

Mike Tallman flies his gorgeous white-and-red FIGT racer. He finished third in the overall championship for the year.



Two Formula 1 GT racers round a pylon and speed up as they head for the straightaway.

USRA RACE OF CHAMPIONS III

THE EXCITING WORLD OF GIANT-SCALE AIR RACING

If the idea of huge, high-powered, gorgeous model airplanes roaring around a racecourse excites you, then giant-scale racing may just be for you. Be prepared, though, because it can be expensive and time consuming, just like the full-scale racers at Reno.

Giant-scale model airplane air racing was started twenty years ago by Tom Easterday and Cliff Adams. A couple of years later the Unlimited Scale Racing Association (USRA) was formed. The USRA is an AMA special interest group dedicated to

promoting the air race format.

In a nutshell, the goal of giant-scale air racing is to recreate the excitement of the full-scale Reno air races, but with large-scale, high-powered models. The classes mimic those of the full-size racers, with names such as Formula One and Unlimited, as do the airframes that, in some cases, look much like those of the Reno racers.

Chris Justus is captured in this photo piloting his unlimited racer just moments before its takeoff.



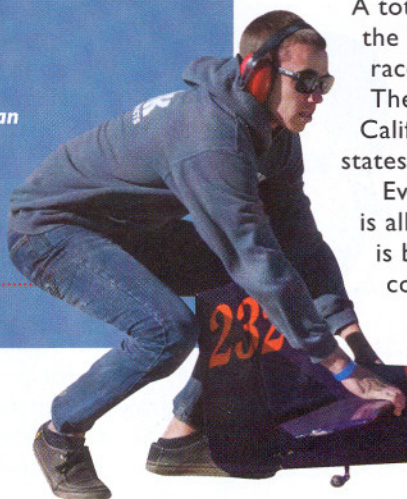
RACE OF CHAMPIONS

We attended the premier USRA event of the year, dubbed the Race of Champions. This year's event was held at the Rabbit Dry Lake Bed in southern California. This is an excellent location for an event of this type because it is a huge open area, with a dry lakebed for the models



Logan Shaw flies his unlimited racer low and fast right in front of the pilot's area. Ear protection is a must!

Unlimited racer Logan Shaw is moments before takeoff. Even at idle, the pull from the engines is substantial.



Tom Keating, designer of the Stiletto, gets ready to race his unlimited airplane. He finished in second place at the Race of Champions III.

to take off and land on. The weather could not have been better either.

A total of 33 pilots attended the 2012 races, which offered racers five different classes.

The competitors traveled to California from a number of states to compete.

Even though each airplane is allowed only one pilot, it is best to think of the competitors as

teams of three. The spotter tells the pilot when to turn the airplane, as well as where to fly it so he can avoid mid-air collisions. The spotter's job is extremely important and makes a significant difference in the outcome of a race. The third team member is the engine mechanic. Racing is all about performance, and only an engine running at peak efficiency will result in winning races. During my weekend at the races, I saw a malfunctioning engine completely rebuilt in a matter of minutes. This is a testament to the skill and dedication of the mechanics.

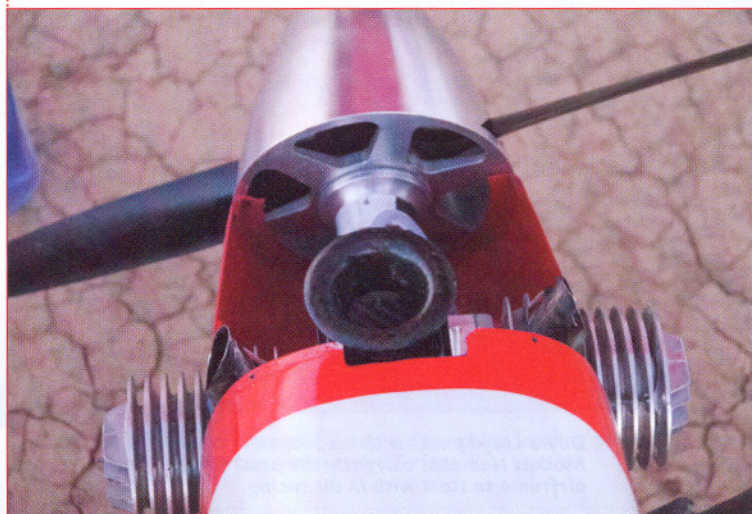
UNLIMITED CLASS

The USRA Unlimited class is the most popular, as well as the most eye-popping for the spectators. These monstrous airplanes weigh 25 pounds, have wingspans of eight feet (2.5 meters) and zip around the pylons at speeds approaching 250 mph (400 kph). It is very difficult finding words to describe what it is like to hear and watch these powerful machines in action.

Although many different airplane designs can be



Look at the engine detail of Peter Goldsmith's unlimited racer. Instead of using a carburetor, these engines use mechanical fuel injection.





The outstanding Miss Ashley model was piloted by Dave Smith for Team Extra—easily the fastest airplane at the meet.



Craig Grunkemeyer is shown with his unlimited racer during a takeoff. Pilots fight a massive P-factor (rolling moment) right after takeoff.



Richard Verano won the Formula 1 Pro season championship easily, flying his GR-7 airplane.



David Lloyd poses with his Seagull Models Nemesis, currently the best airframe to start with in air racing.

flown in this class, two dominate. One is the Stiletto, which was designed by Tom Keating. In fact, Tom was the second place finisher in the 2012 Unlimited race. The other airframe is called Miss Ashley, which was flown by the fantastic Team Extra. They flew it to a first place finish. Both designs are scale models of the North American P-51D Mustang.

If you have a want to get involved in Unlimited Class racing you must know that these airframes cost about \$2500. The airplanes are composite kits. Also, you'll need to outfit the airplane with digital, high-torque servos, such as the Futaba S9157 and JR DS8711, which cost about \$140 each.

The engine of choice for the unlimited airplanes is the Desert Aircraft DA-170. This is an eight-pound (3.5-kg) powerhouse that sells for \$1700. Be prepared, however, to spend another \$700 to get it race ready—clearanced, heads

ported and glow plugs installed. After it is ready to race the engine will turn a 21x27 custom propeller at 10,000 rpm. The DA-170 two-stroke engine normally runs a gasoline and oil mixture for fuel. However, for the power needed for unlimited racing, the fuel is a mixture of alcohol (10%), nitromethane (30%) and oil (6–8%). Think of it as turbocharged glow fuel. And, at their high-power levels, these engines burn 20 gallons of fuel an hour. This is comparable with the fuel-burn rate of a full-scale Piper Cherokee Six, but that is a 3400-pound airplane! Because of the race modifications, the engines idle at over 5000 rpm. Consequently, you could never slow down the airplane for landing with the engine revving that much. Therefore, every landing of an unlimited racer must be made dead stick.

These exotic race airplanes typically need at least four control channels just for power.

One channel is obviously used to control the throttle. Another is used for the mixture—it is programmatically slaved to the throttle channel in the transmitter. Another channel is for fuel shut-off, critical for the dead stick landings.

Sundowner class airplanes prepare for takeoff. The model numbered 44DD in the foreground is a Seagull Models Nemesis.



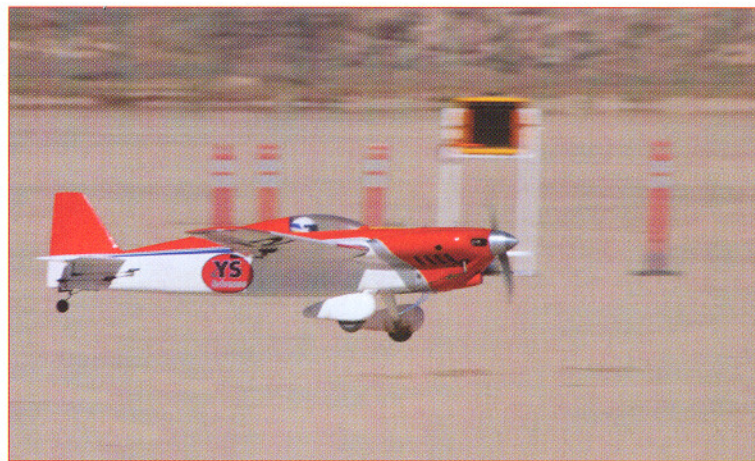
Austin Shaw flew his beautifully detailed Pole Cat racer in the Formula 1 Pro class.



Mark Zeal's GR-7 is captured doing a dead-stick landing after it completed a heat in the Formula 1 GT class.



August "Auggie" Haupt finished third in the 2012 California race with his GR-7 in the FIGT class.



Randy Ritch's airplane is shown speeding past when it takes off in the Formula 1 Pro class.

- ➔ The fourth channel is used to dump excess crankcase pressure. This air pressure is used to pressurize the fuel tank.

SUNDOWNER CLASS

It would be foolish to get started in giant-scale air racing by jumping feet first into the unlimited class.

A far better starting point is the Sundowner class. In order to compete in this class the Sundowner must be flown stock, with a stock engine such as a Moki 2.10.

The Sundowner airframe is no longer being produced, so you'd likely need to find one on eBay or such... However, an increasingly popular replacement is the Seagull Models Nemesis. The kit goes for about \$400. The Moki is about \$250. So, you can have a race-ready airplane for about \$1000, including the remote control system.

The airspeeds of Sundowner class airplanes are in the neighborhood of 100 mph (160 kph). This is more moderate than the unlimited racers, and it provides the pilot time to react as the airplane zips around the pylons. Even at the 100-mph rates,



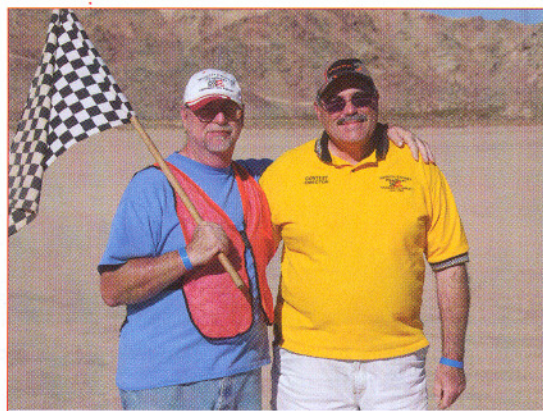
Team Extra poses with their fantastic airplane. (L-R) Tom Easterday, Don Nash, Terry Raymond and pilot Dave Smith.

the Sundowner class still makes for exciting racing.

SAFETY

You might be wondering just how safe the format and airplanes are as they streak around the racecourse. The answer is, they are surprisingly safe. The USRA is justifiably very proud of their safety record. For example, we were not allowed near the flight-line until we had reviewed their safety procedures. Also,

(L-R) Dennis Fuchs, race starter, and Tony Husak, contest director. Tony has been an AMA CD for 20 years. These guys did a fantastic job.





Chuck "Chuckenator" Hebestreit has a hard landing after an F1Pro race. He is a member of the large Wreckless racing team.

we were required to wear a safety helmet, and have a spotter. Frankly, we were thankful that they took my safety so seriously. In the more than 250 race flights we witnessed over the weekend, not once did we see a situation that even remotely put a person in harm's way—impressive! We were an eyewitness to a couple of spectacular crashes. In one, an airplane literally exploded as it was flying around the course. The consensus was that an engine failure caused a violent vibration that literally shook the airframe apart. In the other, an airplane's propeller tore through the wingtip of another as they rounded the pylon. The pilot of the first airplane subsequently lost control, and his airplane then suffered a high-speed impact with the ground.

FINAL THOUGHTS

To host an Unlimited class race, the site must be large enough to provide an area for the pylons to be 2000 feet (600 meters) apart.

Many model airplane sites are simply too small to safely accommodate a racecourse of this size. In fact, the official USRA rules recommend taking over a full-scale airport to hold a giant-scale event race. This is obviously a challenging option for most clubs.

Just like the full-scale Reno air races, the roar of the engines is a large part of the excitement of the racing experience. We found their throaty, deep rumble intoxicating. In this day and age of widespread noise restrictions at RC airfields, these "screamers" would undoubtedly make it difficult to sell a club on hosting an event, and certainly selling it to surrounding communities. Putting mufflers on unlimited racers would result in a very different experience, if not performance level.

Cost must be considered too. If you add up what you'll spend to get an unlimited racer ready it will likely set you back about \$5000. So, you might want to consider buying a

Vendors

Unlimited Scale Racing Association

usrainfo.org

Giant Scale Air Racing Primer

teamerica.org/GSR/indexGSR.html

Reno Air Racing Association

airrace.org

Desert Aircraft

desertaircraft.com

Seagull Models Nemesis

seagullmodels.com/ProductDetail.asp?id=94

Onboard Video from an F1GT USRA Racer

youtu.be/JatISaB35gQ

USRA Race October 2010 Winslow

youtu.be/JatISaB35gQ

USRA Race of Champions II


youtu.be/phN9J6pA6YY

Giant Scale R/C Air Racing: the Good, the Bad, and the Ugly!

youtu.be/Pnu8wzi6YfA

used airplane. Alternately, an entry-level Sundowner class is definitely affordable. We'd add that the cost of giant-scale air racing compares favorably with the cost of competitive aerobic International Miniature Aircraft Club airplanes, if not less.

No matter the cost or time you'll need to dedicate to it, Unlimited class air racing is intoxicating. Several pilots told me that this is their favorite type of flying. The camaraderie and sportsmanship demonstrated by all the participants at the 2012 USRA races set a high standard for other RC competitions.

If you are looking for a new challenge, and to become a much better pilot in the full sense of the word, giant-scale air racing is hard to beat. 

Marty Treat, Formula 1 GT World Champion for 2012.



Richard Verano, Formula 1 Pro World Champion for 2012.



Dave Smith, Unlimited World Champion for the 2012 races.

