

T-ECHO TRAFFIC DETECTION DEVICES

Most gliders today are equipped with FLARM which is proprietary traffic awareness device designed to reduce collision risk. Mosquito GQD and Mini-Nimbus FQA (and also James Dwyer's DG) are FLARM equipped but none of the club aircraft have FLARM installed.

The T-Echo device is inexpensive compared to a FLARM and equipping all our aircraft is a cheap means of reducing collision risk.

The T-Echo device is an open-source device that transmits and receives traffic information enabling T-Echo equipped aircraft to detect other T-Echo or FLARM equipped aircraft.

FLARM equipped aircraft can similarly detect a T-Echo equipped aircraft. T-ECHO and FLARM devices both operate in Australia in the 915MHz band. (921MHz). FLARM and T-Echo signals are not received by non-glider aircraft.



One device has been acquired for each of the club aircraft. Each device has a unique hex code identifier which can be noted on the Page 3 screen and is also marked in the device itself. Device IDs are:

SCL BE6A05
GRF B4CED5
WVR 44AD57
GGQ 9FA06C
DNE 738174 (White)

Each device is marked with the relevant aircraft registration letter.



OPERATING INSTRUCTIONS

TURNING ON

One press of the button on the bottom left side will turn the device on.

Wait while the unit acquires a GPS signal.

The LED light on the right-hand side will flash while the unit acquires a GPX fix

When a fix is obtained the device has been configured to display the “RADAR” screen.

DISPLAY SCREENS

The normal viewing screen is a “radar” type. When a target is received it will be displayed as a dot in the position relative to your aircraft. If there is another T-Echo or FLARM in range one or more target dots will appear on the screen along with the number of targets detected. In the above example the screen indicates 2 aircraft detected (bottom left of screen).



TARGET TEXT INFORMATION SCREEN

If further information is required a single press of the side button will move to a screen which gives text information on the target position and relative height. If more than one target is detected, the closest will be displayed. Remember that if you move to this screen you will have to cycle all the way back to the beginning to display the radars screen again.

OTHER SCREENS

Each subsequent press of the side button will cycle through the remaining screens providing additional information (configuration; altitude, barometric pressure and temperature). The screen is an e-paper screen which is readable in daylight and draws minimal current, but is a little slow to refresh so wait a moment after pressing.

CHARGING

The devices will last for a day's flying without charging. At the end of the day, along with the aircraft battery place the T-Echo on charge using a USB C cable. There are USB ports in both hangar electrical cabinets.

BLUETOOTH

Using Bluetooth and XCSoar a larger more readable display is available using an Android phone or tablet. (Other compatible Bluetooth enabled devices can also be used) Once your Android device is configured and loaded with XCSoar, operation is simple.

XCSoar

Your Android device will need to be loaded with XCSoar (free download) and properly configured. You can configure your device using the information below, or ask someone to do it for you. Cheap used Android phones are available for around \$75 on Ebay. A 6" or larger screen is recommended. Pre-configured phones are to purchase from the Club. Magnetic mounts for your mobile phone are being fitted to our aircraft and you will need to have a metal plate on the back of your phone. The Libelle cockpit is limited and a different installation is required.

DISPLAYING T-Echo on an Android

Turn on the T-Echo and wait until it has a GPS fix. GPS data is then transferred by Bluetooth to your Android device.

Select XCSoar on your device and check that you have a GPS fix (Waiting for GPS Fix not displayed) you are ready to go.

Should you not have a GPS fix:

Check that Bluetooth is enabled on your Android device (If enabled your Android device will automatically connect to the T-Echo)

Check your XCSoar device selection. Go to Config>Devices> and check that you have enabled your aircraft T-Echo device and disable any other devices.

TARGET DISPLAY with XCSoar

XCSoar will automatically display T-Echo and FLARM targets on any of the navigation pages. If any of the XCSoar navigation pages are selected (Cruise, Circling, Final Glide) a pop-up "radar" screen will appear in the bottom righthand corner when a target is detected. In the example below 4 targets are displayed (All aircraft are on the ground). Your position is shown as a glider (or other type).



For more detailed information swipe left on the screen to show the “FLARM” page.



In this example the targets are all on the ground and the display is cluttered. In normal operations targets will be displayed relative to your Course over the Ground (CoG or approximate heading). The ID of the nearest target is displayed in the top left (BE6A05) which is allocated to SCL. Distance is shown bottom left (28.0m) and relative altitude to your aircraft bottom right (0.0, aircraft both on ground in this example).

If you are not using your phone for navigation or you are flying the tug you may prefer to always select the FLARM page

SETTING UP

All T-Echo devices have been set up and there is no need to do anything. The following information is provided or users who wish to set up their own device or users who require more detailed information (trouble shooting).

T-Echo

The club devices are set up and ready for use. Parameters can be modified/reset using the SoftRF Tool App (available on Google Play). Please do not change the settings unless you are fully conversant with the devices and their correct settings.

For information only (please do not change) settings selected are:

Protocol	Legacy
Band	AU (921 MHz)
Aircraft Type	Glider (SCL is set to Towplane)
Alarm Trigger	Distance
LED ring direction	CoG up
Zoom level	Medium (4km range scale)

BLUETOOTH PAIRING

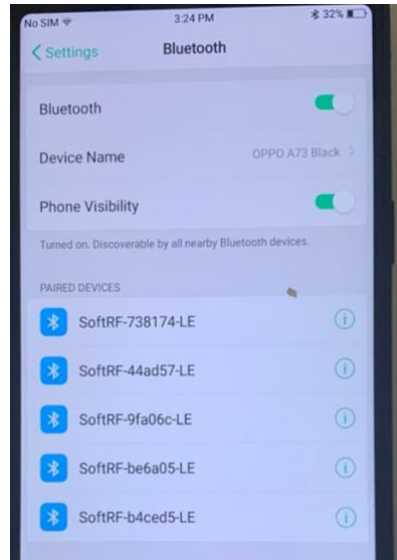
Note: For each device pairing is only needed once. After completion of device pairing, and XCSOAR settings, connection is automatic.

Turn on the T-Echo

Go to Bluetooth on your phone. Press search. A list of devices will be displayed. Select the device for your aircraft. Pair. You can pair to more than one device. Each time you fly your phone will pair to the nearest device (your aircraft).

If you only use one or two aircraft then it is easier and simpler to only pair with the ones you are going to use.

In the example below all the club's devices are paired. When you fly your phone will automatically connect with the nearest device, so once you have paired your phone for the first time there is no need to pair it each time you fly.



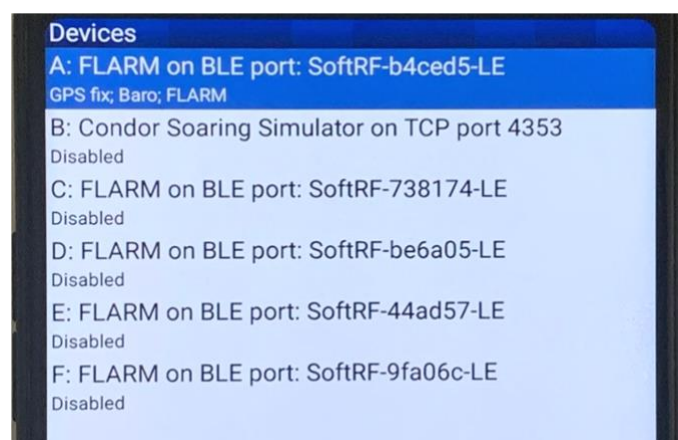
CONNECTING TO AN ANDROID PHONE or TABLET

When connected the T-Echo will send target information, GPS and baro information to an Android device. Using a mobile phone or tablet allows for a better display and also permits two pilots to monitor traffic with a single T-Echo device.

SETTING UP XCSoar

In order to receive data from the T-Echo your android device needs to know where to find the information. This process only needs to be done once for each aircraft you intend to fly. In XCSoar, select Config>Devices

In the Devices page, setup any or all of the T-Echo devices that you intend to use. In this example all 5 club devices have been setup, but only A is enabled.



Firstly disable all selections. If you don't do this you may find XCSoar shuts down each time the app is selected. If you run into this problem open XCSoar in Simulator Mode, go to devices and disable all your connections. Then you can go back into FLY mode and select the correct parameters.

The correct Port and Driver need to be selected. Highlight the Device letter you intend to use and at the bottom of the page select EDIT. You will then see options to select a Port and Driver.

The port you need is the one with your aircraft's T-Echo ID. For example:

SoftRF-738174-LE	BLE port
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Be sure to select the BLE port and NOT the BLE sensor

Then select FLARM driver.

Edit device	
Port	SoftRF-738174-LE
Driver	FLARM

Now you can go back and enable your device. Device A: in the above example.

To test, take the device into the open so that it can get a GPS fix, and open up XCSOar. XCSOar will then display your aircraft position. (If you see a Waiting for GPS fix message, your connection has not been successful and you will need to check that you have followed the procedure correctly.)

USING XCSOar

Once you have successfully connected setup a FLARM page in XCSOar. If you are familiar with XCSOar you will be aware that pages are customisable and selectable. Most users will have setup Cruising, Circling and Final Glide pages. All that is needed is to go into Config>System>Look>Pages and add a FLARM page.