



AIRCRAFT
DESCRIBED

No. 259

Piper Super Cub

Drawn by A. A. P. Lloyd
Described by Charles W. Cain

Super Cub lineage

Since "people-make-planes-'make'-people", the 'Super Cub' starting point is logically with those American pioneers of the 1920-30s whose good ideas have now kept a production-line in being for more than five decades. In the beginning, the originality, the engineering and the sales commitment were those of the Rochester, N.Y.-based Taylor brothers. And not long after the launch of their first sportsplane, the 'Chummy', another name was added to the enterprise — that of oil businessman, William T. Piper, of Bradford, PA.

The 90-hp, 2-seat, parasol monoplane 'Chummy' of 1928-30 would have been conventionally priced and might have prospered but for the untimely death in 1928 of the sales' driving-force, brother Gordon and the hideously spectacular and disastrous collapse of the Wall Street stock market in 1929. Fate redressed the imbalance in that same year by the introduction of W. T. Piper, who with his partner, Ralph Lloyd, injected new finance into the embryo aircraft company. After his brother's death, Gilbert Taylor settled in Bradford, PA, and the link with William Piper was made absolute with the latter becoming a member of the board.

Newcomer Piper provided the right impetus so that Taylor and himself should ride out the storm of the Great Depression of the 1930s. The reasoning was sound. The conventionally-priced 'Chummy' would find only a limited market after the Wall Street crash; but, slash the selling price by 50-60% and still provide a safe-looking, cabin-type, two-seater and the demand should secure the company's economic future. It did, but not immediately and not without changes in the company's structure. The new product was the 'Model E2', the 'Cub', of 1930.

No doubt it was unpleasant for C. Gilbert Taylor, but by early 1931, the original company was made bankrupt and W. T. Piper was able to buy the assets, including the prototype 'Model E2', for a modest

US\$600.00 (about £2,300 in today's £Sterling). By March 1931, a new company was in being as the *Taylor Aircraft Company, Inc.*, with Taylor as President and Chief Engineer and Piper as Secretary and Treasurer. Between 1936-37, the Treasurer first bought out his partner (and assumed two more titles, President and Board Chairman) and then, in 1937, reconstituted the company as the *Piper Aircraft Corporation* with Walter Jamouneau retaining the title of Chief Engineer that he had latterly held in the old company.

Meanwhile, first at Pittsburgh-Butler, PA, and later at Alliance, OH, C. G. Taylor opted for the side-by-side seating for his first independent product, the *Taylorcraft 'Model A'*. As early as November, 1938, the British connection was established and the eventually many-branched *Auster* family-tree was planted in the name of *Taylorcraft Aeroplanes (England) Ltd.*

But back in Pennsylvania, 1937 was also the year when the Bradford, PA, plant was seriously damaged by fire. And, rather than risk losing potential customers by further delay, the 200-strong work-force was relocated some 80 miles south-east to Lock Haven, PA. Soon the former silk factory was employing twice the number of people and was neatly dubbed 'Cub Haven'; even today, the adjoining municipal airport is known by this name.

Super Cub forebears

In broad terms, the *Dacron*-covered, aluminium and welded steel construction 1980s' PA-18-150 'Super Cub' should be the ultimate model in over 50 years of development and production of the *Piper* high-wing cabin monoplane family on the *tandem-seat* theme. That emphasis is necessary because there are other branches of the *Piper* high-wing lightplane clan. For example, there are the 2-seat side-by-siders like the 1938 J4A 'Cub Coupe' and on the 1961 PA-22-108 'Colt'. And there are 3- and 4-seaters from the 1940 J5A 'Cruiser' 3-seater to the 1950s'

PA-22-125/160 'Tri-Pacer' 4-seaters. Broadly-speaking then, with so many variations and anomalies on offer to confound the chronicler, if it has got tandem-seating then it is most probably a 'Model 2' (like E2, F2, H2 or J2 'Cub'), or a 'Model 3' (like J3, J3C-65, F-65 or L-65 'Cub'), or the L-4 'Grasshopper', or a PA-11 'Cub Special', or (at last!) a PA-18 'Super Cub' — of which, more anon, as they say.

The earlier birds — The beginning is with the *Taylor/Piper 'Model 2'* on the 1931 production line. The breakthrough came with the American advance in developing the air-cooled 'flat four' piston engine of 37-40 brake horsepower and to make the power unit available at a price lightplane manufacturers could exploit to create really economical small aircraft. *Continental* was first with its 'Model A-40' producing a maximum output of 38-hp at 2,800 rev/min. The 'A-40' went into the *Taylor/Piper E2 'Cub'*. But, just to be awkward, the F2 and the H2 both had air-cooled, inverted-Y, 3-cylinder engines; the F2 had the 40-hp *Aeromarine* AR-340, and the H2 had the similar power output *Szekely* SR-3 motor.

Next came the 'Model 3' with the J3 'Cub' (sometimes called 'New Cub') for the 1938 production line. By 1940, the trim Cub was being offered with a primary training option which was reflected in the new sales name of J3C-65 'Cub Trainer'. The J3's new suffix is a useful aid since the 1940 model was on offer with the choice of three 65-hp 'flat fours'. The most popular was the *Continental* A-65 (thus, J3C-65). Then there was the J3F-65 for the *Franklin* 4-AC-150 and J3L-65 for the *Lycoming* 0-145-B engine. The 1940 J3 had yet another marketing name — 'Cub Sport.'

A 1/24 scale dye-line print of this drawing is available from Aeromodeller Plans Service, PO Box 35, Wolsey House, Wolsey Road, Hemel Hempstead, Herts. HP2 4SS, price £1.65 plus 50p postage and packing. Please quote Plan No. 3061 when ordering.

Grasshopper era — December 7, 1941 changed the course of World War 2 when the Japanese bombed Pearl Harbor, Hawaii. For *Piper Aircraft*, by that time the company was claiming to have built its first 10,000 'Cubs'. The American fighting services were going to need a lot of 'Cubs'

from then on. But the summer manoeuvres for elements of the U.S. Army Ground Forces proved once and for all that light observation two-seaters (like the 'on-loan' *Piper 'Cubs'* and some of their competitors) just had to be part of Army Ground Forces battle front inventory. The U.S. Army Air

Forces was responsible for placing such orders for both services and, starting with observation O-59, the militarised 'Model 3' advanced to the better-known liaison L-4 'Grasshopper' designation. The L-4 (out of the lookalike other 'Grasshoppers', the *Taylorcraft L-2s* and *Aeronca L-3s*) was chosen as the front-line 'Plane Friday' in every Theatre of Operation from Europe to the Far East. An enlarged version, the L-14 of 1945 was a victim of production cancellation after VJ-Day. Only five Service Test YL-14s were delivered, the further 845 L-14s were not built.

Post-WW2 tandem-seaters — Despite the well over 100,000 trained pilots as potential additional 'Cub' owners, the post-war dream did not quite live up to expectation. Nevertheless, the *Piper* people hurried back into production with the 1940 J3C-65, but gave it the sales name of 'Cub Special'. By 1947, the 'Cub Special' had become the first production model to be fitted into the new nomenclature of *PA* for *Piper Aircraft* — the *PA-11* with a 65-hp *Continental A-65-8* 'flat four'. From the *PA-11*, the next step was a military requirement for America's Nato allies, the *PA-18 'Super Cub'*, which in military guise was to become the L-18 and the L-21.

The Military Super Cub — Under the terms of Nato's M.D.A.P. (Mutual Defense Assistance Pact), the United States agreed to supply arms including aircraft. Various Nato armies, as well as the U.S. Army Ground (later Field) Forces were to be recipients. The first was the Turkish army which was allocated 105 L-18Bs. These were standard *PA-18-95s* (90-hp *Continental C-90* 'flat four') which had been certificated by F.A.A. in November 1949. The L-18s were not equipped with the flaps that graced the 1951 military *PA-18-125*, the L-21 (the L-21A had the 125-hp *Lycoming O-290-D1* and the L-21B had the 135-hp O-290-D2), and the L-18 variants did not have the landing light in the port wing's leading-edge as did the L-21 variants.

After the 105 L-18Bs came the following L-18C orders: Fiscal Year 1951 total of 382; FY1952 (164); FY1953 (184) and FY1954 (40).

In 1951, tests were conducted with tandem main wheels with two YL-21s and some of the L-21Bs were thus adapted for unprepared field operating. In FY1951, a total of 150 L-21As were ordered and of the slightly more powerful L-21B variant, in FY1952, 75 were ordered, in FY1953, three blocks of 47, 29 and 62 were ordered (and up to here it is known that in 1962 the designation U-7A was accorded in reclassification; U-for-Utility). In 1954, two blocks were ordered, 355 and an additional 10 for M.D.A.P. By 1955, the order was down to a mere four plus one commercial production *PA-18* (USAF s/n. 55-4749).

The exact numbers of L-18/21s allocated for Nato use and other foreign countries — some strayed from the commercial production lines — is not a completely filled-in picture. Military 'Super Cubs' went to: Belgium, Denmark, France, Greece, Italy, the Netherlands, Norway, Turkey and West Germany. Also civil/military 'Super Cubs' served in Portugal and Switzerland, as well as with the Argentine army (U-7As), Austria, Ghana, Iran, Israel, Japan, Sweden and Thailand. Today, ex-service Belgian, French and Italian L-18/21s are being refurbished for civil ownership; and some idea of the variety of 'Super Cubs' the



PA-185-150 on Edo floats first registered as N5405Y in 1945 but for some years on the Italian register as I-OLMO and seen frequently at Como.



PA-18A 5B-CAE Cyprus registered agricultural variant with belly tank. Below: French ski equipped version retains the wheels and steerable tailwheel.



A BIPE? Yes - N43512 has a lower wing added and a heavy duty tailwheel unit. Origin of this oddity among PA-18-150's would be interesting. (Photo: A. Heape).



F.A.A. recognises for civilian use now follows.

Super variety Super Cubs — The U.S. Federal Aviation Agency civil register 'Super Cub' coding (71018xx and 71019xx) recognises some 32 variations from 7101802 as PA-18 with Continental C-90 engine to 7101906 as PA-19S, a Lycoming-powered seaplane variant. Some work still needs to be done on sorting out the 71019xx four entries as 7101902 is listed as a PA-19, '1903 as an L-18, '1904 as an L-18C and '1906 as above. Of note, too, is the block of 7101808 to '1811 which are all PA-18-105s. Two are

listed as 'Specials' ('08 and '10) and two as PA-18S-105s (seaplanes, '1810 already noted as a Special, and '1811). The PA-18-105 was an allocation to the American Civil Air Patrol and more than 240 were in C.A.P. use from 1952-53 onwards. A curiosity is the suffix 'AS' as in 7101824 PA-18AS-150. Since 'A' is normally applicable to the Agricultural version (either spray gear or hopper) it would seem that at least a spray gear seaplane 'Super Cub' may exist somewhere in the U.S.A.

As our photographs show, there are 'Super Cubs' at least in all shapes if not sizes but to Switzerland goes the award for the

most attractive-looking glider tug conversion in the 1960s Dätwyler 1038 MDC 'Trailer' (reg'n. HB-RAL). Powered by a 165-hp Franklin 6A4-165-B3, the Max Dätwyler & Co. modifications have made this single-seater capable of towing either one or two sailplanes at a time (one of 1,200lb. or two totalling 1,550lb.). Swiss certification was approved in December, 1962.

Finally, as Piper Aircraft specialist, Colin M. Smith has observed: "This is only the merest tip of the iceberg!" but since a lot of 'Super Cubs' are bound to be around for many years to come . . . you have been warned.

(WTA) Piper PA-18-150 Super Cub: Design Data

Manufacturer: Piper Aircraft Corporation, Lock Haven, PA17745, U.S.A.

Selling Agency: WTA Incorporated, Lubbock Int'l. Airport, TX79401, U.S.A.

1983 models: PA-18-150 (landplane) & PA-18S-150 (seaplane) in three price brackets: Deluxe, Standard instruments and Advanced instruments. Also Agricultural PA-18A-150 (landplane) and PA-18AS-150 (seaplane).

Chief Designer: Walter Jamouneau (1949 prototype PA-18-95).

Category: two-seat (tandem), one-door, cabin lightplane suitable for private-owners, flying clubs, agricultural and service industries' purposes; also military light aviation rôles including liaison/observation/training.

Powerplant: one Avco Lycoming 0-320 four-cylinder, horizontally-opposed piston engine delivering max. output of 150-hp at 2,700 rev./min. (direct-drive) at sea-level. Min. fuel grade 80/87 octane. Two wing tanks, each of 18 US gal. (68.0 l), max. usable total 35.8 US gal. (135.5 l). Propeller by Sensenich, RHT (right-hand turning) 6ft. 2in. (1.88m) diameter, fixed-pitch, two-blade, metal unit with spinner provided.

Dimensions: span 35ft. 3½in. (10.76m); length 22ft. 6in. (6.76m); height 6ft. 8½in. (2.04m); wing area 178.5sq.ft. (16.6sq.m); constant wing chord 5ft. 3in. (1.60m); dihedral 1°; incidence at mean aerodynamic chord 0°; total washout 3° 18'; aspect ratio 7.0. Tailplane span 10ft. 6in. (3.20m). Main wheel track 6ft. 0½in. (1.84m) using standard 6.00X6 four-ply, rib-tread, tyres.

Weights: empty 984lb. (446kg); max. loaded 1,750lb. (794kg); useful load 766lb. (348kg) inclusive of baggage 50lb. (22.7kg) in 18cu.ft. (0.51cu.m) compartment.

Loadings: max. power 11.6lb/hp. (5.3kg/hp); max. wing 10.0lb./sq.ft. (48.8kg/sq.m).

Performance: max. speed at sea-level 130mph (210km/h); cruise at 75% power 115mph. (185km/h) at 5,000ft. (1,525m); initial climb rate 960ft./min. (293m/min); service ceiling 19,000ft. (5,790m); range 460 miles (740km) at 75% power using 9 US gal./hr. (34.0 l/h); stalling speed (flaps) 43mph (69km/h); landing roll (flaps) 350ft. (107m); take-off run (flaps) 200ft. (61m).

Acknowledgements — Most sincere thanks to Colin M. Smith of Sawbridge-worth, Herts. (*Air-Britain Specialist on Piper aircraft*) and Messrs. M. J. ('Mike') Hooks of Croydon, Surrey, and K.G. ('Ken') Wakefield of Barry, S. Glamorgan, all of whom unstintingly opened their files and shared their enthusiasms — not least being K.G.W. who has gone the whole way and now proudly possesses a genuine L-4 'Grass-hopper'!



One of several newcomers to the British register, 'BKRF is a 'straight' L-18, ex Italy, and overhauled in the UK. Battery access panel behind glazing on St'd side is a British modification.



Long nose, sunray wing decor, and roadrunner markings ahead of N49875 reg'n give the clue that this is one of the re-worked aerobatic versions in the USA. (Photo: Erwin J. Bulban, Dallas).



Two Swiss examples 'RAL (see text) has a Franklin engine and locally made wheel spats. 'OOV (below) in typical surroundings is on skis for the mountain rescue service which the 'Cubs' maintained for years until arrival of helicopters.

