

# PLAN Your Flight



*Flight log containing only essentials can be prepared quickly  
and will require only a minimum of mid-air bookkeeping*

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AOPA 44908

**M**y first solo cross-country flight was also the itchiest. With my map stretched on the grass beneath the wing of a J-3 *Cub* I had plotted courses, computed headings, and corrected for drift, variation, deviation, and everything but the kitchen sink. Oh yes, let's not forget the carefully spaced marks at 10-mile intervals and the multitudinous notes denoting something about each and every railroad, lake, power line, or "podunk" town which I might encounter. Man, I flight planned the hell out of this one, and what was my reward? Prone on the grass I had picked up no less than a dozen stowaways, those little red chiggers that burrow under your skin and itch like the devil.

Yes, flight planning is great, but too much of a good thing can still spoil any stew. Like you, I finally have reached the point where I can plan a

flight and get off the ground in less time than it takes to fly it. After our destination shows up successfully time after time, we eventually learn that a flight can be made without enough notes to obliterate the map.

However, let's stop and ask ourselves whether our flight planning techniques have really improved commensurate with our increased flying experience. Perhaps you just jump in your bird, turn on your omni, or "bird-dog," and bore holes to your destination. If so, consider this. The *Tri-Pacer*, *Navion*, *Twin Beech*, or whatever you fly today may stay up five, six, or seven hours at a stretch. Maybe you travel more than twice as fast as the *Cub* you first flew. Perhaps a single leg of your journey may extend 500 to 1,000 miles or more. Naturally, when you travel faster over greater distances for longer pe-

riods of time, you must likewise encounter more different kinds of weather and terrain, more unexpected weather changes, and more situations which require intelligent en route changes in your flight plan. Furthermore, today's busy skies are no place to have your head in the cockpit when you are faced with in-flight problems involving ADIZ's, alternates, weather, flight plan changes, clearances, fuel supply, etc. It becomes more important than ever that you have readily available the necessary data to make rapid and intelligent in-flight decisions.

Such is the function of a good flight log. To be good it should be devoid of useless and time-consuming junk which would discourage you from using one at all. On the other hand, it should have the necessary data to tell you what you've done so far, where you are now, what you still have to do, and what you still can do.

If you encounter unexpected headwinds that reduce your ground speed, your log should enable you to determine immediately whether or not you have sufficient range to continue safely to your destination.

If you encounter adverse weather or an in-flight emergency it should enable you to fix your position and to determine just how far you can go to reach an alternate airport. In these respects your flight log assists you in the solution of fuel management and time-speed-distance problems.



Just what should your flight log include to accomplish these purposes? A record of your flight progress, the times over check points and the ground speeds computed therefrom, will tell you what you've done so far. A record of your last fix together with your elapsed time, speed, and course since that fix will tell you where you are now. Your flight planning data, the courses, distances, and navigational aids along each leg of your flight, will tell you what you still have to do. A record of remaining distance and fuel and past ground speed or performance will tell you what you still can do.

The actual construction or format of your log may be varied to suit your particular type of flight operation. However, for an example, I have shown in Figures 1 and 2 (Figure 2 may be found on page 48) a flight log which I have found equally suitable for either VFR or IFR operations. It consists of a single card which can be reproduced easily with a mimeograph or other duplicating equipment. One side (Figure 1) consists of three sections. The first is used for over-all trip data such as aircraft number, destination, alternate, total distance, fuel, and estimated time en route. The second section is used for copying Air Traffic Control (ATC) clearances for IFR flights. The last section is for any miscellaneous remarks or notes pertinent to the flight. The reverse side of the card (Figure 2) is for the trip itinerary where each successive check point may be listed in sequence with the pertinent en route data for each leg of the flight.

To illustrate the use and value of this log let us consider a hypothetical VFR flight from Augusta, Ga., to Front Royal, Va., in a Piper Tri-Pacer. The entries for this flight are included in Figures 1 and 2. Prior to the flight the pilot entered in the top section of Figure 1 his aircraft number, departure point, destination, true airspeed (TAS), total route distance, and estimated time en route (ETE, hours plus minutes). In this example, his time en route is based on a no-wind condition in which his ground speed would equal his true airspeed. He has entered his total fuel supply which indicates that he will have a thirty-nine minute reserve for this flight.

Had this been an IFR flight the pilot would have selected an alternate airport and entered his estimated time en route from destination to alternate in the space provided. However, since this is a VFR flight, he has left both this and the second section of Figure 1 blank. In the bot-

tom or "remarks" section of Figure 1 are shown some miscellaneous notes on weather, fuel management, and the destination airport.

On the reverse side of the card (Figure 2) is the pilot's itinerary. He has selected a route from Augusta direct to Charlotte, then along Victor Airway 143 to Montebello, and finally direct from Montebello to Front Royal. The first six columns of Figure 2 constitute the pilot's flight planning data and were completed prior to takeoff. In the first column he has selected easily identified check points at reasonable intervals along his route and listed them in sequence.

In the second column the pilot has noted the route and altitude he intends to fly to each check point. The routes have been designated by the number of the civil airway being used, such as V-143 or, in the case of direct flights off airways, by the ab-

breivation "Dct" for "direct." Of course, the altitudes selected should be consistent with those designated for the particular courses and airways flown. This pilot's magnetic course is within the northeast quadrant, viz., between zero and 89°, and he is northbound on an odd-numbered airway so he has selected an odd thousand-foot level for the entire flight, both on and off airways.

Opposite those check points where a radio navigation aid is available, the identification letters and frequency have been entered in the third column. If there is no radio facility available, the identification and frequency of some nearby station from which the pilot can measure a bearing or radial can be substituted. An example on this flight is the Lake Murray check point which lies on the 302° radial of the Columbia VOR station.

(Continued on page 48)

Flight log (front)

Figure 1

AIRCRAFT TYPE & NO. <i>Piper Tri-Pacer N 3567M</i>		DEPARTING <i>Augusta</i>	FOR <i>Front Royal</i>	ALTERNATE —
TAS <i>132</i>	DISTANCE <i>445</i>	ETE (dest.) <i>3 + 21</i>	ETE (alt.) —	FUEL <i>36 gals.</i> <i>4 hrs. 0 min.</i>
ATC CLEARS		FROM	TO	
VIA		TO	ALTITUDE	
CLIMB & OTHER INSTRUCTIONS				
REMARKS <i>Front Royal: field west side of river &amp; town, in valley, elev. 735'</i>				
<i>WX: 1000E, 650 85 @ 120 @ 15'</i> <i>F. Royal 18 @ 90 @ 12'</i>				
<i>Fuel</i> <i>Start L</i> <i>L → R 1010</i>				



## Plan Your Flight

(Continued from page 35)

The identification and frequency of Columbia were entered in the third column, and a note in the first column indicates that the check point lies on the 302° radial and not at the station. Similar examples on this flight are Penhook, Grottoes, and Front Royal. On the other hand, the VOR stations themselves constitute the fixes or positions at the other check points.

The fourth column is provided for the magnetic course (MC) and/or magnetic heading (MH) used to fly to each check point. For example, the magnetic course of 034° from Augusta to the western tip of Lake Murray is listed opposite Lake Murray. On this flight the pilot has elected to omit the magnetic headings since he has VOR radio stations along the entire route by which he can maintain his proper course without computing drift correction and heading.

The fifth and sixth columns are reserved for distance data. Opposite each check point, the distance to that point from the preceding one is entered. Then, the remaining distance from the check point to the final destination is entered in the next column.

With the flight plan data tabulated in the first six columns, the pilot can fly from point to point along his entire

1	2	3	4	5	6	7	8	9	10
CHECK POINTS	VIA ALT.	ID FREQ.	MC MH	DISTANCE LEG TO	REM.	ETE	ETA ATA	GS	FUEL REM.
Augusta	///	AGS 113.9	///	///	445	///	///	///	4+00
Lake Murray (W.T.P.) (302° radial CAE)	DCT 7000	CAE 114.7	034	50	395	23	43 45	119	3+35
Charlotte	DCT 7000	CLT 117.2	034	70	325	35	1020 21	116	2+59
Greensboro	V-143 7000	GSO 116.8	040	91	234	47	1108 08	116	2+12
Penhook (302° radial SBV)	V-143 7000	SBV 113.3	023	64	170	33	41		
Montebello	V-143 7000	MOL 116.1	025	73	97				
Grottoes (307° radial GVE)	DCT 7000	GVE 115.3	035	38	59				
Front Royal (268° radial HRN)	DCT 7000	HRN 114.0	037	59	0				

Flight log (back)

Figure 2

route with little or no reference to maps, facility charts, etc. Thus, he can devote his full attention to observing other traffic, operation of his aircraft, and consideration of other in-flight problems such as changing weather conditions.

The last four columns of Figure 2 are for in-flight use, and they constitute a record of flight progress. The first of these is for the pilot's estimated time en route (ETE) to his next check point. In the next column he can enter his estimated time of arrival (ETA), which he determines by adding his ETE to the actual time of arrival (ATA) over the previous check point. Both the ETA and the ATA are entered in the same column.

Once the pilot reaches each check point he computes his ground speed from his actual time en route and the distance from column 5. He enters the ground speed in the next to last column and can use it in estimating his time en route to the next check point. Last of all, he subtracts his actual time en route from his previous fuel supply and enters his remaining fuel (hours plus minutes) in the last column.

Continuing with our hypothetical flight, we see that the entries in the last four columns of Figure 2 are those which would have been accomplished by a pilot who is now somewhere en route between Greensboro and Penhook. Let's briefly reconstruct his flight, referring to Figure 2 as we go. Starting with his takeoff point, Augusta, the remaining distance (column 6) is obviously the entire 445 miles to Front Royal, and his available fuel (column 10) is his full supply of four hours. Immediately after takeoff he entered his departure time of 0920 (column 8), tuned in the Augusta VOR on 113.9 mc (column 3), and tracked outbound on the 034° radial to Lake Murray (column 4).

Based on his estimated ground speed of 132 m.p.h. and his 50-mile leg to Lake Murray (column 5), he computed an ETE of 23 minutes (column 7). Adding his ETE to his departure time of 0920, he established an ETA at Lake Murray of 0943 (column 8). When this

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**Palley's**



time approached he tuned his omni to 114.7 mc and checked his actual time over Lake Murray (the 302° radial of the Columbia VOR). Upon crossing Lake Murray he entered his ATA of 0945 in column 8. Since he was two minutes past his ETA, he used his actual time en route of 25 minutes and the 50-mile distance to compute his ground speed of 119 m.p.h. (column 9). He also subtracted his en route time from the previous fuel supply to indicate his remaining fuel of three hours 35 minutes (column 10).

In a similar manner he used his ground speed to Lake Murray to compute an ETE and ETA to his next check point, Charlotte. After retuning his omni set to 117.2 mc, he proceeded to Charlotte and arrived one minute late at 1021. This established a new ground speed of 116 m.p.h. with two hours 59 minutes fuel remaining. Then, based on his new ground speed, he determined an ETA at Greensboro which he made good at 1108.

With his reduced ground speed it became obvious to the pilot that his flight would take longer than he had anticipated. To see how this would affect his flight he needed only to look at his Greensboro flight data. With 234 miles yet to go (column 6) and a ground speed of 116 m.p.h. (column 9), the pilot computed that it would take two hours one minute to reach his destination. With only two hours 12 minutes of fuel remaining (column 10), he would have a reserve fuel supply of only 11 minutes. Thus, very early in the flight, the pilot anticipated and could plan on stopping short of his destination to refuel.

The subject of fuel management warrants further individual attention here. The current fuel remaining, as tabulated in column 10 of Figure 2 is most useful for flight planning and en route decisions. However, the tabulation is based on a known original supply and an estimated consumption rate. Since fuel gauges are not sufficiently accurate to check rate of consumption, it is desirable to use one or more tanks to check consumption rate on long flights.

In the foregoing example, for instance, the four-hour fuel supply is based on a 36-gallon supply and a consumption of nine gallons per hour. Referring to the "remarks" section of Figure 1 we see fuel notes indicating that the pilot started on the left tank, then switched to the right tank at 1010. If he continues on the right tank until fuel exhaustion he can determine his exact consumption rate while he still has more than an hour's fuel in the left tank. If the pilot does not wish to exhaust the tank completely he can run it until the gauge indicates near-exhaustion. Then if he is able to get two hours or more from an 18-gallon tank, he at least can confirm that his consumption does not exceed his estimated nine gallons per hour. On the other hand, if a check on one or more tanks reveals higher consumption than normal, the pilot can reduce his fuel supply figures

LOU-DCA  
AOPA's  
Flight Log

Date 11/15/57

FROM	TO	MILES			COURSE		GS	TIME		MISCELLANEOUS
		Leg	To Go	Total	Plot	Act.		Est.	Act.	
BDW	GGX	60	413	-	080			1316	085	1254 LOU 112.1
GGX	YRK	89	324	149	078		197	43	43	LEX 112.4 YRK 108.6
YRK	GAY	75	249	224	084		204	1406	05	019 FCHW 113.7
GAY	EKN	82	167	306	088		205	30	29	EKN 114.5
EKN	PTG	52	115	358	090			45	45	
PTG	FRR	51	64	409	090		218	1500	1459	FRR 113.5
FRR	DCA	64	-	473	111					

WINDS ALOFT		
STA	CHW	EKN
2000	240 09	
3		
4	240 09	
5	270 13	
6		
7	270 20	
8		
9	270 37	270 35
10		
12	240 32	

EKN 400/15  
MRB 10/15  
DCA 60/15



Above is an example of how the AOPA Flight Log is used. You will notice that it covers a flight from Louisville, Ky., to Washington, D. C. The form differs from one described by Captain Ellis, in that it is not suited for IFR flight planning

in column 10 by an appropriate amount while he still has plenty of fuel to avoid an emergency situation.

As is evident from our preceding example, a flight log actually simplifies the routine tasks of navigation. With

nothing but an occasional glance at a single card the pilot has immediately available all of the information necessary to tune his radio, establish his course, determine his ETA's, and check his position at regular intervals. END

go relaxed!  
arrive untaxed!

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