



FlyItSafe

User Operating Manual

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1. Introduction

This manual aims to provide a comprehensive walkthrough on how a UA operator can use the 'FlyItSafe' mobile application to monitor one's UA flights to prevent flying into non-permitted areas.

2. About FlyItSafe

'FlyItSafe' is a mobile application that allows the UA operator to monitor their UA flights. You would need to start and end your UA flights with the application.

This mobile application is meant to assist UA operators with ensuring that they fly their UA within permitted areas and to prevent unintentional breaches into non-permitted areas.

The mobile application is available on both Singapore Google Play Store and Apple App Store.

3. Getting Started

Kick start your journey by following the steps below:

1. Download the 'FlyItSafe' mobile application from either Google Play Store or Apple App Store.
2. Before opening the application, you will need to switch on the location feature on your phone for the application to detect your current location. You will also need to allow the application to access your location at all times for the application to be updated on your flight.
3. Ensure that you have given the application the notification rights in order to receive the notifications. Your sound and vibration settings should be switched on in order for the alerts to be more prominent.
4. Launch the mobile application and you will be presented with a short tutorial about the application if you are accessing it for the first time.

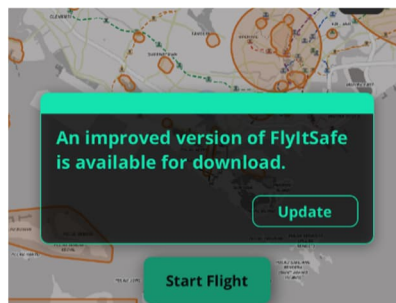
5. You will be presented with the map and the No-Fly Zones in Singapore. This will be the home screen of the application.

4. Important Information

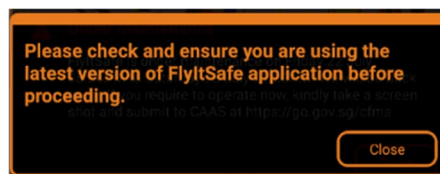
New Releases of Application

If your application version is out-of-date, there will be a prompt for you to update the application through your Singapore Google Play Store and Apple App Store.

After updating your application, you may proceed to use the application as usual.

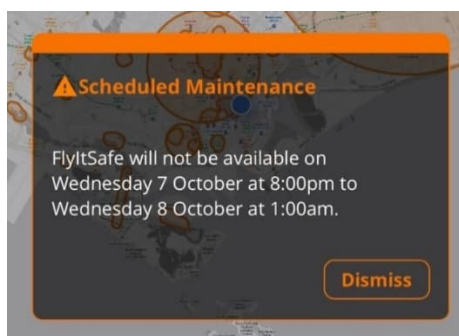


If your internet connection is unstable, the application might not be able to properly check if your application version is out-of-date. Be sure to check if your app is using the latest version.

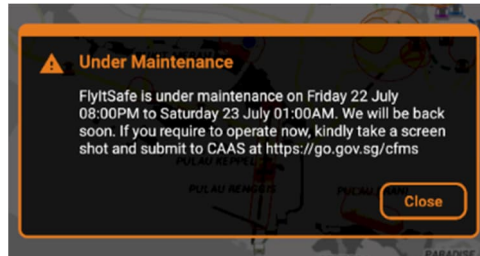


Maintenance of Application

The application will undergo scheduled maintenance occasionally. You will be notified in advance of any upcoming scheduled maintenance date through a prompt when you open the application.

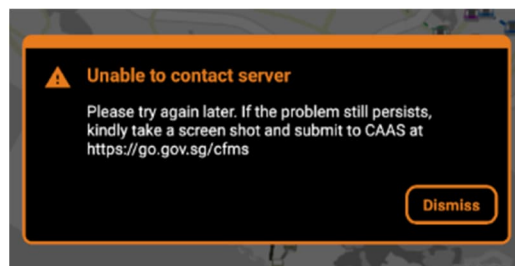


During maintenance, you will not be able to access any functionalities of the application.



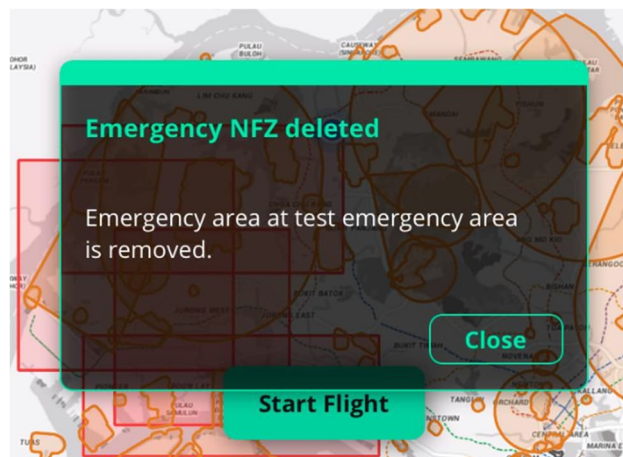
Unexpected Error

In the event where the application encounters unexpected error, you will be notified via the prompt below and you will be expected to follow the instructions stated in the prompt.



Deletion of Emergency Area

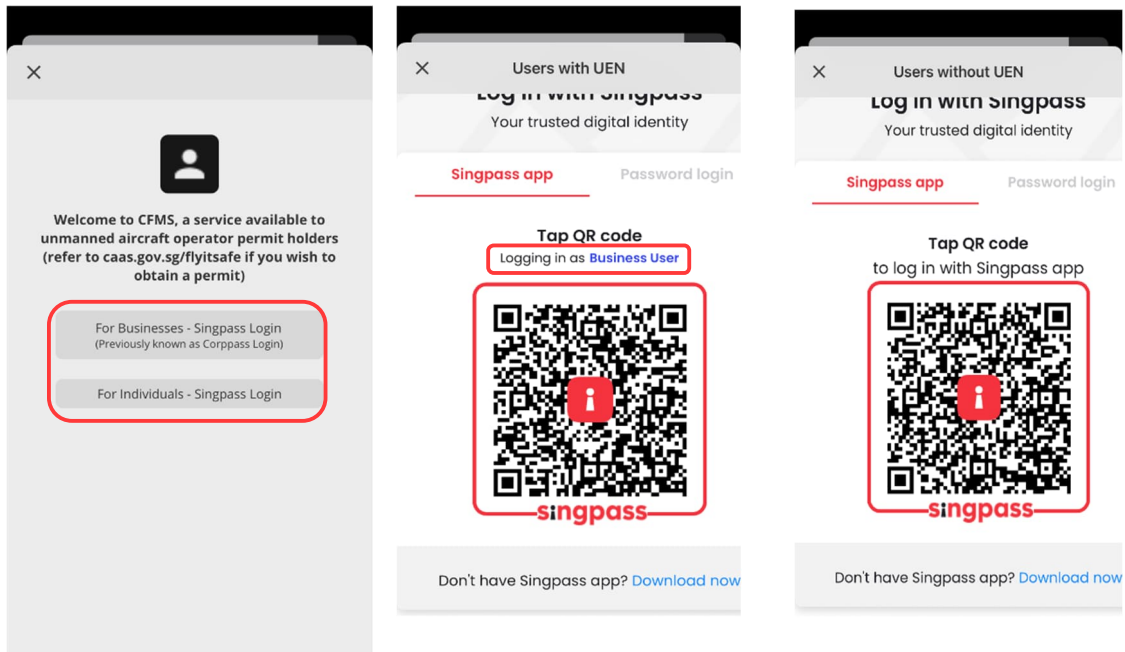
If an Emergency Area is cleared, the application will receive an alert if you are logged in about which area was cleared. If you were previously unable to start or continue a flight due to an Emergency Area, you should be able to start a flight now.



5. Essential Information

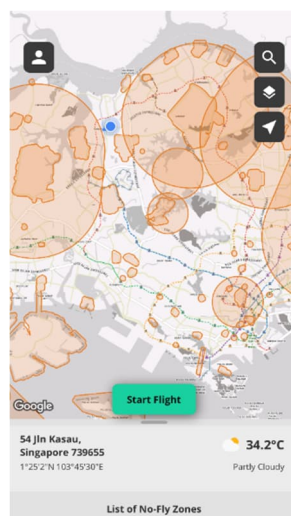
Essential information that is required to conduct a UA operation can be accessed through the side menu after you have logged in. Complete the following steps to login:

1. Choose to either login as a business user or individual. All users will need to login through their Singpass account.



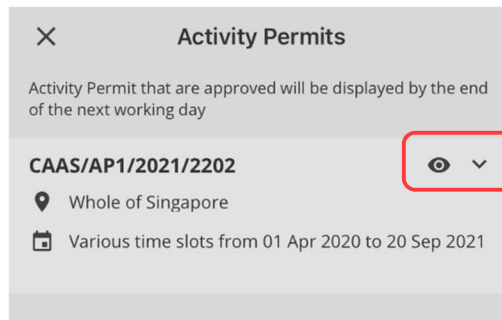
Note: The above screenshot serves as a reference for logging in via Singpass and is correct as of Oct 2021. Please refer to the Singpass website for the latest login procedure.

2. Once you have successfully logged in, you will be redirected to the home screen.



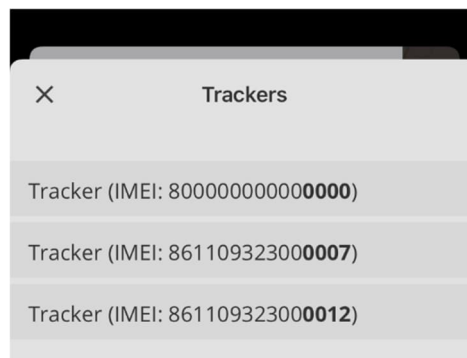
Activity Permits

After you have logged in, you will be able to view your activity permits. You can expand each row to more information of each Activity Permit. To view the areas in the Activity Permit on the map, click on the eye icon.



Trackers

Similarly, you will also able to view the list of trackers that are linked to your Operator Permit.



6. Flight Operations

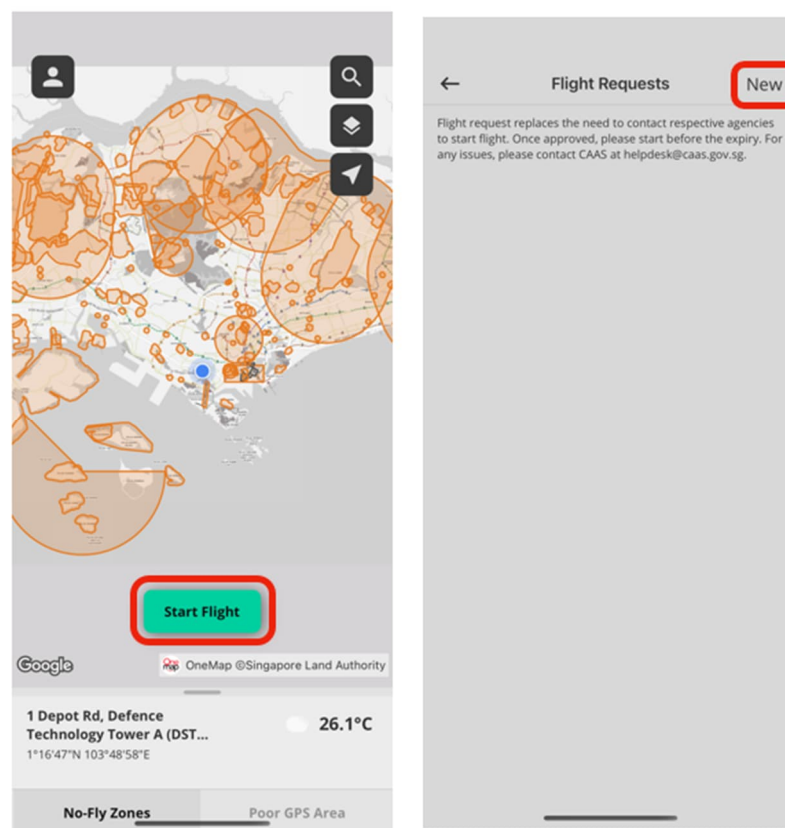
A flight operation (hereinafter termed "flight") refers to the time period between when you declare the start of your flight activity, until when you declare the end of it to the relevant Air Tower Controller unit. This can be a single launch, or a series of multiple launches. The 'FlytSafe' mobile application requires you to declare the start and the end of your flight operation to provide you with correct and relevant notifications.

6.1. Requesting for flight approval

Before starting a flight, your flight has to receive positive clearance you're your respective Tower Duty Controllers. In most cases, there is no need to contact them. You can simply request for a flight approval through the application. However, please take note that there may be certain exceptions where there is still a need to call a Tower Duty Controller.

When you wish to request for a new Flight Approval:

1. Click on the Start Flight button on the home screen. This will bring you to a new page where all Flight Approval Requests are shown.



2. Click on the New button located at the top right to request for a new Flight Approval. This will bring you to a new page with a checklist to create a flight request.

3. Select the Activity Permit that you are going to fly with.
4. Under the Location Tracking Method,
 - a. You may select Tracker. You are only required to switch on and connect to the tracker after the flight request has been approved.
 - b. If you are flying a UA under 250g or if your tracker is non-functional, you may proceed to choose Mobile¹ as the location tracking method.

Note: You may experience potential false violations alerts for your flight if your Activity Permit coincides with areas of poor GPS coverage.

- c. If you are flying the UA remotely, you may proceed to choose Telemetry via API Gateway as the location tracking method.
5. Select whether the flight will be tethered.
6. Please enter the last 20 characters of your Flight Controller Serial Number, for DJI drones, it is usually found in the About section of the DJI app, (e.g., 1581F5741239FD23419S). If you do not have a flight controller serial number, please enter 'NA'.

¹ Under CAAS' policy, UA operators are only allowed to use the mobile application as the mode of telemetry in any of the following situations (i) tethered UA operation (ii) via telemetry transmission (iii) Multi-UA flight display (iv) UA is below 250g (v) when the tracker is non-functional.

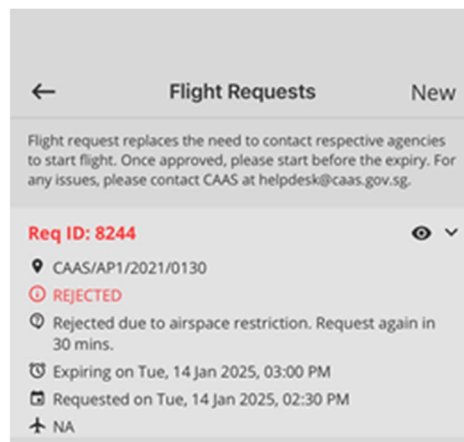
Note: It is a violation if you do not accurately provide your Flight Controller Serial Number.

7. Once all the information is entered, you may proceed to send your Flight Request.
8. After you submitted your flight request, your respective air traffic controllers will be notified. You are also able to monitor the status of your flight request in the Flight Requests Activity.
9. In the event where there is no response from your respective air traffic controller or if you urgently require a flight approval, please revert back to the manual process and contact them via phone.

6.2. Flight Approval Statuses

Once your flight request has been approved, a notification will be sent to your mobile device and your flight request will be highlighted green. Your flight approval will be valid until the end time of your Activity Permit. (e.g., if you are permitted to fly from 2PM to 5PM, if your flight request is approved at 2.10PM, it will be valid until 5PM). You may proceed with step 6.3 to start a flight.

However, there are a few other exceptions that you may encounter:

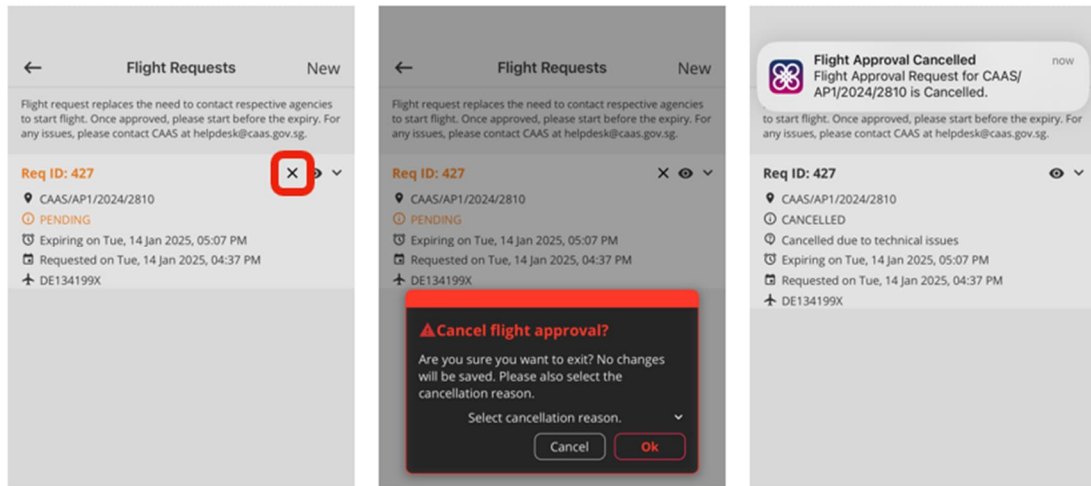


1. Rejected

If an air traffic controller rejects your Flight Request, a notification will be sent to your mobile device. Any reason and remarks will also be displayed on the Flight Request Activity. Usually, the reason for rejecting your request will be indicated, as well as some information on how to resolve any issues. (e.g., Ongoing military exercise, please request again in 30 minutes)

2. Cancelled

There are 2 scenarios where a Flight Request will be cancelled:



- a. In the event where you would like to cancel any pending or approved Flight Request, you may click on the X button located at the top right of each Flight Request. A dialog will then appear and you will have to select the reason as to why you are cancelling this Flight Request. Please note, you are only able to cancel pending and approved flight requests.
- b. There may also be an event where an air traffic controller is required to cancel your approved Flight Request due to unforeseen circumstances. In such an event, a reason will be provided.

3. Expired

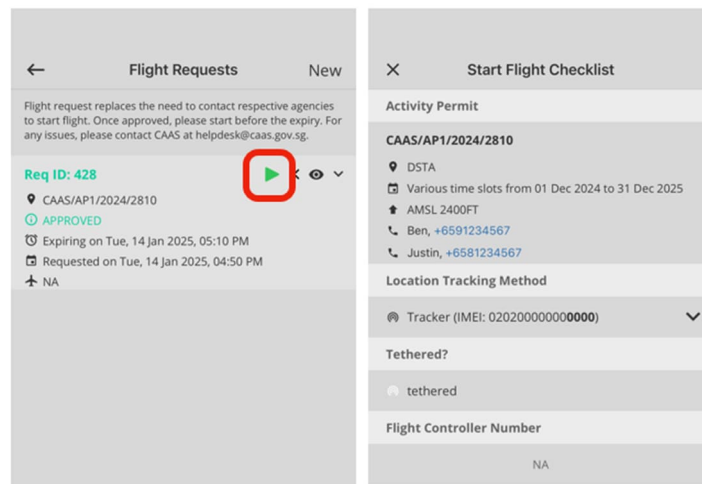
There are 2 scenarios where a Flight Request will be expired:

- a. Respective air traffic controllers will have 30 minutes to approve or reject your flight request. In the event where 30 minutes have passed, your Flight Request will expire and you will be required to submit a new Flight Request.
- b. As mentioned in section 6.2, any approved Flight Request will be valid until the end time of the respective Activity Permit. Hence, if you do not start your flight within your approved window, the Flight Request will expire.

6.3. Starting a Flight

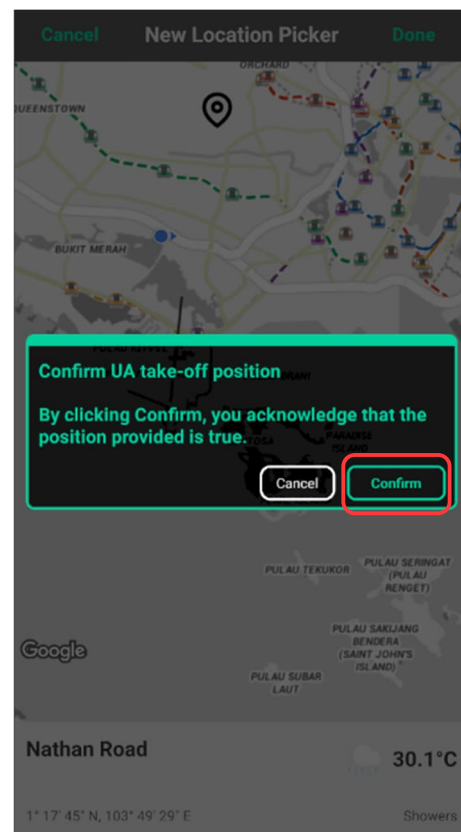
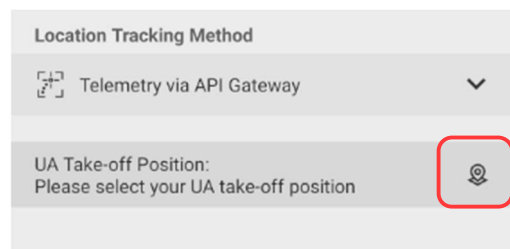
When you are ready to start a flight:

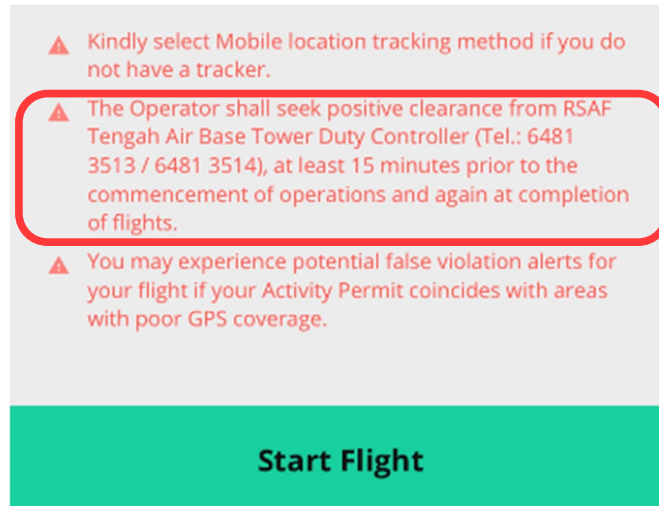
1. Access the side menu on the left and verify that the tracker that you are planning to use for the flight is listed. The IMEI of all the trackers that are linked to your Operator Permit will be listed here.



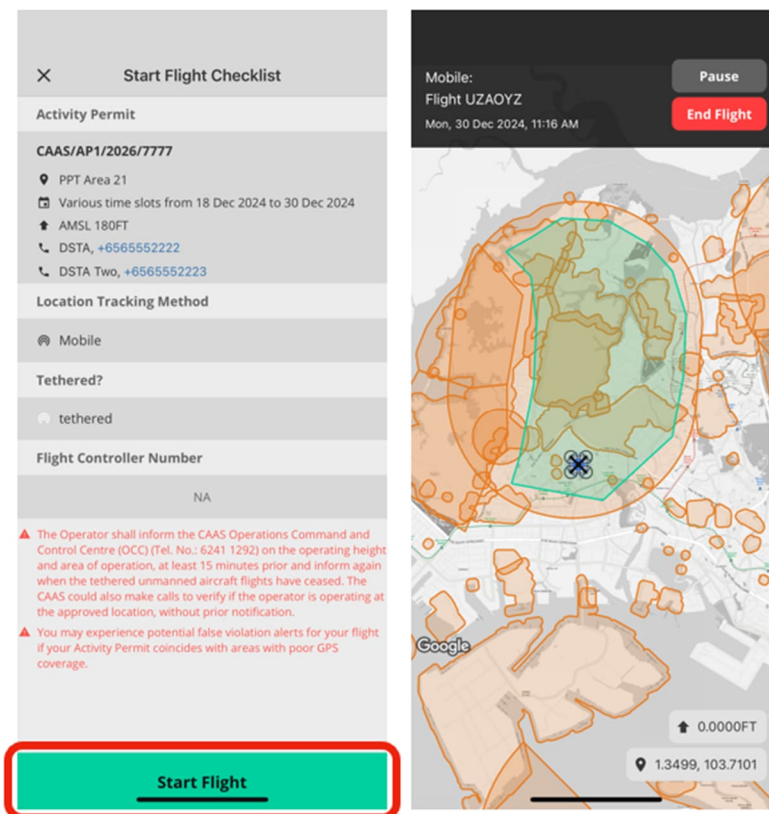
2. After you have mounted and powered on your tracker, click on the **Green Right Arrow** button located on your approved Flight Request.
3. Your Activity Permit, Tether Mode, and Flight Controller Serial Number will be automatically populated. Please confirm the details, if there are any inaccurate information, please cancel your approved Flight Request and resubmit a new Flight Request with the correct information.
4. Under the Location Tracking Method, there may be additional steps depending on the method you selected in your Flight Request.
 - a. In the event where you selected **Tracker**, select the tracker that you are going to fly with. You can only proceed when the battery life and its status being reported as 'Not in flight'. The tracker status is updated every 5 second. If the tracker is not detected, you should turn the tracker off and back on again. Wait up to a minute for it to obtain a GPS location. You can also refer to the UA Tracker Manual for exact troubleshooting steps for the tracker.

- b. In the event where you selected **Mobile**, ensure that your location service for your mobile device is on.
- c. In the event where you selected **Telemetry via API Gateway**, you are required to select the location of where the drone will be flying. The default location for the UA location selection will be the user's location. From here, tap the right location from the map, making sure that it will be within the permit area. Afterwards, click Confirm to return back to the Start Flight Checklist.



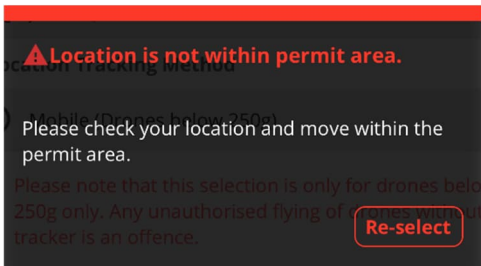
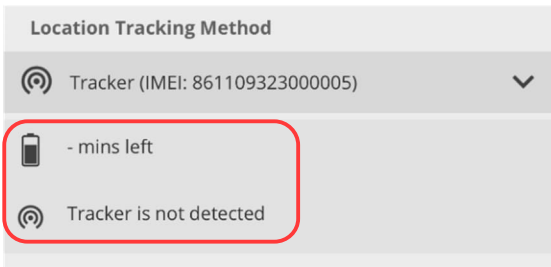


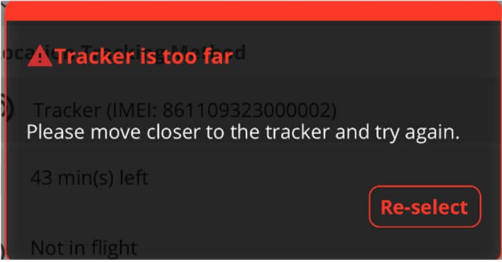
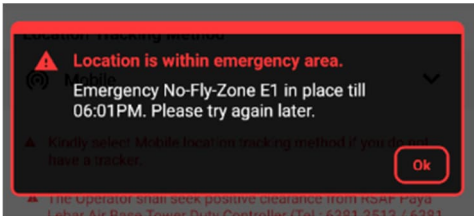
Note: There may be some cases where you are still required to contact your respective air traffic controller even if your Flight Request is approved. Please look out for any warning message in red before starting your flight.



- Once you have received clearance from the relevant authority (if required) and verified all your details, please click **Start Flight**.

The following section documents the error messages you may face when starting a flight, and the recommended steps to resolve.

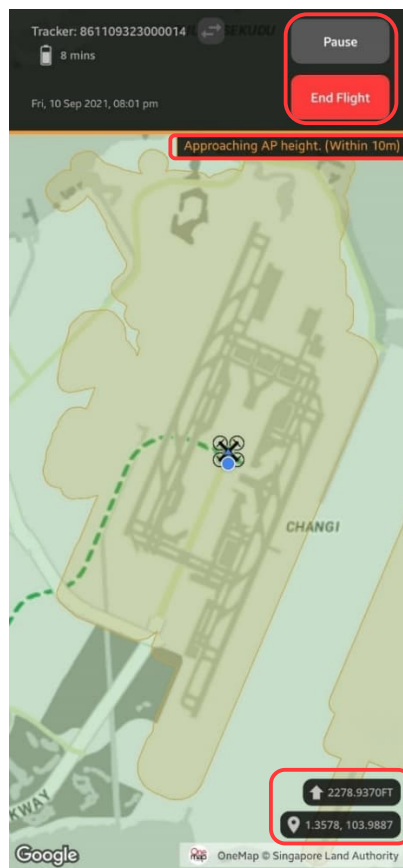
Error Message	How to Resolve and Why It Happen
	<p>Please ensure that your mobile device and tracker is within the Activity Permit. You can preview the Activity Permit area by clicking on the eye icon.</p> <p>This error occurs when the system detects that you are not within your approved area when the Start Flight button was clicked.</p> <p>If you are using the Mobile mode of telemetry, your current location will be checked to determine if you are within the chosen Activity Permit area.</p> <p>If you are using Tracker mode of telemetry, the tracker's location will be used to check whether it is within the chosen Activity Permit area.</p>
	<p>Turn off the tracker and back on again. Wait for up to a minute for the tracker to obtain a GPS location. You can also refer to the UA Tracker Manual for exact troubleshooting steps for the tracker.</p> <p>This error message appears when your chosen tracker is not detected by the system. This could mean that your tracker is not switched on, or that it is not connected to our server.</p>

	<p>Make sure your tracker is near your mobile device, and try the 'Start Flight' button again.</p> <p>This error occurs when our system detects that your chosen tracker is too far away from your mobile device when the 'Start Flight' button was clicked.</p> <p>The tracker needs to be in close proximity with your mobile device.</p>
	<p>Make sure that the location you are starting the flight in is not within an Emergency Area, while still being in the permit area.</p> <p>If this is possible, try the 'Start Flight' button again.</p> <p>If this is not possible, wait until the Emergency Area has been cleared.</p> <p>This error occurs when the location you are starting a flight from is within an Emergency Area and it is not advised to be flying a UA in there at this stage. To reflect this, a red Emergency Area has been added.</p>

5.1. During a Flight

The following information and buttons are available to you during a flight:

1. **Pause/Resume** flight button (Button will switch between these two statuses)
2. **End Flight** button
3. Mode of Telemetry
4. Current Date and Time of flight
5. Activity Permit area, which the UA is permitted to fly within
6. Any notifications that have occurred during the UA flight. Clicking on the notifications will clear away or acknowledge the notification²
7. Current coordinates and altitude of the tracker

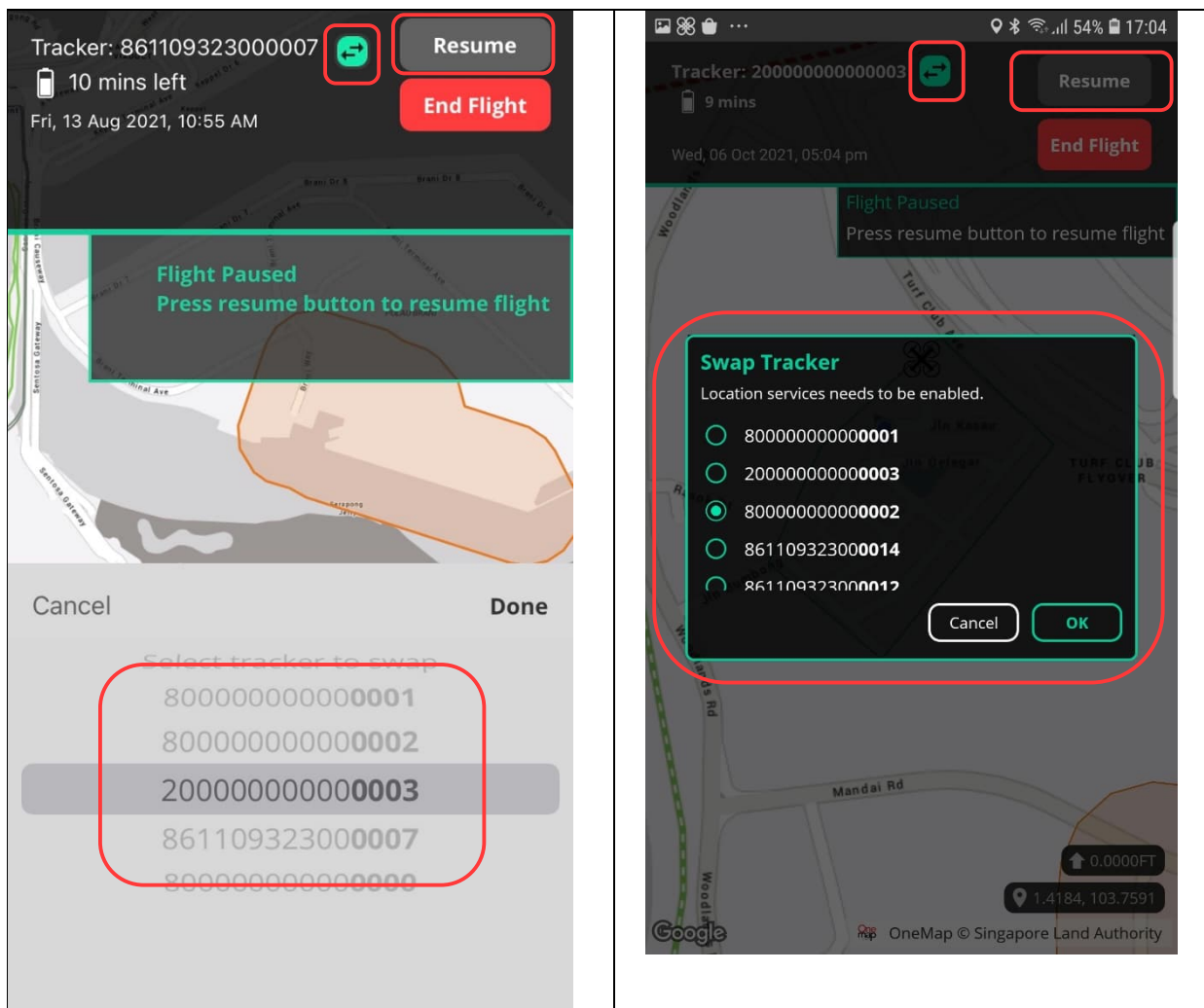


² For Emergency alerts, there will be an **OK** button for the UA Operator to acknowledge and UA Operator is expected to land within 5 minutes.

Swapping a Tracker

In the event where you need to swap trackers mid-way through your flight, make sure that the tracker you want to switch to is already switched on before proceeding with the following steps.

1. Land your UA in a safe area
2. Activate switching of trackers by clicking on the Swap Tracker icon
3. Select the IMEI of the second tracker that you will be using
4. Click the **Resume** button and proceed to take off your UA³



³ If there are any error messages, follow the prompter message to resolve the error before trying to switch tracker again. You may wish to refer to the section on error messages in the Starting a Flight section.

5.1.1. Notifications

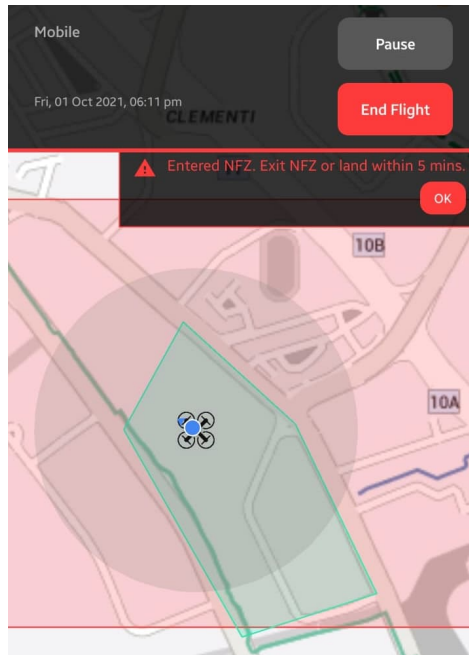
Notifications occurs when the UA flies near or into non-permitted areas. When a UA flies near a non-permitted area, the notifications are of Warning status, and it will be indicated by an orange colour. When a UA breaches into a non-permitted area, the notifications will be of Breach status and will be coloured red.

Notifications are also categorised into different types and these types will be conveyed in their respective titles for both Breach and Warning statuses. Here is the list of notification alerts that you may receive during a UA flight:

Notification types	Breach Status	Warning Status	Info Status
Emergency Area	Entered NFZ. Exit NFZ or land within 5 mins.	Approaching No-Fly Zone (Within 200m)	Emergency area at ___ is removed
Temporary No-Fly Zone	Entered NFZ. Exit NFZ or land NOW.	Approaching No-Fly Zone (Within 50m)	N/A
No-Fly Zone	Entered NFZ. Exit NFZ or land NOW.	Approaching No-Fly Zone (Within 50m)	N/A
Drone Proximity	N/A	Tracker mode of telemetry: Caution: Other drones operating nearby (200m radius)	N/A
Permit Height	Exceeded AP max height. Descend now.	Approaching AP max height. (Within 10m)	N/A
Permit Expiring	AP expired. Land now.	AP expiring in 10 minutes.	N/A

Notification types	Breach Status	Warning Status	Info Status
Permit Exceeded	Exited permit area. Re-enter permit area or land NOW.	Approaching permit area border. (Within 20m)	N/A
Low Battery	N/A	Tracker Batt is low. (~10 minutes remaining)	N/A
Track Drop	N/A	Tracker mode of telemetry: No updates from your tracker. Please check your tracker. Mobile mode of telemetry: No updates from Mobile GPS. Please check your mobile phone.	N/A
Inactive Flight	N/A	Flight has stopped due to inactivity. If flight is still on-going, please start another flight.	N/A

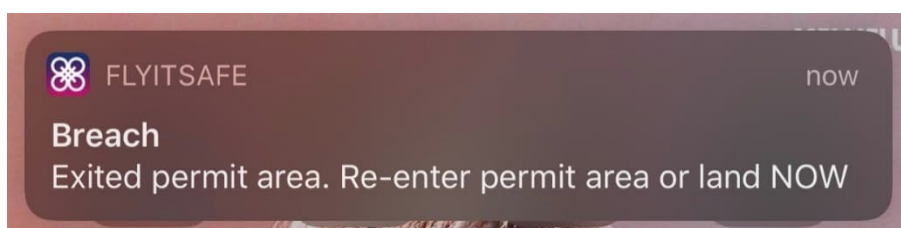
Notifications will appear on your screen in a box with their corresponding colour indicators for notification status. This is to notify you when you are in-app. For notification types other than Emergency Area, acknowledgement is not required. For Emergency Area type of notifications, you must acknowledge Breach type notifications by clicking the **OK** button.



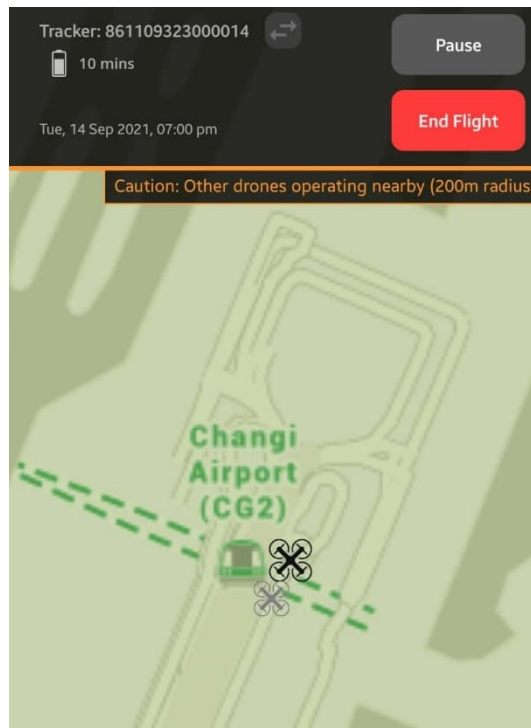
If you put the mobile application into your phone's background, any notifications occurring during mid-flight will still be made known to you via push notifications accompanied with sound and vibration (if the mobile device settings are allowed)

Upon receiving these push notifications notifying you of your UA flight, you can click on the notification to open the 'FlyItSafe' application to review the details of the notification.

To resolve the notification, you will need to fly your UA away from the non-permitted area and into your chosen Activity Permit area.

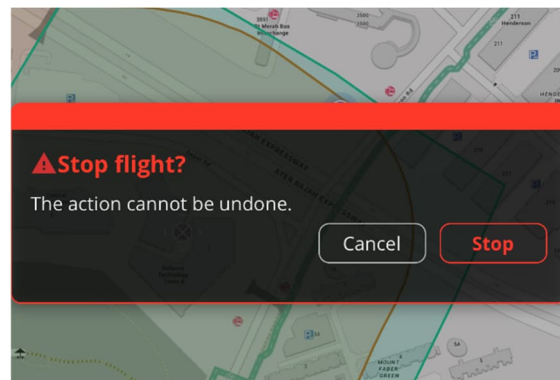
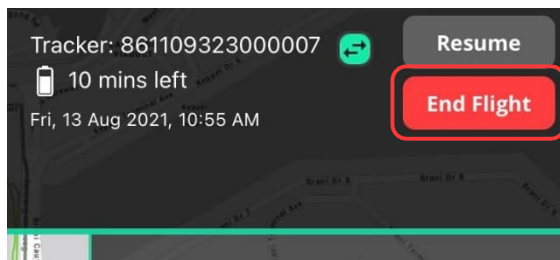


You will be able to view the position of any UA that falls within 1km radius of your UA on your screen. For notification on UA proximity, any nearby UA (tracker) that falls within 200m radius of your UA (tracker) trigger the alert as shown in the figure below. The alert will disappear upon user clicking on it and the alert will only be triggered again when another UA (tracker) falls within the 200m radius which also applies for an existing nearby UA (tracker) if it exits and re-enters the 200m radius.



5.2. Ending a Flight

A flight is only considered to have ended when you click the **End Flight** button and confirm the action.

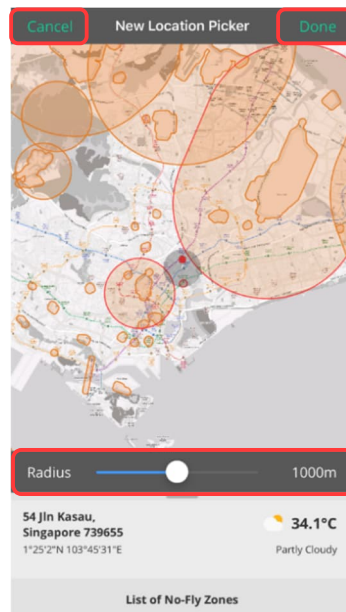


6. Looking for Areas to Fly

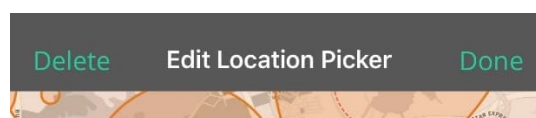
You can find out if the area that you intend to fly in overlaps with no-fly zones by dropping a pin on the map. A pin is dropped by clicking and holding on a location on the map. Once the pin is created, you can now proceed to adjust the radius of the pin. Areas on the map which are within the pin's radius will have their area outline coloured red.

Adjustments for the Pin

1. Drag slider to adjust radius of pin. No-fly zones that overlap with the pin radius will be outlined in red.
2. Click **Done** button to save the pin.
3. Click **Cancel** button to remove the pin.



After saving the pin, the screen will return back to the home screen with the pin in place. If you want to delete the pin, click the pin again before proceeding to click the **Delete** button.



Information about No-Fly Zones and Poor GPS Zones

You can find out the list of no-fly zones and poor GPS zones by swiping up in the home screen.

The no-fly zones are categorised into Aerodrome, Protected, Danger, Restricted and Prohibited, Temporary and Emergency areas. You can expand the list within each area types to view the individual no-fly zone. If you want to find out the location of the no-fly zone on the map, simply expand the rows and click on any

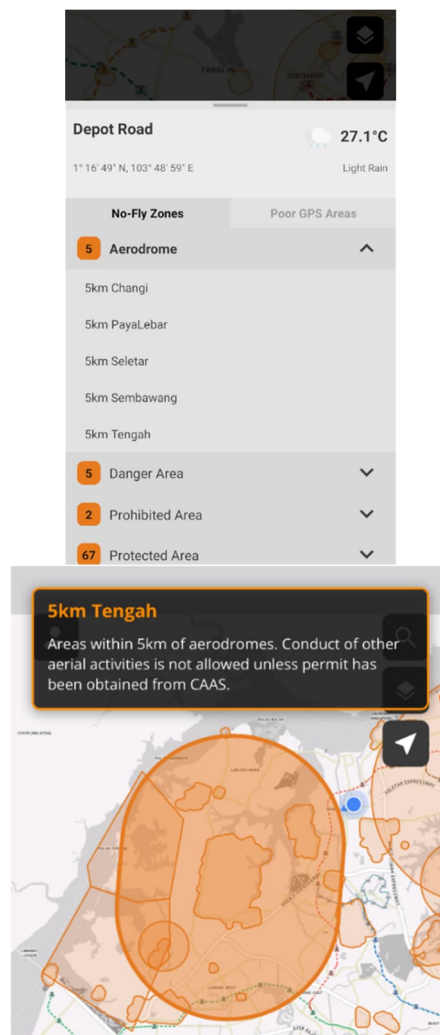
entry. The no-fly zone will be selected and highlighted on the map. The name and description of the no-fly zone will also be displayed.

Whenever you select a no-fly zone on the map by clicking on it, the name and description of the selected no-fly zone will be displayed.

The above also functions the same for poor GPS zones, except they are listed in a separate tab.

Temporary areas such as those demarcated during special events like National Day will also be listed in this section when they are announced.

You may receive information of Emergency areas and they will be listed here as well.

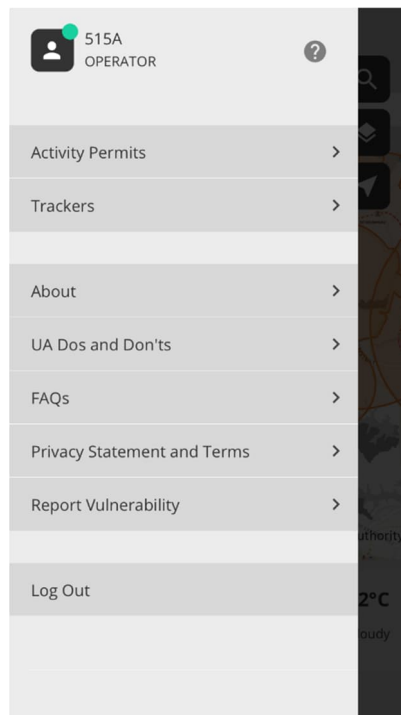


7. For More Information

Explore the side menu for more information such as the FAQs and UA Do's and Don'ts.

Contact us through the link in the About page for further enquiries.

You may access the page to report any vulnerability of the mobile application here as well.



For any issues with the application, you can contact the CAAS helpdesk and follow the instructions given.