materials:** *Important for participants in the Beta Program*, please retain the box and its packaging materials. These materials are helpful if you decide to exchange or return your Paro device as part of the Beta Program.

To configure your Paro device, you'll need a WiFi-enabled device, such as a computer or smartphone. This WiFi-enabled device will enable you to connect to your Paro device and configure its settings, allowing you to tailor its autonomous functions to your specific needs.

Please refer to the included quick start guide for immediate setup guidance, and for a more detailed understanding of the device's features and functionality, continue reading this user manual.

4 – Paro Device Overview

The Paro device is a compact, unobtrusive black box, measuring approximately 110mm x 90mm x 50mm (length x width x height). Its discreet design is optimized for practicality, making it well-suited for various applications.

On the top of device, you'll find a small OLED display, providing clear and concise information about its current status and observations. The display offers a user-friendly interface for quick reference.

Also on top there is a physical power on/off switch, allowing you to easily control the device's operation. The presence of this switch ensures straightforward and intuitive control of the Paro device.



On the side of the device, for charging and power supply, the Paro device features a USB-C port. This port provides a convenient and widely compatible means of recharging the device, ensuring it remains ready for use.

To facilitate mounting on various means of conveyance, the Paro device is equipped with four thumbscrews on top. When used in conjunction with the Paro accessories, these screws allow for secure attachment to different platforms, whether it's a vehicle, robot, or protective enclosure.

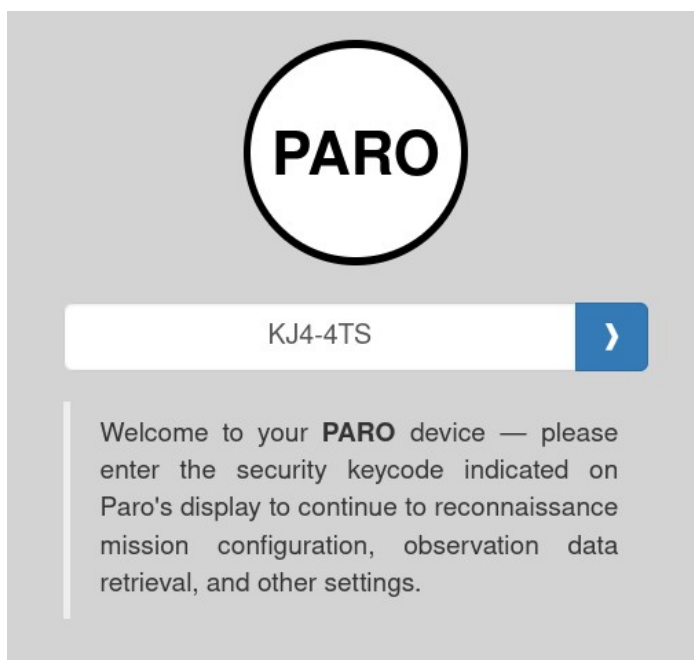
Finally, on the bottom of the device, there is a small port for the video camera. This port serves as the lens for capturing visual data, providing a valuable perspective of the environment. Together, these physical features make the Paro device a versatile and self-explanatory tool for autonomous reconnaissance and observation tasks.

4 - Configuring Paro for a Reconnaissance Mission

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4.1 – Connecting via WiFi

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4.2 – Configuring Paro

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4.2.1 – Reconnaissance

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Reconnaissance –

Configure the *reconnaissance mission* that your Paro is going to undertake. When the settings are to your liking, be sure to *arm* the mission.

☐ **Timed observations** —once armed, Paro will make observations of its surroundings every:

15s 30s 1m 5m 15m 30m 1h

☐ **Triggered observations** —once armed, Paro will wait until for a trigger before taking an observation:

☐ Trigger on motion detection.
☐ Trigger on human proximity detection.
☐ Trigger on object recognition.
☐ Trigger on sound recognition.
☐ Trigger on radio spectrum event.

Arm Reconnaissance Mission

4.2.2 – Observations

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Observations –

Your Paro device has **145** observations recorded from its previous **6** missions.

- The last Paro mission ended **1 hour** ago, and resulted in **3 high priority**, **7 medium priority**, and **10 routine** observations:
 - Download the **Last** mission's data (572k .zip).
 - Download **All** mission data (1.2GB .zip).
- Your Paro device has used **27%** of its storage capacity, and has **73%** available. With your current configuration options, it is estimated that storage will be at capacity in **5 days**:

27% used 73% free

Delete All Observations

4.2.3 – Communications

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Communications –

Paro can silently make observations for future retrieval, or it can relay some or all of its observations to you in real-time.

- ☒ **Radio silence** —once armed, Paro will turn off WiFi and VHF communications, and make its observations for later recovery. This is most useful in environments where RF signals could lead to adverse interference or Paro's inadvertent detection.
- ☐ **Email notifications** —once armed, Paro will connect to the WiFi network indicated below, and will send the selected wait until for a trigger before taking an observation:

WiFi SSID

SSID

Password

WiFi Password

Email

notifications@domain.io

☐ Email all **high priority** notifications.

☐ Email all **medium priority** notifications.

☐ Email all **routine** notifications.

☐ Email **situation report** notifications every 24 hours.

4.2.4 – Paro Status

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Paro Status –

Your Paro device is functioning normally:

- Paro Core Firmware: **RC1 KJ** .
- Firmware Build Date: **20231127T004257Z** .
- Additional Sensors: **Not installed.** .
- Current WiFi SSID: **Paro-KJ43** .

Paro's onboard battery is functioning normally:

