

Enhancing Traffic Awareness

contributed by Lloyd Klee

There would be few regular pilots who haven't had a traffic surprise at some time during their flying experiences as the sky can be a much smaller place to share than we sometimes assume. Devices that assist with traffic awareness must not be a substitute for traditional observation practices but they can be very useful to tell you where to focus extra attention for the moment. These devices have become much more available and affordable over the last couple of years. With the very recent tragedy at Feilding bringing the subject close to the front of many pilots' minds, KiwiFlyer asked Lloyd Klee from Aviation Safety Supplies Limited to outline current options and considerations for assisted traffic awareness.

BETWEEN the portable and panel mounts, there are at least seven systems available ranging in cost from under US\$500 to nearly US\$20,000. Are the portables worth the investment? I think the answer is YES. Even the most expensive portable alerter - the Zaon XRX is still a modest investment and although it will not see all traffic, it will see enough to make the investment worthwhile.

Zaon XRX-A

Under the Zaon brand, probably the most popular worldwide, the company has the premium priced XRX-A model at US\$1500 and the bargain MRX-A, at only US\$549. These prices are ex USA but they are available ex stock Auckland from Aviation Safety Supplies Ltd @ NZ\$2180 and NZ\$795 + GST.

Zaon call these devices PCAS, an acronym for Portable Collision Avoidance Systems. The XRX provides new capability to the field with its unique ability to detect not just range of a threat, but also azimuth. It does this through a signal amplitude / phase cancellation antenna mounted on the top the receiver. The Zaon models also have their own altimeters, so if the host aircraft transponder fails or does not function correctly, the device can still display relative altitudes to tracked aircraft. It is also capable of showing aircraft heading through a built-in electronic compass.

The XRX can detect and display up to three target aircraft, providing the range, bearing (with pointer arrows), the relative altitude and the trend. This data appears on a single, smallish LCD screen although this can be difficult to read in bright sunlight.

If you really want azimuth, the best investment is to integrate with one of the XRX's remote display options, such as the Garmin GPS map 396/496 / Aera etc. Performance wise, the XRX shows targets in 45-degree quadrants and it handles multiple aircraft. The XRX is sensitive to panel placement and needs to be as level as possible. It should be clear of a magnetic compass or window post. The excellent ZAON operational manuals explain all this in detail.

Zaon MRX

The ZAON MRX-A is an excellent investment if you want to

be aware of any traffic. The MRX is very small, measuring only 66 x 110 x 19 mm high and weighs less than 200 grams including the 2 AA batteries. It will also operate on aircraft power. A small antenna screws into the left side of the device and there is a jack for the audio alerts that are tones only. The bright red LED display is highly visible and the single control knob is easy to use.

The range is up to 5 miles and like the XRX; it shows relative altitude of targets, with trends. It also has a built-in altimeter to fill in for an errant transponder and although it will track multiple targets, it does not have the azimuth capability. The MRX will issue advisories for distant traffic and alerts for closer threats, depending on distance and relative altitude. It displays data for what it calculates to be the most immediate threat, but if another target comes into view, it flashes "new," then gives the new target data.

According to many published articles available on line, the MRX performance is excellent. Like many of the other products that that have been tested over the years, it occasionally missed traffic, but generally, it locked on quickly and gave practical if not perfectly accurate range numbers. The audio alerts are logical and easy to interpret. Without question, the MRX was best at tracking traffic approaching from the rear.



The Zaon XRX, detecting traffic ahead and below (on the runway) and also in the circuit (at left).



The XRX can interface to a variety of portable GPS units, showing easy to interpret relative traffic positions.

Passive versus Active

The XRX and the MRX are stand-alone, passive systems. Passive systems are different from active systems such as TCAS, Skywatch®, etc. Active systems can be found in commercial airliners, corporate jets, and higher-end general aviation aircraft. They actively interrogate aircraft transponders within a specific range. Passive systems like your XRX listen for the replies to these interrogations, as well as ground-based RADAR interrogations.

Relative position information on the XRX

The key to displaying smooth, understandable traffic information is relativity. The XRX contains a range of instruments including built in compass and altimeter to make relativity calculations on your behalf as traffic is detected. If the information is always relative to your aircraft, you are your own point of reference. Range is relative to your location, as is the relative altitude (i.e. +600 feet above your altitude) and relative bearing (i.e. to your right). Thus looking for detected aircraft is a simple matter that does not require additional pilot interpretation in the heat of the moment.

For more information

There is very good information on www.zaon.aero with blogs, forums reviews and testimonials or contact Lloyd Klee of Aviation Safety Supplies Limited on 09 420 6079.