The Costs of an Islander Service (Revised)

This note attempts to be no more than a first round approach to costing up a joint Islander/Beaver service compared to the existing service. As will become clear a large number of assumptions are involved, and my guesses are made mainly to be knocked down, and replaced by more reliable assumptions and estimates. Some of the issues will be discussed with the Director of Civil Aviation, and some with the Civil Engineer member of the Internal Communications Survey Team. At present I must take full responsibility for all errors.

2. This present survey of internal transport is not the first, and various other reports have touched upon the costs and operations of FIGAS. So far as possible I have attempted to follow the methods and data of such reports, in particular those by Peat, Marwick and Mitchell, Comben and Waller, and Shackleton, et al.

The Costs of the Existing Service

3. The most recent source of cost data is the 1977/8 estimates. The F Y 1976/7 has been excluded, due to the fact that FIGAS operations in that year were by no means typical. Thus the actual 1975/6 costs and estimates for 1977/8 are used below.

4. The first step is to break down the costs in the estimates between fixed and variable costs (as per Peat, Marwick and Mitchell). This breakdown is given in Table I. From this it will be noted that the estimated fixed costs for 1977/8 are slightly (11.5%) higher than the actual costs for 1975/6, whereas the variable costs are expected to fall sharply (by 26.3%). This fall is due to a large drop in the expected bill for petrol and lubricants, and that for materials and spares. The former is because a reserve stock-pile was created in 1975/6, and the latter due to the fact that present aircraft are in need of less spares.

5. If the total flying hours p.a. is taken as 1,000 then the variable costs per hour in 1975/6 were £71.52, and the same figures for 1977/8 is estimated at £43.50.

6. In addition to the costs given in Table I it is necessary to include an allowance for depreciation of the aircraft and FIGAS buildings, as well as some allowance for miscellaneous expenditure,

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not included under "Aviation" in the Estimates. Table II shows the calculation of the total costs. Elements (a), (c), (d) and (e) are all "fixed", although (d) might vary if with less use the Beaver could be taken to depreciate over a longer period.

7. The next step is to compare the totals in Table II with revenue, to obtain a fair approximation of the degree of subsidy in existing FIGAS operations. This comparison is made in Table III, and shows that the subsidy reached 68.7% of total costs in 1975/6, but is projected to fall to 48.1% in 1977/8. This reflects both the projected fall in variable costs, and the increased revenue expected due to the changed fare structure. The new fare structure is shown in Table IV. The subsidy element shown in Table III can be compared with Comben and Waller's estimates in 1973 of a 50.7% subsidy, and their recommendation of a 25% subsidy being more reasonable. Even with the increased fares, the estimated subsidy in 1977/8 is only just below the 1973 level, and the 1975/6 figures must have been an all time high.

8. It is of interest at this stage to calculate a cost per passenger mile for the existing service. One major problem is that the load factor is not known. Following a recommendation in the Peat, Marwick and Mitchell report certain data is reported to the Chief Secretary every week. However, the figure given for "passenger miles" on this form is inaccurate in concept, and thus cannot be used to compare against seat miles to obtain an estimate of load factor. From examination of FIGAS data for 1969 and 1970 Peat, Marwick and Mitchell estimated the load factor at 45%. As can be seen from Table V passenger numbers rose by 38% from the 1969/70 average to the 1975 level. It is not possible to calculate what share of the passenger growth was due to increased miles flown, and what share to increased load factor.

9. Information is also lacking on number of flying hours p.a. Peat, Marwick and Mitchell refer to 900 flying hours p.a., but this figure was probably exceeded in 1975/6. Table VI shows the cost per flying hour and passenger mile using varying assumptions of flying hours and load factors. (An average speed of 100 m.p.h. is assumed).

Possible Islander Costs

10. The first costs to be taken into account for the possible Islander operations are depreciation on the aircraft, and new hangar, and the re-location costs involved in resiting the old Beaver hangar and building a new slipway. The quotation provided

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for the aircraft on 12/10/77 was $260,520 or £148,025 @ US $1.76 = £1. At the present rate of US $1.88 = £1 this falls to £138,574. However, the quotation is only valid for 60 days, and doesn't include the costs of delivery or of an extra spare engine or (?) the extended wing tips with additional fuel tanks. A first round estimate of the delivered mid 1978 price inclusive of spare engine et al might be around £170,000.

These figures are too low: see table

11. The estimate of hangar cost ex UK was £25 - 30,000, delivered and erected for a 50 ft x 50 ft hangar. The higher price is taken in the following analysis, as the hangar will need to be slightly larger than 50 ft x 50 ft. The FIGAS Committee received a quote in late 1976 of close to £5,000 ex Argentina. To reflect the inflation since then, delivery and erection costs a figure of £10,000 is used below. There would also be costs in re-locating the Beaver Hangar, building a new slipway, and building a suitable track to join the hangars. (All repair and maintenance work of both types of aircraft would be carried out at the new hangar). A first round estimate of this cost is £7,500. The p.a. equivalent cost of these capital costs is shown in Table VII.

This figure is too low: see table

12. The total p.a. costs for a joint Islander/Beaver service would consist of the following components:-

(i) p.a. equivalent of Islander capital costs
(ii) Fixed costs
(iii) Variable costs for Beaver(s)
(iv) Variable costs for Islander
(v) Share of Misc Appropriation Vote
(vi) Depreciation of Beaver(s) and old hangar
(vii) Maintenance costs of road joining hangars

Item (i) above is considered in Table VII. The remaining items are now considered.

(ii) Fixed costs: Table I shows fixed costs for the existing service in 1975/6 and 1977/8. For a 1978/9 figure some initial inflation allowance is required (say 10% on 1977/8), and to allow for an Islander operation some extra costs must be added, e.g. for heat, light and power at the new hangar, extra staffing, higher insurance for the more expensive fleet etc. These extra costs might be around £5,000 on top of the inflation allowance.

This figure is probably too low

(iii) Variable Costs for Beavers: For a continued Beaver service (above) the 1978/9 variable costs might be taken as 10% upon the 1977/8 costs. With an Islander, the variable costs of the Beavers would fall. As an example, if flying hours were reduced by 60%,

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the variable costs would fall by around the same amount.

(iv) Variable Costs for Islander: This is perhaps the most difficult item to estimate. The C.A.A. have provided some information on costs of equivalent UK service, and the variable costs per seat-mile vary between 5.6p and 3.3p. The higher figure comes from a more suitable service for comparison with FIGAS operations, and given the additional costs likely due to services outside the Colony, a figure of 6p per seat-mile will be used with a 9 passenger capability this equates to £0.54p per flying mile. If the Islander took over 60% of the flying miles of the existing service, the cost per annum, using the 1,000 flying hours assumption of the existing service (i.e. 100,000 flying miles in total) would be £32,400.

(v) Share of Misc Appropriation Vote: With both the existing and changed service this is taken as 10% more than the 1977/8 figure, to allow for inflation.

(vi) Depreciation of Beaver(s) and old hangar: If a joint service was introduced the Beavers might be depreciated over 15 years rather than 10 years. The depreciation on the old hangar would not change.

(vii) Maintenance Costs of road: A token figure of £500 is included here.

13. On the basis of the above Table VIII sets out the 1978/9 estimates of the costs of (a) the existing service and (b) a joint Islander/Beaver service, with the islander taking 60% of the service. It must be appreciated that this is all based on very crude approximations, and the figures should be improved as better data becomes abailable, and assumptions are changed. However, it is hoped that this approach provides a suitable framework for comparisons.

14. On the basis of Table VIII the improved service would cost FIG around £35,000 p.a. more than the present service. (It was mentioned above that the variable costs of an Islander were particularly difficult to calculate. If the costs per seat-mile were 3.5p, the variable costs would fall to £18,900 and the extra cost of the new service would be £21,500. This helps to demonstrate the rough nature of the above calculation).

15. In financial terms the extra costs of the service would have to be met either from increased revenue (i.e. higher fares or

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greater use of FIGAS) or a higher subsidy. To maintain the subsidy at the 1977/8 level, revenue would have to be raised by around £25,000. To reach Comben and Waller's target of a 25% subsidy, the extra revenue required would be nearly £50,000.

16. In development terms the investment in the Islander, et al would be justified if the benefits exceeded the costs. This type of examination is best made within the context of an overall survey of internal communications of the type now in hand.

Internal Communications Survey
December 1977

Table I FIGAS Operating Costs (£'s)

A/ Annual Fixed Costs	1975/6 (Actual)	1977/8 (Estimates)
Salaries and Wages 1/	28,331	32,116
Overheads:-		
(i) Heat, light and power	1,585	1,600
(ii) Incidental	7	30
(iii) Insurances	881	933
(iv) Labour and Transport	1,115	600
(v) Hanger Equipment	83	350
(vi) Protective Clothing	159	150
(vii) Rent	-	8
Total Overheads	32,160	35,867

B/ Variable Costs	1975/6 (Actual)	1977/8 (Estimates)
(i) Petrol and Lubricants	49,608	27,500
(ii) Materials and Spares	10,622	4,000
(iii) Overhauls outside Colony	11,287	12,000
Total Variable Costs	71,517	43,500

Total Fixed + Variable Costs 2/	103,677	79,367

Source:- Estimates 1977/8

1/ Including board and lodging - relief pilot

2/ Excluding 'special expenditure' and 'adding machine'.

TABLE II FIGAS Total Costs (£'s)

	1975/6 (Actual)	1977/8 (Estimated)
a) Fixed Costs	32,160	35,867
b) Variable Costs	71,517	43,500
c) Depreciation of Buildings Value £27,800 1/ including interest @ 8% on an annuity basis over 10 years	2,272	2,272
d) Depreciation of Beavers £114,000 2/ cost including interest @ 8% on an annuity basis over 10 years	16,986	16,986
e) 7½% of Miscellaneous Appropriations Vote	2,437	1,475
Total a) + c) + d) + e)	53,855	56,600
Total a) - e) inclusive	125,372	100,100

Source: 1977/8 Estimates and Internal Communications Study

1/ Comben and Waller used a value of £19,000. This has been increased @ 10% p.a. to reflect inflation.

2/ Cost of 2 Beavers in 1976/7.

Table III FIGAS Costs and Revenue

	1975/6 (Actual)	1977/8 (Estimated)
(i) Total Costs	125,372	100,000
(ii) Revenue	39,219	52,000
(iii) Loss/Subsidy	85,153	48,100
(iv) (iii) as % of (i)	66.8%	48.1%

Source: 1977/8 Estimates and Internal Communications Study

Table IV FIGAS Fare Structure

Mileage Rate	15p per mile	
Resident rebate	10p per mile	
Boarding Fees	Adults	£6.00
	Children 7- school leaving age	£3.00
	Children 1-7	£1.50
	Children under 1	free
Medical Patients	Adults	£2.00
	Children 7- school leaving age	£1.50
	Children 1-7	£0.75
	Children under 1	free

Source: Gazette No 11 19th August 1977

Table V FIGAS - Passengers, Freight, Mail Drops

Year	Passengers	Freight	Excess	Mail Drops (Flights)
1960	2,044	4,332	n.a.	-
1961	2,132	6,606½	n.a.	-
1962	2,474	5,867	n.a.	12
1963	2,551	6,486	9,787	13
1964	2,174	5,309	8,831	12
1965	2,873	8,497	8,726	8
1966	3,030	5,684	7,907	15
1967	3,182	8,573¼	10,008	13
1968	3,692	6,680¾	7,561	7
1969	3,867	8,988¾	8,066	13
1970	3,683	8,486¾	11,796	13
1971	3,911	8,490¾	13,261	11
1972	4,225	13,970¾	8,339	22
1973	4,327	16,728¾	6,490	49
1974	4,666	18,839¾	8,918	47
1975	5,213	17,924¾	6,323	47
1976	3,364	11,345	3,774	284
1977 (10 mo)	1,843	2,589¼	1,059	40

Source: FIGAS

TABLE VI FIGAS Costs per Flying Hour and Passenger Mile

Cost per Flying Hour (£)	Flying Hours 900	1,000	1,100
1975/6 (Actual)	139.3	125.4	114.0
1977/8 (Estimate)	111.2	100.1	91.0

Cost per Passenger Mile (£) Load Factor	Year	Flying Hours 900	1,000	1,100
45%	1975/6	0.77	0.70	0.63
	1977/8	0.62	0.56	0.51
50%	1975/6	0.70	0.63	0.57
	1977/8	0.56	0.50	0.46
55%	1975/6	0.63	0.57	0.52
	1977/8	0.51	0.46	0.41
60%	1975/6	0.58	0.52	0.48
	1977/8	0.46	0.42	0.38

Source:- Internal Communications Study Estimates

Table VII Per Annum Equivalents of Islander Service Capital Costs

	Capital Cost low	high	P.A. Equivalent low	high	
A) Aircraft + spare engine, etc.	170,000	-	25,330		1/
B) New Hangar a) Ex UK	30,000	100,000	2,452	8,173	2/
b) Ex Argentina	10,000	?	877	?	2/
C) Relocate Old Hangar, New Slipway and Road Joining Hangars	7,500	30,000	613	2,452	3/
Total A, B(a) and C	207,500		28,395	36,000	
Total A, B(b) and C	187,500		26,820	?	

Source: Internal Communications Study Estimates

1/ Annuity @ 8% over 10 years

2/ Annuity @ 8% over 50 years

3/ Annuity @ 8% over 50 years

Table VIII 1978/9 Costs of Existing and Improved Service

	Item	Existing Service	Improved Service Low	Improved Service High
(i)	p.a. Equivalent of Islander capital costs	---	28,000	36,000
(ii)	Fixed Costs	39,454	44,500	55,000
(iii)	Variable Costs of Beavers	47,850	19,140	
(iv)	Variable Costs of Islander	---	32,400	
(v)	Share of Misc Appropriations Vote	1,623	1,623	
(vi)	Depreciation of Beavers and Old Hangar	19,258	15,590	
(vii)	Maintenance Costs of Road	---	500	
	TOTALS	108,185	141,753	160,000
	Extra Cost		c£35,000	c£52,000