

The Light Sport Repairman

A Story of Alchemy & the Peanut

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Since the advent of the Light Sport rules in 2004, many have benefited from its versatility. Sadly, others believe there are limited commercial opportunities related to light sport, but as George Washington Carver is quoted as saying, "Fall in love with the peanut and soon it will reveal all of its secrets to you."

There are those who have built businesses around manufacturing and selling LSA aircraft, kits, engines and accessories; others have profited from publishing books and software about the rules and how to obtain the airman's certificate. There are those who have found opportunities as flight instructors. These are all ways to turn a seemingly non-commercial set of rules into profit centers.

This peanut has revealed much to me in the last few months in the form of the LSRM-A certification. This is the Light Sport Repairman with a Maintenance rating for airplanes. With 120 hours of training, a qualified person can perform maintenance and annual condition inspections on Special Light Sport Aircraft (S-LSA) and Experimental Light Sport Aircraft (E-LSA). As an LSRM, the holder of the certificate

can maintain their aircraft and also perform such work for hire. The LSRM rules do not allow the holder to maintain or inspect Standard Category LSA qualified aircraft like the Ercoupe 415C, Luscombe 8A or Piper J3 Cub. Note that there is also a 16 hour course that allows the holder of that privilege to perform condition inspections on their E-LSA, this is the Light Sport Repairman with an Inspection rating (LSRI). It does not qualify the holder to work as a repairman for hire or work on an S-LSA.

My mechanical pinnacle, prior to completing the LSRM-A, is a 1930 Model A Ford closed-cab pickup truck. A ground up restoration which included an engine rebuild, woodworking and extensive metalwork. Even though I had a little experience via this flivver project, there are no prerequisite mechanic skills or even a pilot's certificate needed to obtain this rating.

While walking through the hangars at AirVenture a few years ago, I noticed the Rainbow Aviation Service booth. I had recently read Carol and Brian Carpenter's book, *Sport Pilot Airplane: a complete guide* and recognized them. As I

approached, they were discussing the LSRM with several people. My work schedule would not allow me to attend a 120 hour course because it is scheduled over three continuous weeks. The Carpenter's took my information and I grabbed a brochure. That spell-binding brochure shifted back and forth on my desk for months. Two years after our brief discussion, I received a telephone call from Carol. "Hi John, still interested in the 120 hour repairman course, I just received word from the FAA that we can offer it over three non-consecutive weeks?" I was impressed with this follow-up call after two years and she even remembered my situation! If they could register a dozen students for this special schedule, they would hold the class. My deposit was mailed the next morning.

Changes subsequently occurred in my business schedule. Carol and Brian were accommodating and I attended at Oshkosh, WI for the first week of class in September and then at Corning, CA for the second and third weeks in October and February, respectively. This gave me the unique opportunity to experience the course at the headquarters of both the EAA and Rainbow Aviation Service.

My LSRM experience placed me with a diverse student population. They included a recent high school graduate starting a new career, a Designated Pilot Examiner, a US Navy veteran of the Iraq war currently employed by one of the new LSA airplane companies, a circuit court judge running for re-election, the owner of an LSA manufacturing company and several doctors of both the medical and research species. Experienced home builders and general enthusiasts like me rounded out the group. All turned out to be talented when it came to the work that brought us together. The cohort size is kept to about twelve people. Much of the work is done in

teams and pre-planning is done to match experienced people with those who are a bit greener. Camaraderie formed quickly, everyone was eager to learn, and patience was the norm. No one was left behind.

The course syllabus is straight forward. While I worked toward the Airplane rating, Rainbow also offers this training for Weight Shift and Powered Parachute aircraft. Lighter-than-Air and Glider are also future possibilities governed by the rule. An individual can earn any aircraft rating or a combination. The hours and cost would differ, but again, therein lays the versatility. The rating includes four training modules – three Core and one Elective (choose one or more Airplane, Weight Shift, Powered Parachute). Each module includes a required amount of lecture and hands-on practical experience.

Here is a brief view of the modules in the Airplane course, the minimum time required and an abridged list of the elements:

Module 1 (Core) is a sixteen hour Regulatory Maintenance Overview unit including elements on the ASTM consensus standards by which LSA are certified, requirements of the rules governing LSRM, record keeping, and safety.

Module 2 (Core) is a twenty-four hour Airframe General unit including elements on hands on weight and balance, performance of minor repairs and alterations, inspection of structures, and the electrical system.

Module 3 (Core) is a forty-five hour Engine and Propeller unit including elements on 2 and 4 cycle engines, service and inspections, trouble-shooting, propeller theory and maintenance, propeller repairs, electrical and mechanical engine instruments, and accessory removal and replacement.

Module 4 (Elective) is a thirty-five hour Airplane Class unit including elements on theory and operation of flight controls (remember there is no requirement to be a pilot in order to earn this certificate), aircraft rigging



Gabe Dellaventura and John team up to properly tension an aileron control wire during the first week of class. (photo Jason Golden)



One team works to get an accurate revised weight & balance on a Kit Fox as they lift a wing so a scale can be placed under the main landing gear. (photo John Craparo)

"Fall in love with the peanut and soon it will reveal all of its secrets to you."



Everett Perkins proudly shows off his spark plug rack aluminum fabrication project. (photo John Craparo)

of flight controls, inspection, removal and recovering of cloth on wings and tail surfaces, removal and installation of the engine and accessories, trouble shooting and adjustment of carburetors and magnetos, composite materials and repairs.

While designed around light maintenance and inspections and the regulations governing the privileges of the LSRM, the potential for broader privileges exist. Under the rules an LSRM can take on heavy maintenance if they receive training in advance and a Letter of Authorization from the manufacturer of the LSA aircraft. For instance, Rotax has partnered with Rainbow Aviation and after a student passes a Rotax specific comprehensive examination a Service Specialty certificate is issued to LSRM-A graduates for the 912 series engine. This was an unexpected extra of taking the course with Carol and Brian.

Our textbooks consisted of specially prepared slides bound in an indexed three ring binder, the FAA's Aircraft Inspection, Repair & Alterations: acceptable methods techniques, & practices (sic) - FAA AC 43.13-1B/2B, and various manufacturer and aircraft parts manuals. Supplemental material included videos and FAA FAAST online courses which we completed in the computer labs or for homework.

All materials and textbooks used in the course are included in the tuition. You have the option of bringing some of your own hand tools. Carol and Brian act as a teaching team and their technical assistant, Jason Golden, provides practical advice on everything from looking up part numbers to teaching proper wing stitching technique.

We worked in three settings at both locations -- a classroom, a lab, and a hangar. Safety is emphasized at all times. The classroom is where the lectures and many workbook exercises take place. Carol's lectures center around regulations and jurisdiction, use of checklists, compliance with Safety Directives, aircraft type certification, tools, workshop safety, ASTM Consensus Standards, sound business practices, and record keeping. The exercises include continuous emphasis on finding current maintenance procedures for particular aircraft, compliance with manufacturer instructions and directives, and writing proper logbook entries.

Lab work includes setting up an online IACRA account and starting the 8610-2 rating application for issuance of the certificate by the FAA. In the bench lab, safety wiring of carburetors and propeller hubs takes place. One exercise had the class measure,

identify and find the part numbers for about sixty bolts, nuts, rivets and other hardware items. Emphasis was placed on accurate measurement and metal identification. Here we also cut open and analyze the contents of oil filters using various re-agents that would identify debris through chemical reactions. Tube fitting, fastening and fabrication were practiced and we built out a pitot static system with working instruments. Two lab projects involved fabricating complex aluminum parts from plans. These projects required calculations to insure cutting and bending were done accurately. The metal brake was used to form the parts with the correct placement and radius of bends. Parts were attached with bucked rivets. Individual work was rated based on proper symmetry, riveting technique and compliance with the strict tolerances called for in the plans. One quickly realizes how lopsided a complex part becomes due to a one millimeter measuring error.

In the hangar we had access to a variety of airplanes. These included a brand new Remos, a Kitfox, an experimental Ranger, a Diamond motor-glider and a Standard Category Ecoupe. We practiced doing full weight and balance calculations after placing aircraft on scales; repairs and balancing were conducted on wood, metal and composite propellers; rib stitching and fabric repairs were completed, and inspection holes, drains and covers were installed. One element included repairs to fiberglass surfaces after Brian used an auger bit to form a nice gash in a complex curved part like a salvaged wheel fairing or wing tip. After scarfing the surface around our damaged part, we did an epoxy and glass cloth multi-layer repair to bring it back to original condition per 43.13-1B 3-3. Sanding and finishing were required and a grade was assigned for difficulty of the repair, its strength and the aesthetic result. We also worked to remove and replace engine accessories. This included retiming magnetos, gapping piston rings, performing compression checks and synchronizing dual carburetors on the Rotax 912 series engine.

Practical elements of the students work are continuously graded over the 120 hours. The instructors never

hesitate to say, “Do the whole thing over please” nor do they hesitate to sit down and help you through the rough spots. On the last day of the course, a timed fifty question FAA multiple choice written examination is conducted. By the time the exam comes around, the student is well prepared to pass.

The course and elective modules are offered several times a year both at EAA headquarters in Oshkosh, WI and at Rainbow headquarters in Corning, CA. Rainbow also offers the 16 hour LSRI discussed earlier in the article. Comfortable value-priced accommodations are plentiful minutes from both venues. Drive-time to either location is about two hours from the major airports serving Oshkosh and Corning. Downtime can be spent exploring things like the EAA aviation museum, meeting new people at barbecue fly-ins and pancake breakfasts, touring aircraft factories, and even taking a tour of an olive farm and processing facility in Corning. Did you know that all olives are soaked in lye to make them edible! Many of these group activities are arranged in advance by Rainbow.

Adding to the versatility of the LSRM rating, the holder of the certificate can log all worked performed and after 30 months apply to take the licensing examination for A&P. The LSRM attests to their own work and does not have to work as an apprentice or attend a resident course of study. One of Rainbow's former students received his A&P this way.

The course is challenging and fast paced. It is taught by intelligent, interesting and caring people who are tremendous advocates of general aviation and the Sport Pilot movement. I fell in love with this peanut and it will certainly turn into gold as I gain experience and a customer base.

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TOP TEN

Reasons to Choose Rainbow Aviation's Light Sport Repairman Maintenance Course

1. Rainbow Aviation professors are trusted, experienced professionals who work in the field that they teach, bringing real-world experience into the classroom. They have owned and operated a full service fixed base aviation service for over 25 years and have been offering the Light Sport Maintenance courses since 2006 with successful graduates throughout the country and around the world.
2. Rainbow Aviation Support Program: Rainbow Aviation provides an exclusive support program for its graduates to keep informed and share ideas with other LSRMs throughout the country. This valuable service provides a format for assistance, guidance, advice and provides information and support. We encourage all of our graduates to take advantage of the service. Details provided during the 120 hour Repairman course training.
3. Reduced lodging rates, free on-field RV parking and our local EAA members hosting program offer great options for housing.
4. Industry-current aircraft, engines and practical with a full computer lab. All texts and practical materials provided.
5. Hands-on training - Students can learn by doing, using the techniques and tools of professionals working in their desired career field. Whether you're pursuing business management training or another field, you can get the training that can help prepare you for your career.
6. Business and Career Assistance - Assisting current students with critical promotional tools and opportunities to establish your customer base. We also support our graduates who are interested in the A & P or DAR option.
7. Condensed three week classes or split sessions are available as well as additional ratings such as weight shift and powered parachute.
8. Focused attention from instructors.
9. The Rotax service level certification is issued as part of the Repairman Maintenance Training.
10. Programs are designed to prepare students for immediate entry into the aviation maintenance industry.

Rainbow Aviation's LSRM course offers the highest quality instruction providing graduates with a strong foundation. At Rainbow Aviation dedicated instructors are committed to helping you prepare for career opportunities. With two Locations - The 120 hour Repairman course is taught each September at the EAA headquarters and in California in the Spring and Fall each year.