USER GUIDE

print your own plane

3DLabPrint Republic P-47N-15 Thunderbolt ver.1.0 Slic3r

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3D Lab Print Republic P47 N-15 – fully printable R/C plane for your home 3Dprinter

Future of flying - Print your own plane

The first fully printable airplane with suitable files prepared for your 3Dprinter. Flight charecteristics are comparable or even better than classic build model airplane.
Simply download and then print it anytime you need only for $10 (filament cost).
This is not a dream, now you can print this HI-TECH …. at home, print spar parts, and so on...

Both parts the wing and the fuselage features extensive hitech 3d structural reinforcement which makes the model very rigid while still maintaining light-weight airframe and exact airfoil even when it is made only from plastic. This perfect and exact 3d structure is possible only due to aditive 3dprinting technology. So welcome to the 21th century of model flying. Be The first at your airfield. Of course we complies with the ACES aircombat rules.

Easy to assembly, you do not need any extra tool or hardware, you only need to glue printed parts together and make pushrod for elevator. The rest of the as-sembly is very easy.Simply add brushless motor, ESC, servos and radio system.
Don´t worry, detailed step by step PDF/VIDEO is included.
You will get superb performance airplane with High efficient powerplant which let you fly 7+ minutes at full throtle with the speed exceeding 150 kph. On the other hand low stall speed is achived for easy landing.
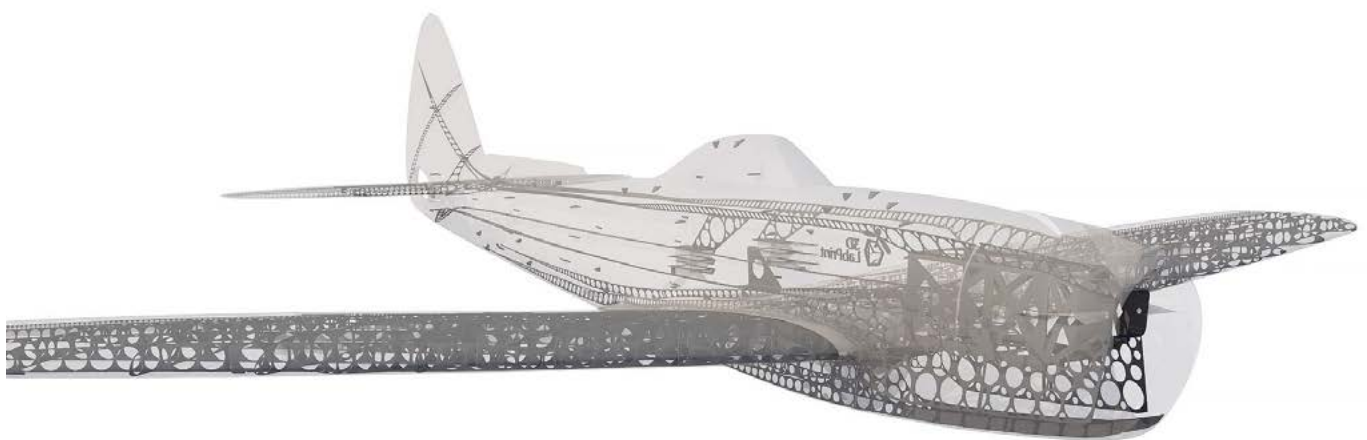
Republic P47 N-15, History

The Republic P-47 Thunderbolt is one of the largest and heaviest fighter air-craft in history to be powered by a single 4 stroke internal combustion en-gine. It was built from 1941-1945. It was heavily armed with eight .50-caliber machine guns, four per wing. When fully loaded, the P-47 weighed up to eight tons, and in the fighter-bomber ground-attack roles could carry five-inch rock-ets or a significant bomb load of 2,500 pounds; it could carry more than half the payload of the B-17 bomber on long-range missions (although the B-17 had a far greater range). The P-47 was designed around the powerful Pratt & Whit-ney R-2800 Double Wasp engine—the same engine used by two very successful U.S. Navy fighters, the Grumman F6F Hellcat and Vought F4U Corsair, the latter air-craft itself the first to fly with Double Wasp power in late May 1940—and was to be very effective as a short-to-medium range escort fighter in high-altitude air-to-air combat. When deployed as a fighter-bomber with its usual "double quartet" of heavy-caliber M2 Browning machine guns, it proved especially adept at ground attack in both the World War II European and Pacific Theaters

The P-47N was the last Thunderbolt variant to be produced. It was designed as an escort fighter for the Boeing B-29 Superfortress bombers flying raids on the Japanese home islands. Increased internal fuel capacity and drop tanks had done much to extend the Thunderbolt's range during its evolution, and the only other way to expand the fuel capacity was to put fuel tanks into the wings. Thus, a new wing was designed with two 50 U.S. gal (190 l) fuel tanks. The second YP-47N with this wing flew in September 1944. The redesign proved suc-cessful in extending range to about 2,000 mi (3,200 km), and the squared-off wingtips improved the roll rate. The P-47N entered mass production with the uprated R-2800-77(C) engine, with a total of 1,816 built. The very last Thun-derbolt to be built, a P-47N-25, rolled off the production line in October 1945.
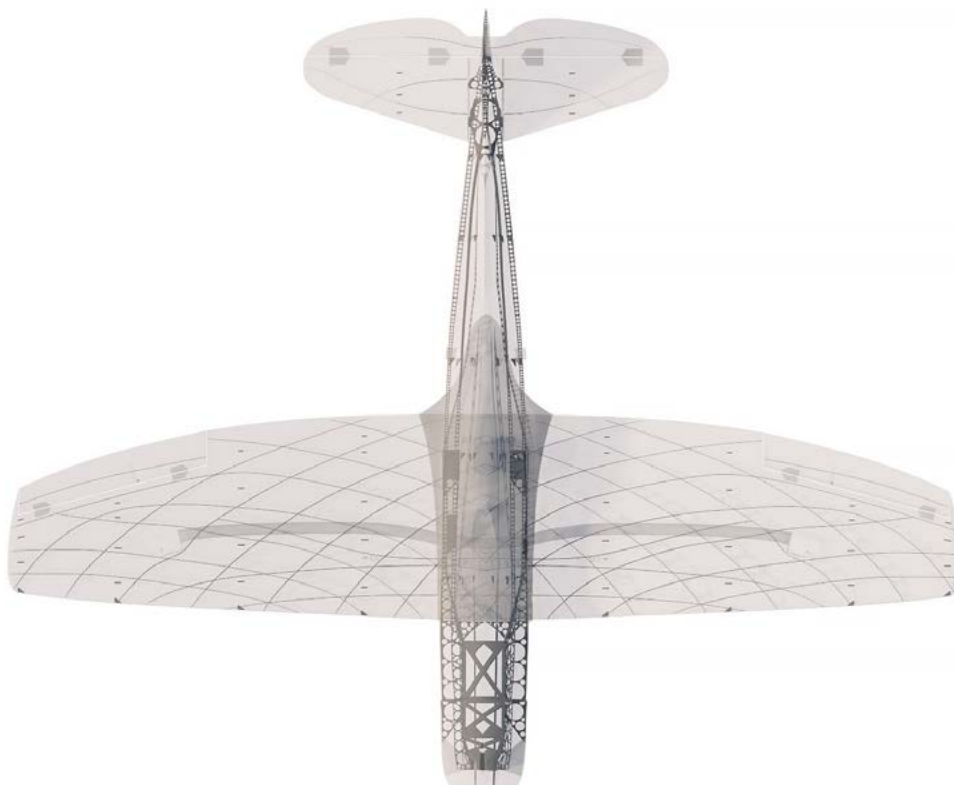
General specifications

|		
Lenght:	36.7in	933mm
Wingspan:	45.6in	1160mm
Height:	11.4in	291mm
Wing area:	378sq in	24.5 dm2
Wing loading:		42.0 g/dm2
Airfoil:		aircombat modificated
Print weight:		640g
Takeoff weight (6s 2200 lipo):		1040g
Max takeoff weight:		1140g
Never exceed speed, VNE:		150km/h
Design maneuvering speed, VA:		120km/h
Stall speed, VS:		20km/h

Powerplant

Propeller:	Aeronaut ELP 11/6-7 or APC 11/5.5–7
Motor:	Turnigy D3530/14 1100KV
ESC:	Aerostar 40A or any 40Amps ESC
Battery:	Turnigy nanotech 2200 mAh/3s, 252g, 25C

Performance measurment

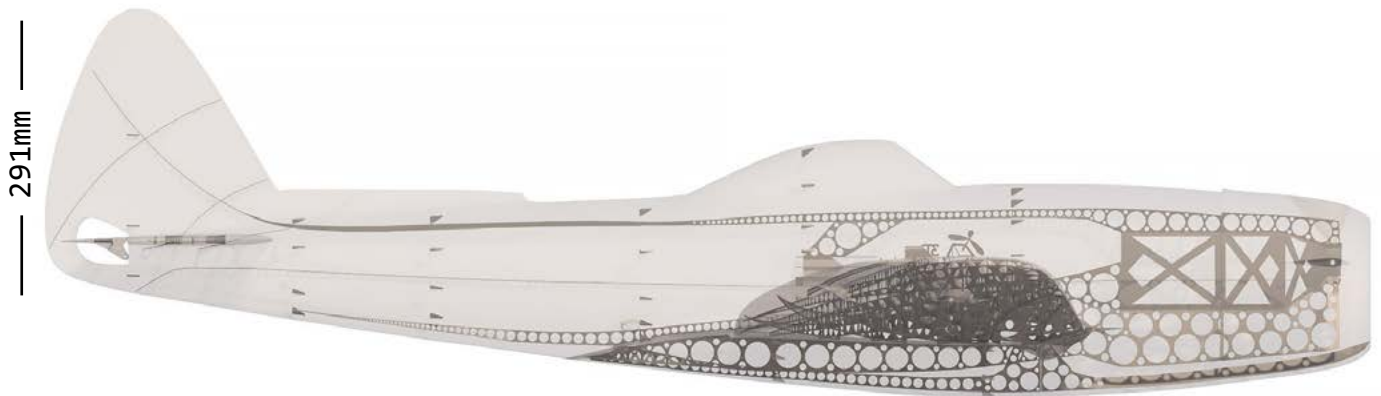|	
Max speed VH (level flight):	90 km/h – 67.5kn – 78 mph with APC 11/5.5
	105 km/h – 73kn – 84 mph with APC 11/7
Rate of climb:	15 m/s (5 373 ft/min) with APC 11/5.5
	16 m/s (5 728 ft/min) with APC 11/7
Flight time (3s 2200mAh/full throtle):	8:40 with APC 11/5.5
	7:30 with APC 11/7
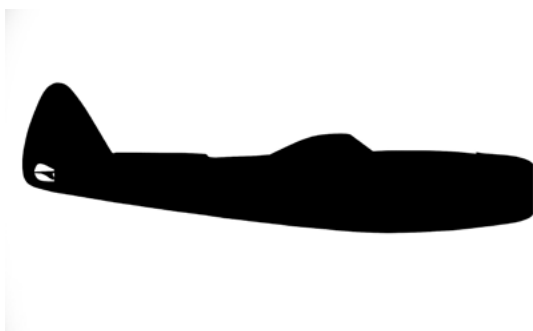
1160mm

291mm

933mm

Step by step PDF/VIDEO user guide:

1. Choose airplane at www.3Dlabprint.com **and please visit youtube!!!**

2. Select and procced to check out.
The only thing your printer must have is a min build volume approx **195/195/150 (250/120/150)** or bigger and nozzle diametr **0.4mm**.
If you feel a little bit confused feel free to contact us at support@3dlab-print.com.
You will get STL files, pro tech support, detailed PDF/VIDEO guide and some accessories.
The only mandatory thing is nozzle 0.4 and sufficient build volume of your printer....
Attention: this Slic3r version is not compatible with retract conversion kit.

3. Download and silice it
After checkout you will get a download link to your email, download it and unzip it.
After unziping you get several STL files divided into directories(and PDF/VIDEO guide + slicer setting)
See videolinks below for proper slicer setting (very important) adapt it for your 3d printer (filament diameter, build volume, retract value if you are using bowden extruder and so oon...)
Scaling the model will lead to unusable result!
And please note that this version is suitable for Slic3r 1.2.9 software (maybe it will work also with another slicers) for S3D, MatterControl and CURA please use the standard version.
See video guide #2 slicer setting

You can also use our predefined Slic3r setting file included in package (always adapt it for your printer, change build volume, filament diameter and so on... depends on your printer!!!):

3dlabprint_config01.ini

4. Print it
Save generated Gcodes and insert SD card to your printer, prepare your printer and start printing the first gcode file and then next and so on... (we prefer to use SD than direct connection) Notice: ABS filament is not suitable for this...
See video guide #3
you will need: PLA filament - good quality PLA (we get the best result with PLA so far)
                Strong hair spray
                Razor blade

!!Note!!

We recommended 0.7mm retraction for non-bowden extruders, for bowden 4-6mm is OK, we need retraction for all spots not only for outer perimeters!
If you find underextrusion at layer startpoints increase extra restart distance this value add some extra filament after retraction, 0.5-0.2 works (if your slicer is able to)
Good first layer adhesion is very important, you should see :-) first layer must be flatened on bed very vell, also you can decrease first layer speed.
Turn OFF cooling fan for better layer adhesion (HE fan of course ON) we dont need it for our thin wall printing...
We try lot of filaments and so far PLA is still the best for our models (2015).
HEATED BED is very recommended, 70celsius with strong hair spray (print without warping ends)
Looks like any standard quality PLA is OK for our planes, BUT it always depends on combination PLA vs. Extruder vs. HotEnd.
Sometimes you need to experiment with HE temperature.
We find that some color of filament has lower layer adhesion also.
Nowadays there is lot of 3dprinters on the market, very most of them is OK for printing our aircrafts (specific thinwall printing...) suficient volume, heated bed, 0.4mm nozzle.
We use Prusa i3 ORIGINAL and Makerfarm i3 10 (works well)
Some printers has disproportion in X, Y, Z axis which leads to unusable results... you need repair firmware steps setting.
This STL version is designed for use with Slic3r 1.2.9 and is not compatible with standard version (S3D CURA Mattercontrol), altough we get best result with Simplify3D and standard version, this STLs allows you work with Slic3r and achieve lighter result, but not so smooth as with S3D, but it works and flies. So lighter is great, but on the other hand not so strong and smooth print result (still strong enough for ECO setup and acrobatic flying).

5. Assembling printed parts

5.1 Wing assembling
Glue wing parts with CAglue together, use activator and instal ailerons...
See video guide #4
you will need: CA Glue - medium or similar medium viscosity CA glue
                Activator for CA Glue or similar, but not mechanical is better
                AC Hinge Sheet or similar
                Scissors
                Snap knife
                Some cloth for wiping CA glue...

5.2 Fuselage assembling
Glue with CAglue fuselage parts together, use activator, instal elevator, **fine tune parts shape with knife or sandpaper. Assembly wing and underfuselage part.**
See video guide #5
you will need: CA Glue - medium or similar medium viscosity CA glue
                Activator for CA Glue or similar, but not mechanical is better
                AC Hinge Sheet or similar
                Scissors
                Snap knife or Sandpaper
                Optionaly some cloth for wiping CA glue...

6. R/C equipment preparing

6.1 Complete your RC Powerplanr unit, withou any soldering...

you will need: Turnigy D3530/14 1100KV or similar 3530-35, 2836 1100kv
                Aerostar 40A Electronic Speed Controller or similar 40Amps
                Turnigy 2200mAh 3S 20C or similar 2200/3s
You can use own setup instead with suficient thrust and weight, (always check C of G maybe you will need some wights in nose)

6.2 Test and center all servos with servo tester or transmitter, then instal horns in midle position, plug extension wires and cut wing Servos mount...
See video guide #7
you will need: 3x 9g Servo HXT900
                3x Servo Lead Extension or similar
                Your R/C transmitter and receiver or servotester with batt.
                Small screwdriver+
                Snap knife
                Soldering Iron or Small handsaw or Dremel

7. Instal prepared RC equipment: Motor, ESC, Servos... please motor mount in this version differ from videoguide use motor mount cross.
See video guide #8
you will need: Small screwdriver+
Your earlier prepared R/C equipment
4x Self Tapping Screw M3x8mm or similar

8. Made 3x steel pushrod for ailerons and proceede the same way with elevator (this version differ in this point from videoguide)
See video guide #9
you will need: Steel pushrod, diameter 1.2mm
Pliers
Firelighter

9. Instal your reciever, connect batery, setup servos and etc. with your trasmitter, lock servo position, then instal propeller...

!!!Make sure that the battery is firmly placed inplace (use foam strips to achieve it or velcrosystem), if it moves during the flight it shifts the center of gravity backwards and aircraft will be uncontrollable!!!
See video guide #10
you will need: Your own Rx/Tx system
Turnigy 2200mAh 3S 20C or similar 2200/3s
Rubber rings
Foam strip for Li-Pol battery
Scissors
Velcro
Propeller APC Style 11/5,5 or similar (11/5.5-7)
Small screwdriver+
CA Glue - medium + activator

10. Before flight check: center of gravity is very important (move it forward for the first flights see CG markings and chapter 11 bellow), battery properly charged, ailerons and elevator deflection check, your own flying skills or RC simulator training...
    Then go flying: set full throtle, put the elevator little upwards (1-2mm) and throw it energetically to the wind approx 10 grades up, wait till plane gain speed, then fly it in your manner...
See video guide #11

...so, are you ready for flying popcorn, yeah!

11.Pilots Please Attention!!!

For the first flights we recommend setting the center of gravity of the airplane by about 5-10 mm forward of the CG tag (nose heavy, this increases the stability) is also good to increase the expo settings on your transmitter for elevator and ailerons to 70 % (this calms response from your stick inputs)
 Also you can decrease a little bit elevator and ailerons deflection.

Make sure the battery is well fixed in proper possition if it moves during flight it will cause move CoG aft and will lead to uncontrolable flight behavior...

You can then return to the center of gravity (balance aircraft) the CoG points and expo set to 50 % as stated in the video/instructions... this gain back maneuverability when you will be sure with flying your airplane.
Please use this files only for your own... thanks very much.

!!!Never fly aft positioned CoG!!! thanks :-)