

on November 7th, 1945, G/C. H. J. Wilson flew a Gloster Meteor 4 at 975.675 km/hr (606 m.p.h.). This was the first record established by a jet-propelled aircraft in any category. The figure showed an increase of 220.537 km/hr (137 m.p.h.) over Wendel's record. Naturally enough, jet types have held the absolute record ever since, although in 1949 the F.A.I. decided to recognise records in both piston-powered and jet-propelled categories, so that Wendel's record, dropped from the official list in 1945, has since been restored as a record in Group 1.

After G/C. E. M. Donaldson had increased the record for this country (to 991 km/hr) in 1946, America made four more attempts and improved the speed each time.

While it has always been necessary to await suitable weather before making a record attempt, the introduction of jet aircraft flying at high Mach numbers has necessitated a further consideration—that of temperature. The speed of sound increases with an increase in temperature, delaying the onset of sonic waves and permitting a greater speed by the aircraft. In this country weather conditions are never good enough to permit high-speed aircraft to fly at their absolute maximum speed. At Muroc, California, the U.S.A.F. has an ideal base at which to break records, and that is partly the reason why that country has managed to increase so substantially the absolute speed record four times between 1946 and 1948. If the Meteors of the High Speed Flight flew at Muroc it is estimated that about another 20 m.p.h. would be added to their speed. The air at Muroc is relatively free from the turbulence which is always met with in Great Britain and which can make flights at high Mach numbers difficult and dangerous.

The first of the American records was made on June 19th, 1947, when Captain Albert Boyd, U.S.A.F., flew a Shooting Star at 1003.700 km/hr, becoming the first man to exceed 1000 km/hr.

The U.S. Navy made the next two records, both with the Douglas Skystreak. Finally the Army, represented by Major R. L. Johnson, had another go and this time pushed up the record to its present figure of 1079.841 km/hr (670.981 m.p.h.). The aircraft used was an F-86, the first swept-wing type to hold the record.

TABLE 11: 1920-23 (1km COURSE)

Date	Pilot and Country	Aircraft	Engine	Speed (km/hr)
7.2.20	S. Lecoite (Fr.)	Nieuport 29	Hispano Suiza	275.264
28.2.20	J. Casale (Fr.)	Spad-Herbemont	" "	283.464
9.10.20	de Romanet (Fr.)	Spad-Herbemont	" "	292.682
10.10.20	S. Lecoite (Fr.)	Nieuport 29	" "	296.694
20.10.20	S. Lecoite (Fr.)	Nieuport 29	" "	302.529
4.11.20	de Romanet (Fr.)	Spad S.20	" "	309.012
12.12.20	S. Lecoite (Fr.)	Nieuport 29	" "	313.043
26.9.21	S. Lecoite (Fr.)	Nieuport-Delage Sesquiplan	" "	330.275
21.9.22	S. Lecoite (Fr.)	Nieuport-Delage Sesquiplan	" "	341.023
13.10.22	W. Mitchell (U.S.A.)	Curtiss R.	Curtiss D.12	358.836
18.10.22	W. Mitchell (U.S.A.)	Curtiss R.	" "	361.280
15.2.23	S. Lecoite (Fr.)	Nieuport-Delage Sesquiplan	Hispano Suiza	375.000

For an attempt over the 3 km course the following rules as specified by the F.A.I. and detailed in *The Competition Rules of the Royal Aero Club of the United Kingdom* must be followed:—

The distance of the course must be measured by direct measurement or observation by an approved method and by an official survey authority. The course must be approved by the F.A.I. and a permanent course licence issued in respect of it.

The course has to be prolonged at each end by an approach of at least 1,000 m, the extreme boundaries of which must be marked by pylons. The course itself and the approaches thereto must be marked clearly enough for the pilot and the stewards appointed by the Royal Aero Club to see them easily. One steward is stationed at the entrance to the course, one at the starting point and one at the finishing point. The method of marking the course is left to the R.Ae.C., but the F.A.I. must give its approval. For the R.A.F. High Speed Flight attempts at Herne Bay and Littlehampton in 1945 and 1946 barrage balloons and buoys were used. The course can, if necessary, be marked out over land or water.

The aircraft making the attempt must not fly over 1,000 m before entering the course, and over the course itself must not fly higher than 100 m, so that untrue speeds cannot be built up by diving on to the course. To ensure that these conditions are adhered to, observers are carried in other aircraft flying at 500 m, and their certificate that the record-attempting machine has not flown above the observer aircraft is required. The record aircraft carries a barograph, the chart of which is included in the dossier of particulars subsequently sent to the F.A.I. for official confirmation of the record.

The aircraft attempting the record flies over the course twice in each direction and the average speed of the four flights, calculated to the nearest km/hr below the recorded speed, is accepted as the record figure. If more than four flights are made, any four alter-

TABLE 1: SPEEDS FROM 1906 TO 1913

Date	Pilot and Country	Aircraft	Engine	Speed (km/hr)
12.11.06	A. Santos-Dumont (Fr.)	Santos-Dumont	Antoinette	41.292
26.10.07	H. Farman (Fr.)	Voisin	"	52.700
20.5.09	P. Tissandier (Fr.)	Wright Flyer	Wright	54.810
23.8.09	G. Curtiss (Fr., later U.S.A.)	Curtiss	Curtiss	69.821
24.8.09	L. Blériot (Fr.)	Blériot XI	Anzani	74.318
28.8.09	L. Blériot (Fr.)	Blériot XI	"	76.995
23.4.10	H. Lathan (Fr.)	Antoinette	Antoinette	77.579
10.7.10	L. Morane (Fr.)	Blériot	Gnome	106.508
29.10.10	H. Leblanc (U.S.A., later Fr.)	Blériot	"	109.756
12.4.11	H. Leblanc (Fr.)	Blériot	"	111.801
11.5.11	E. Nieuport (Fr.)	Nieuport	"	119.760
12.6.11	H. Leblanc (Fr.)	Blériot	"	125.000
16.6.11	E. Nieuport (Fr.)	Nieuport	"	130.057
21.6.11	E. Nieuport (Fr.)	Nieuport	"	133.136
13.1.12	J. Vedrines (Fr.)	Déperdussin	"	145.161
22.2.12	J. Vedrines (Fr.)	Déperdussin	"	161.290
29.2.12	J. Vedrines (Fr.)	Déperdussin	"	162.454
1.3.12	J. Vedrines (Fr.)	Déperdussin	"	166.821
2.3.12	J. Vedrines (Fr.)	Déperdussin	"	167.910
13.7.12	J. Vedrines (Fr.)	Déperdussin	"	170.777
9.9.12	J. Vedrines (U.S.A., later Fr.)	Déperdussin	"	174.100
17.6.13	M. Prévost (Fr.)	Déperdussin	"	179.820
27.9.13	M. Prévost (Fr.)	Déperdussin	"	191.897
29.9.13	M. Prévost (Fr.)	Déperdussin	"	203.850

nate consecutive flights, provided they are made within 30 minutes, may be selected.

In measuring the speed an accuracy of plus or minus 0.5 per cent (recently increased from 0.2 per cent) is required. The old figure of 8 km/hr required before a new record could be confirmed has been abolished, and it is now necessary for the existing record to be beaten by one per cent. That means that any aircraft attempting to improve upon Major Johnson's record in the F-86 Sabre will have to fly at about 1091 km/hr (678 m.p.h.). After the demonstrations of the Hawker P.1081 and the Supermarine 535 flying at Farnborough last year there seems to be no reason why, with developments of these aircraft, Great Britain cannot regain the record. It is six years since we held it.

Not one of the "absolute" records—speed, height and distance—stands to the credit of Great Britain; all are held by America. (It should, of course, be remembered that the absolute height record is held by a balloon; Britain does possess the "heavier-than-air" record, secured by G/C. Cunningham, Vampire, at 59,446ft.)

Since the Annual Conference (the 43rd) of the F.A.I., held in Stockholm last year, it is possible for the absolute speed record to be made at an unlimited height. With aircraft flying at supersonic speeds the maximum speed cannot be achieved at low level. Obviously the 3 km course would be too short over which to measure such attempts, so the length of the course in this case is extended to 15-25 km with an entrance, or "run-in," of 5 km. Two flights, one in each direction, must be made and measurement must be to within an accuracy of 0.5 per cent.

One of the most important of the conditions for the speed record at unlimited height is that any means of launching an aircraft making such an attempt is authorized. This means that a small aircraft with rocket- or jet-propulsion, provided it carries a pilot, can be carried up to height under a larger aircraft.

Other conditions are as for a speed attempt over the 3 km course.

So far no attempt has been made to gain a record under these new conditions, and the whole question of accurately observing and timing such a flight is one raising important issues. The ciné-camera methods employed in 1945 and 1946 are obviously outdated and it seems like a job for the National Physical Laboratory to establish a suitable means by radar.

TABLE 111: 1923-1948 (3 km COURSE)

Date	Pilot and Country	Aircraft	Engine	Speed (km/hr)
29.3.23	R. L. Maugham (U.S.A.)	Curtiss R-6	Curtiss D.12	380.751
2.11.23	H. J. Brow (U.S.A.)	Curtiss R-6	Curtiss D.12	417.059
4.11.23	A. J. Williams	Curtiss R-6	Curtiss D.12	429.025
11.12.24	A. Bonnet (Fr.)	Bernard-Ferbois	Hispano Suiza	448.171
4.11.27	M. di Bernardi (It.)	Macchi M.52	Fiat AS 3	479.290
30.3.28	M. di Bernardi (It.)	Macchi M.52bis	" "	512.776
12.9.29	A. H. Orlebar (G.B.)	Supermarine S.6	Rolls-Royce	575.700
29.9.31	G. H. Stainforth (G.B.)	Supermarine S.6b	Rolls-Royce	655.000
10.4.33	F. Agello (It.)	Macchi-Castoldi M.C.72	Fiat	682.078
23.10.34	F. Agello (It.)	Macchi-Castoldi M.C.72	Fiat	709.209
26.4.39	F. Wendel (Ger.)	Messerschmitt Bf 109R	Daimler-Benz	755.138
7.11.45	H. J. Wilson (G.B.)	Gloster Meteor 4	2 R-R. Derwent	975.675
7.9.46	E. M. Donaldson (G.B.)	Gloster Meteor 4	2 R-R. Derwent 5	991.000
19.6.47	A. Boyd (U.S.A.)	Lockheed P-80	G.E.C. J-33	1003.700
20.8.47	T. Caldwell (U.S.A.)	Douglas D-558	G.E.C. J-35	1031.178
25.8.47	M. E. Carl (U.S.A.)	Douglas D-558	G.E.C. J-35	1047.536
15.9.48	R. L. Johnson (U.S.A.)	North American F-86	G.E.C. J-47	1079.841