An Aeroflot Mi-4 ("Hound") at Vnukovo Airport, Moscow. Rather larger than the Sikorsky S-58, the Mi-4 has an all-up weight of 15,875 lb. (Photo: B.E.A.)

MODERN SOVIET AIRCRAFT: No. 17

'Hares' and 'Hounds'

The Mi–1/Mi–4 family

by John W. R. Taylor

BACK IN 1950, Sikorsky were turning out the S-51 and S-55 helicopters in large numbers in America, while Bell and Hiller were equally well established in the light helicopter business. Britain, too, had the promising little Skeeter and Sycamore.

By contrast, the Soviet Union seemed to be plodding on with designs like the impractical Kamov "flying motor-cycle" and, at the other extreme, the Bratukhin Omega, looking rather like the Forth Bridge with side-by-side rotors.

The whole picture changed when Mikhail Mil's Mi-1 (N.A.T.O. code-name "Hare") put in a first appearance at the 1951 Soviet Aviation Day Display at Tushino Airport, Moscow. There was nothing startlingly new about it. On the contrary, like most other helicopters that worked, it followed the classic single-rotor formula pioneered by Igor Sikorsky. But it looked a thoroughly workmanlike aircraft of the kind that might be churned out in vast numbers for years—and this has proved to be so.

The configuration, structure and control system of the Mi-1 are entirely orthodox. It has a central welded steel-tube pylon, to which are attached the light alloy semi-monocoque cabin and tail boom, the 575-h.p. AI-26V seven-cylinder fan-cooled radial engine, a 53-gal. main fuel tank and the main undercarriage oleos. The three blades of the 45 ft. 11 in. main rotor each have a steel-tube spar and wooden ribs, covered with fabric near the root and plywood further outboard. The tail rotor blades are all-wood.

In standard form, at an all-up weight of 4,960 lb., the Mi-1 carries a pilot centrally in front and two or three passengers on a rear bench seat. However, it can be used for many other jobs, including mail carrying, ambulance duties, and crop-spraying and dusting, with a hopper for 880 lb. of chemicals mounted externally on the port side of the cabin.

In the ambulance version, the patients travel inside two heated external panniers, connected to the cabin by tunnels so that a nurse can attend to them in flight. With a 33-gal. external fuel tank carried instead on the port side, the range of the Mi-1 goes up from 217 miles to 310 miles at 87 m.p.h. Maximum speed is 124 m.p.h.

The Mi-1 flew for the first time in 1950 and was in service with the Red Air Force and Aeroflot within a year. A second production line was set up at the WSK (Transport Equipment Manufacturing Works) at Swidnik in Poland in 1955, and this factory now exports the aircraft to the Soviet Union and other countries.

The Polish version is designated SM-1 and its licence-built AI-26V engine is known as the LiT-3. By lengthening and enlarging the front fuselage, WSK-Swidnik produced the five-seat SM-2, which flew in 1960 and is now in series production. The larger cabin and hinged nose-door of this helicopter enable it to carry its two stretchers internally.

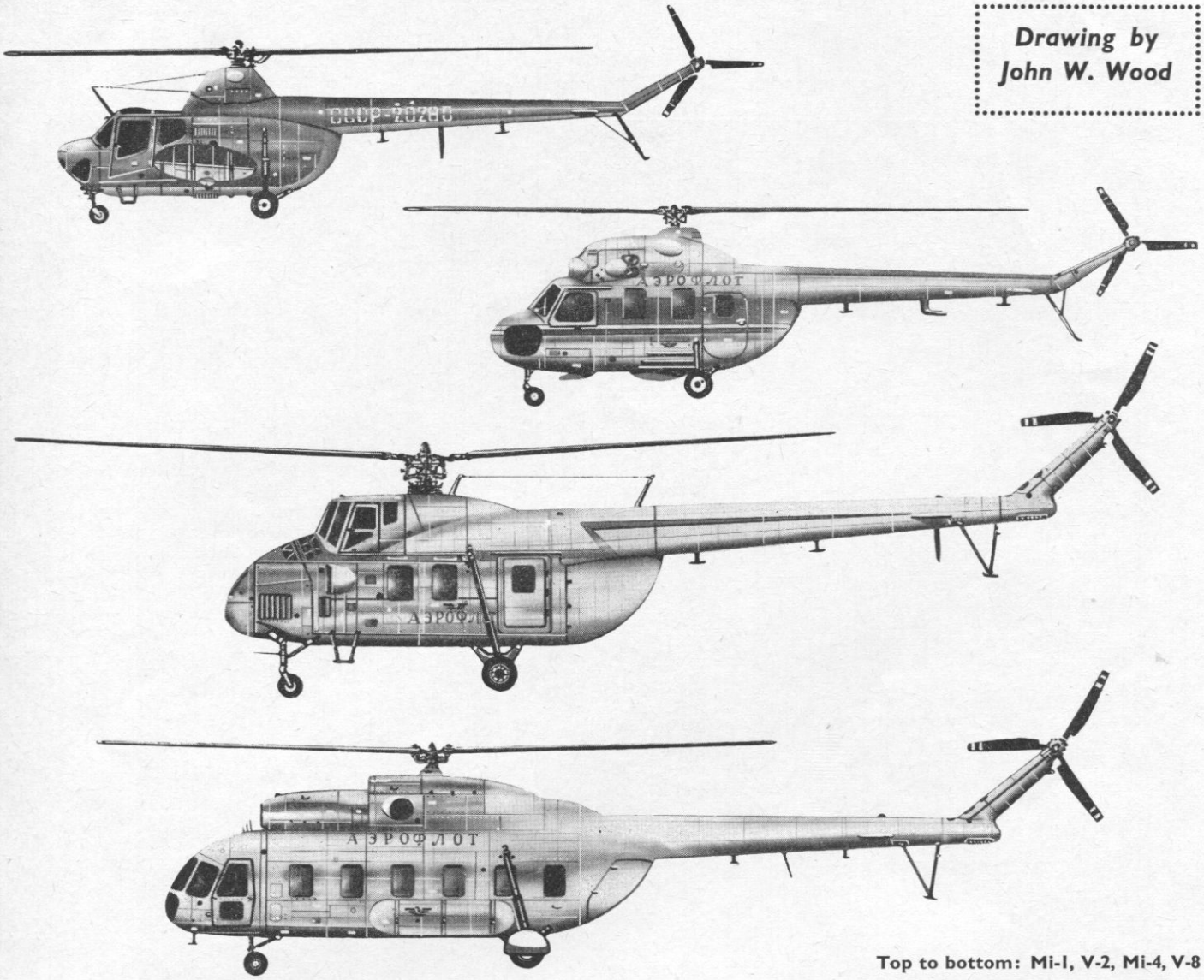
Mil also has been busy developing the Mi-1. As a start, he evolved the Mi-3 with four-blade rotor. Then, in mid-1960, the now standard four-seat Moskvich appeared, with all-metal rotor, hydraulic controls, improved soundproofing and all-weather capability. It was followed in the autumn of 1961 by the V-2 (N.A.T.O. code-name "Hoplite"), with the same rotor system but powered by two small shaft-turbines (said to be 700-800 h.p. units by S. Izotov) mounted side-by-side above the cabin. Cleared of the power plant, the whole interior of the V-2 is available for payload and up to eight passengers can be carried without any increase in overall dimensions.

Second basic design

The story of Mil's second basic design, the 8/14-passenger Mi-4 (N.A.T.O. code-name "Hound"), is similar. Rather larger than the Sikorsky S-58, with a rotor diameter of 68 ft. 11 in. and all-up weight of 15,875 lb., it went into production in 1952 for civil and military use, with a

An early V-8 ("Hip") with single turbine above the cabin. A twin-turbine version, which now seems more common, first appeared in October 1962

A turbine-engined development of the Mi-1 series, the V-2 ("Hoplite") shown here has two units of 700-800 h.p. each and can carry eight passengers



Top to bottom: Mi-1, V-2, Mi-4, V-8

1,700-h.p. ASh-82V eighteen - cylinder radial engine behind clamshell doors in the nose. Military versions have an under-fuselage gondola for a navigator and rear doors for loading freight and small vehicles. In the airline version (Mi-4P) the rear of the cabin contains a toilet, wardrobe and space for 220 lb. of baggage. The Mi-4S agricultural model carries a ton of dust or 352 gal. of chemical spray in a hopper in the cabin.

Thousands of Mi-4s have been built. Their performance, with a range of 155-250 miles at 99 m.p.h. and top speed of 130 m.p.h., and good handling qualities, compare with the best contemporary western types and hundreds have been exported throughout the world.

Now, the Mi-4 has been developed into the turbine-powered V-8 (N.A.T.O. code-name "Hip"). The original version of this aircraft had a single shaft-turbine above its cabin, but it is now depicted usually with two turbines, reported to be 1,300-h.p. engines by Izotov. Shifting the power plant has made room for the crew in the nose, where they have an improved view; and the main cabin—cleared even of fuel, which is in an external tank on each side—can accommodate twenty-four passengers, fourteen stretchers or three tons of freight.

If the V-8 is as good as it looks, it may well give the Soviet Union an inter-city airbus service that will be the envy of the world in the 1960s.

An Mi-1 ("Hare") of Aeroflot's Arctic Region air fleet takes off from Murmansk Airport. Below it can be seen some ski-equipped An-2s and a couple of Yak-12s