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**Great Planes**

**Generation 3 "Real Flight" RC Simulator**

by Francis DiNovio


As an instructor, it is getting easier to recognize when a very new student pilot has been spending time on an RC flight simulator. Without some simulator time, those first few flights are very tough for a student pilot. The controls are very new with effects that are difficult to interpret when the pilot has yet to learn just what a model airplane is doing in the sky.

During the first flights, the student pilot usually sees only two things – all blue and all green (or brown in treeless locations), might hear something moving in the sky and may occasionally spot a formless blur moving against the blue/green background. Most new pilots do well to keep the airplane's wings within 20 degrees of level on that first training flight. They have yet to learn to watch the wingtips, nose and tail as the key indicators of their aircraft's future flight plans. Making a level turn yet remains a few flights in their future.

But the very new RC pilot with simulator time has an advantage. The controls and their responses are familiar after some hours flying around the virtual skies. The new pilot's usual tendencies to over control are not as evident. Best of all, the pilot has experienced watching the airplane and coordinating its movements with the control sticks.

While the skills learned on the simulator are not sufficient for a brand new pilot to get a real-world airplane up and down safely, the instructor knows immediately that this student has had simulator experience. The learning process can be accelerated a little as the new pilot has a better understanding of the instructor's directions and is better able to follow them.

Finally like all learned skills, learning to be an RC pilot benefits from the student being able to practice often. But most new pilots are only able to practice actual model flying on the weekends and even that is subject to inclement weather. Long gaps between practice flights mean that the student must often relearn skills practiced last time rather than moving quickly on to the next challenges.

Having a good RC flight simulator enables the student pilot to practice everyday. That is, assuming the pilot can get the "kids" away from the computer for a while. If the simulator accurately reflects real-world RC flying, the frequent practice sessions results in less "re-learning" during actual flight sessions.

In the end, initial and continued simulator flight time speeds the learning process on several levels. As a guess, and this is just an opinion, a good simulator will shorten the learning period by about 25%. But whatever the actual advantage might be for an individual pilot, a good simulator makes learning easier while adding to the fun.


Photo 1 Photo 2

Before the original Great Planes' "Real Flight" simulator was introduced several years ago, I got my first one in the mid-to late 1990's, the few RC simulators available used illustrations for graphics and were not all that realistic regarding flight characteristics. Real Flight was the first RC simulator whose aircraft actually flew much like their real-world counterparts.

The best part was that the graphics were photo quality. The flying fields were actual model airports; complete with all their foibles like trees near the runway, hills and obstructions. The aircraft looked and flew like the real thing. True, there were some shortcomings. The pilot could fly outside the "world" for example. But on the whole, the first Real Flight simulator was ahead of the other simulators.

Real Flight's excellent graphics and realistic flight simulations caused the other simulators to upgrade their systems. The result is that the RC pilot today has many excellent simulators to choose from. But Great Planes also did not rest on their first achievements either. They have also continued to upgrade Real Flight and to introduce various expansion packages over the years.


Photo 3

The latest Real Flight RC Simulator is called the G3, for Generation 3, and is by far the best Real Flight yet. Photo 3 shows just a few of its abilities. The basic package includes 42 different aircraft, from the original Wright Flyer to turbine-powered jets and even a TwinStar to practice engine-out twin flying. The graphics are outstanding and the airplanes fly exactly like the true models.

There are ten new airfields that cover 5,000 square miles of territory presented in TrueLife Terrain™ detail that includes elevation changes like mountains, valleys and rolling fields. Five flying fields, the most popular ones, from the previous G2 edition are also included.

The basic package includes a 7-Channel transmitter with dual rates on the elevator and ailerons. The sixth channel is proportional using a rotating knob. It is primarily used for flaps. The fifth channel is the usual on-off switch used for retractable landing gear. The transmitter has a USB cable that will work with USB 1 or 2 systems. Your computer should have a USB port to best work this simulator.

That subject brings us to:

**SYSTEM REQUIREMENTS**

| MINIMUM | OPTIMUM |
|---|---|
| Windows XP, 2000, ME 98 | Windows XP |
| Intel Pentium 1.0 GHz or equivalent | Intel Pentium 3.0 GHz or equivalent |
| DirectX 9 or better | 3D Accelerated Video card 128 MB RAM |
| 3D Accelerated Video card 38 MB RAM | 1 GB RAM |
| 256 MB RAM | |

The G3 Real Flight simulator always includes its own transmitter. But using your own transmitter is possible as connecting cords are enclosed. However, the hassle involved in using your own transmitter doesn't make it worthwhile in my own opinion. If you do not have a computer transmitter, then the trims may need resetting, as may the control surface travel directions. Using a computer transmitter allows the simulator settings to be stored in a separate "model" memory.

With either type transmitter, you must be certain to reset everything before going to the real flying field or disaster may await you there. There is also the matter of charging the transmitter batteries. While the battery drain during simulator use is not that great, the RF circuit is usually not activated when using a trainer cord, it is still present and the transmitter always seems to lose power just when things are getting interesting.

Are all these hassles, and possible model loss, worth it just for the dubious advantage of having the same "stick feel" while flying the simulator and the real world model? First, most beginner transmitters all feel about the same. The G3 InterLink™ controller feels exactly like these transmitters. Second, when the feel is different, so is the pilot's perspective simulator to real world. Fly real world and simulator for a while and your brain automatically adjusts for stick feel based on your perspective. But if you insist, by all means use the provided cord and your own transmitter. Just remember to reset everything before leaving the virtual sky for the real one.

## Simulator Usage

### Flying Fields

There are fifteen different flying fields in the G3. Five are from the older G2 version but are still very challenging. These fields are far smaller than the ten G3 fields. The simulation ends if you fly outside their boundaries. The five fields are:

Black Rock – A dark, overcast sky with forbidding clouds that top out at about 17,500 ft. I reached them in a turbine powered F-86 Sabre Jet. Above the clouds, the Black Rock entire world can be seen using the cockpit view. The runway is gravel and short.

Fun Fly – A small field full of people and tents. There are lots of cameras and obstacles. Fly past the mountains and the simulation ends.

Green Valley – A nice field in a tree rimmed valley with some other fliers and lots of livestock you can scare.

Rainbow Canyon – This is the field used in the limited simulator supplied with the NexSTAR basic trainer. The rainbow is there, but the river valley is far more interesting. Unlike the NexSTAR simulator, you can fly through these valleys. Don't get caught in a blind one though unless you have plenty of climb power. The big Ultimate biplane is a good airplane for exploring this unique terrain.

The Real Flight Park – Another limited valley airport with a few tents and lots of trees to make sure you stay on the straight and narrow approach.

The graphics for these fields are excellent but the area is limited. They are great for RC practice and each offers challenges to any pilot. The runways are short and the approaches narrow. Flying RC from these airfields will never get boring.

### G3 Flying Fields

Photo 4

These airports are the heart of the new G3 simulator. The Real Flight Ranch field shown above has an open approach and a good-sized runway. But it is over 4,000 ft. high. Your airplane will not have as much power as it would at sea level nor will the propeller work as well or the wings develop as much lift. Good practice to learn how altitude affects flight performance.

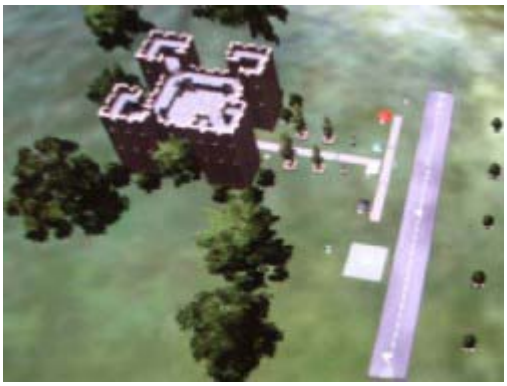

Photo 5 Photo 5A

The Castle field has a long runway but the approaches narrow on one side. Yes, you can land a helicopter on the castle roof if you wish. Don't let the airplane get behind or the trees will hide it.

Photo 6 Photo 7

You can fly any RC airplane off Observatory Hill. But you can also slope soar an Eagle (Hawk?) or any glider from this field as well. It is a good learning experience to fly the Cap 232 or Ultimate Biplane off this milder cliff as well.

Photo 8

If you want a real slope soaring experience, plant your virtual feet on the stone overlook of the Sierra Nevada Cliffs; 8,000 feet up with winds blowing from 35 to 58 mph. Here you can slope soar all the many gliders and even most of the power airplanes. Just don't get caught downwind trying to get back to the landing area cause you just ain't gonna to make it back.

Photo 9 Photo 10

The Palace (photo 9) has a runway just made for jets and the larger scale airplanes. You can even fly small electrics inside the stadium. Joe's Garage is a wide open flying field. This airport has a few "Easter Eggs" located in and around it. In fact, several of the airports have hidden aircraft or representations of the people who created this great simulation if you taxi around looking for them.

Photo 11 Photo 12


Photo 13 Photo 14

There is an obstacle field as well. Called the “Obstacle Course” (a coincidence no doubt), this field features limbo flying over varying height limbo bars (photo 11). There is also a circular course of rings at different heights and curvature rates that is a real challenge to fly (photo 13). Probably one of the most fun courses to fly is the cross country tube course. This challenge runs about 50 miles over wooded mountains and plains and uses tubes about 40 feet long suspended at varying heights and curvatures that the pilot must fly through...

However, you cannot fly any of these obstacle courses “RC”. That is, you cannot fly through the ring circle, over the limbo or cross country through the tubes using the regular “pilot on the ground” RC position. Flying these obstacle courses means that you must either be in the cockpit view mode (photo 14) or flying chase above and behind the aircraft (photos 12 and 13).


Photo 13A Photo 14A

However, the G3 does contain the more traditional limbo bar flight that can be flown “RC” as well as spot landing, pylon racing and auto-rotation for helicopters. These 3 events can be flown online as well in the multiplayer mode. A nice feature is that these events can be placed at any of the airfields in the G3. The airplane in photos 13A and 14A is the famous Bulldog pylon racer designed by Robert Hall after he left the Granville Brothers (of Gee Bee fame) design team.In all, there are actually 17 different airfields in this version of Real Flight. The box says 15, but there are two more pictorial fields available as well. With all the different flying fields and various activities, plus the cross country flying available on the 10 G3 fields, you will never get bored with this simulator.

**The Airplanes**

Photo 15

Photo 16


Photo 17 Photo 18

Photo 19

A choice of 42 different airplanes is available in the G3 simulator. These range from high-performance aerobatic airplanes like the Yak 54 and Ultimate Biplane through large and small scale aircraft like the big Top Flite P-51 Mustang and the AT-6 Texan to some hot jets like the L-39 (195 mph!).


Photo 20 Photo 21

You can also fly great sport airplanes like the Great Planes Ultra Sport ARF in photo 20. This 40-size airplane, a good third aircraft in the real world, features retracts and a strong 46 pulling it around. The Space Walker in photo 21 is more gentle but still capable of some good sport aerobatics.


Photo 22 Photo 23

There are park flyers, electric versions of glow airplanes, scale aircraft, fun fly airplanes with giant control surfaces and small wings, eight or more gliders, flying wings and even some unusual aircraft like the original Wright Flyer, a real challenge to fly, and how about a blimp?


Photo 24 Photo 25

The G3 has 42 aircraft to fly so we cannot picture all of them here. This includes about a dozen different helicopters. There are high-performance aerobatic helicopters and more sedate scale machines. There are several electric powered helicopters and some large enough to be powered by 60-size engines. The helicopters perform well but there is no “training mode” to allow a new helicopter pilot to learn by flying one axis, usually yaw, while the computer takes care of the others. All controls are required all the time.


Photo 25 Photo 26

Having all these airplanes, helicopters and flying fields is great. But what about the Real Flight G3 as a training tool for new pilots? Besides having some of the easier to fly sport airplanes like the Space Walker, the Ryan and the Cessna 182, the G3 has two honest to real basic trainers.

The first is the famous NexSTAR by Hobbico. This aircraft is reviewed in Sport Aviator and has the 3-axis flight stabilizer system. The G3 offers the aircraft both ways, with and without the stabilizer. Even though all of this simulator’s aircraft can be modified, there does not seem to be an easy way to just remove the

NexSTAR's leading edge cuffs or flaps. Simulating such removal would require knowing each feature's effects on the aerodynamic data presented in the modification charts and most of us just don't know that information.

An even simpler basic trainer is the PT-40. This aircraft has been around for years and has trained so many RC pilots that they could form a fair sized air force on their own. The PT-40 has more dihedral than most basic trainers yet still has ailerons. The airplane self-rights more than usual for an aileron-equipped aircraft and has a landing speed somewhere down near the negative number scale. (Well almost negative anyway)

The G3 allows the user to modify all the airplanes in its memory. The user can also modify each airport; adding or deleting structures, changing the runway's shape or size and can even modify the clouds. It takes a while to learn to do this can be a lot of fun. You can even create your own flying field if you care to but that does take a lot of knowledge. For me, the 17 flying fields in the G3 are more than enough.

Of course, the user can vary the wind speed and direction to the point where it is not possible to fly. So if you like a challenge, try landing the Yak 3D on a narrowed Castle runway with the trees moved closer to the runway in a 40 mph crosswind. Why 40 mph? Because the current AMA wind speed limit for aerobatic contests is 40 mph so that sort of practice can help competitive flyers.

**How Real Is The Flying?**

Photo 27 Photo 28

Any flight simulator can be fun to fly and will help improve flying skills. But the more closely a virtual airplane's flying characteristics mirror the real world version, the more meaningful the learning experience. The first Real Flight simulator featured Real Physics™ that made it the most realistic simulator then available. The G3 version features updated Real Physics that are more precise and accurate for the most realistic Real Flight RC flying experience yet.

Obviously, I have not flown every one of the 42 models available in the GT3. But I have flown the NexSTAR, the Space Walker, The PT-40, the Large Top Flite Mustang, the Great Planes Ultimate Biplane, the AT-6 Texan and the Twin Star. While no simulator program can perfectly and exactly match an aircraft's real world performance abilities, the G3 comes close.

Where it does deviate, it errs on the side of caution. For example, the G3 NexSTAR stalls, power off, at 18 mph. The real World NexSTAR had the slowest power-off stall speed of any aircraft Sport Aviator has ever tested – less than 6 mph.

Photo 29

The Twin Star, also reviewed in Sport Aviator, has a single engine Vmc, **V**elocity **m**inimum **c**ontrol, of about 29 mph in the real world. The G3 version seems to reach Vmc at about 33 mph. That isn't much difference. In fact, the difference is negligible since 33 mph becomes 29 mph very quickly in a single-engine climb. Vmc is the airspeed below which an aircraft's rudder can no longer keep the nose straight with the right engine developing full power and the wings holding no more than a 5 degree opposite bank (impossible to see in the air). Slow too much and the airplane will roll inverted and head earthward.

Kill the engine? Sure you can. Just hit "K" on the keyboard and the engine will stop. On the Twin Star, sometimes it is the right engine that quits, sometimes the left and sometimes both at the same time! Hitting K on a single engine airplane means Dead Stick!

But for the most part, all the G3 airplanes fly very much like their real-world versions. The big Top Flite P-51 is heavy on the elevator and fast on the ailerons just as it is for real. The PT-40 generic trainer flies like a light version of the Tower Hobbies Trainer 40 Mk II. It even self-rights itself in a steep bank just like it is supposed to do.

The 10 pound AT-6 Texan Advanced Trainer, in the full-size world not in model aviation, hangs in the air with the flaps and wheels down like it always does at the field. The left wing is heavy just like always and a lot of down elevator is required at any airspeed over about 30 mph when full flaps are deployed. In short, I defy anyone to find a virtual vs. real world difference for this aircraft.

I can not find any differences in the remaining aircraft I have flown either. There might be small variances but they just cannot be meaningful or identifiable. The G3 is a very accurate representation of the real world. It is probably safe to assume that this accuracy extends to those remaining 34 G3 aircraft I have not flown.

Photo 31

This accuracy even reaches to the crash scene. While a crashed airplane may not show all the tiny pieces found in a real-world re-kitting, the major sub assemblies have no trouble separating from the fuselage. There is no doubt that this was a completely crunched aircraft! And if the visual clue was not sufficient, the crash is accompanied by the most sickening "crrr-inching" noise I have ever heard.

The former version, the G2 simulator had at least five add-on programs that expanded the airfield and airplane inventory. These expansion packs work just as well on the G3. There is even a new G3-only expansion pack available as well. In the near future, we will be reviewing all these expansion packs here

in Sport Aviator. As a guess, the G3, with all the expansion packs, has more than 100 aircraft and probably over 30 airfields available.

The G3 offers so many options it is not possible to describe them all. In addition to changing any aircraft or field parameter, you can record your virtual flight for posterity using the camera option. Follow from behind the airplane or fly from the cockpit. There are “Easter Eggs” spread around the various fields; can you find the full-size AT-6 Texan? All types of 3-D flights are possible including Hovers, Harriers and Blenders. You can even put a gyro in the big Yak 54. I would guess that it would take a year of dedicated simulator flying to learn all the variations the G3 has. By then, you will have become one of the best RC pilots at your field

For now, the G3 offers an extremely realistic flight and learning RC experience. It also has some “games” that provide a mental relief during those learning breaks we all need. For more information on this excellent and varied product, go to www.realflight.com .You will have to excuse me for now. I need to get another helicopter lesson and some more “Harrier” landing practice.

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