

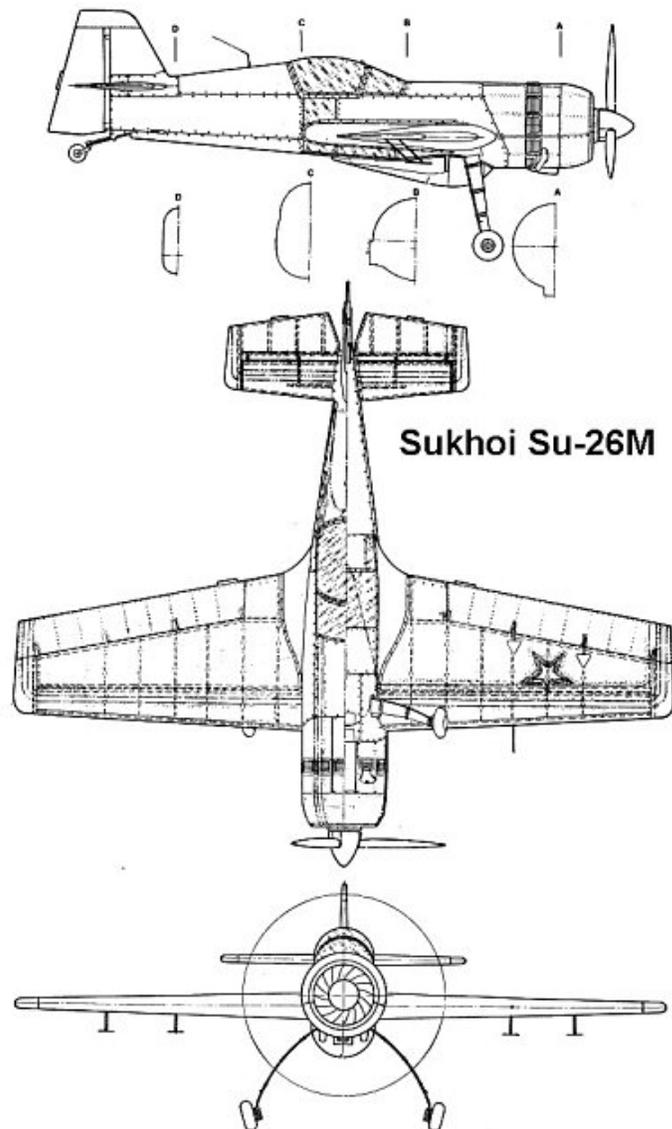
Special aircraft for extreme aerobatics for REFLEX XTR

Sukhoi Su-26M

True-to-scale behavior as a model or even 3D capable

The Su-26M is a special aircraft for extreme aerobatics, built by Sukhoi in Russia (<http://www.sukhoi.org/eng/planes/civil/su-26/>). *Gerd Gunzenhauser* now created a model for the REFLEX flight simulator, which is modeled after a real Su-26M. It's an aircraft in the Honda Road Angels outfit, flown by *Will Curtis* in England.

From <http://richard.ferriere.free.fr/3vues/3vues.html>:



The Su-26 is supposed to be one of the first aircraft in the 1980s that were able to fly extreme maneuvers unknown till then, by means of their maneuverability and strong engine. The flight behavior parameters developed by *Gerd Gunzenhauser* and *Jürgen Dreyer* render a 3D model, though, that is able to fly even more extreme maneuvers. I prefer flight characteristics similar to those of the original aircraft, so I adjusted them myself, as suggested by *Jürgen*. The model resembles the original quite well, but it may be a good 3D model as well if set up as typical for a model.

The REFLEX models

The Su-26M was set up for REFLEX in several sizes/scales. In any case the model supplied by *Gerd Gunzenhauser* is used, but each size has its own drive sound. For each size there is a version adjusted to a flight behavior similar to that of the real airplane, and another version adjusted as a 3D model.

Scale	Wingspan		Weight		
1:2.3	134 in	3.40 m	61.7 lb	28.0 kg	1 more realistic weight
1:2.3	134 in	3.40 m	61.7 lb	28.0 kg	2 better wing parameters
1:2.3	134 in	3.40 m	52.9 lb	24.0 kg	set up also for 3D
1:3.5	89 in	2.25 m	15.5 lb	7.0 kg	set up also for 3D
1:3.5	89 in	2.25 m	14.1 lb	6.4 kg	1
1:3.5	89 in	2.25 m	14.1 lb	6.4 kg	2
1:3.5	89 in	2.25 m	14.1 lb	6.4 kg	E169 1 Eppler 169 airfoil
1:3.5	89 in	2.25 m	14.1 lb	6.4 kg	E169 2 maybe best version
1:3.5	89 in	2.25 m	13.0 lb	5.9 kg	
1:3.5	89 in	2.25 m	13.0 lb	5.9 kg	E169 1
1:3.5	89 in	2.25 m	13.0 lb	5.9 kg	E169 2
1:3.5	89 in	2.25 m	11.5 lb	5.2 kg	
1:4	78 in	1.97 m	10.4 lb	4.7 kg	set up also for 3D
1:5	62 in	1.58 m	5.3 lb	2.4 kg	electric, also for 3D

The first two scales were also used for the Zivko EDGE 540. It's a bit smaller and has more slender wings than the Su-26M. Its big wing area gives a small wing loading despite the substantially higher weight. In each size the model's weight was chosen so that all have the same cubic wing loading. So you may compare different sizes and the Su to the EDGE.

The Su is bigger, heavier, and more stocky. High engine power and big control areas make for the excellent maneuverability. Damping of motions is slightly smaller than that of the EDGE. High angles of attack give a big increase of drag. The Su is not completely symmetrical and neutral, but to a great extent. These differences are noticeable in REFLEX.

The trust/weight ratio is 1.8 in the 3D versions and 1.2 in the normal versions. There, the deflections of ailerons and elevator are set to 20 degrees, in the 3D versions to 30 degrees. The rudder deflection is set to 25 degrees in all versions because there is a mechanical restriction. In REFLEX, expo is set with different rates to have easier flying with the big control areas. If you don't like that simply remove these settings (F5).

The 28kg versions scaled 1:2.3 are experimental to better match the original's flight characteristics. Version 1 has parameters for the wing airfoil which make for a distinct stall. Version 2 has a softer stall and different

control throws. The original versions were all set up for no stall at all so spins and snap (flick) roll are "faked" there.

The versions scaled 1:3.5 with weights other than 7 kg are experimental as well, and as well with more true-to-original flight characteristics in mind. The 5.22kg version was an attempt to combine a realistic weight with a smooth wing stall, like in the 28kg version 1.

The 5,9kg version, on the other hand, should only test a different weight and improve some parameters, for instance the drive. The same holds for the 16,37kg versions 1 and 2. The latter has 1° incidence of wing and stabilizer to achieve a more neutral knife-edge flight.

The versions with the special aerobatic airfoil Eppler E169 try to achieve that by different C/G locations. The difference between the 5.9 kg and 6,37 kg versions seems small in terms of stall behavior and thus spinning and snap (flick) rolls. Both 5,9kg versions have a quite rear C/G what makes for a neutral but somewhat twitchy flight behavior. The 6,37kg version 1 has a more fore C/G and a bit down thrust while version 2 has an even more fore C/G and no down thrust.

The latter version seems to be the best of all, at least to me. It flies good verticals and nearly neutral knife-edge. Due to airfoil and weight it's easy to stall, but you may protect yourself from inadvertent stalling by setting up Dual Rate. In contrast, the pronounced stall at full elevator enables proper spins and snap (flick) rolls.

The thrust/weight ratio is about 1 on all experimental versions what enables no 3D flying but fast classical pattern flying. That allows to compare the Su-26M with the equivalent model versions of the Extra 300, EDGE 540, Zlin Z-50LS, and even Z-526AFS.

Please try yourself!

The REFLEX Model Files

The installer program creates the folder (directory)

...\\Flugzeug\\Sukhoi\\

and stores the par files and some other files there. The file „Sukhoi su26m-2.mod“ from the zip file published by *Gerd Gunzenhauser* and *Jürgen Dreyer* (at [RC-Sim](#)) has to be in this folder as well, renamed to „Su-26M.mod“. If *Gerd Gunzenhauser's* original package was installed in the right place before, the installer copies and renames the mod file automatically.

I prefer a model engine's sound for the REFLEX model, even if I don't have the „correct“ one. *Herbert and Janning Quint* recorded the sound of a ZG 38 and published it on [RC-Sim](#). This quite sonorous sound is assigned to the big 1:2.3 (3.40 m) model versions (use permitted by *Janning Quint*). The sound of a Zenoah G20ei is assigned to the 1:3.5 (2.25 m) versions. The small 1:4 (1.97 m) version has the O.S. 120 AX engine sound as a perfect fit. *Jorma Kinnunen* published a P-47 model for REFLEX on [RC-Sim](#). The included sound of a Hacker A30-26 brushless motor is well suited to the 1:5 (1.58 m) electric version and is used here with his permission. Some of the experimental 1:3.5 versions got the sound of a Saito FA 90R3 radial engine.

The drive sound files are

ZG38-1550.wav and ZG38-1550_.wav,
Zenoah G20ei.wav and Zenoah G20ei_.wav,
OS 120 AX.wav and OS 120 AX_.wav,
HackerA30.wav and HackerA30_.wav,
Saito FA 90R3.wav and Saito FA 90R3_.wav.

Now all should be available, including a demo flight, and this text should be accessible in the program menu „Programs\\REFLEX\\models“. Of course, the demo flight „Su-26M“ (hit F9 in REFLEX) with the 89 in version is intended to show the (great) abilities of the aircraft and not my (small) ones. Especially the roll rate is remarkable.

Enjoy!

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<http://time.hs-augsburg.de/~erd/Modellflug/textReflex.html>

More REFLEX models and the latest versions are on my page
<http://time.hs-augsburg.de/~erd/Modellflug/textDownloads.shtml>

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