



Yak-55 SP



Ultimate RC-Aerobatic Contest Aircraft

Span: 3.31 m (131")
Length: 2.95 m (115")
Weight: 18.5 - 20 kg (40 - 44 lb)

Preliminary Assembly and Setting Instructions

safety instructions and warnings

In the interests of your own safety and that of others, the model must only be operated by experienced, disciplined modellers with sufficient specialised expertise, and it must be serviced and maintained regularly and competently. If you have no experience in building and operating models of this type, it is vital that you enlist the help and advice of an experienced jet modeller if you are to avoid potentially catastrophic errors; this applies in particular to the jet engine itself, which should only be run when an experienced operator is present. If you have a model flying group or club in your area where training and support are available, we strongly recommend that you join that group. With this model any defect or deficiency in its construction or operation can result in serious personal injury or even death.

CAUTION!

Before you operate this model aircraft, you must determine the local by-laws and regulations which apply to you. In legal terms our models are classed as aircraft, and as such are subject to legal regulations and restrictions which must be observed. Contact your Rep regarding the AMA Regulations for turbine powered aircraft.

WARNING!

It is your responsibility to protect others from possible injury. Keep a safe distance from residential areas in order to protect people, animals and buildings: at least 1.5 km “as the crow flies”.

Keep well clear of high-tension overhead cables. Don't fly the model in **poor weather**, especially when there is **low cloud cover** or **fog**. Don't fly the model directly **into the sun**, as you could easily lose visual contact with the model. To avoid collisions, always keep well clear of full-size aircraft, whether manned or unmanned. It is your responsibility to land immediately if a real aircraft approaches.

When operating a jet engine you must keep people and animals in a safe distance from it. This means:

In front of the engine	4.5 m
To the side of the engine	7.5 m
Behind the engine	4.5 m

WARNING!

The operator of the model must be in full possession of his or her bodily and mental faculties. Operating a model aircraft under the influence of alcohol or drugs is not permissible under any circumstances. This applies both to the operator and to his or her assistants.

WARNING!

Radio-controlled model aircraft may only be used for the purpose intended by the manufacturer. They must never be used as machines for carrying people or goods, nor for any other purpose except as model aircraft. Misuse of this model may result in serious personal injury or even death.

WARNING!

It is important not to make any modifications of any kind to the model. If you deviate from the instructions, perhaps by using different components or materials, or by making changes to the structural design, you may seriously affect the ability of the model aircraft to function correctly. Please resist the temptation, and build the model exactly as directed.

WARNING!

Before you fly the model it is essential to check the Centre of Gravity and the control surface travels, as stated in these instructions. These settings are very important, and our recommended values must be observed. Before you fly the model, carry out a careful check of all the working functions and all the control surfaces. Check the range of the radio control system with the transmitter aerial collapsed. If the check is satisfactory, repeat it with the engine running, with an assistant holding the model securely. Read the instructions supplied with your radio control system, and make sure that you observe the manufacturer's recommendations.

LIABILITY EXCLUSION AND DAMAGES

You have acquired a kit which can be assembled into a fully working RC model when fitted out with suitable accessories, as described in the building instructions in the kit. However, as manufacturers, we at Composite-ARF are not in a position to influence the way you build and operate your model, and we have no control over the methods you use to install, operate and maintain the radio control system components. For this reason we are obliged to deny all liability for loss, damage or costs which are incurred due to the incompetent or incorrect application and operation of our products, or which are connected with such operation in any way.

Unless otherwise prescribed by binding law, the obligation of the Composite-ARF company to pay compensation is excluded, regardless of the legal argument employed. This applies to personal injury, death, damage to buildings, loss of turnover and business, interruption of business or other direct and indirect consequent damages. In all circumstances our total liability is limited to the amount which you actually paid for this model.

BY OPERATING THIS MODEL YOU ASSUME FULL RESPONSIBILITY FOR YOUR ACTIONS.

It is important to understand that Composite-ARF is unable to monitor whether you keep to the instructions contained in this operating manual regarding the construction, operation and maintenance of the aircraft, nor whether you install and use the radio control system correctly. For this reason we at Composite-ARF are unable to guarantee or provide a contractual agreement with any individual or company that the model you have made will function correctly and safely. You, as operator of the model, must rely upon your own expertise and judgement in acquiring and operating this model.

SUPPLEMENTARY SAFETY NOTES

Pre-flight checking

Before every session check that all the model's working systems function correctly, and be sure to carry out a range check. This is the procedure: switch on the transmitter, followed by the receiver. Leave the transmitter aerial collapsed and walk away from the model. At the appropriate range check that all the control surfaces work perfectly when you move the sticks.

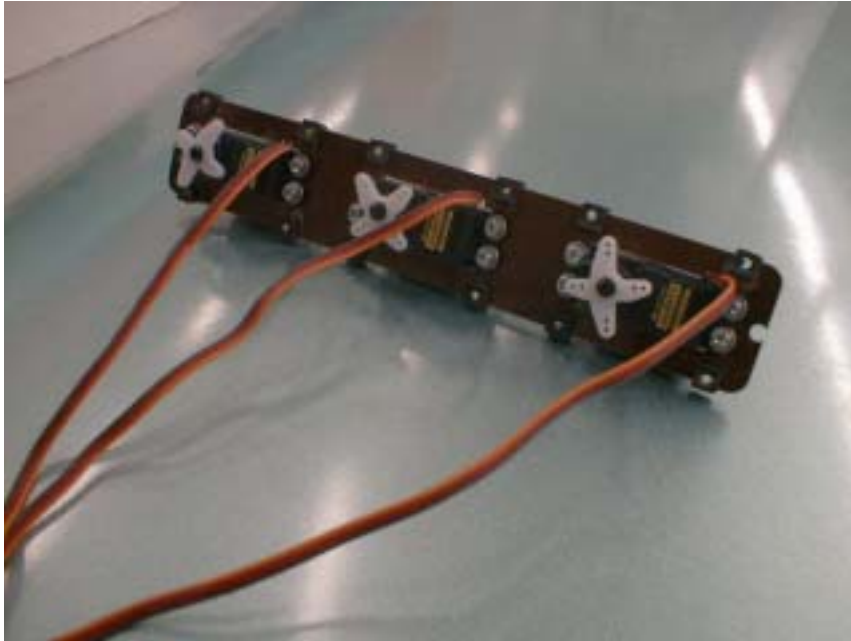
Repeat the procedure with the engine running, while an assistant holds the model securely.

The first time you fly any new model aircraft we strongly recommend that you enlist the help of an experienced modeller to help you check the model and offer advice while you are flying. He should be capable of detecting potential weak points and errors.

Be certain to keep to the recommended CG position and control surface travels; if adjustments are required, carry them out.

Don't ignore our warnings or those provided by other manufacturers. They refer to things and processes which, if ignored, can result in fatal injury or permanent damage.

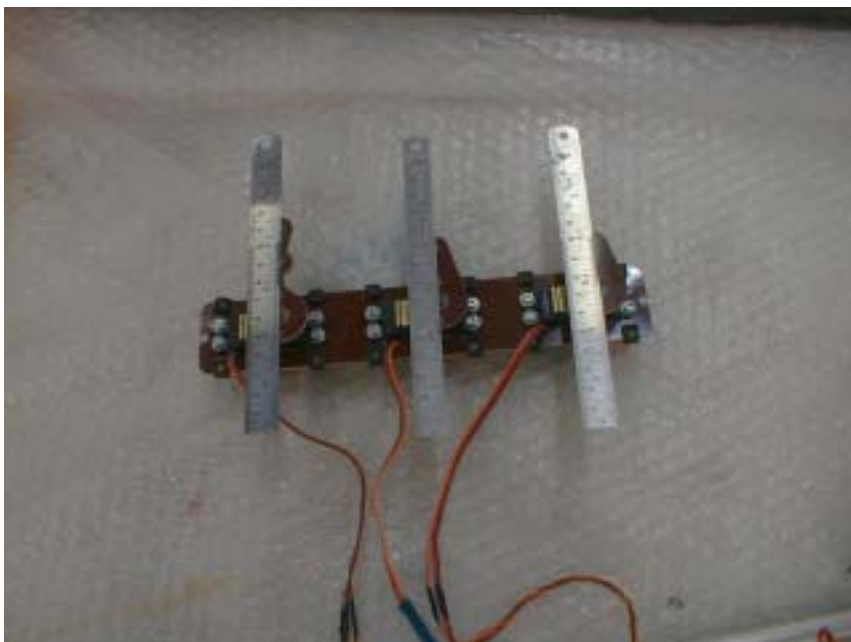
Aileron Servo Setup



Mount the servos in the servo tray. Use the M3x12 allen screw with stop nuts. Use the 3mm washer on top of the servo. Do NOT use the rubber soft mounts. Tighten the servos **ROCK HARD** to the phenolic servo tray.

Now insert the rubber soft mounts into the outer mounting holes of the phenolic servo tray.

Then plug the servos into your receiver and center



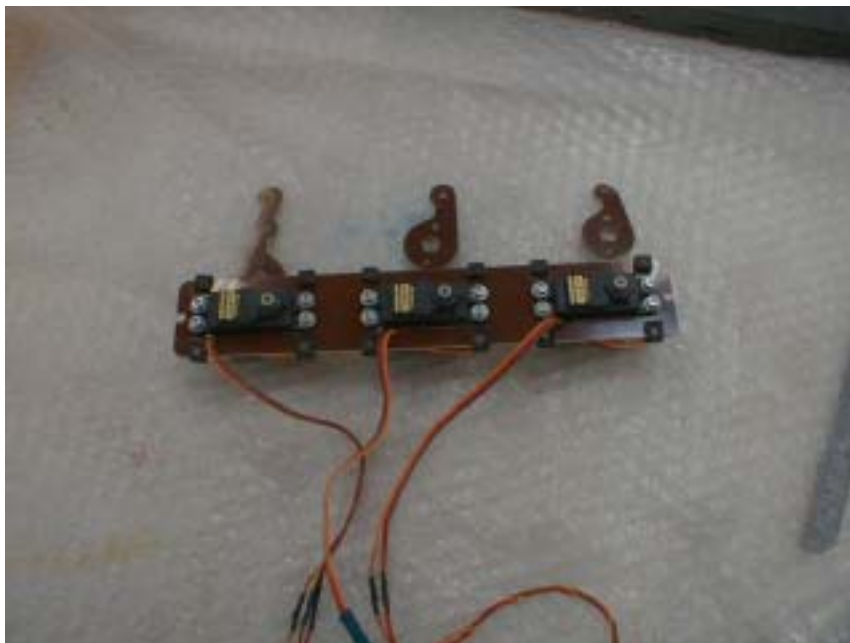
them precisely. Now glue the extension servo arms to the servo discs. Use CA glue. Steel rulers laid on the servo horns help to align them **BEFORE** you glue them on. All servos center slightly different. You **MUST** center the servos first before you glue the horns on. The horns must be 100% parallel. Then take the disc of the rear servo off and glue the second long horn from the bottom side of the servo disk.



Finally use the small sheet metal screw (2 per servo) and secure the horns to the servo disc additionally.

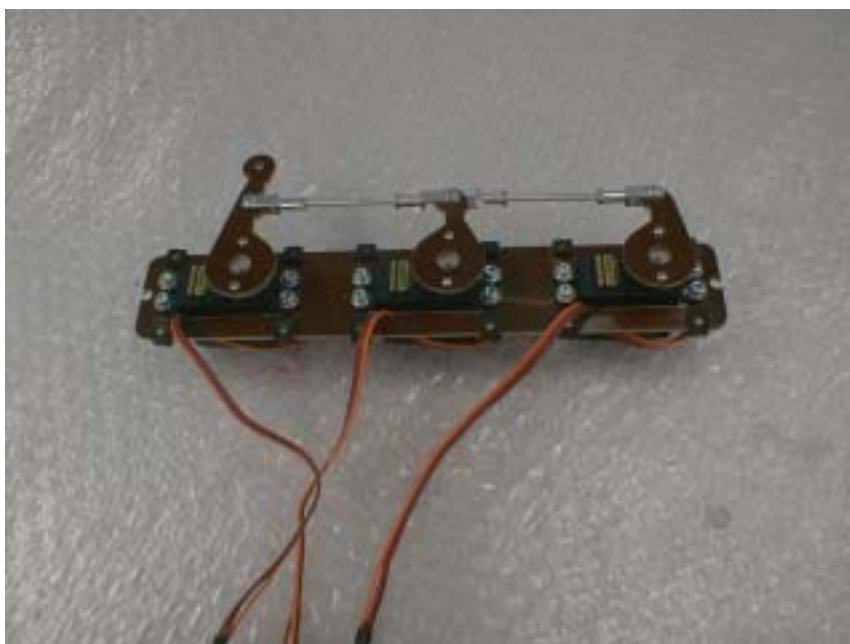
Now assemble the linkage between the 2 servos. Use the supplied aluminum clevises.

The 2 clevises on the center servos have to be modified. Cut one arm of each clevis off, so that 2 clevises (one from the front servo and one from the rear servo) mount with the same pin. The left over pin and e-ring please keep at a safe place for eventual replacement.



A useful hint: If you cut a little slot into the phenolic servo tray, aside each servo, you can feed the wires through and the whole unit is unmounted and removed from the wing within seconds for maintenance or adjustments.

Now slide the whole unit into the wing and fix it with 14 servo screws. Check the servo arm cut out in the bottom wing surface and re-shape it, if necessary.



Now install the ball link into the aileron control horns and install the main aileron linkage. The servo-side clevis will NOT be mounted with the aluminum pin, but with the M3x12 screw and stop nut, through both horns, for double safety. Slide the brass tube over the all thread and after adjustment secure it with CA glue.

Elevator servo setup

The elevator servo mount is very similar to the aileron system. Please use the same technique as described in the aileron section.

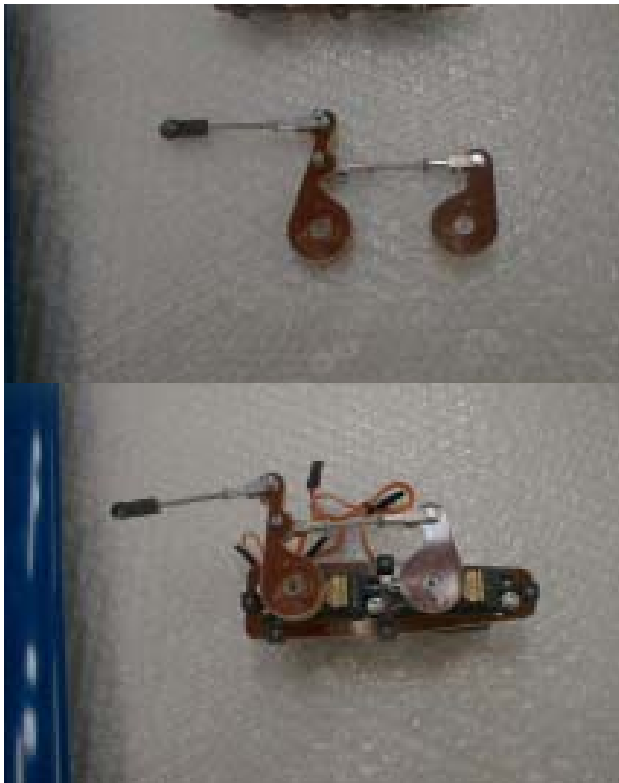
It is important that the long rear servo arm is always doubled, to make the system rigid and stiff.

Mount the servos rock hard to the phenolic tray, and mount the phenolic tray with the rubber soft mounts in the stab.

Make sure again, that the servo arms are 100% parallel, this only can be done by centering the servos with the receiver FIRST, and then glue the phenolic servo horns on the servo disc.

Use 2 small sheet metal screws to secure the phenolic arm to the servo disc.





After you installed and adjusted the linkage, take the servo discs off again.

You cannot insert the servo tray with the arms mounted. After the servo tray is in place, then you can mount the servo arms to the servos and tighten the center screw. Use thread locker to make sure that they don't come loose.





Check the system for free movement. you might have to re-shape the cutout slightly. You can get a 45-50 deg throw on the elevators.



Very important:

Make sure that the slot in the stab is WIDE ENOUGH so that the e-rings on the aluminum pins cannot be stripped off by touching the cutout borders!!!



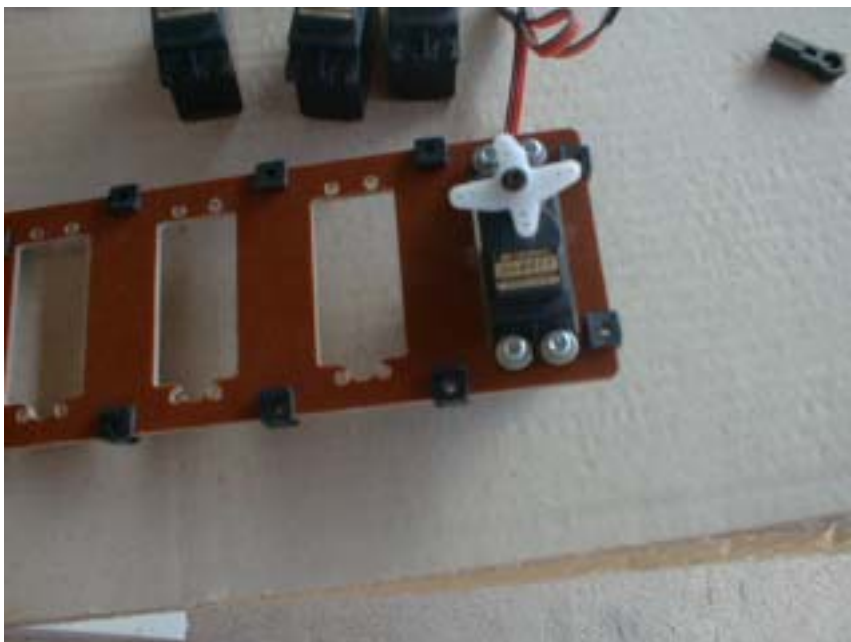
Rudder Servo setup

The 4-Servo rudder setup is also a quickly removable unit, to make service and adjustment easy. It will accept JR 8411 servos or any other brand.

Complete hardware is included. It is important, as usual, that the servos are centered **BEFORE** the horns get finally mounted.



This rudder setup is not a 100% closed system. Basically it is a system of 2 servos, which are coupled by the 2 long all threads and the 4 ball links. This setup is sufficient when you use the Volz Alustar Digital servos. On top of that main drive, both servos get a coupling to another backup servo, which is connected to the main disk of each main servo.



But, and this is important, these 2 backup servos are **NOT** connected with each other. This allows a better fine tuning for centering.

Start with screwing the 4 servos into the phenolic servo tray. Insert the rubber soft mounts into the slots of the servo tray, and check that they match the holes in the fuselage board.



The main horns are doubled for maximum safety and stiffness. Glue the bottom horn first, but make sure that the servos are centered (of course you can use a match box to get rid of that problem).

then glue the small doubler to the bottom horn. Don't forget to use a medium rough sand paper to prepare the glue surfaces. Use thin CA glue.

Then attach the top horn to the servo disc and the small phenolic doubler.

Attention: The top servo horn has the additional horns for servo No. 3 and No. 4. Both sides are in mirror, so check carefully which horn you glue to which side. the additional arms point backwards, and the slot for the pull/pull cables must point forward.

This means, the 2 big discs are NOT the same. It is too late, when you find out after you glued them on!





Now, after all 4 servos are installed and centered, you can mount the servo horns. Test run the system, before you connect any linkages.

Then install the linkages. The main ball links have to be installed first. Use the supplied hardware. Make sure that the nut does not hit the servo case. If it is too tight, use a normal nut instead of the stop nut and use thread locker.



If you use a small original servo disc, you will have to fill the space between top and bottom horn with a dot of 5 minute epoxy, so that you can tighten the M3 screws properly.

the small horns are connected with standard clevises. It is on purpose, that the holes in the discs are slightly bigger than the pin of the clevis. This takes any possible tension out of the system.



Now insert the unit into the main fuselage board and fix it with the supplied sheet metal screws.

Install the pull pull wires as usual. After setting is finished, you might want to make sure that the wire cannot slip out of the slot at maximum throw. Even if this was never a problem, we still recommend to glue a little piece of phenolic or fiberglass board in front of the slot.

Here are some additional photos without further comments, how I set up my last prototype. These are just ideas, but most important is, that all heavy equipment must be as far forward as possible. The long tail and the huge stab, with all their advantages, ask their tribute...

Install all batteries in the cowling area.

I recommend to use tuned pipes to have the performance you expect. See the photos also for possible and simple pipe mounting.

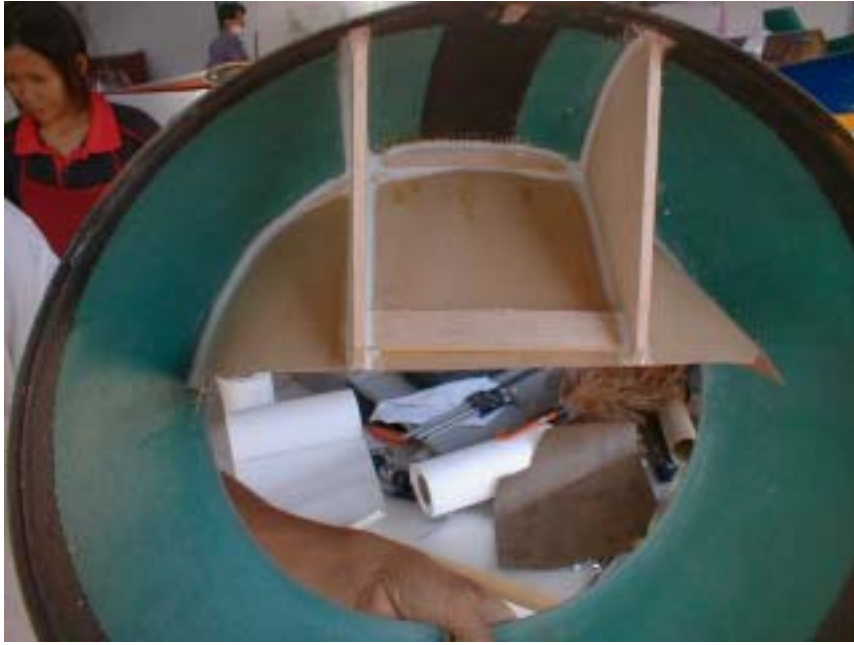
the adjustable wing and stab mount should be fixed permanently, when you are satisfied with the adjustments during the first flights. Especially I do not trust the carbon thread for more than a few hours of engine vibration, so after you set the incidence perfectly, fill the outer area of the hole with Silicon. this still allows to get it off one day, and readjust, if needed.

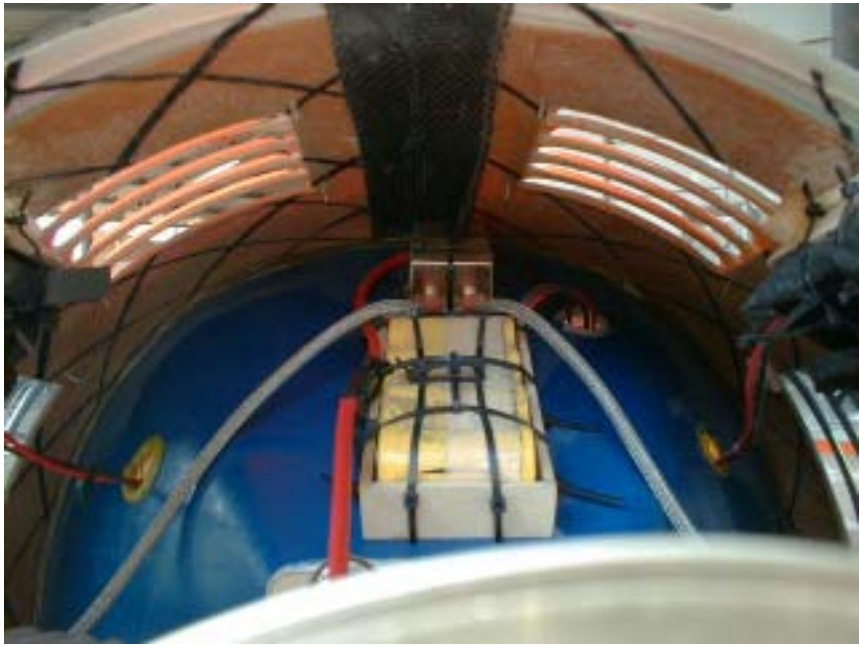
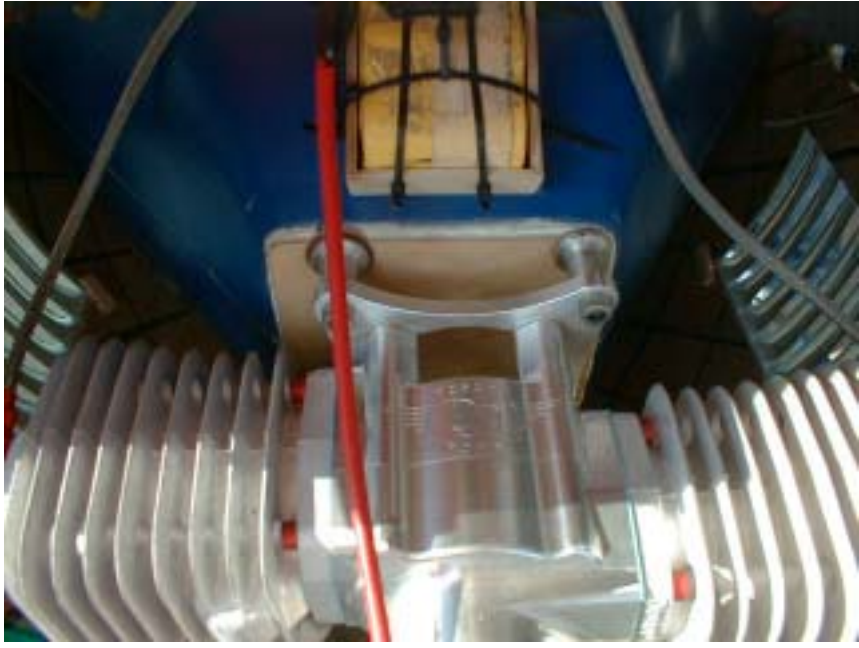
This wing and stab adjustment system is still in an experimental stage, and I would appreciate any comments about the efficiency and performance, as well as about any occurring problems right away.

Have fun with your Yak!!!

Andreas









CG:

The CG is widely changeable. Measured from the leading edge, just where it begins to go straight (outside of the filled):

270 - 350 mm

60 mm are adjustable by choosing either the front or the back mounting position. Another 20 mm are variable due to battery and other hardware components placing.

Control throws:

Our first three prototype planes were used to determine the best throws. We found out, that basically the plane can be set up with ONE CG only, and with either high or low rates. We think that it is not necessary to add a third rate setting for snapping. This makes the programming very easy, and while flying it will let you concentrate on performing the manouvers instead of additionally kicking switches all the time.

Travel Setting Table:

	Low Rate		High Rate		
	up	down	up	down	
Aileron	75	90	110	130	(at root)
Rudder	135	135	160	160	(counter blalance L.E.)
Elevator	60	60	150	150	(couter balance L.E.)

Incidences:

We determined the wing to be 0.4 - 0.5 deg positive and the stab to be 0.2 deg negative. this can be achieved by setting the rear wing dowel to approx. the center of the slot, and the front pin of the stab approx. 1 - 1.5 mm down.

Thrust:

The Yak-55SP needs remarkably low amount of side thrust, 1.5 deg is allready enough. But the engine needs approx. 0.5 deg. down thrust. With an initial setting of 1.5 deg right thrust and 0.5 deg. down thrust it will be almost perfect right from the beginning. The holes in the firewall are exactly set for this thrust angle, and as soon as the spinner is centered to the cowling, these angles will appear automatically. You will have to use washer packs to adjust the length of your engine. Side and down thrust is approximately built in the firewall plate, but not 100% exact due to manufacturing tolerances.



We hope that you enjoyed building your Yak-55SP. Please let us know whether you like this all new instruction manual, or you have any ideas to improve it. This manual is the start to attempt a new level of Composite-ARF instructions, and we would like to complete all our products with this style instructions. Also let us know, whether you think that some hardware is missing or inadequate. We tried to offer this airplane as complete as possible. Please let us know, you will help us to continue making good things better.

You purchased a Yak from the very first production run. If you notice any problems, or have improvement ideas, this is more important than ever that we know this immediately. So we can make improvements quickly.

We try hard to improve our product continuously, and we try hard to improve the instruction books. Any comment is welcome.

Email: feedback@composite-arf.com. We appreciate your comments very much.

Thank you!