

## PICASIM REVIEW

### RC Simulation

PC-based flight simulators are a huge boon to those learning to fly. This is true for both full-size and RC model aircraft and, in my experience, it is especially true for RC. In the case of a full-size aircraft, the limitations of PC simulation quickly become apparent; the feedback from the controls is minimal, the cockpit environment is not replicated, there is no vibration, and the noise simulation is usually very poor. An RC simulator suffers from none of these drawbacks. Radio control is by definition remote from the aircraft so the absence of haptic and environmental cues is no longer such a problem.



*Spitfire PSS in Picasim*

To be clear, I'm not suggesting that it is a panacea; PC-based simulators suffer from poor field of view, lack of three-dimensional depth and an absence of subtle cues – for example, those that indicate wind velocity. Certainly, a simulator can never replicate the underlying nervous tension caused by the effort and financial investment that has gone into a real model. Otherwise, a good RC simulator is pretty much on the money. It's entirely possible to learn to fly RC using one, and more advanced flyers can hone their skills and learn new manoeuvres without fear of wrecking a valuable model. The trouble is that good RC simulators can be expensive. Fortunately, there is an exception – and that's Picasim. Picasim is entirely free to download, although you can make a voluntary contribution to its developer. In my opinion it compares very well with the best pay-ware, and outperforms it in some respects – especially in its simulation of RC gliders.

### Models and Scenery

Picasim has many model and scenery options; it would take a very long time to describe all of them so I'm not going to do that here. In broad terms, it offers the following models: a variety of flat field, slope, DLG and electric gliders; RC trainers, sport models and aerobats; indoor models and, perhaps surprisingly, control-line. Most of them are based upon well-known model types. Sadly, Picasim doesn't offer any helicopters, although there is one multi-rotor. In terms of scenery, there are broadly two types: 'panoramic', which means photo-realistic, and standard computer-drawn scenery. The panoramic scenery is quite impressive, and it includes mountains, flat fields, a meadow, a recreation ground, and a sports hall for indoor flying. The computer-drawn scenery includes cliffs, mountains, islands and plains. Note that the scenery can be adapted for 3D viewing if you have stereoscopic viewing hardware...although it is possible to 'freeview' it if you can cross your eyes enough!



*Picasim's 'Panoramic' Scenery*

The programme comes in two versions; the PC or 'Full' version and a mobile phone/tablet version. The mobile version has fewer aircraft and scenery options, and the models are controlled by touch panels on the screen. Although this version is great fun, the touch panel controls are rather awkward to use and, to me, it's more of a game than a simulator in this form. However, it is possible to upgrade the mobile version to 'full' (ie identical to the PC version) for a couple of pounds. To derive most benefit from Picasim, you'll need to use the 'full' version connected to a proper RC transmitter – preferably the one that you use for live flying. This entails purchasing some additional, but inexpensive, hardware which I'll describe later. With so many options available it would take a very long article indeed to cover all of Picasim's features and capability, so I'm going to confine this giving you my opinion on how to use it for basic training powered flying and gliding, with a short section on more advanced manoeuvres.

### **Getting the Most from an RC Simulator**

To achieve the best training results from an RC simulator, or any type of simulator, it's necessary to take it seriously. By all means use the simulator as a game – it's fun, you'll learn something along the way and you can explore the capabilities of the program – but if you want to train yourself to fly RC or learn to be a better RC flyer, you'll need a little bit of self-discipline. If you're a beginner, try to use proper flying techniques and avoid getting into bad habits. For example, when you level off in the circuit, don't simply push the nose down and turn: instead, lower the nose to a level attitude, reduce to cruise power and check that you are trimmed for level flight. Of course, it's easy to stuff the nose down, maintain full power, then 'bank and crank' - but that's not the point of this exercise. To turn, check that it's clear, apply bank smoothly with a touch of in-turn rudder, and raise the nose gently to maintain height. Try to maintain a constant height throughout the turn and as you roll out onto the downwind leg. Don't accept crashes – if you mess up an approach, go around and try again. Try to treat the model as though it matters. If you're preparing for a BPC or A Certificate, do the SMART checks before you take off, lookout properly and make the appropriate calls – if only in your mind. Finally, take the time to set your transmitter up properly, and learn how to use the simulator's basic environmental settings. Adjust them both to suit the type of training that you're trying to achieve. Picasim's environmental settings are quite complicated and, in general, the defaults work well; however, it's worth learning how to adjust the wind, turbulence and thermal settings to suit your experience level and requirements.

### **RC Power Training**

For learning basic RC power flying techniques, I recommend using the Jackdaw 4-channel trainer and the 'panoramic' recreation ground scenery; indeed, this is one of two default training scenarios. There is no wind or turbulence to complicate matters, so a beginner can concentrate on basic handling, orientation and height awareness. The recreation ground scenery has plenty of marker

features such as houses and trees which can be used for circuit planning, height judgement and positioning which, to a large extent, makes up for the simulator's inherent lack of peripheral vision.

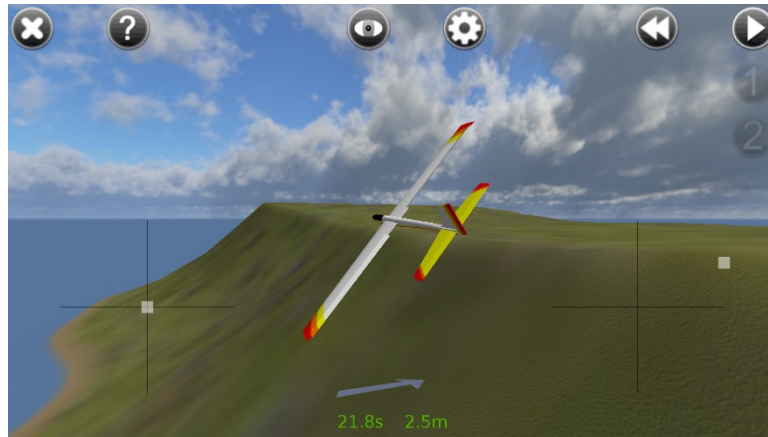


*'Jackdaw' 4-channel Trainer at the 'Recreation Ground' Scenery*

Once confident with this setup, it's possible to go into the scenery settings to increase the windspeed – but be careful not to use too much wind otherwise it might destroy your confidence! Slightly irritatingly (for me) speeds are measured in metres per second; 5m/sec is 18kmh, which is a fairly brisk breeze for a model aeroplane. Although physical wind cues are missing, you'll see a transparent blue arrow which indicates direction, and hear you'll appropriate sound effects. Once you're ready, you can practise the manoeuvre sequence for the BMFA BPC or A Certificate using this scenario; indeed, if you intend to take a BMFA Achievement test, proper use of the simulator can improve your ability, readiness and confidence. Note that if you want to use a runway instead of a random patch of grass, the panoramic 'meadow' scenery has one. In my opinion, the meadow scenery isn't quite as good as the recreation ground for RC power flying because it lacks nearby visual cues such as trees and buildings; however, using the runway is certainly better for developing your take-off, approach and landing skills.

### **Slope Soaring**

Slope soaring is the area in which Picasim really excels and, for learning basic slope soaring skills, it's difficult to beat Picasim's 'cliff' scenery. It's not photorealistic, but in practice that doesn't matter; for me, the combination of sea, cloud-scape, wind noise and terrain is just like my favourite slope-soaring site at St Agnes Head in Cornwall. Importantly, the cliff has a good, flattish landing area downwind, which enables a beginner to practise the classic approach, landing and go-around techniques. I say 'classic' landing techniques because the advent of EP foam models means that the availability of a good, flat, into-wind landing area has become far less important. Such models can be landed more-or-less anywhere on the slope without fear of damage. Of course, if you intend to fly a traditional built-up model or a scale or scale-like sailplane, you'll need to learn the 'proper' technique. The simulation of the model's acceleration as you turn it downwind in preparation for landing, followed by deceleration and pitch up as you turn into wind for the approach, is simply superb.



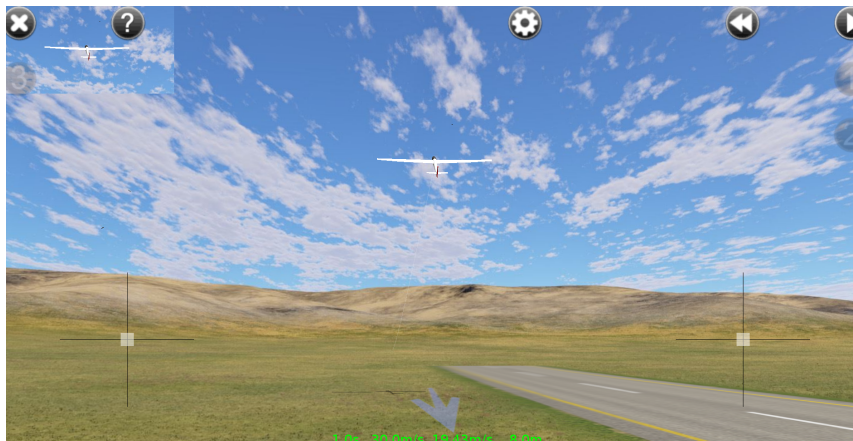
*Picasim's 'Cliff' Scenery Screenshot*

*Note the touch-screen controls, wind indication, speed and rate of climb/descent indication in the bottom half of the screen*

A word of warning though – if you use the default wind and turbulence settings, the glider becomes very difficult to control as it flies through simulated rotor streaming downwind from the cliff. To my mind, this is unrealistic and makes it very difficult, perhaps impossible, for a beginner to learn the proper slope approach and landing technique. Fortunately, this is easy to rectify by going into scenery 'advanced' settings and setting 'rotor tendency' and 'dead air turbulence' to '0'. These can be increased again once the basic technique has been mastered. With regard to models, the 2-channel glider trainer is good to start with, but as soon as you've mastered the basics you should move on to a 3-channel model. My personal favourite is the Chris Foss Phase 6, which is uncannily realistic, but there are plenty of others to choose from. The Neoslope glider is another good choice for basic-to-intermediate training.

### **Thermal Soaring**

For flat-field gliding, be it electric, bungee-launch or DLG, Picasim offers a wide variety of flat terrain options. The presence of thermals is indicated by soaring birds and, for unpowered thermal gliders, there is an audio variometer which increases in pitch as the glider gains height. There is also a digital indication of climb and descent rate on the screen. Thermal soaring is problematic for any RC simulator because, compared with power or slope, the model is usually flown higher and further away from its pilot. This means that, on a comparatively small screen, the shape of the model soon becomes difficult to pick out. Of course, this is a problem in the real world too, but limited screen resolution certainly exacerbates it. There are two work-arounds for this; firstly, use a large model eg ASW15 or Discus and, secondly, use the close-in view panel on the top-left hand side of the screen. It's best to try to find thermals that are as close as possible to the launch position, which will help you to stay in visual contact with the glider.



*Bungee-launching an ASW15.*

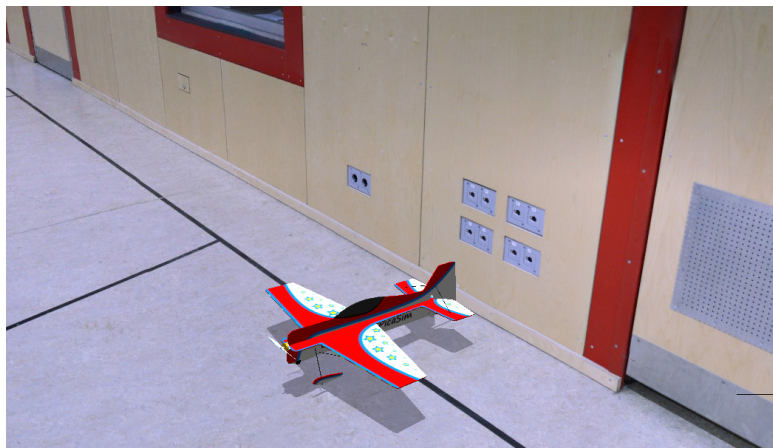
*Note the close-in view panel top-left*

For unpowered gliders, the launch itself is either by bungee or discus depending upon the model. For the bungee launch, the climb and release phases are realistic and can be unforgiving if you mishandle the glider. Just like the real thing, it's all too easy to stall and lose height unnecessarily at the point of release. For thermal flying, I like to avoid using the digital variometer indication; it wouldn't be there for real and, even if you had an RC system with telemetry, you should be looking at the model and not the transmitter's display panel. Nonetheless, I have to admit that it's useful, especially in the absence of other cues. As with the RC power simulation, once you've mastered the basics it's easy to practise the manoeuvres required for the BMFA Silent Flight or Silent Flight (Electric) 'A' tests; if you do so, it's worth using the runway threshold in the 'meadow' scenery to practise landing within 20m of the selected landing point. My only real criticism of the thermal soaring simulation is that one of the most useful cues for finding a thermal – ie the sudden unexpected pitch-up or wing rise which shows that the nose or wing has entered rising air – is difficult to see, whereas with a real model it's usually blindingly obvious. In 'advanced settings', it's possible to manipulate the characteristics of thermals, so there might be a setting which makes this effect more noticeable, but I have yet to find it. In practise, this is a minor problem; for me the reality of unpowered thermal soaring is usually a series of 2-to-3 minute flights interspersed by the occasional extended flight. That is what Picasim provides.

### **Advanced Aerobatics**

A simulator is great for learning more advanced aerobatic manoeuvres. My own preference is to use the recreation ground scenery with an indoor EP foam 3D model. I usually use the Eraser 5, which needs to be kept slow and close. This is a relatively slow-flying but fast responding model, which makes it easy to learn the control inputs required for manoeuvres such as inverted low passes, hesitation rolls, hovering, knife-edge loops and rolling circles. If the response is too fast, there is an option to slow the simulator down so that the aircraft flies in slow motion but, personally, I've never found this helpful for anything other than taking screenshots. Instead, I set up my transmitter with a lot of negative exponential (-60%) in pitch and roll which tames the initial response, but leaves full control deflection available. Once each manoeuvre has been mastered, it can be practised on the faster and larger Extra 3D. Moving on to indoor flying, the sports hall scene is excellent and the indoor 3D models provide some challenging flying. In many ways, this is the most realistic scenario of all; indoors, the lack of a wide field of view is far less important, there are no weather effects to contend with and if the model 'gets away from you', it hits a wall.





*Sports Hall Detail*

### **Picasim Set-up**

To allow Picasim to work with your transmitter, you'll need to ensure that it has a buddy-lead plug socket at the back. You'll then need to purchase a USB interface and an appropriate connecting lead. These are readily available on line; I bought mine on ebay from here:

<https://www.ebay.co.uk/itm/RC-USB-Flight-Simulator-FMS-Cable-Futaba-JR-ESKY/254021599924?hash=item3b24de02b4:g:xDYAAOSwd-pdAhHT>

The pack included several leads to fit transmitters from different manufacturers. Sadly, the quality of the leads is rather variable; the internal connections are easily broken and I've had one that left a pin in the transmitter socket. The only solution seems to be to take extra care with the leads; the option to buy higher quality items doesn't seem to exist. Of course, some RC systems have wireless dongles, which might be a solution to this problem, but I haven't had the opportunity to try one of these. Setting up the transmitter to work properly with Picasim is too complex to go into here – suffice to say that it can be very frustrating until you become familiar with the process. Fortunately, there are a number of on-line guides and YouTube videos available to guide you through it, or you can ask for advice from club members who are familiar with it. If all else fails, you can email the developer, Danny Chapman, who is, I understand, happy to provide new users with advice. Finally, I understand that it is possible to set the Android version up to use a standard RC transmitter, but not the IOS version. Personally, I've not done this and I'm unsure about hardware compatibility, but it would be worth looking into should you not have access to a PC.

In summary, a PC-based RC simulator that uses a proper RC transmitter to control the model can, if used properly, be an invaluable aid for learning to fly and preparing for tests. Personally, I wish that such systems had been available when I was learning; it would have saved so much frustration and heartache as yet another lovingly-built model turned itself into matchwood or landed in a pond. The only downside for me, as far as I can see, is that my repairing skills would be nowhere near as good as they are now. Nowadays I most often use my simulator to practise flying faster models, especially if I haven't flown them for a while. In my view, Picasim is one of the best RC simulators available – and not just because it's free. Of course, I've only scratched the surface of its capabilities here. If you haven't already done so, why not download it and give it a try.

Simon Burch