

Scale sight and sound

Although there are many non-scale fun, sport, or aerobatic planes that many of us enjoy, who doesn't like a nice scale model? And of the scale models, a nice scale example of the WWI dawn patrol biplanes is something just about all of us like. So, when I decided to get a WWI biplane model, I had a good look around at what others were flying, and what really appealed to me was the Fokker D.VII.

It has a classic design, with fairly simple cabane struts, and not a lot of complicated rigging. If you need to remove the wing for transport in a compact vehicle, this simplicity is a real asset. Also, because I fly all electric, importantly the Fokker has a nice long nose, to help make final balancing of the plane easier. After looking at many options, I settled on the Hangar 9 Fokker D.VII. It is a nice size, with a good presence and visibility, and yet it is relatively easy to get to the field and back. In fact, it fits nicely in the back of my mid-size SUV with no disassembly required at all.

Hangar 9 has done a nice job on designing this for either electric or engine power right out of the box. I chose to use their recommended E-Flite 60 motor, E-Flite 60 amp switching BEC, and used some of my existing 3S 5000 LiPo batteries connecting two in series to make a 6S 5000 pack. I am using a Spektrum DX7 transmitter, and AR7000 receiver. The Fokker ARF assembly was very straight forward. As usual, Hangar 9 supplies outstanding directions; the kit was well packaged, with a good fit and finish.

During the construction, I noted that the eyelets for the cabane struts were all a bit too small for the supplied 4-40 screws, and I had to enlarge them all with a drill. Also, the center axle for the front landing gear appeared to slide laterally back and forth, so I added some wheel collars on each side of the wing spreader to keep it centered. The tail skid also quickly became a little loose, so I glued it in to the fuselage with epoxy. These are easy, straightforward fixes. After no more than 6-7 hours of building time, it was done. So much for the scale sight, this is a good looking airplane!

SCALE SOUND

I like electric power for many reasons, but let's face it; the electric motor does not even come close to producing a scale engine sound. In fact neither do the IC engines to

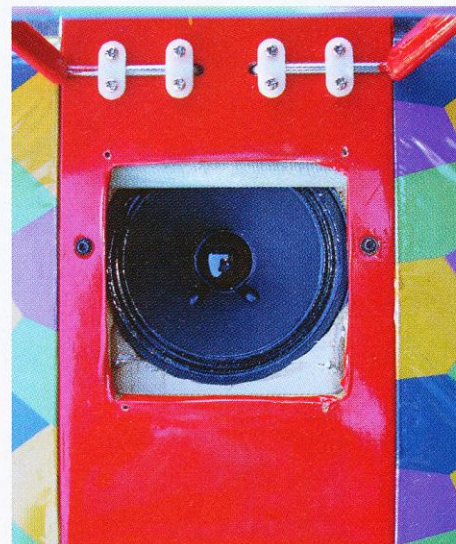


Author with Fokker

be honest. Having set my heart on getting a scale sound to go with the scale sight, I looked around and found the SFX6 from Model Solutions of Canada Ltd. (\$199 CDN from www.modelsolutions.ca). They produce a sound system designed for models of all sorts. When ordering the sound module, you choose from an extensive sound library, but even if your model isn't listed they may still be able to find it. Then they preload your system with the authentic sounds of your exact aircraft, which are actual digital recordings of the real airplane.

The sound system they provide is built on a small, sturdy printed circuit board. It has the ability to play startup, idle, running, and shutdown authentic engine sounds for your particular model. It can also reproduce the exact scale machine gun sounds, and with appropriate LED's, can even flash the gun barrels in sequence with the sound.

To play these sounds, you will need to install a speaker or two in the plane. To get maximal 40-watt sound requires two 4-Ohm speakers (\$20 CDN each), which Model Solutions can provide. These 4-inch diameter speakers weigh about 7 ounces each, so the plane needs to have sufficient room and carrying capacity for this. On my Fokker, I mounted one speaker in the fuselage just behind the main gear pointing down.



A small amount of covering under the fuselage is removed, and the speaker is mounted inside the bottom of the fuselage.

I opened an area of the plane's covering here, and covered it with a similar color fabric speaker grill.



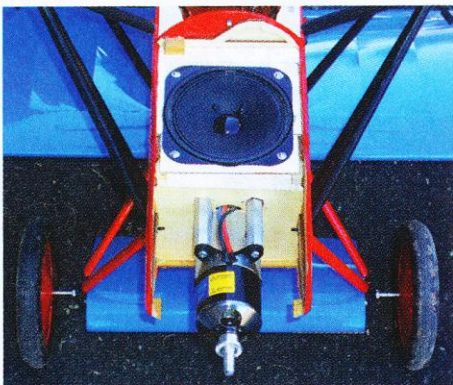
The SFX6 sound module circuit board nestles in nicely beside the Spektrum AR7000 receiver.

SCALE SIGHT AND SOUND



A closer look at the bottom speaker and with grill cloth installed.

I made a small 'baffle cone' out of 1/16 ply to help amplify its sound.



The second speaker pointed up under the cowl. Note careful full enclosure to maximize sound.



Roughly pyramid shaped 1/16 in. plywood 'baffle cone' covers the rear of the bottom speaker inside the fuselage.

I mounted a second speaker just behind the engine facing up. Most of this speaker's sound is actually directed forward due to the cowl.

With one speaker just behind the plane's CG and one speaker just in front, no disturbance of the CG resulted. In fact the plane required no extra balancing at all. These two speakers are connected in series, to give an 8 Ohm impedance. They connect to a screw terminal block on the SFX6 board.

The throttle from the receiver is then connected with a male-to-male servo extension (supplied by Model Solutions) to the 'throttle in' on the SFX6 board. The ESC out on the SFX6 board is then connected to the ESC via its normal connection. I chose to use the ESC's BEC to power my receiver, and also power the SFX6 board, although one could

use a separate receiver battery. I made a Y-connection from the main battery leads, and connected the main battery (26 volt) to the SFX6 board again on its terminal screw block. This power is used by the SFX6 audio amplifier to drive the speakers.

With these simple connections, I plugged in my 6S 5000 battery pack, and turned on the receiver power. Much like first setting up an ESC, on first power up you press a button on the SFX6 board. Then advance the throttle fully open, and then back to throttle off. The SFX6 'reads' the transmitter positions and stores them.

This done, I now gradually advanced the throttle, and viola, an authentic Fokker D.VII Mercedes engine sound burred to life, and in a few seconds, was 'idling' smoothly. As the throttle was advanced further, the engine sound smoothly accelerated in synchrony with the propeller speed. I throttled back, and the engine sound did a very convincing shutdown. Beautiful! I subsequently added another male-to-male servo connection from the SFX6 board to my DX7 auxiliary switch which controls volume on-off.

GUN FLASH LEDS

I then set about getting some machine gun action. Using two Model Solutions supplied bright orange-red LED's, I soldered 22-gauge wire connections to them and placed them at the end of the Fokker gun barrels. I drilled a small hole under the guns to route the wires inside. Then I slipped some black heat shrink over the gun barrel tips, covering the wires and the base of the LED's. A little heat, and bingo, a very easy and good looking LED installation.



Details of the LED installation at gun tips. Note heat shrink holding them in place and covering wires.

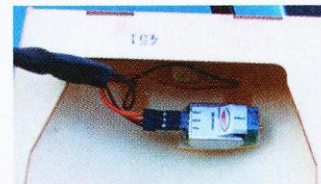
Inside, the two LED's are connected in series. From the SFX6 board, I connected a small voltage regulator (approx. \$15) from Dimension Engineering to decrease the main battery power from 26v to 6.4v, and then on to the LED's.

I connected my 'gear' channel on the DX7 to



the 'switch 1' input on the SFX6. Now, when I flip my gear switch up, I get a terrific machine gun sound, and both gun barrels flash in sequence. What an effect!

Off I went on my maiden flight. At the edge of the runway, I spun the propeller



Underside of the cockpit deck showing machine gun wiring and voltage regulator.

with one hand, and with the other advanced the throttle a notch, and the Mercedes sprung to life. This was quite the theatrical effect and met with much pleasure from onlookers. The Fokker does not have a steerable tailwheel, just a skid which is scale. So, it requires a little finesse to keep straight down the runway until enough airspeed is gained for the rudder to be effective. Then, a little up elevator and away it goes. All the while, it was producing that delicious scale engine sound.

After a couple of passes to allow some minor trim, it was flying very comfortably at 1/2 throttle. Just ahead, appeared an errant Piper J-3 model. I flew in behind and let a few bursts of machine gun fire, complete with flashing muzzle. Then, the Fokker's work done, the Hun's sky clear, I rounded for a nice landing to the cheers of all those around, except perhaps the J-3 pilot...

Editors note: See video of John Falconer's Fokker at www.flyrc.com.

Links
Dimension Engineering,
www.dimensionengineering.com

Hangar 9, distributed exclusively by Horizon Hobby Distributors, www.horizonhobby.com, (800) 338-4639

Model Solutions of Canada,
www.modelsolutions.ca, (613) 882-4649

Spektrum, distributed by Horizon Hobby,
www.spektrumrc.com, (800) 338-4639

For more information, please see our source guide on page 121.