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AIRCRAFT OPERATING COSTS

This is the second issue of a special Aviation Statistics Centre Service Bulletin devoted to an examination of aircraft operating costs as reported by commercial airlines in Canada. Cost figures have been arranged so that a range of reported expenses is shown, based on costs per hour of flying a certain type of aircraft. The aircraft types selected are those on which detailed information is available from at least three companies. Therefore, figures for jet aircraft used by the two major air carriers are not available.

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Statistics concerning aircraft operating costs are collected only from carriers with gross flying revenues of at least \$500,000 a year. As a result many types of aircraft used by smaller companies are not represented. The tables shown are compiled from data contained in the 1968 annual reports of air carriers.

The tables show a wide range of reported costs for each type aircraft in order to indicate the variety of cost situations reported by carriers in different parts of the country providing different types of service over varying distances and operating under different climatic conditions. The interrelationship of cost factors such as aircraft utilization, fuel costs, wage levels, overhead expenses and rate of depreciation make it difficult to single out any item as the prime factor influencing operating costs. The figures shown are derived from unaudited carrier statements without adjustment for variations in accounting practice, and hence should not be considered as representing all carriers.

The variety of aircraft types for which costs are shown changes from year to year as the number of complete reports for a particular type of aircraft fluctuates. In the previous issue it was possible to show costs for the Piper Super Cub but this has not been included this year. However, costs for three additional types of aircraft have been obtained. These are the Piper Apache, Piper Aztec and Twin Otter. The sequence of aircraft types is arranged according to gross take-off weight for a particular type. Helicopters have been divided into two groups "large" and "small" with the dividing line at 5,000 lbs. rather than at 3,500 lbs. as is used for purposes of licensing. Both piston-engine and turbine-engine helicopters are represented in the "small" and "large" categories. Some of the increase in "small" helicopter costs is due to the larger proportion of turbine powered machines such as the Bell 206 and Hiller FH1100. (One Sud Aviation Alouette III is included in the "small" helicopter category.)

To put cost figures reported for owned aircraft on a comparative basis with those reported for leased aircraft, rental expenses have been deducted in calculating flying operations cost data. Variable cost details included in these calculations cover items such as salaries and wages, personnel expenses, fuel, oil, materials and supplies, landing fees, insurance and damage expense. Amounts shown under "Other" cover maintenance labour and services, engines, airframes and other flight equipment, overhaul, depreciation and rentals. Non-operating expense items such as promotion and sales, general administration and passenger servicing are not included.

Average costs in the summary table consist of the sum of reported expenses divided by the total number of hours flown using the type by all the reporting carriers taken together. For each type listed the experience of individual carriers is detailed in Table 2. Note that the summary figures were calculated independently, and are not derived from the detailed carrier averages.

Inquiries concerning the statistics shown should be directed to Mr. K.J. Marks.

TABLE 1. Aircraft Operating Expenses per Flying Hour,
Summary by Aircraft Type 1968

Aircraft type	Designator	Gross take-off weight (000 lbs.)	Average operating expenses per hours flown		
			Flying	Other	Total
			\$	\$	\$
<u>Fixed-wing</u>					
<u>Single engine:</u>					
Cessna 180	C180	2.5 - 2.8	27.81	26.60	54.41
Cessna 185	C185	3.2	30.76	27.51	58.27
Beaver	DHC-2	5.0	29.61	28.09	57.70
Norseman	NO. 4, 5, 6	6.4 - 7.5	32.26	25.72	57.98
Otter	DHC3	8.0	42.82	49.79	92.61
<u>Twin engine:</u>					
Piper Apache	PA-23-160	5.2	39.59	26.68	76.27
Piper Aztec	PA-23-250	5.2	38.52	49.13	87.65
Beech 18	BE18	8.2 - 9.5	50.84	59.54	110.38
Twin Otter	DHC-6	11.6 - 12.5	69.64	97.04	166.68
Douglas DC-3	DC-3	27.0	75.45	85.36	160.81
Canso PBY	CNSO	32.0	118.96	144.04	263.00
<u>Four engine:</u>					
DC4	DC4	73.0	128.74	153.86	282.60
<u>Helicopters:</u>					
Small*		1.6 - 5.0	47.45	52.78	100.23
Large		7.0 - 13.0	78.92	109.37	188.29

* (Includes one Alouette III.)

TABLE 2. Average Costs per Hour and Number of Hours Flown,
Selected Carriers, 1968

Aircraft type	Carrier rank	Operating expenses per hour flown			Average no. of hours flown per aircraft 1968
		Flying	Other	Total	
		\$	\$	\$	
<u>Cessna 180</u>	1	14.26	11.88	26.14	133
	2	16.90	16.43	33.33	553
	3	17.26	10.54	27.80	457
	4	23.03	17.69	40.72	413
	5	27.42	29.00	56.42	333
	6	32.36	36.98	69.34	579
	7	40.24	39.53	79.77	655
<u>Cessna 185</u>	1	25.65	40.57	66.22	564
	2	29.96	21.73	51.69	803
	3	46.94	45.22	92.16	170
<u>Beaver (DHC2)</u>	1	21.08	20.44	41.52	726
	2	21.70	20.29	41.99	682
	3	25.49	15.48	40.97	634
	4	28.84	38.99	67.83	698
	5	33.42	25.22	58.64	615
	6	34.29	21.88	56.17	692
	7	35.81	40.23	76.04	610
	8	36.78	54.10	90.88	525
	9	39.73	41.29	81.02	476
	10	46.87	46.02	92.89	539
<u>Norseman IV, V, VI</u>	1	29.16	35.96	65.12	533
	2	30.09	16.68	46.77	679
	3	33.34	25.80	59.14	656
	4	76.15	74.88	151.03	125
<u>Otter (DHC3)</u>	1	22.29	96.57	118.86	387
	2	31.78	82.45	114.23	737
	3	34.70	23.12	57.82	793
	4	36.57	35.92	72.49	789
	5	39.51	73.23	112.74	748
	6	46.60	51.00	97.60	773
	7	48.60	43.41	92.01	543
	8	54.10	38.81	92.91	935
	9	64.02	49.18	113.20	571

TABLE 2. Average Costs per Hour and Number of Hours Flown,
Selected Carriers, 1968 - Continued

Aircraft type	Carrier rank	Operating expenses per hour flown			Average no. of hours flown per aircraft 1968
		Flying	Other	Total	
		\$	\$	\$	
<u>Piper Apache (PA-23-160)</u>	1	18.49	30.76	49.25	111
	2	36.43	38.24	74.67	177
	3	48.96	37.93	86.89	309
<u>Piper Aztec (PA-23-250)</u>	1	11.33	49.54	60.87	345
	2	23.67	23.25	46.92	970
	3	38.58	54.18	92.76	578
	4	47.03	123.66	170.69	115
	5	52.77	48.30	101.07	441
	6	64.79	45.56	110.35	336
<u>Beech 18</u>	1	32.61	29.51	62.12	516
	2	38.52	56.95	95.47	517
	3	48.15	48.04	96.19	686
	4	58.02	79.04	137.06	295
	5	66.95	81.44	148.39	586
<u>Twin Otter (DHC-6)</u>	1	60.74	72.65	133.39	998
	2	67.60	81.46	149.06	1,890
	3	72.35	138.39	210.74	294
	4	72.65	150.24	222.89	817
	5	104.05	190.11	294.16	526
<u>Douglas DC-3</u>	1	29.94	227.15	257.09	136
	2	60.94	70.37	131.31	854
	3	68.47	85.18	153.65	1,234
	4	71.26	106.07	177.33	864
	5	72.23	87.67	159.90	1,038
	6	73.29	93.43	166.72	213
	7	73.32	73.18	146.50	846
	8	73.65	87.18	160.83	507
	9	76.67	67.37	144.04	681
	10	81.75	136.82	218.57	648
	11	82.90	62.27	145.17	851
	12	86.36	95.99	182.35	706
	13	102.07	66.77	168.84	566
	14	235.40	131.10	366.50	193

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TABLE 2. Average Costs per Hour and Number of Hours Flown,
Selected Carriers, 1968 - Concluded

Aircraft type	Carrier rank	Operating expenses per hour flown			Average no. of hours flown per aircraft 1968
		Flying	Other	Total	
		\$	\$	\$	
<u>Canso PBY</u>	1	84.77	74.03	158.80	451
	2	87.42	81.65	169.07	342
	3	97.70	113.76	211.46	208
	4	159.07	339.49	498.56	158
	5	176.86	121.63	298.49	221
<u>Douglas DC-4</u>	1	112.72	140.41	253.13	1,627
	2	123.15	148.57	271.72	1,900
	3	125.15	102.15	227.30	1,927
	4	129.78	156.84	286.62	895
	5	131.21	159.83	291.04	1,726
	6	148.36	194.73	343.09	1,264
<u>Small Helicopters</u>	1	28.96	49.05	78.01	545
	2	30.10	28.55	58.65	826
	3	35.52	55.12	90.64	674
	4	39.73	48.48	88.21	699
	5	42.56	33.56	76.12	161
	6	44.27	38.16	82.43	519
	7	44.53	83.13	127.66	365
	8	51.11	81.44	132.55	363
	9	58.41	50.26	108.67	492
	10	67.40	61.70	129.10	510
<u>Large Helicopters</u>	1	48.60	146.42	195.02	405
	2	55.09	202.51	257.60	442
	3	65.97	113.62	179.59	422
	4	78.74	60.92	139.66	1,145
	5	80.98	130.72	211.70	644
	6	94.32	72.99	167.31	987
	7	190.01	174.99	365.00	85