Above: The 11-78 Midas shows off its underfuselage "traffic lights" which co-ordinate receivers for radio-silent refuelling Below; About 100km track length is needed to top up a Fencer

Below: Breaking contact, or a soft prod, results in a fuel wash

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he Soviet air force's Sukhoi Su-24
Fencer strike force has a previ-
ously unknown buddy-buddy air-
to-air refuelling (AAR) capability,
using a tanker variant of the Fencer, the Su-24MK, to refuel both Su-24s and the Mikoyan MiG-31 Foxhound interceptor.
All the Su-24s from the Fencer D model (Su-24M) are equipped with a retractable flight-refuelling probe on the port side of the nose. Soviet air force tankers include the purpose-built Ilyushin 11-78 Midas, which has replaced all the tanker conver-sions of the Myasischev Mya-4 Bison, and some tanker Tupolev Tu-16 Badgers.
The Soviet air force first started AAR in the late 1940s, using a wingtip-to-wingtip hoseline system on Tu-2 Bats. In 1955 tip-to-tip AAR tests were made with the Tu-16, and by the end of 1956 the proce-dure was standardised in Tu-16 regiments. Total transferable fuel for the Tu-16, using the tip-to-tip method, was 19,000kg.
The Soviet air force converted some of its Tu-16s to "conventional" trailed single-point hose/drogue AAR in 1963, with the hose-reel unit mounted in the bomb bay. This had the advantage of being considera-bly easier for the receiver pilot, who no longer had to peer over his shoulder to pick up the hose with a wingtip attachment. The single-point Tu-16 had less fuel available, however, with a transferrable total of 15,000kg. A prime receiver for the Tu-16s was the Tupolev Tu-22 Blinder strategic bomber, which started tanking in 1961. Buddy-buddy AAR was first tried in the mid-1970s, using Sukhoi Su-15 Flagons with a centre-line mounted hose/drogue pod. It is thought that this did not progress to operational use but was to establish the parameters of buddy refuelling for the Su-24. The Su-24MK's buddy pod is called UPAZ (unified refuelling pod) and the aircraft has 9,000kg transferrable fuel total. Western tanker drogues have small Beta lights around their circumference to aid engagement during night AAR. The Russian drogues do not have any, so the receiver aircraft must illuminate the drogue. The Su-24 has special underwing spotlights for this and night AAR is practised regularly. The method of tanking is basically the same as in the West: the receiver pilot is responsible for join-up, engagement and disengagement, and the navigator is respon-sible for the fuel-transfer procedure. To refuel a strike group, usually ten to 12 Fencers, an 11-78 Midas will pass each aircraft 8,000-9.,000kg of fuel, which takes up a track length of some 100-120km (54-65nm) each.
•The tactical radius of an Su-24 is in-creased by 85-90% after a single refuelling
and, with both pre-and post strike refu-
elling, up to 135%-180% of the standard
tactical radius can be achieved, depending
on whether the aircraft flies a hi-lo-hi or a
lo-lo-lo mission profile. •

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