

Instruction Manual

MANUAV2 REV-C 08/07/16

UAV SYSTEMS WIRELESS TELEMETRY KIT



Note: Tablet computer and UAV for display purpose only

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The information, illustrations and technical data were considered to be correct at the time of preparation.

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YOUR PRODUCT DETAILS

Record the details here for future reference when discussing service with your Silvan dealer, ordering service parts or making a warranty claim.

DATE OF DELIVERY _____

SELLING DEALER: _____

DEALER ADDRESS _____

DEALER PHONE NUMBER _____ INSTALLED BY _____

SILVAN SERIAL NO _____ SILVAN PART _____
(Sticker next to flight controller) NUMBER

OWNERSHIP DETAILS
OWNERS NAME _____ OWNER PHONE NUMBER _____

PRIMARY PILOT NAME _____ SECONDARY PILOT NAME _____

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the Silvan

Warranty

This warranty is the only warranty applicable to Silvan new products ('Products') and, to the maximum extent permitted by law, is expressly in lieu of any other conditions or warranties expressed or implied in relation to the Products.

Subject only to legislative obligations to the contrary, Silvan shall not be liable for incidental or consequential damage resulting from ownership or use of a Product.

Silvan does not authorize any person to create for it any other obligation or liability in connection with these products.

Silvan warrants its authorised Dealer, who in turn warrants the original purchaser (owner) of each new Silvan product that it will repair or replace the product, or, pay the cost of repair or replacement, as determined by Silvan without charge for labour or any defective or malfunctioning parts in accordance with the warranty limitations and adjustment schedule below.

The warranty period begins on the date the product is delivered to the first retail purchaser for a period of 12 months

This Warranty Covers

Only conditions resulting directly from defects in workmanship or material under normal use and service.

Warranty Exclusions

The Warranty does not cover:

- Conditions resulting from misuse, mis-operation, exceeding machine specifications including overloading, impact damage, negligence, accidental damage or failure to perform recommended maintenance services.
- Any product which has been repaired by other than an authorised Silvan service outlet in a way which, in the sole and absolute judgement of Silvan, adversely affect its performance or reliability.
- The replacement of maintenance items or wearing components such rotors, propellers or landing feet, etc.
- Loss of time, inconvenience, loss of use of the product liability to third parties or any other consequential damages.
- Incidental costs associated with a warranty repair including any travel costs, out of hour's labour charges, cleaning costs, transportation costs, freight costs or any communication costs.

The repair of a defective product qualifying under this warranty will be performed by any authorised Silvan service outlet within a reasonable time following the delivery of the product, at the cost of the owner, to the service outlet's place of business. The product will be repaired or replaced, using new parts supplied by Silvan. Silvan, in its absolute discretion, may choose to pay the cost of replacement or repair of the product.

The owner is responsible for the performance of regular maintenance services as specified in the Owner/Operator Manual applicable to the product. Failure to carry out regular maintenance may invalidate warranty



Ensure you have read and understood this manual and all other support documentation in its entirety before attempting to operate or install

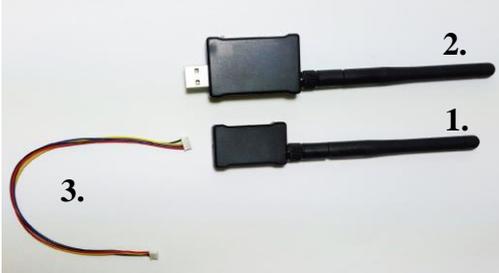
Read and take note of all following safety warnings and notices.

Failure to comply with these warnings may result in serious injury or death.

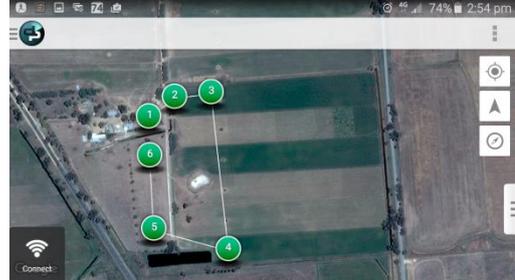
- Warning !** This product is highly technical, although it has functions to allow for easier flying this product is not a toy and absolute caution must be used to avoid damage to the equipment and people and animals.
- Warning !** Never allow an inadequately trained person to install or operate. We recommend that you seek the assistance of an experienced pilot when flying for the first time.
- Warning !** Operator miss-operation may cause severe damage or injury to people or property and is the responsibility of the operator.
- Warning !** Ensure that all operators and associated personnel are familiar with the legal regulations and codes of practice that apply to usage. CASA (Civil aviation safety authority) is the main regulatory body and we suggest your review www.casa.gov.au for your initial regulatory information for flying a RPA (remotely piloted aircraft).
- Warning !** Always keep a safe distance in all directions around the UAV to avoid collisions or injury. This UAV is controlled by a radio signal subject to possible interference or obstruction outside of your control that may cause momentary loss of control.
- Warning !** Always keep transmitter powered on while aircraft is powered and never operate with low batteries.
- Warning !** This product should never be left unattended and must always have an active and attentive operator whenever the UAV is powered on.
- Warning !** Always, disconnect all batteries when not in use and remove from the UAV, Always remove batteries before disassembly.
- Warning !** This product and its accessories utilise Li-ion and/or LiPO type batteries that must be maintained and cared for. Miss-handling or improper care may degrade battery performance, cause irreversible damage or fire to the battery or connected equipment.
- Warning !** Ensure that the electrical cables are always in good condition: Do not allow them to become tightly knotted, crushed or pinched. Damaged cabling may cause critical failures, electric short or fire damage. **Never** fly with damaged parts.
- Warning !** Do not exceed the maximum take-off weight, this may apply undue stresses on the airframe, create instability, cause damage or wear to equipment.
- Warning !** If any batteries or accessory equipment is fitted to the Hexacopter (including parts for FPV configuration) you must fit the items closest to the centre of gravity to minimise any imbalance and to not exceed the maximum total weight of 3.0kg.
- Warning !** Moisture can cause damage to electronics. This equipment not specifically designed and protected for water exposure so it should be avoided.
- Warning !** Always reduce the throttle when collision, crash or rotor strike to prevent further damage to rotors, motors or other items.
- Warning !** Some Flight modes need to be disabled in the event of a collision, crash or rotor strike to allow the rotor to be completely stopped.
- Warning !** This product should be re-calibrated after any collision, crash or configuration change to the accessories fitted effecting the weight distribution or magnetic field to the compass.
- Warning !** Always keep moving parts clean. Always let parts cool after use before touching. Always keep clear of moving parts.
- Warning !** Always keep aircraft in sight and under control. Always operate UAV in open spaces away with appropriate separation distance from people, vehicles, animals and structures according to guidelines and regulations set by CASA.

The Farmeyes telemetry kit is a hardware transmitter receiver system that allows an Android device to connect to the UAV and act as a Ground Control Station. Using 2-way communications live interactive display of flight data called Telemetry information makes and the ability send commands to the UAV to generate missions and tasking's. The Ground Control Station (GCS) uses the operators existing Android mobile phone or tablet via a local Bluetooth link monitor flights or planning and executing missions.

Contents



Planning missions via Android device

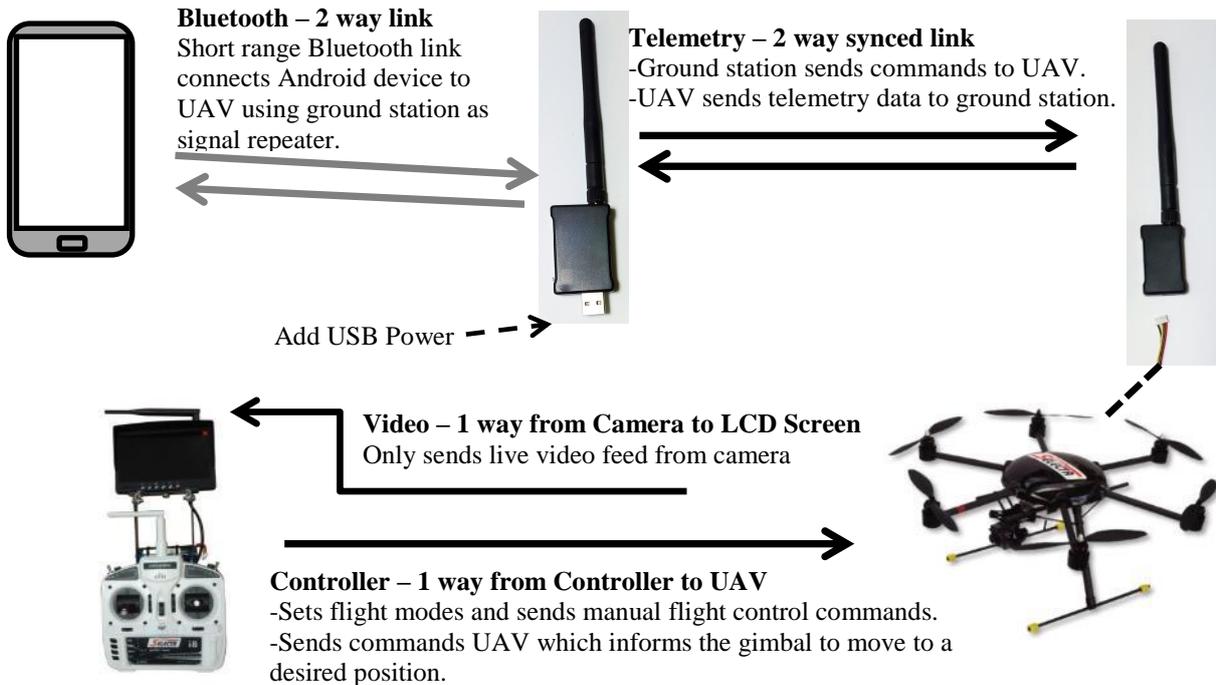


Technical Specifications

1. Air born Radio for UAV TX / RX
 - o Powered by connection to the FARMEYES telemetry port
 - o Range of Telemetry radio is maximum 500m for live connection however UAV can remain on mission when out of telemetry range.
2. Ground Control Radio TX / RX
 - o Powered by USB connection such as laptop USB power bank or phone charger (note input Power 5V 500mAh to 5V 1000mAh is suitable)
 - o Toggle switch for Ground station data connection via USB connection or Bluetooth
3. Telemetry Cable
 - o Simple cable for connecting Air born radio with data and power

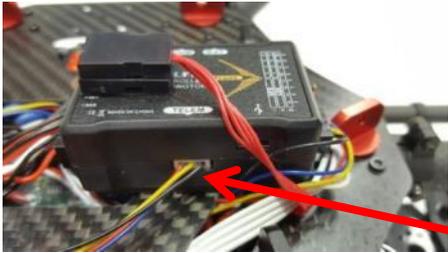
COMMUNICATIONS OVERVIEW (How it works)

It is valuable to understand which components communicate together and what kind of data is transmitted. When operating this equipment if the functionality is different to unexpected you can review this diagram then undergo targeted troubleshooting or testing.



AIRBORNE RADIO

The Airborne Radio connects to the UAV via cable. Fit the cable to the TELEM (Telemetry) port on the flight controller and the other end to the radio.



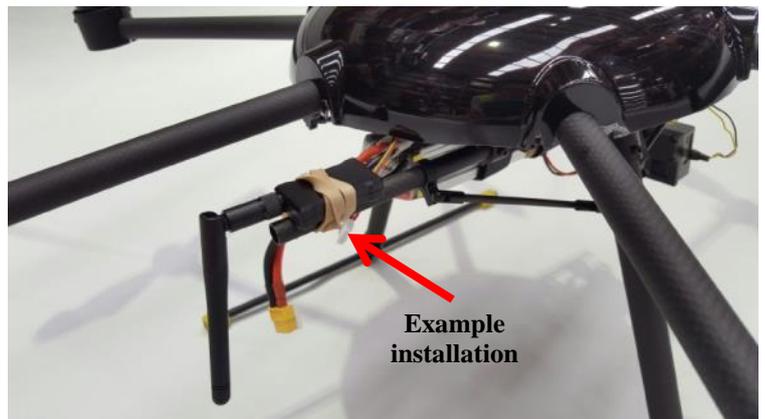
**TELEM
port**

The Airborne Radio should be fitted in a convenient location where the antenna will not be able to contact the rotors and in a position where obstructions, obstacles or interference is reduced.



Note: The front of the UAV is the position for the camera which is also where the receiving antenna is located for the normal controller. Preferentially you should place the Telemetry transmitter/receiver away from the other transmitters/ receivers.

One of the easier locations to install the airborne radio is to the accessory rails at the back of the UAV. If affixing the radio to the round accessory rails it is best to use tape or a thick elastic band as these offer the best grip.



**Example
installation**

GROUND CONTROL RADIO

The Ground control radio can communicate to the Ground control station via Bluetooth or through USB data transfer depending on what is the most convenient for the operator and the ability to position the radio for best reception.

This device supports connection to modern Windows based computers by USB data transfer however compatibility of hardware (operators computer or laptop) with drivers and software required may be an issue for some operators.

This Manual covers connection using Bluetooth to an Android powered mobile phone or tablet as this type of connection is easier to trouble shoot and relatively standard equipment is available to operators.

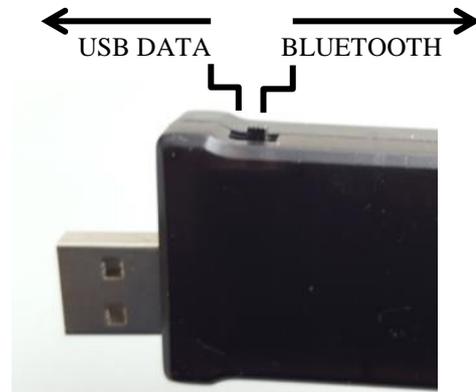
The Ground control radio requires standard USB power to operate ie. 5V DC Amp supply from 0.5 to 1.5A is sufficient for operation. Most mobile phone chargers or USB power bank plug should be sufficient to power the Radio however it is better if the power supply is portable so that you can ensure the antenna is in a suitable elevated position away from walls and obstacles to ensure signal strength is maximised.



Set the connection type.

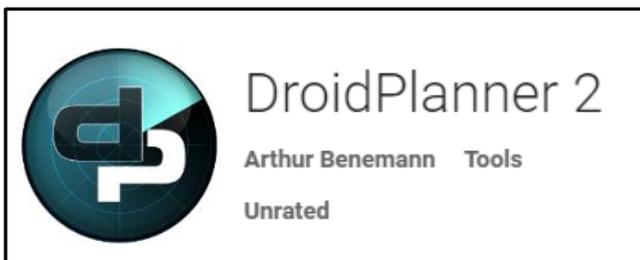
The ground control radio has a selector switch that changes the connection type between USB data transfer and Bluetooth (ie. Wired / wireless). Before connecting power ensure the switch is in position for Bluetooth.

SET CONNECTION TYPE TO BLUETOOTH



Software Installation

The FARMEYES Remote observation system and Telemetry kit is designed to be compatible with the APM Multiplatform Autopilot system. The APM system is compatible with a range of software and for the purpose of this instruction manual we utilise the free access software for Android called “DroidPlanner 2” which enables a wide range of high level functionality. Silvan Australia Pty Ltd is not a distributor of this software but if required to utilise it can be found by searching “DroidPlanner 2” at the Google Play marketplace for Android apps <https://play.google.com/store> or alternatively scan the QR code.

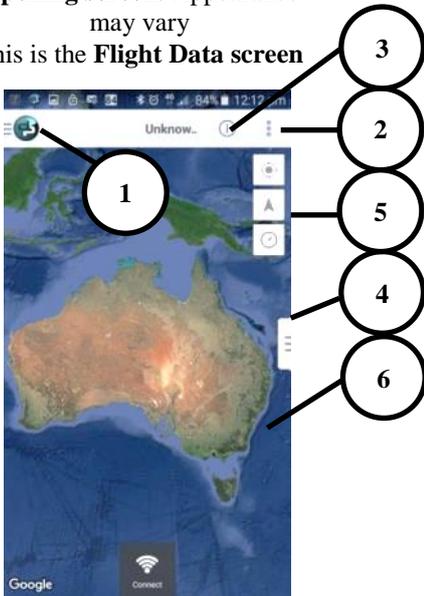


As there are various Droidplanner apps you can look out for the above icon to ensure you are using the same app as described.

It is best to become familiar with the Droidplanner 2 app, where the menus lead to, how to prepare missions. This manual covers the basics however there is a wide variety of information available on the internet including instructional videos and tutorials.

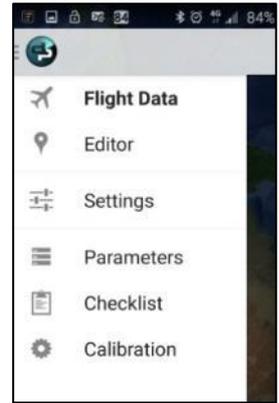
Upon opening the app you will find a number of selectable areas that open menus, display data or operate functions detailed below and or covered later in this manual to more extensive detail.

Opening screen. Appearance may vary
This is the **Flight Data screen**



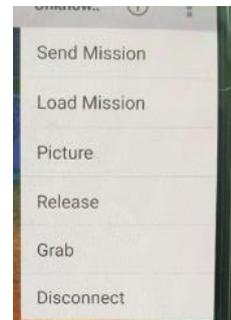
1. Main Menu

- Flight Data for live map view of location and feedback in flight as well as allowing take off, landing, enabling and pausing mission.
- Editor is where missions are generated and edited
- Settings for advanced adjustment
- Parameters when loaded brings up a numerical list of background settings
- Checklist to similar to a preflight checklist but also allows you so see detailed status of the GPS satellite connection
- Calibration is a simple and intuitive process to reset the UAV's 3D compass which should be done periodically to maintain flight stability.



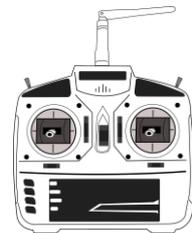
2. Secondary Menu

This menu is context sensitive and the options change depending on if you Connected / Disconnected to the UAV, if your in the Flight data or Editor screen and if you have generated a mission.



3. Flight Mode

When connected this status will update to the current flight mode typically set by handheld remote control but will also indicate when the system changes to any Failsafe modes.



4. Current Flight Data

Tab can be exposed by sliding left. Data includes Artificial horizon, numerical compass bearing, tit and roll angle, speed and altitude.



5. Map View

Detailed under Mission planning these functions move the map to a GPS location or orientate the map.

6. Map

Data is sourced from Google maps showing the satellite type representation. Manipulate maps by sliding and pinch to zoom

Initial Setup

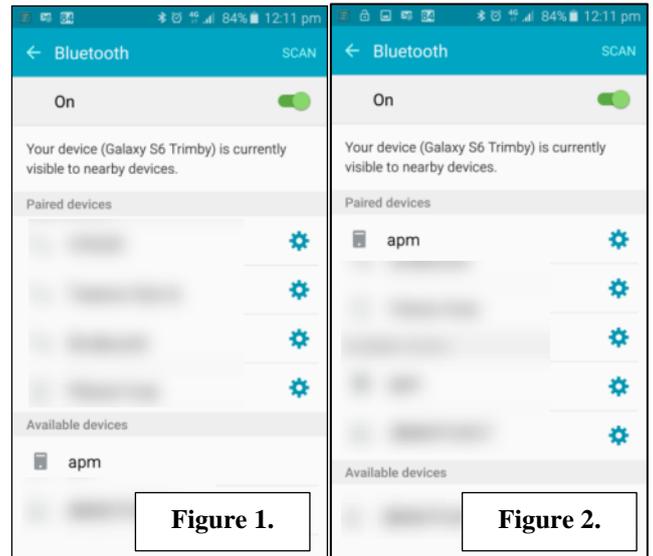
1. The telemetry radio's will automatically sync to each other once they are both powered. Connect the Flight Battery to the UAV which will power the *airborne radio* then connect the *ground control radio* to power.

On both radio's a green light will blink to indicate syncing and will become solid green once synced.



2. It is now time to connect your Android device. The Phone or tablet must already have Droidplanner 2 installed, Bluetooth must be active. Internet access to the Android device will allow maps to be loaded to the area of interest.
3. On the Phone / Tablet open the Bluetooth menu (Figure 1). Your device should be able to scan and locate the telemetry radio which is called **APM**. In Figure 1 you can see **APM** is an available device but is not yet paired. Select **APM** to pair, when asked for password use the default **1234**. As per Figure 2 The telemetry radio called **APM** should now appear under "paired devices".

Note: Figure 1 and 2 are general examples of a Android Bluetooth menu and appearance may vary according to version of Android operating system, manufacturer customisation and or visual display themes applied by phone/ tablet owner.



4. Open the Droidplanner 2 app. Within the app you will need to configure you connection the first time you connect to the Telemetry Radio. Further usage of the app you will only need to select the connect / disconnect buttons.
5. Droidplanner 2, First time setup.
Open the app, press the icon in the top left corner (figure 3.) for menu then select settings (figure 4.). In the settings menu select the telemetry connection type (figure 5 & 6.) and ensure BLUETOOTH type connection is selected. Now to return to the Flight Data screen again by selecting the icon in the top left (figure 3.) then from the menu select "Flight Data" which is the same screen displayed when you open the app.

Figure 3.

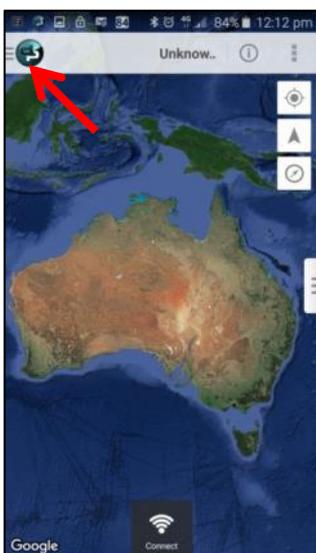


Figure 4.

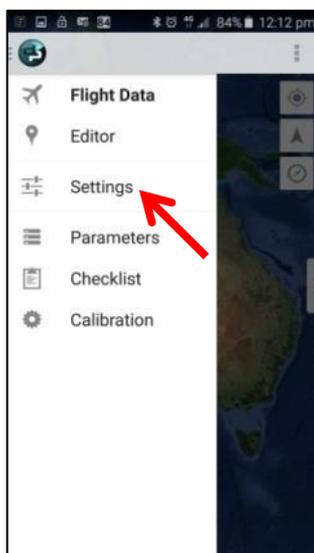


Figure 5.

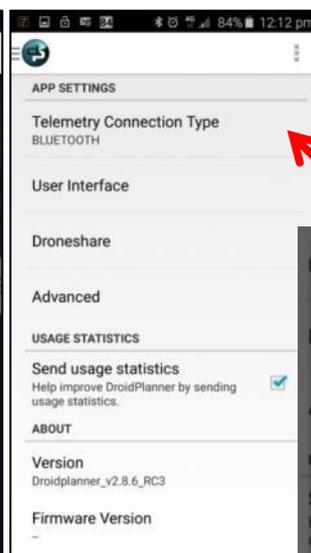
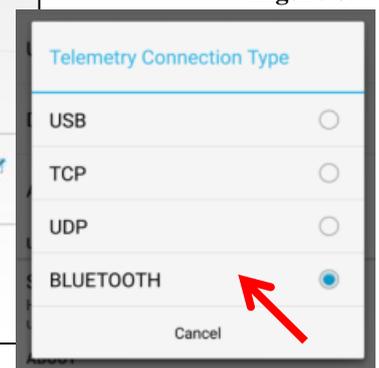


Figure 6.



Initial Setup continued.

- Now that you are back in the “Flight Data” (figure 7.) you can select connect at the bottom of the screen. The first time the Telemetry radio is connected a list Bluetooth devices will be displayed (figure 8). You must select **APM** which sets the Telemetry radio as the default device to connect to, you will now no longer see the prompt as shown in figure 8 when using the app in future.

Initial set-up operations are now complete. The following steps reflect regular operations.

Now each time you connect or disconnect to the Telemetry system will remember the telemetry unit and will connect with a single click.

Trouble Shooting Notice: This program remembers the identity of the telemetry radio (set as default device). Where an operator is using one android device with additional telemetry kits you may receive an written error message when connecting. You will need to tell the Droidplanner program to forget the default device by following the following menus.

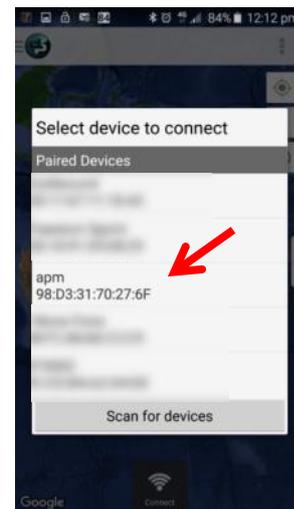
Settings → Advanced → Connection Preferences → Forget default device

You can now return to the flight data screen and select “connect”. This time when connecting you will be prompted again with Bluetooth devices to connect too. Select the correct APM.

Figure 7.



Figure 8.



Connecting / Disconnecting procedure

Connecting the telemetry kit to an Android device that has already been configured. Ensure that the UAV and Remote control are powered on, the ground control radio must be powered and the switch positioned for Bluetooth connectivity.

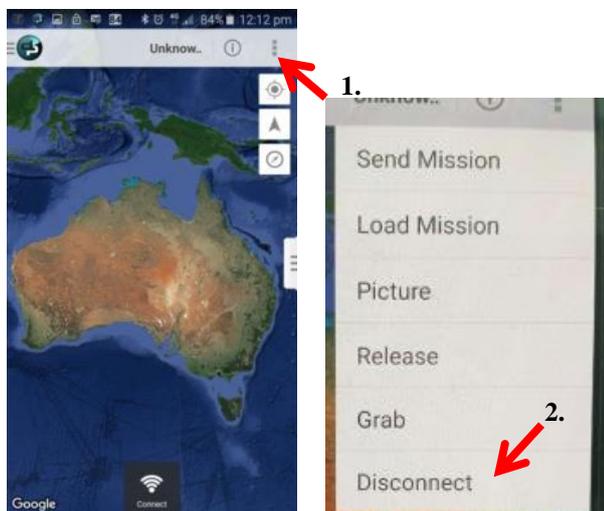
Look at the indicator light on the ground control radio and confirm that the two telemetry radio's are synced together as indicated by a solid green light on each radio.



To connect press connect then wait for audio confirmation.



To disconnect 1.press the menu top right corner of the screen. Then 2.select Disconnect from the drop down menu. After disconnected power down all equipment and remove all batteries

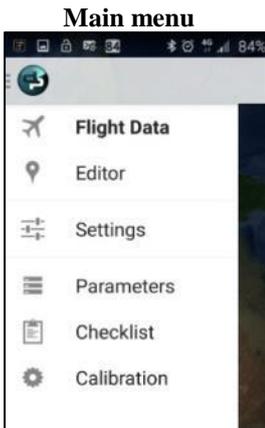


Constant Green light indicates sync between telemetry radio's

There are basic steps to using a Telemetry kit to monitor the UAV, plan missions and activate missions.

- **Power the UAV then connect the Ground station radio and connect using the Droidplanner 2 app**
- **Configure waypoints**
- **Send mission to UAV**
- **Activate mission and monitor UAV**

Configure Waypoints / Planning Mission



Open the left side (main) menu and select *Editor*. Editor is the area in the program where you can place waypoints and configure them to become take-off/landing zones, change heights of waypoints and a lot more. Your collection of waypoints will become a mission that can be saved and or sent to the UAV.

Once in the editor screen you will see two side bars of essential tools.



Waypoint tool for placing individual waypoints

Draw path of intended course and the program will convert to waypoints

Polygon tool. Draw an area then the program automatically sets a survey path

Delete waypoint tool

Centre Map to location of Android device (ie. Your phone or tablet)

Centre Map to location of UAV (when connected)

Reset map direction (Map will rotate to align north to top of page)

Fits current mission to page (Zooms in/out to centre current mission to page)



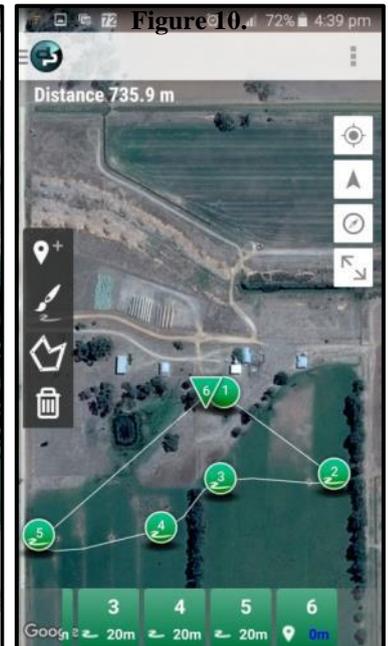
Designing a mission takes practice in the app. You can design missions even when the UAV is not connected or turned on. Observe the following examples to inspire how to design your own missions

Move the map to the desired area (Hint: if GPS is active on your Android device you will be able to see your current location). The left side of the screen has

Mission Example: Survey Water troughs

In this example we set a path over several paddocks that will tell the UAV to pass over a series of water troughs at the end of which the UAV is commanded to fly to a specific location and told to land autonomously.

- In figure 9 the location of the water troughs are highlighted.
- Select the *Waypoint tool* select a starting location on the map where you want to start the mission. In figure 10. The starting point for the mission is depicted as point 1 in the green circle
- Now tap to add waypoints passing over the 4 water troughs taking note that the troughs are not all in a straight line. See waypoints 2,3,4,5.
- Now that the mission is set to fly over the area of interest you can even program it to land in a safe area. Place waypoint 6 in an open area free of obstacles then at the bottom of the screen select the green tab representing waypoint 6. A blue square will appear with information allowing you to configure the waypoint. Press the Blue area and a drop down list will appear that allows you to change the nature of the waypoint to Land. On the map the waypoint has changed shape from a circle to downward facing triangle.



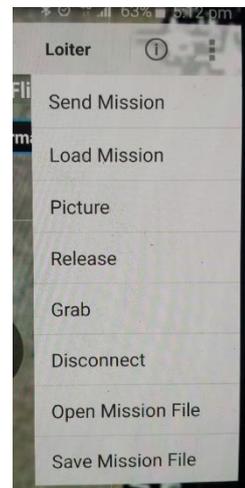
Send or save mission

Once a mission is designed in the app it can be saved to your android device to be recalled whenever required ideal for missions that are intended to be repeated. Alternately when connected to the UAV it can be directly uploaded (sent) to the FARMEYES.

Select the menu in the top right of the page, if your already connected to the UAV the menu will appear as displayed to the right giving both the opportunity to send the mission or to save the mission to the phone / Tablet.

If the UAV is not connected you will only be able to save the mission.

Note the menu to send missions is context sensitive to which mode you are in when sending the mission. If you have designed a mission then switched mode back to Flight Data you will have a restricted menu as displayed right



Sending mission when in Editor mode



Sending mission when in Flight Data mode

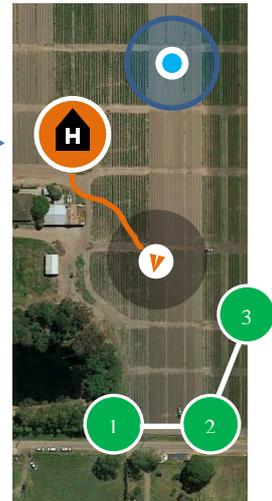
When you have sent a mission to the UAV it will take additional time for more complex missions. When the mission is successfully sent you will hear a verbal message of confirmation

Operation: Flight Data and Flying



With the UAV powered on, rotors disarmed and telemetry connected through Droid planner 2 app you can use the main menu to select *Flight Data*. The Flight Data Screen can show a number of icons and symbols to indicate position, direction or waypoint with common iconography detailed below.

- Current Position of Phone / Tablet displayed as a blue circle (when your GPS is on) →
- Home Location displayed as a H in a orange circle is the GPS position of the UAV at time of take-off / launch. When in RTL mode (Return to Launch) the UAV will fly back to this location. →
- Path where UAV has recently flown is shown as an orange line. →
- Current Position and direction of UAV shown with a directional arrow to indicate the front face of the UAV. →
- Waypoint are green icons with a number. The Shape or appearance of the waypoint may change to reflect different types of waypoint such as Take-Off or Land. →



Terminology

The Droid planner 2 program uses different names for flight modes compared to the operations manual (MANUAV) distributed with the FARMEYES. See below to clarify what Droid Planner 2 calls the modes set by the SW1 and SW2 switches on the handheld controller. Hint: When you change the Flight mode using the hand held controller a UAV connected with the Telemetry Kit the app will announce the current flight mode for your confirmation.

Title of flight modes as per the Droid planner 2 software and the FARMEYES Operators manual

Droid Planner 2	FARMEYES operators manual
Stabilise-	Manual-0
Alt hold-	Altitude hold-1
**Stabilise -	Direction lock-2



FARMEYES operators manual	Droid Planner 2
3 Position switch SW2	
0 -Manual	-Stabilise
1 -GPS loiter / assist with altitude hold	-Loiter
2 -GPS Return to land	-RTL (Return to Launch)

Flight Mode Definitions

- **Stabilise (Manual):** UAV will automatically assume level flight unless operator adjusts Pitch or roll. Flight style is fully manual and the most challenging even for experienced pilots. In this mode the throttle setting on the controller directly relates to the throttle output of the UAV meaning altitude can vary wildly according to operator control.
- **Alt hold:** UAV will automatically assume level flight unless operator adjusts Pitch or roll. UAV will maintain altitude if throttle at 50%. Moving throttle above or below 50% level will slowly raise / lower UAV altitude. **Note:** When arming rotors flight will not begin until throttle is raised above 50%
- **Loiter:** This mode is the same as Alt holds with added using GPS to hold position and altitude in three dimensional space when operator stops adjusting Pitch or roll which is most useful to maintain more control of the UAV by compensating for moderate wind drift. In addition this mode limits maximum flight speeds to rates that are safer and allow for better capture of imagery. **Note:** When arming the UAV it will not arm until GPS reception is strong enough and any mechanical or calibration issues are resolved
- **RTL:** This mode can be activated by operator or can be activated as a failsafe when the signal from the controller is not active. When enabled the UAV will fly to a minimum height of 15m above altitude of Take-Off location, then will proceed by direct line to over the Take-Off location before automatically landing

Droid Planner 2 may display additional flight modes not listed for FAILSAFE type modes when activated.

Flying with Droid planner 2

Within the Droid planner 2 app the Flight data area can be used passively to monitor flights controlled by the operator or to enable and manage a mission where it is the mission parameters that controls the UAV.

As the FARMEYES UAV is distributed with a manual hand controller (transmitter) many operators can initially be hesitant to pass operation over to the telemetry system. It is perfectly acceptable to get familiar with the Telemetry system by testing small short flights still under control of the manual hand controller in an open area with good weather to take-off as per normal in the Loiter mode (GPS assist). For these first flights you can grow accustomed to the passive flight data before you expand to using planned missions.

Passive use of Flight Data

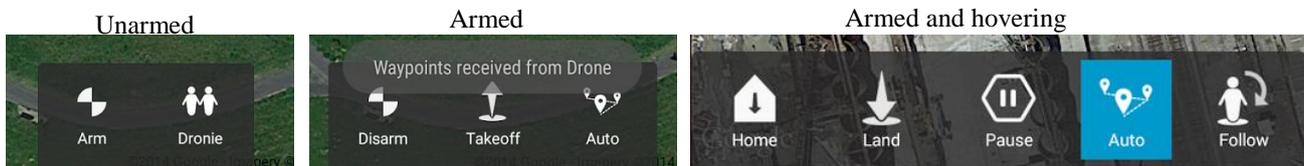
To receive flight data you only need to have the telemetry kit connected. You will be able to see the location of the UAV and a line to indicate where it has gone. For detailed data a tab of current telemetry information can be seen by swiping from the right of the screen (as seen right and on page 8) and from this tab you can see the Artificial horizon, numerical compass bearing, tit and roll angle, speed and altitude.



- Artificial Horizon works the same as any aircraft and can highlight to the operator when the UAV is flying at angles different to expected. **Note:** The artificial horizon can be an indicator for when compass or gyroscopes need calibration or poor health of components.
- Compass heading is listed as both degrees and as an arrow indicator around the artificial horizon and on the map where you can see the direction of the front of the UAV.
- Altitude is displayed in meters relative to the location of take-off rather than barometric altitude. This means if take-off was from an elevated position such as a deck it is possible to have a negative altitude if flying below the take-off site. **Important Reminder: You must be familiar with CASA regulations which specified not to not fly above 120m in controlled airspace and as a general rule of thumb it is best never to exceed 120m above ground level.**

As the menus and options within the Droid Planner 2 app are context sensitive you will see the Command options change

1. When Unarmed options are limited
2. When armed and hovering the Command bar similar to the example below will show different commands that you can issue to the UAV.
3. When armed but not hovering you can use Droid planner 2 to takeoff however the system will quickly disarm rotors so the operator must be quick to trigger takeoff.



Mission controlled Flights

To make the UAV fly according to a pre-designed mission there are two factors required to enable or begin mission.

1. The mission has to have been send to the UAV as per covered in the Mission Planning section of this manual.
2. The UAV must be armed with rotors spinning (preferably already airborne).

Note: Safety reasons the UAV will automatically disarm the rotors less than 2 seconds after arming if the throttle level is low.

Missions can be enabled after becoming airborne or activated through the app.

Procedure to activate mission while airborne

1. Set UAV flight mode to Loiter (GPS assist) , arm UAV motors and increase throttle to commence take-off
2. For safety position the UAV at an altitude between 4-20 meters above ground level.
3. Refer to Flight Data Screen within Droid Planner 2. The Command bar at the bottom of the screen will display commands you can issue to the UAV. Press Auto and the UAV will fly to waypoint 1 then fly according to mission

Mid-Mission controls

When the mission is actively under way the program will announce what is happening for example “going to way point 5” or “mode land” at the end of a mission. You can interrupt the mission with different options available as described.

Home: Stops mission and changes flight mode to RTL, where UAV flies direct back to home (start) location at altitude of 15m above ground level or higher.

Land: UAV will change to “mode land” for a controlled descent and self-land over its current location. Note: The UAV remembers the altitude of ground level (based on barometric pressure) and when landing will descend fast then slow as it approaches the ground level of the starting location. If flying over an elevated area such as a hill the UAV could potentially approach the ground too fast for a safe landing. **Warning!!** It is best to use the auto-land only over ground at the same elevation as the take-off location.

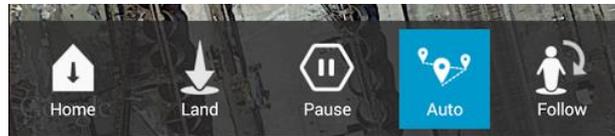
Pause: The mission will change to loiter mode using GPS positioning to hold its location in space until resumed

Auto: Auto will set the UAV to follow the mission already sent to the UAV’s internal flight controller

Follow: In regards to the FARMEYES UAV follow is not configured

Follow: Warning the FOLLOW feature is not configured for the FARMEYES UAV. Under no circumstance press this as you may experience immediate loss of control.

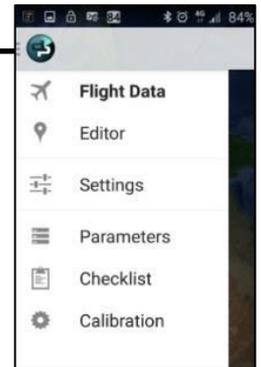
WARNING !! FARMEYES UAV’s are not warranted for the use of the follow function.



Parameters

Through the main menu you can find the parameters file. This is an advanced user feature allowing tweaks that can all matter of operations. When parameters are loaded for viewing they are displayed as code names for different functions. **Never adjust any parameters without express written permission from Silvan technical support.**

WARNING !! Unauthorised adjustment of parameters automatically voids warranty of the UAV and associated equipment.



Checklist

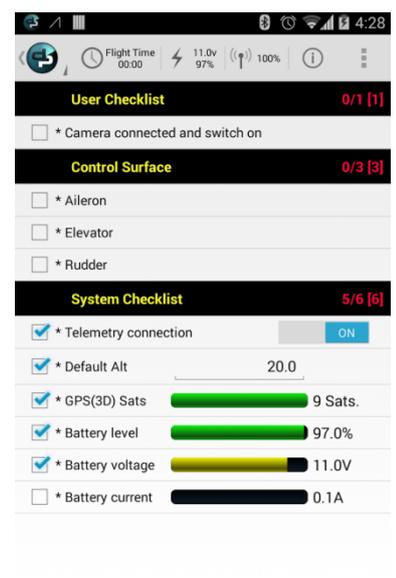
Checklist acts similar to a preflight checklist and can be used to display some useful data to assist the operator with the most important described below..

GPS(3D) Sats :Shows the number of satellites being used to generate a GPS location and the accuracy of the calculated coordinate which can help the operator to understand when the UAV has a well defined position to support take off in loiter mode.

Battery level: Calculates the remaining battery percentage based off battery voltage, known battery size (5000mAh) and the current (amp) used. **Note: The FARMEYES UAV does not have a amp (current) meter to the battery percentage will always show full.**

Battery Voltage: This is a simple measure of flight battery voltage. When voltage drops to a pre-set level the UAV will change failsafe mode to Land to prevent the UAV from falling when the battery power is exhausted.

Battery current: For UAVS with an active amp meter the current being used is displayed live. The FARMEYES UAV does not have an active amp meter.

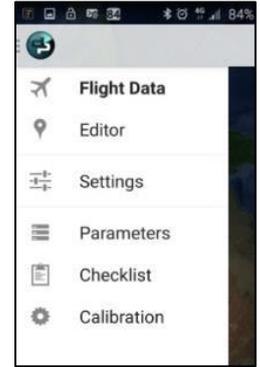


Calibration



The last part of the main menu is Calibration and it is a most useful tool for calibrating Compass/ Gyroscopes of the UAV. When selected the menu offers a series of easy to follow instructions asking the operator to place/hold the UAV on it different sides.

Calibration should be redone periodically, after moving 50km from the last calibration location or after any crash or incident.



Trouble shooting

Problem type	Cause	Solution
Motors are armed but 1 or more motors to not turn correctly	<ol style="list-style-type: none"> 1. Damaged motor or bearings 2. Loose connection at the Flight Controller 3. If the motor attempts to move but can only jitter the main power has been interrupted near the hinge for the motor arm. 	<ol style="list-style-type: none"> 1. Disconnect the flight battery and by hand slowly turn the motor feeling for a bearing fault. If different to a working motor replat part. 2. There are 6 motor connections to the Flight Controller (on the GPS side of the control box). Make sure all connectors are fully inserted. 3. Un--power the Hexacopter, exiting the motor arm is a yellow cable that connection to a blue cable that needs to be reconnected.
<p>Motors will not ARM</p> <p>Droid Planner app specifies error</p>	<ol style="list-style-type: none"> 1. Droid Planner has recognised an error with equipment or a signal level is too high/low for safe operation. 	<ol style="list-style-type: none"> 1. Record the quoted error code. Some errors may be self explanatory suggesting the nature of the problem other issues may require the operator to contact technical support
Low Signal or lost signal to telemetry	<ol style="list-style-type: none"> 1. The telemetry radio range has been exceeded 2. The telemetry radio may be obscured limiting range 3. The cable connection may be loose or not complete 	<ol style="list-style-type: none"> 1. Fly back within range for live telemetry data. If on mission the UAV will continue according to mission without live feedback, but the operator should remain at the hand controller if necessary 2. Objects between the ground station and the UAV may limit radio reception including the UAV airframe, try moving the UAV or rotating it in search of better signal 3. With UAV on ground and disarmed carefully remove the airborne radio and reattach

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