LMH 110

The R/C helicopter is one of the most exciting and challenging aspects of flying. Yet because of the cost and complexity, it does not enjoy the same popularity as airplanes. With this concept in mind, Lite Machines Corp. produced the LMH-100. Dave and Paul Arlton, with the aid of Paul Klusman, spent years in the development of the first mass produced 1/2A class (.049/.051) powered helicopter (R/C Modeler '95) in the U.S.

The LMH-100 includes many unique features not found in other helicopters. The plastic main rotor blades are hinged and can fold during a crash to reduce damage. The Arlton Sub Rotor system adds maximum efficiency and lift to this non-collective pitch rotor head. Especially unique is the Arlton Gyro which replaces the need for an electronic gyro and extra battery capacity.

KIT:

The entire kit is produced in the U.S.; metric tools are not required. All the parts are organized in labeled bags; a list is included detailing the contents of each bag. The quality of the computer (CNC) plywood, bearings, linkages, machined and plastic parts were quite a surprise in such a small helicopter. My husband Les , and I have built and flown many helicopters together. The LMH-100 has one of most complete, easy to understand construction and operating manuals we've seen. The manuals include detailed drawings with instructions, which is done with some enjoyable humor.

CONSTRUCTION:

In the building of any helicopter, we began by putting the contents of each bag in individual plastic containers with the bag's label included. The first step is to assemble the plywood crutch which is the main structure of the LMH-100. The radio gear and all other major assemblies attach to the crutch. Using thin CA, we attached the hardwood keel stiffeners to the crutch. It is important to check to make sure that your servos fit properly before permanently gluing the lower keel stiffeners to the crutch. It is important to check to make sure that your servos fit properly before permanently gluing the lower keel stiffener and servo riser. A standard 4-channel airplane radio is all that is needed to fly the 100; you will need to use micro servos. We used the Hitec focus 4 that is especially set up for the helicopter, and is only available through Lite Machines. It comes complete with four HS-80 micro servos, an RCD receiver, and a 270mA battery pack. The HS-80 servos fit into the crutch with out any modification. The remaining pieces of the crutch are then assembled' fire wall halves, front landing gear bulkhead, and the floor. The use of toothpicks in factory predrilled alignment holes is an excellent aid in assembling the crutch. The first plastic parts attached to the crutch are the canopy mounting brackets. Upon completion of the crutch, we sealed the plywood with a light coat of CA, then painted it with 21st Century paint. Next, we preceded to assemble the canopy. The use of masking tape as recommended on the planes is a definite must to assure proper fit during assembly. There are several ways to finish the canopy. You can paint it or even use trim sheets. We painted the windows and defined them with striping tape, then we decorated the canopy with decals and sprayed it with K&B Super Poxy Clear.

The assembly of the main rotor and subrotor is explained thoroughly in the instructions. The rotor head and linkages are remarkably sturdy. The main rotor system on the LMH-100 rotates counterclockwise, while most helicopters rotate clockwise. Two different sets of main rotor blade

grips are included in the kit. It is recommended to try the set with six dots imprinted on the grips. The six dots indicated the degree of pitch added to the natural pitch angle of the blades. When assembling the subrotor, it is important to properly install the setscrew weights into the subrotor blade as they lock the pivot rod in place. Upon completion of the rotor head, the main shaft is assembled.

The primary components of the main shaft assembly are two bearings in bearing blocks and a crown gear. The main shaft assembly is then temporarily mounted to the crutch to balance the main rotor system (subrotor) along with the main blades. This is another bonus of the LMH-100; special balancing equipment is not required. After balancing, the rotor head is removed from the main shaft and the swashplate is assembled. Sixteen steel ball bearings are placed in the machined inner race of the swashplate. Tweezers are helpful for this job; extra balls are included. Then the machined outer race is threaded on and can be adjusted as it wears in. The most unique feature of this helicopter is the Arlton Gyro (patented). In all other helicopters, an electronic gyro is required to help stabilize the tail rotor. Th Arlton Gyro uses a miniaturized version of the flybar and paddles system used on the main rotor head of most model helicopters. It is very important that the gyro is assembled correctly or it will not work properly. When assembling and installing the gyro, recheck to make sue the setscrew in the gyro pivot mount is facing down. The next step is to complete the tail boom, tail rotor gearbox and the tail rotor blades. The tail rotor assembly contains two bearing. The tail rotor blades are approximately the same length as a .30 size helicopter but they are wider and cupped. In the final assembly, the engine is prepared and installed. The rotor head, landing gear, tail boom, main gear, tank pushrods, and radio gear are installed and your LMH-100 is ready to fly.

FLYING:

Though the LMH-100 is small in size, it is still advisable to get help from an experienced helicopter pilot. The helicopter is started from the bottom on a machined aluminum start cone. It may be necessary to reverse the rubber insert on your electric starter to fit properly on the start cone. The only special starting equipment is a glow plug igniter for 1/2A, which fits in the heat sink head. We used Model Products #052 for deep heat sink heads. Lite Machines also recommends Sig 35% Nitro fuel and Glo Bee GB-5P glow plugs. Until you become familiar with the starting process, it is easier to have a helper. I held the 100 on its side (tank facing down), and held the rotor head to keep it from turning. While starting the engine, Les put his finger over the carburetor inlet until the engine fired. If you are starting it by yourself, you must prime the engine instead.

Our first two flights on the 100 were not to our liking. We didn't have enough rpm to achieve a stable controlled hover. We found out from Lite Machines that when flying at low elevations (especially around sea level), we would probably be happier with a lower we would probably be happier with a lower main blade pitch which would increase rotor head speed. This is achieved by changing the main blade grips. We left one blade grip at a plus six, and change the other to a plus four which makes a natural pitch angle a plus five. This made a big difference. Les was able to achieve a stable hover even in a fairly strong steady wind. The plus five pitch gave us plenty of power for forward flight. Everyone was curious how well the unique Arlton Gyro works; it works extremely well, we were quite impressed. After we had approximately ten flights on the helicopter, we installed the training gear to see how it would handle. We made the gear doweling 2" shorter than

recommended (22" instead of 24"), and used wiffle-style golf balls. We found that the LMH-200 handled just as well with the training gear on.

Les learned to fly on an noncollective helicopter, so he adapted quickly to the LMH-100. I had never flown anything but a collective pitch helicopter; it took me a little longer to learn to land from forward flight. If you are using an airplane radio to fly the 100, there is a modification you can do to your transmitter that makes it easier to hover. Most airplanes radios come with "clicks" (detents) in the (left). If these clicks are removed, it makes it much easier to hover a helicopter. If you are not knowledgeable about transmitters, or a little hesitant about working on them, the radio manufacturers can easily do it for you at a modest price. This is definitely worth doing; it does make a difference.

Once we become familiar with the LMH-100 flight characteristics, we experimented with different set-ups. Les felt that our 100 made nice left turns, but right turns were a little more difficult to do smoothly. This was most noticeable when flying a figure eight and in slow forward flight. When we moved the stick to initiate a right turn, the helicopter seemed a little sluggish, then it turned a little to quick. We took the tail rotor servo arm and installed it the opposite direction. Our arm is now pointing forward instead of aft as the instructions showed. To do this, we had to lengthen the tail rotor pushrod by unsoldering the connector and extending it approximately 3/8" to 1/4" long. Scott Carnahan had been flying his 100 for quite some time before he tried our mod. He made an extra tail rotor pushrod so he could try it both ways. Scott never shortened gyro weights. He also installed his servo arm more towards the centre than we did. He seemed quite happy with the change. This tail rotor set-up is just a personal preference of ours ad not something the manufacturing recommends. Lite Machines offers great customer support if you need any help or have any questions.

We've heard some remarkable reports on how the 100 can sustain most crashes with minimal damage. One novice pilot flew full throttle going sideways into his garage door without any damage to the helicopter. While another pilot's engine quit from 70 feet up, the helicopter bounced when it hit the ground without any damage.

The LMH-100 was not designed for aerobatics; but it is definitely an economical, extremely rugged, and fun way to get involved in R/C helicopters.

SPECIFICATIONS	
Name	LMH-100
Aircraft Type	Helicopter
Manufactured By	Lite Machines Corporation 1291 Cumberland Ave. West Lafayette, IN 47906
Mfg. Sug. Retail Price	$199

Available From	Both Mfg. and Retail
Total Length	26.4 Inches
Weight	27 oz.(with fuel)
Main Rotor Blade Type	Semi-Flexible, Twisted, Tapered UnderCambered, Three Airfoil Sections
Main Rotor Diameter	24 Inches
Sub Rotor Diameter	9.5 Inches
Continuous Main Rotor Speed	1750 rpm
Tail Rotor Diameter	7.5 Inches
Gyro Rotor Diameter	5.5 Inches
Mfg. Rec. Engine Range	Cox TD .049-.051
Rec. Fuel Tank Size	2 oz. (Included in kit)
Rec. No. of Channels	4
Controll Functions	Tail Rotor, Throttle, Fore & Aft Cyclic, Left & Right Cyclic
Basic Materials Used In Construction	Ply, Plastic, Machined Aluminum
RCM PROTOTYPE	
Radio Used	Hitec Focus 4H
Engine Make & Disp.	Cox TD .051 H
Tank Size Used	2 oz.
Weight	25 oz.(No Fuel)

SUMMARY
WE LIKED THE:
Easy to build, excellent instructions, well designed, quality parts, economical, very rugged, a good entry level trainer.
WE DIDN'T LIKE THE:
Messy, but not too difficult to clean up