

# Forecasting Research

Forecasting Research Division  
Technical Report No. 205

## Analysis of User Requirement for General Aviation

by

Ruth Patton

November 1996

Meteorological Office  
London Road  
Bracknell  
Berkshire  
RG12 2SZ  
United Kingdom



**Forecasting Research  
Technical Report No. 205**

**Analysis of User Requirement  
for  
General Aviation**

**by**

**Ruth Patton**

**November 1996**

**Forecasting Research  
Meteorological Office  
London Road  
Bracknell  
Berkshire  
RG12 2SZ  
United Kingdom**

**© Crown Copyright 1996**

**Permission to quote from this paper should be obtained from the above  
Meteorological Office division.**



## Abstract

The sensitivity of users to various aspects of terminal forecasts, principally, visibility and cloud base, for general aviation is derived through questionnaires to GA pilots, flying clubs and flight briefing units. In this context we are dealing principally with TAFs (Terminal Aerodrome Forecasts) and METARS (METeorological Actual ReportS).

Difficulties arise in quantifying the exact limits for each of the meteorological phenomena considered because of the spread of opinion. However, improving the forecast of these phenomena for identified ranges could affect general aviation operations.

Significant interest in a 48 hour TAF is implied by the results, but this will more than likely not affect the operations at general aviation airfields because of the perceived accuracy of the longer range forecasts which may be erroneous.

The importance of the quantified sensitivity is that it will enable those seeking to improve forecasts of ceiling and visibility to concentrate on those aspects where benefits can most readily be felt, or allow some degradation in aspects which are relatively unimportant.



## Contents

<b>1. INTRODUCTION</b>	<b>3</b>
<b>2. QUESTIONNAIRES</b>	<b>3</b>
<b>3. CLOUD BASE AND VISIBILITY</b>	<b>3</b>
<b>4. THUNDERSTORMS, ICING AND WIND</b>	<b>8</b>
<b>5. FORECAST LENGTHS</b>	<b>11</b>
<b>6. CONCLUSIONS</b>	<b>14</b>
<b>7. APPENDICES</b>	<b>15</b>
7.1 Pilot Questionnaire	16
7.2 Airfields Questionnaire	19
7.3 Topline Results - Pilot Questionnaire	21
7.4 Topline Results - Airfields Questionnaire	29
7.5 Figures 17 - 22 Cloud Base Cross Tabulations	34
7.6 Figures 23 - 28 Visibility Cross Tabulations	37
7.7 Figures 29 - 31 Cloud Base vs. Visibility Cross Tabulations	40
7.8 Figures 32 - 34 Thunderstorm Cross Tabulations	42
<b>8. REFERENCES</b>	<b>43</b>



## **Analysis of User Requirement for General Aviation**

### **1. INTRODUCTION**

The work for this technical report was done under contract to the European Commission as part of the 4MIDaBLE study (Cost/Benefit Definition Study Leading to 4-D Meteorological Information DataBases Linked Across Europe). This part of the project forms the work of WorkPackage 2600.

The ultimate aim is to quantify how sensitive aviation users are to meteorological data and forecasts. We are seeking to establish the values of particular meteorological parameters, principally, visibility and cloud base, which are critical to GA pilots and flying clubs. In this context we are dealing principally with TAFs (Terminal Aerodrome Forecasts) and METARS (METeorological Actual ReportS). Questionnaires are used to identify user behaviour and user requirements.

### **2. QUESTIONNAIRES**

Two different questionnaires were devised, one for GA Pilots and one for Flying Clubs/Airfields. A total of 1067 questionnaires were sent to pilots, of which 412 were returned which gives a response rate of 38.6%. For the Airfields/Flying Clubs questionnaire, a total of 270 were sent out, of which 100 were returned which corresponds to a response rate of 37%. Both questionnaires therefore, represent a significant sample of the general aviation population. The two questionnaires can be found in Appendices 1 and 2. In Appendices 3 and 4 are the "topline" results for the questionnaires which also contain figures for the demographics of the pilots concerned. These figures will not be treated in great detail in this part of the report.

Both groups were asked about their critical operating limits for various meteorological phenomena. Finding out the crucial decision visibilities, cloud bases and windspeeds may help to justify increasing forecast accuracy at these levels or including a separate bulletin containing this information or improving longer range forecasts of these limits.

### **3. CLOUD BASE AND VISIBILITY**

Pilots were asked in question 10 about their cloud base limits.



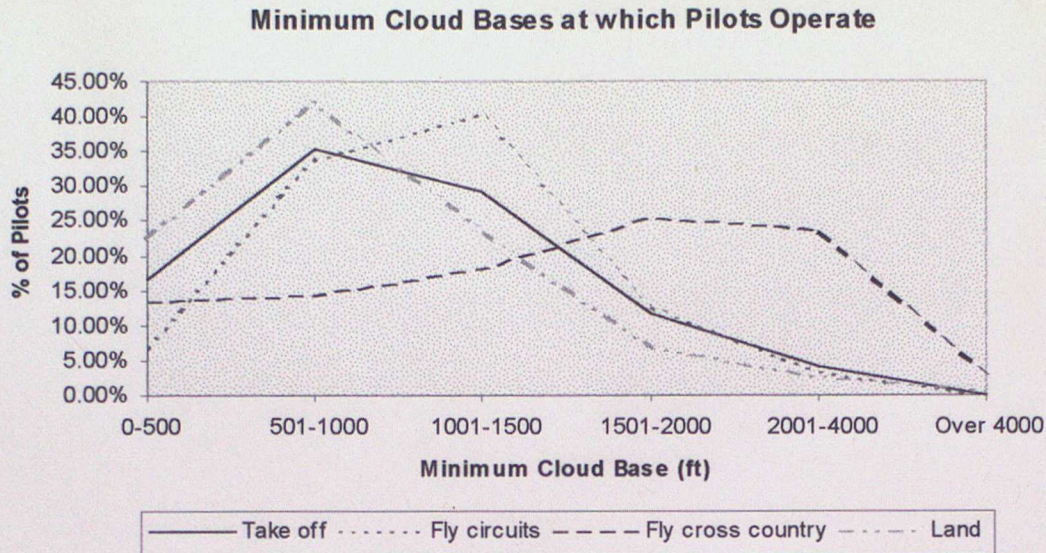


Figure 1

As can be seen, there is no significant difference between the critical limit (501-1000 ft) for landing and taking off. Understandably cross country flights need a higher cloud base for the purposes of flying longer distances. These answers were cross tabulated with the different pilots concerned as different pilots with different experience behave differently. The pilots have been divided according to the qualifications they possess. A Basic PPL Holder is permitted to fly in Visual Meteorological Conditions only. What has been labelled IMC +/- or IR means that the PPL holder has either or both of an IMC rating or Instrument Rating. CPL means Commercial Pilots Licence and PPL with rating includes pilots with either or both of a multi-engine rating or night rating. The results of the breakdown are shown in Appendix 5, figures 17 - 22 where it can be seen that the majority of the pilot types follow the same pattern except for Student Pilots. They are on the whole much more cautious than the other pilots with cloud base limits being 500 - 1000 ft higher than the other groups. Generally speaking, the critical decision limit for cloud base is in the range 500 - 1000 ft. As a student, the decision whether to fly may well be decided by the instructor.

Figure 2 shows how the pilots behave when their minimum cloud base limit is reached. At the planning stage of the flight, over 50% of pilots will cancel the flight altogether and not go. Approximately 30% would change their destination rather than cancel their flight altogether. Once airborne however, rather than abandon the flight and return to their departure point, over 50% would reroute enroute.



### Likelihood of Changing Destination Given Minimum Cloud Base at Destination

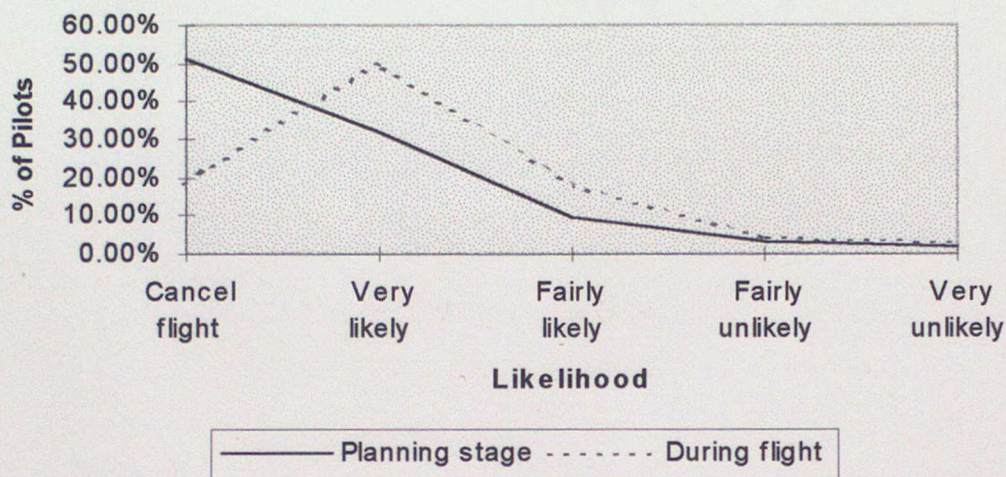


Figure 2

This analysis was once again broken down to see how different pilot types behave. Figures depicting this information are shown in Appendix 5. The CPL holder and the student pilot would be more likely to change their destination at the planning stage than to cancel the flight. No significant difference exists between the pilot groups for the likelihood of changing the destination during the flight.

As a cross reference, airfields and flying clubs were asked about the likelihood of the majority of flights out of their airfield being cancelled given the same cloud base ranges. A graph of this result is shown in figure 3. As is expected the likelihood increases as the visibility decreases. The critical point however is the cloud base at which the likelihood changes from "fairly likely" to "fairly unlikely". This falls in the range 1001 - 1500 ft. We conclude therefore that the *average* critical limit (obtained from the airfield limit and the pilot limit) for cloud base to be 1000 ft  $\pm$  500 ft.



### Likelihood of Majority of Flights Being Cancelled Given Cloud Base

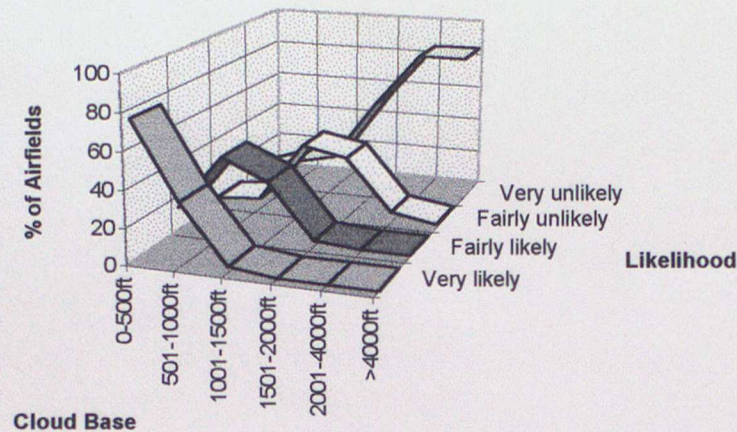


Figure 3

A similar analysis has been done for the issue of visibility. Figure 4 shows the minimum visibilities at which pilots operate.

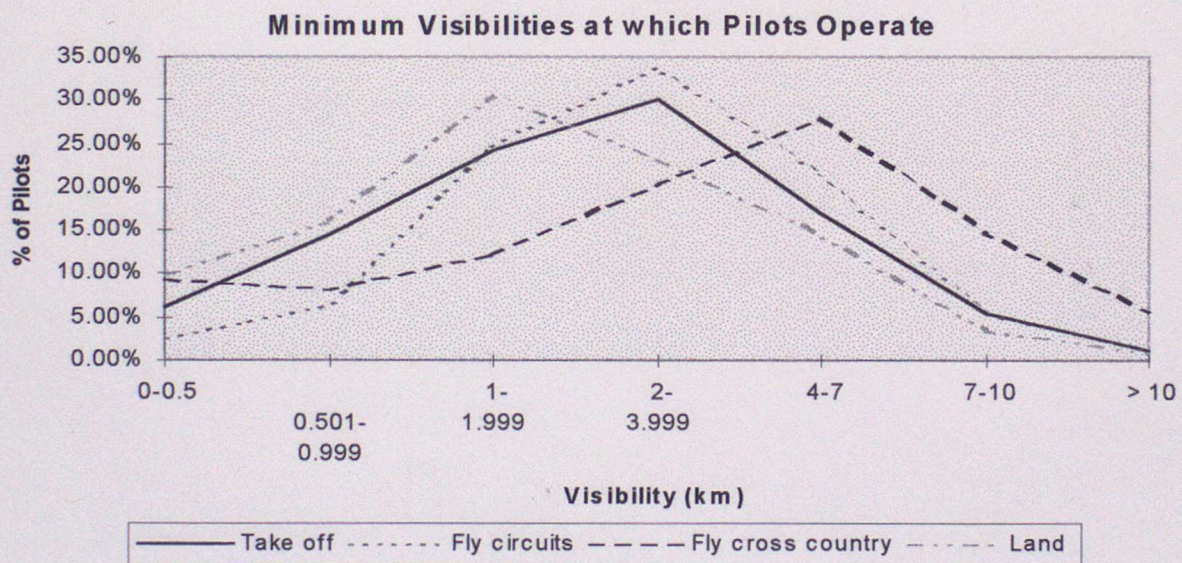


Figure 4

Here, there is a significant difference in the critical limits for landing and taking off. Taking off requires better visibility than landing. Circuits requirements are very similar to those of taking off. Again, cross country flights have the highest requirements of all. The critical limit for take-off is 1 - 2 km, for landing and circuits, 2 - 4 km and for cross country flight, 4 - 7 km. Unfortunately, the behaviour of pilots with respect to visibility is not so clear cut.

Again, the same breakdown was done for pilot type. Again, we see that the students differ from the main pattern. Figures 23 - 28 are shown in Appendix 6. For each operation the students have two peaks in the distribution as opposed to just one which is the case for the other pilots. In each case, the peak corresponding to the lower visibility is lower than that indicated by the other pilot types, and the second corresponds to a much higher visibility.



Figure shows the likelihood of pilots changing the destination given the visibility being below the minimum limit that they have already specified. It is almost exactly the same as that for cloud base but closer inspection of the pilot types shows that differences do exist. The pilot breakdowns are in Appendix 6, figures 23 - 28.

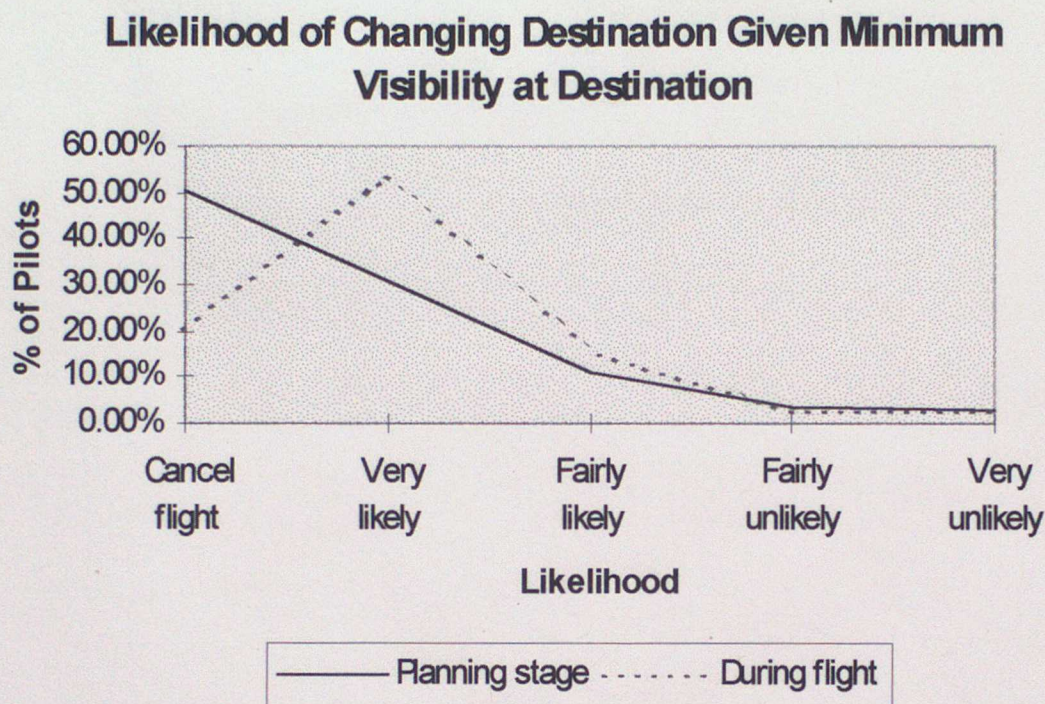


Figure 5

Again a cross reference with a question asked to the airfields was done. As can be seen from figure 6, the cross over of the "fairly likely" and "fairly unlikely" categories is at approximately 4 km. This gives the same limits as with the pilot's answers for all operating procedures except take-off. We conclude therefore that the *average* critical limit (obtained from the airfield limit and the pilot limit) for visibility to be  $4 \text{ km} \pm 3 \text{ km}$ .



### Likelihood of Majority of Flights Being Cancelled Given Visibility

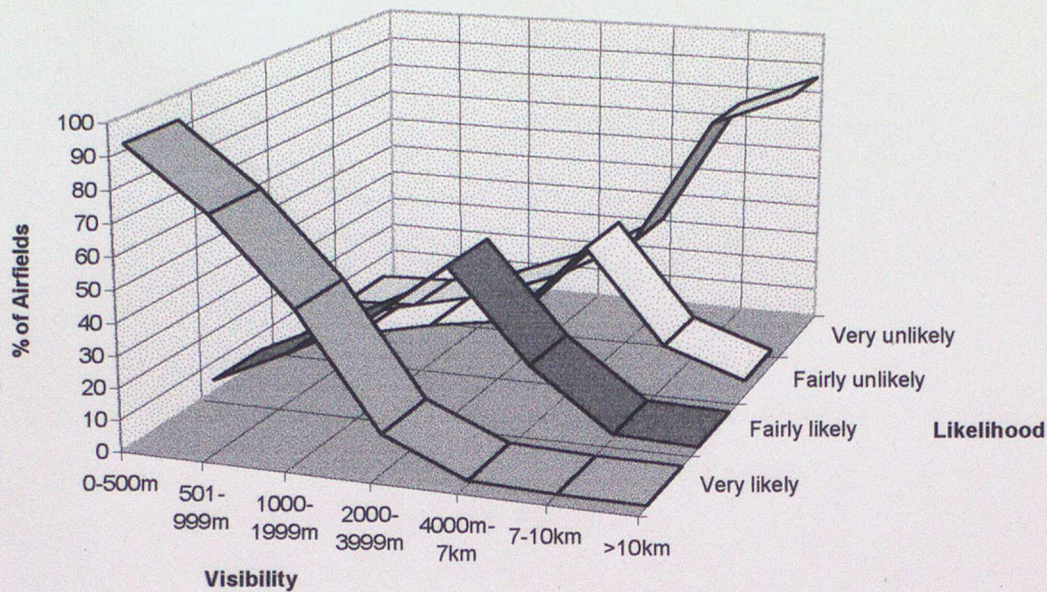


Figure 6

### Cloud Base vs. Visibility

A cross tabulation was done to see if pilots were more sensitive to visibility or cloud base. It seems reasonable that one may be more critical than the other. Cross tabulations were done for each of the four operations considered (take-off, circuits, cross country and landing) to see if one was more critical than the other. The graphs are shown in Appendix 7. It can be seen that there is indeed a correlation showing that those pilots with low minimum cloud base limits also have low minimum visibility limits. This is true through the range. There is one anomaly though in the landing operation where 44 % of pilots who have their minimum cloud base over 4000 ft have their minimum visibility in the range 1000 - 1999 m.

## 4. THUNDERSTORMS, ICING AND WIND

Thunderstorms can be included in the main body of the TAF or if they are less likely in PROB40 and PROB30 statements. We wish to know what risk indicated on a TAF would prevent a pilot from flying in order to assess at what level they should be included in the forecasts. Figure 7 shows how likely pilots are to cancel a flight given the thunderstorm forecast.



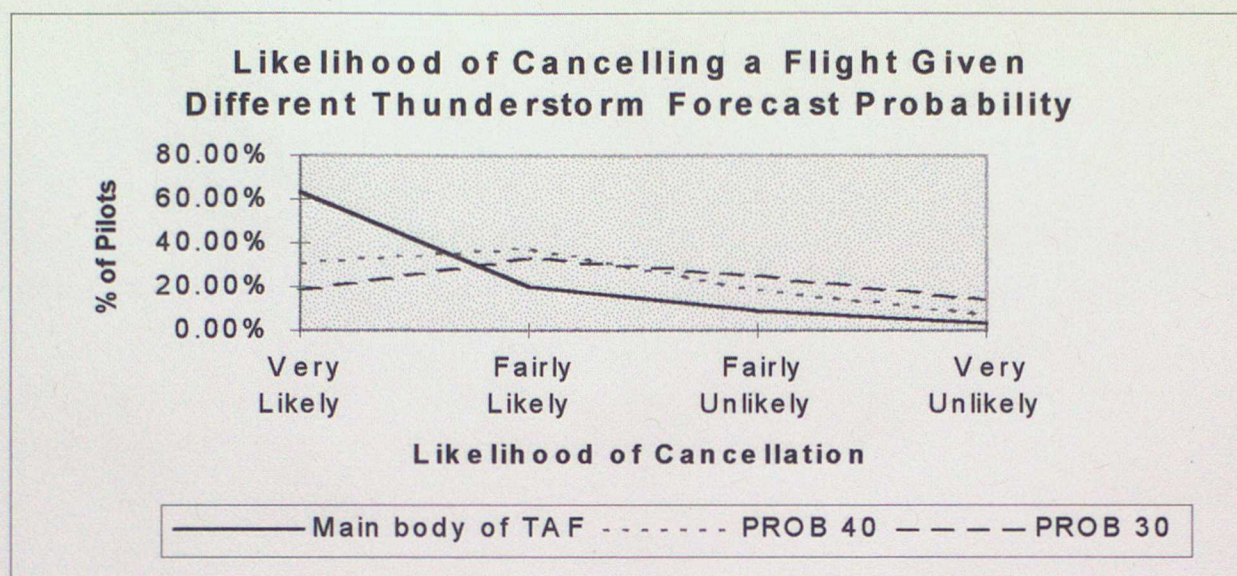


Figure 7

As can be seen, there is very little difference between the likelihood of cancellations for PROB40 and PROB30. This would imply that it would not be worth a forecaster agonising over whether to include the thunderstorm as a PROB30 or a PROB40. If the thunderstorm is present in the main body of the TAF the pilot type breakdown shown in Appendix 8 shows that there is very little difference in likelihood between pilots. For PROB40 and PROB30 statements the student pilots are again erring on the side of caution.

The cross reference with the airfields emphasises the fact that there is very little difference in the interpretation of the PROB30 and the PROB40. The critical point in the likelihood occurs at PROB40.

**Likelihood of Majority of Flights Being Cancelled Given Thunderstorm Probability**

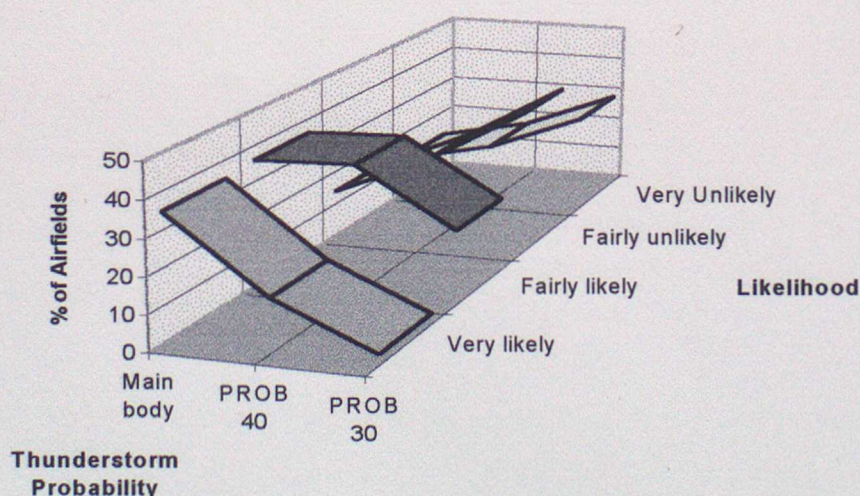


Figure 8

A brief question was included in the pilots questionnaire regarding the hazard of icing. The majority of pilots experienced very little in the way of icing effects on their flying activities, as figure 9 shows.



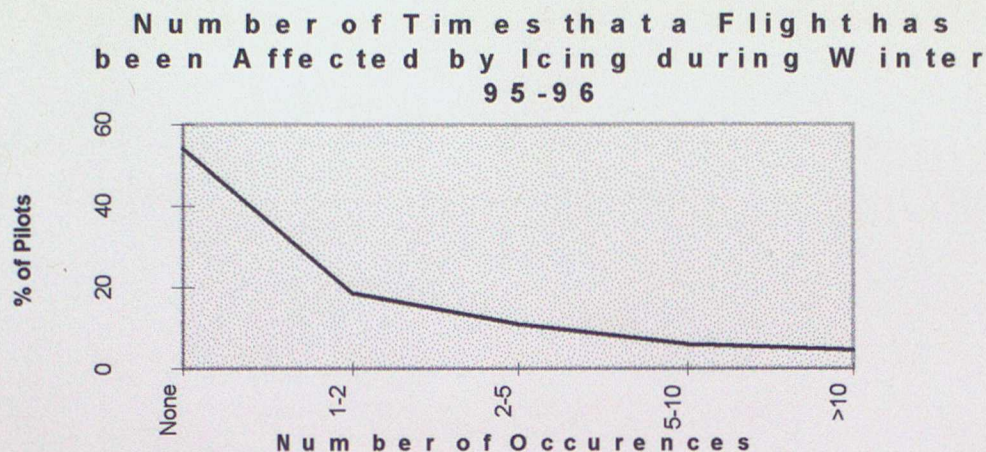


Figure 9

The reliability of the results obtained for the questions on windspeeds is in doubt. The pilots were asked about the maximum surface and operating height windspeeds at which they operate. The airfields were asked about the likelihood of the majority of flights being cancelled given certain windspeed ranges. The majority of pilots said the maximum surface windspeeds at which they would fly are in the 0 - 20 kt range. The airfields said that it is very unlikely that the majority of the flights operating out of their airfield would be cancelled if the mean windspeed was in this range. It is thought that the pilots interpreted the surface wind to mean the surface cross wind. This, however, can not be guaranteed to include all of the respondents so this result is not valid. According to the airfields, the critical operating height windspeed appears to be approximately 25 kts whereas the majority of pilots have their critical limit above 35 kts. We conclude therefore that the average critical limit (from airfields and pilots) to be 30 kts  $\pm$  5 kts.

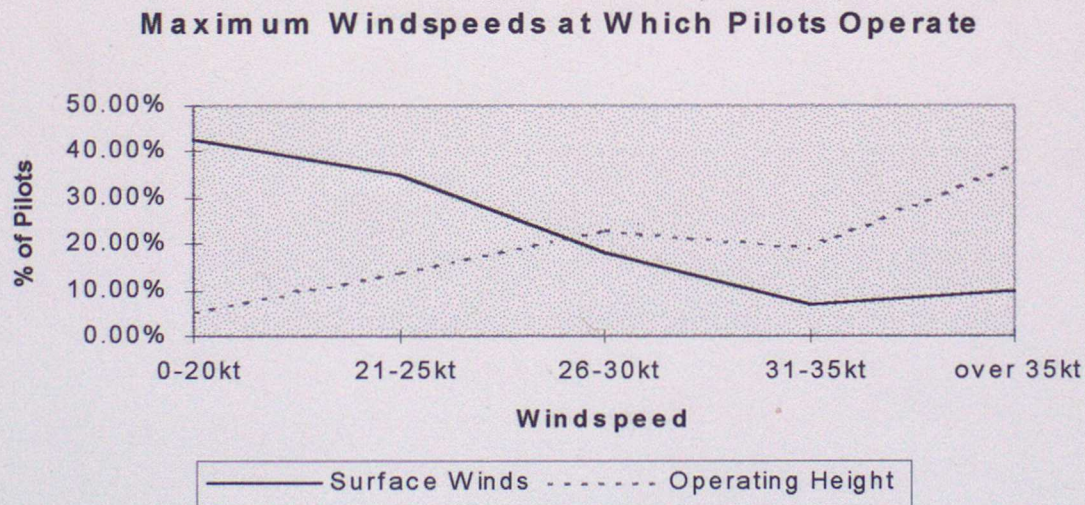


Figure 10



### Likelihood of the Majority of Flights Being Cancelled Given Mean Wind Speed

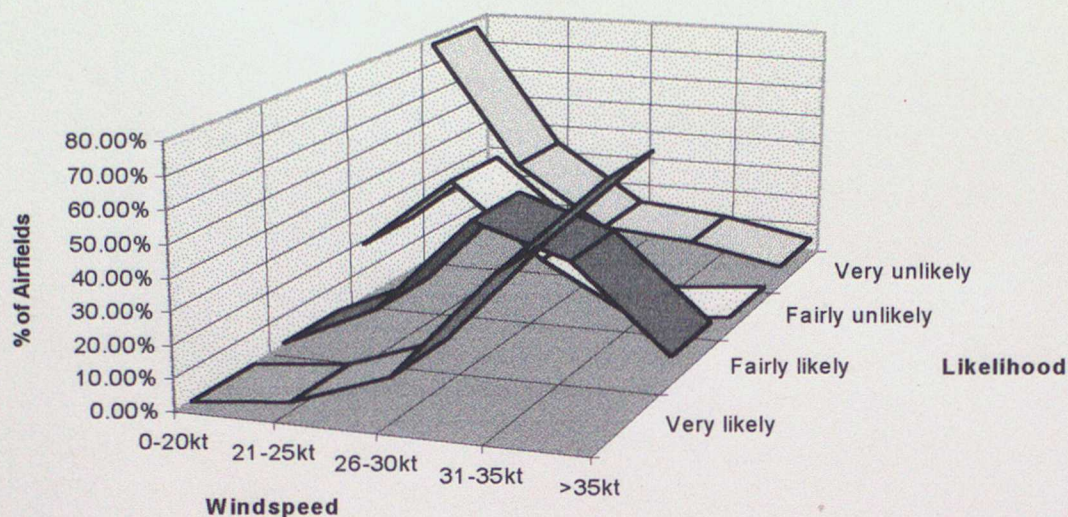


Figure 11

## 5. FORECAST LENGTHS

Whilst planning a flight, the majority of pilots use forecasts in the range 4 - 12 hrs, which obviously includes the 9 hour TAF. A significant number also use the 1 - 4 hour range and the 12 - 24 hour ranges. When asked what forecast ranges they would like to use there seems to be a fairly even spread across the ranges, with a peak at 1 - 4 days.

### Forecast Range Usage In Flight Planning

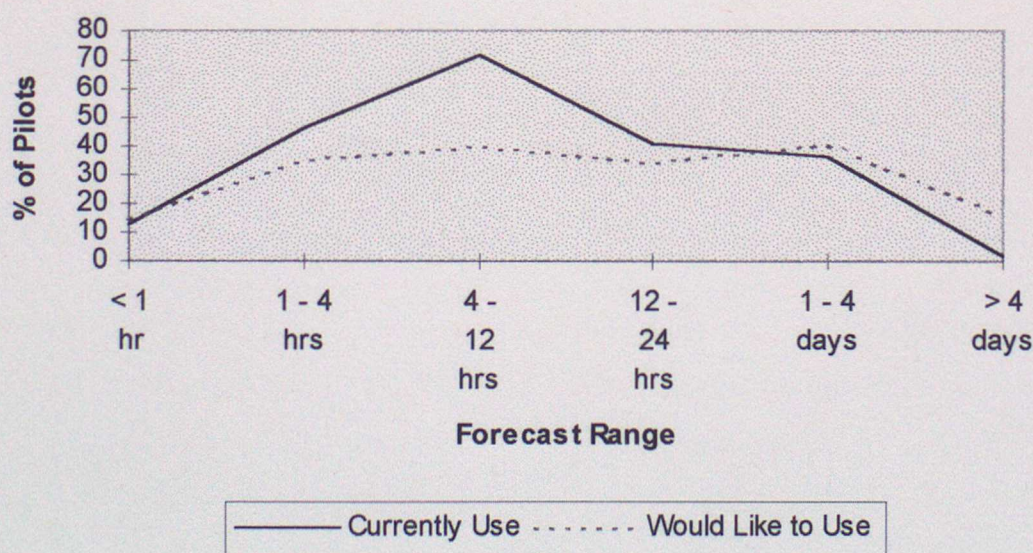


Figure 12

The airfields show a very similar pattern except that usage of 1 - 4 day forecasts is less common. This is presumably because the forecasts in this range used by the pilots are



predominantly obtained from the television. Again, the airfields/flying clubs would like to make a 1 - 4 day forecast available to the pilots using the airfield.

### Forecast Ranges Displayed at Airfields

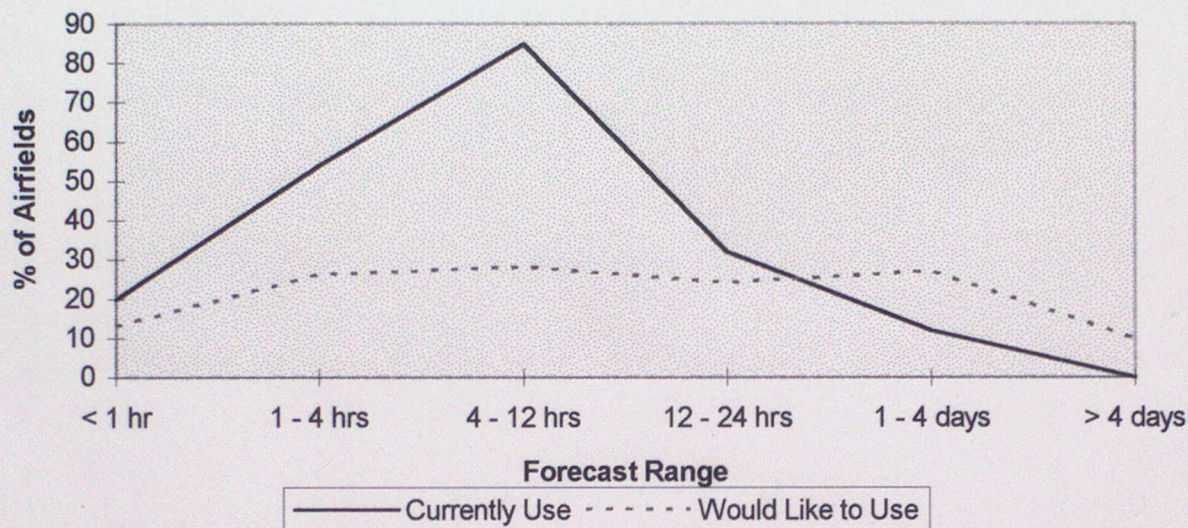


Figure 13

Most pilots will give 1 - 4 hrs notice if they are going to cancel a flight because of adverse weather. This is despite the fact that most would be using a 9 hour TAF which falls in the 4 - 12 hr forecast range given as an option. This shows that pilots have little faith in the forecasts they obtain in advance.

### Range at Which Pilots Cancel Flights Because of Adverse Weather

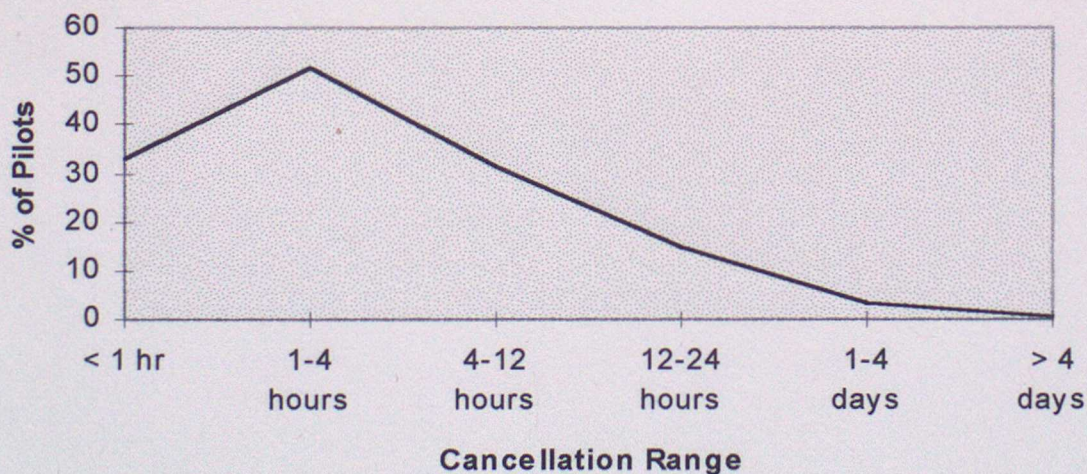


Figure 14

As can be seen from the figure 15, there is little correlation between the forecast range used and the advance notice given of cancellation. There is an anomaly in this however, in that 44% of pilots who use a forecast of greater than 4 days would cancel at a range of 12 - 24 hours. Despite this a flight will usually be cancelled at the last minute.



### Correlation Between Forecast Ranges Used and Advance Notice of Cancellation

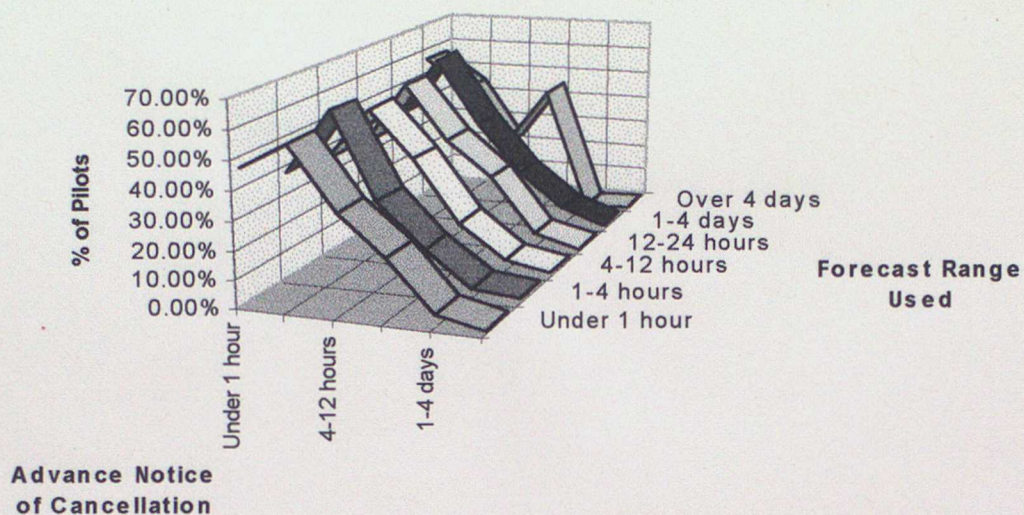


Figure 15

The airfields say that there is very little difference in the cancellation range for IMC pilots and non-IMC rated pilots as is shown in figure 16.

### Advance Notice Given By Pilots

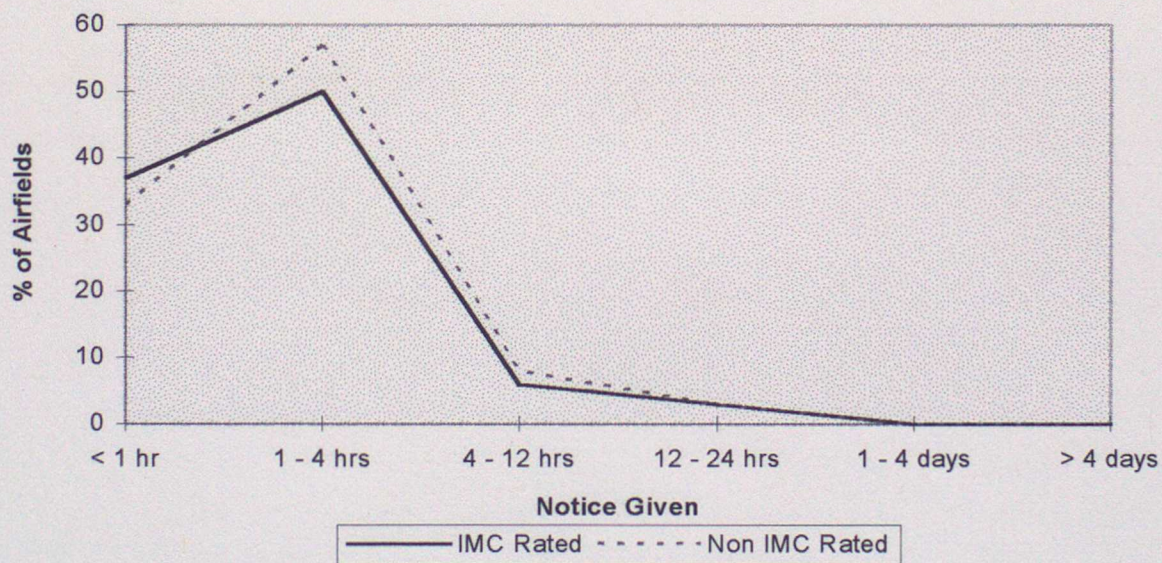


Figure 16

In this respect it is doubtful whether increasing the accuracy of long range forecasts for the purposes of planning for aircraft maintenance, staffing levels, fire crew etc. would make a great deal of difference to airfield operations. The statistics show that cancelling at 1 - 4 hours or at least on the day of the flight is ingrained across the board. However, since both pilots and airfields/flying clubs said that they would like to use this range, it may well be worth investigating the possibility of developing a forecast product in this range.



It was hoped that some idea of the cost to the flying club of bad forecasts in terms of planning for aircraft maintenance, staffing levels, fire precautions etc. could be determined. It soon became apparent through talking to personal contacts that the vast majority of flying clubs would not have any figures on the subject so questions along this line were not included in the questionnaire.

## 6. CONCLUSIONS

It is hard to quantify the exact limits for each of the meteorological phenomena considered because the pilots did not always agree with each other and the airfields/flying clubs did not always agree with the pilots but the table below shows the average critical limits that have been deduced from the data.

Meteorological Parameter	Critical Limit
Cloud Base	1000 ft $\pm$ 500 ft
Visibility	4 km $\pm$ 3 km
Thunderstorms	PROB40
Windspeed at Operating Height	30 kts $\pm$ 5 kts

Table 1 - Critical limits of meteorological parameters for general aviation.

Improving the forecast of these phenomena in the above ranges could affect general aviation operations.

On the subject of forecast ranges pilots seem to want to use anything that is available, but particularly something in the 1 - 4 day range. This implies that there would be significant interest in a 48 hour TAF. However, this will more than likely not affect the operations at general aviation airfields as cancellations due to adverse weather or the forecast of adverse weather are predominantly made 1 - 4 hours before the flight was due to take place.

This tendency could reflect the perceived accuracy of the longer range forecasts which may be erroneous.



## **7. APPENDICES**



## 7.1 Pilot Questionnaire

**USERS OF METEOROLOGICAL DATA****General Aviation - Pilots**

The UK Meteorological Office is continually striving to monitor and improve our products. In order for us to do this, we would be grateful if you could spend a few moments of your time and complete the following questionnaire, returning it using the envelope provided. Thank you for your time.

**1. Are you...?**

Basic PPL Holder	<input type="checkbox"/>	PPL-IMC rated	<input type="checkbox"/>
Instructor	<input type="checkbox"/>	Other	<input type="checkbox"/>
CPL Holder	<input type="checkbox"/>	(Please specify)	

**2. In which areas do you fly and how often? Please tick one box only per area.**

	More than once per week	Weekly	Less than once per week	Monthly	Less than once per month
Local	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
UK	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Europe	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**3. Please specify what types of aircraft you fly:**

Single Engine	<input type="checkbox"/>	Rotary	<input type="checkbox"/>
Twin Engine	<input type="checkbox"/>	Microlight	<input type="checkbox"/>
Glider	<input type="checkbox"/>	Other.....	
Balloon	<input type="checkbox"/>	(Please specify)	

**4. Please indicate the average length of your flights and the frequency. Please tick one box per range**

RANGE	More than once per week	Weekly	Less than once per week	Monthly	Less than once per month
Under 1 hour	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1 -3 hours	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Over 3 hours	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**5. Please indicate when you normally fly and how often by placing a tick for each period.**

PERIOD	More than once per week	Weekly	Less than once per week	Monthly	Less than once per month
Monday - Friday	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Saturday/Sunday	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Weekends Away	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**6. Please indicate your source of pre-flight and in-flight weather information. Please tick all that apply**

MetFAX	<input type="checkbox"/>	Airmet Area Forecasts Telephone Service	<input type="checkbox"/>	Airmet Tafs / Metars Telephone Service	<input type="checkbox"/>
MIST	<input type="checkbox"/>	The Met. Office, Bracknell	<input type="checkbox"/>	Airfield / Airport / Flying Club	<input type="checkbox"/>
ATIS	<input type="checkbox"/>	Regional Weather Centre	<input type="checkbox"/>	TV / Radio	<input type="checkbox"/>
VolMet	<input type="checkbox"/>	Satellite	<input type="checkbox"/>	Other	<input type="checkbox"/>
		Internet	<input type="checkbox"/>	(Please specify)	



7. Please indicate which ranges of forecast you currently use or would like to use when planning a flight. Please tick all that apply

	Under 1 hr	1 - 4 hours	Over 4 hours, up to 12 hours	Over 12 hours, up to 24 hours	1 - 4 days	Over 4 days
Currently use	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Would like to use	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

8. Please indicate which ranges of forecast you currently use (if any) or would like to use when airborne. Please tick all that apply

	None	Under 1 hour	1 - 2 hours	Over 2 hours, up to 4 hours	Over 4 hours
Currently use	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Would like to use	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

9. At what range would you cancel a flight due to adverse weather conditions or forecast adverse weather conditions?

Under 1 hr	1 - 4 hours	Over 4 hours, up to 12 hours	Over 12 hours, up to 24 hours	1 - 4 days	Over 4 days
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

10. Under what minimum cloud base (AGL) conditions would you: Please tick one box for each flight category

	0 - 500 ft	501 - 1000 ft	1001 - 1500 ft	1501 - 2000 ft	2001 - 4000 ft	Over 4000 ft
Take Off	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Flying Circuits	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Flying Cross Country	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Landing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

11. Please specify the likelihood that you would change your destination if the cloud base at your desired destination is lower, or forecast to be lower, than the minimum you specified above in the planning stage and during flight.

	Cancel Flight	Very Likely	Fairly Likely	Fairly Unlikely	Very Unlikely	Don't know
Planning stage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
During flight	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

12. Please specify the minimum visibility at which you would take-off (T/O), Fly circuits (C), fly cross-country (XC) and land (L)?

	0 - 500m	501m - 999m	1000m - 1999m	2000m - 3999m	4000m - 7 km	7 km - 10 km	> 10 km
Take Off	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Flying Circuits	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Flying Cross Country	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Landing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



13. Please specify the likelihood that you would be to change your destination if the visibility at your desired destination is lower, or forecast to be lower, than the minimum you specified above in the planning stage and during flight.

	Cancel Flight	Very Likely	Fairly Likely	Fairly Unlikely	Very Unlikely	Don't know
Planning stage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
During flight	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

14. Please specify the maximum mean surface wind speed and operating height wind speed at which you would fly.

	0 - 20 kts	21 - 25 kts	26 - 30 kts	31 - 35 kts	Over 35 kts
Surface winds	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Operating Height	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

15. Approximately how often this winter have you cancelled or altered a flight due to icing related dangers?

None	<input type="checkbox"/>	1 - 2 times	<input type="checkbox"/>	2 - 5 times	<input type="checkbox"/>
5 - 10 times	<input type="checkbox"/>	10 or more times	<input type="checkbox"/>		

16. Thunderstorms can be indicated on a TAF as part of the main body of a forecast, or if they are less likely, given as a probability statement, e.g. PROB 30, PROB 40. Given this, please specify how likely you are to cancel a flight given the different levels of forecast probability.

	Cancel Flight	Very Likely	Fairly Likely	Fairly Unlikely	Very Unlikely	Don't know
Main body	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PROB40	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PROB30	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

17. Please give any other comments you may have regarding meteorological forecast provision for the aviation industry: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Thank you for taking the time to complete this questionnaire. All responses will be treated in strictest confidence and results will be published in statistical format only in accordance with the Market Research Society's Code of Conduct.**



## 7.2 Airfields Questionnaire

### USERS OF METEOROLOGICAL DATA

#### General Aviation - Airfields and / or Flying Clubs

The UK Meteorological Office is continually striving to monitor and improve our products. In order for us to do this, we would be grateful if you could spend a few moments of your time and complete the following questionnaire, returning it using the envelope provided. Thank you for your time.

**1 Please indicate your source of pre-flight and in-flight weather information.**

*Please tick all that apply*

- |        |                          |   |                          |                                       |                          |
|--------|--------------------------|---|--------------------------|---------------------------------------|--------------------------|
| MetFAX | <input type="checkbox"/> | Airmet Area Forecasts Telephone Service | <input type="checkbox"/> | Airmet Tafs/ Metars Telephone Service | <input type="checkbox"/> |
| MIST   | <input type="checkbox"/> | The Met. Office, Bracknell              | <input type="checkbox"/> | Airfield / Airport / Flying Club      | <input type="checkbox"/> |
| AFTN   | <input type="checkbox"/> | Broadcast Fax                           | <input type="checkbox"/> | Internet                              | <input type="checkbox"/> |
| ATIS   | <input type="checkbox"/> | Regional Weather Centre                 | <input type="checkbox"/> | TV / Radio                            | <input type="checkbox"/> |
| VolMet | <input type="checkbox"/> | Satellite                               | <input type="checkbox"/> | Other                                 | <input type="checkbox"/> |

*(Please specify)*

**2. Please indicate how the information is made available. Please tick all that apply**

- |                      |                          |              |                          |                    |                          |
|----------------------|--------------------------|--------------|--------------------------|--------------------|--------------------------|
| Via noticeboard      | <input type="checkbox"/> | Via database | <input type="checkbox"/> | Via open broadcast | <input type="checkbox"/> |
| Special request only | <input type="checkbox"/> | Other        | <input type="checkbox"/> |                    |                          |

*(Please specify)*

**3 Please indicate which ranges of forecast you make available or would make available for flight planning purposes. Please tick all that apply**

- |                   | Under 1 hr               | 1 - 4 hrs                | Over 4 hrs up to 12 hrs  | Over 12hrs up to 24 hrs  |
|-------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 1 - 4 days        |                          |                          |                          |                          |
| Currently use     | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Would like to use | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

**4. Please specify how much advance notice most pilots give when cancelling a flight due to adverse weather or forecast adverse weather?**

- |           | Under 1 hr               | 1 - 4 hrs                | Over 4, up to 12 hrs     | Over 12, up to 24 hours  | 1 - 4 days               | Over 4 days              |
|-----------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Non IMC   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| IMC rated | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

**5. Given the following cloud bases (AGL) at your airfield, please specify how likely it is that the majority of flights operating from your airfield would be cancelled.**

- |                | Very Likely              | Fairly Likely            | Fairly Unlikely          | Very Unlikely            | Don't know               |
|----------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 0 - 500 ft     | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 501 - 1000 ft  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 1001 - 1500 ft | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 1501 - 2000 ft | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2001 - 4000 ft | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Above 4000 ft  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |



6. Given the following visibilities at your airfield, please specify how likely it is that the majority of flights operating from your airfield would be cancelled.

	Very Likely	Fairly Likely	Fairly Unlikely	Very Unlikely	Don't know
0 - 499m	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
500 - 999m	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1 - 2 km	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2 - 4 km	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4 - 7 km	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7 - 10 km	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
> 10 km	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

7. Given the following maximum mean wind speeds at your airfield, please specify how likely it is that the majority of flights operating from your airfield would be cancelled.

	Very Likely	Fairly Likely	Fairly Unlikely	Very Unlikely	Don't know
0 - 20 kts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21 - 25 kts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26 - 30 kts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
31 - 35 kts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Above 35 kts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

8. Thunderstorms can be indicated on a TAF as part of the main body of a forecast, or if they are *less* likely, given as a probability statement, e.g. PROB 30, PROB 40. Given this, please specify how likely it is that the majority of flights operating from your airfield would be cancelled, given the different levels of forecast probability.

	Very Likely	Fairly Likely	Fairly Unlikely	Very Unlikely	Don't know
Main body	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PROB40	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PROB30	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

9. Please give any other comments you may have regarding meteorological forecast provision for the aviation industry, please state whether these are your own opinions, or they represent the general consensus within the Airfield/Flying Club: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Thank you for taking the time to complete this questionnaire. All responses will be treated in strictest confidence and results will be published in statistical format only in accordance with the Market Research Society's Code of Conduct.



### 7.3 Topline Results - Pilot Questionnaire

Data file = pilots

Records on file = 412

Response rate 38.6%

Q1 Are you...? multi

/1	160	38.8%	Basic PPL Holder
/2	151	36.7%	PPL - IMC rated
/3	33	8.0%	Instructor
/4	21	5.1%	CPL Holder
/5	107	26.0%	Other

\$F1 Other single

/B	305	74.0%	
/1	107	26.0%	Other

Q10OTHER q10other single

/B	307	74.5%	
/1	20	4.9%	PPL IR
/2	11	2.7%	APTL
/3	0	.0%	PPL (H)
/4	5	1.2%	Hang Glider Pilot APC
/5	1	.2%	APTL & CPL Balloon
/6	3	.7%	PPL/Instrument rating
/7	3	.7%	ATPL/H IR
/8	1	.2%	PPL (M)
/9	1	.2%	HG Pilot
/10	1	.2%	Owner of arial photo co.
/11	2	.5%	Night and Multi plus C550 type rated
/12	4	1.0%	Gliding instructor
/13	10	2.4%	Night rated
/14	8	1.9%	Paraglider pilot (P(S) rating)
/15	1	.2%	Ops dept
/16	1	.2%	IR USA Commercial USA
/17	1	.2%	Balloon pilot
/18	1	.2%	AFI (Expired)
/19	0	.0%	Trainee PPL
/20	3	.7%	PPL MicroLight
/21	1	.2%	Night & Twin Rating
/22	1	.2%	IR & CPL Student
/23	2	.5%	T.I.R.
/24	3	.7%	Solo Glider Pilot
/25	0	.0%	Jet
/26	2	.5%	ATPL Helicopter VFR- Operations
/27	2	.5%	Student PPL
/28	1	.2%	Instructor APTL
/29	1	.2%	PPL (A)
/30	2	.5%	Multi Jet
/31	4	1.0%	BHPA P2
/32	1	.2%	APTL BX EXAMINER
/33	2	.5%	Hang Glider/Paraglider
/34	1	.2%	BCPL
/35	1	.2%	FAA Commercial Flight Instructor IFR SEL & MES Glider Brone (C) UK
/36	1	.2%	Flight Ops Manager Jetstream B Pup, Bull Dog Operations at Base and Various UK Airfileds (detachment)
/37	1	.2%	Sail Plane Pilot
/38	1	.2%	PPL Twin IR



/39 1 .2% RAF Cadet

Q2%A Local multi

/B 67 16.3%  
 /1 79 19.2% More than once per week  
 /2 87 21.1% Weekly  
 /3 100 24.3% Less than once per week  
 /4 52 12.6% Monthly  
 /5 28 6.8% Less than once per month

Q2%B UK multi

/B 83 20.1%  
 /1 48 11.7% More than once per week  
 /2 56 13.6% Weekly  
 /3 74 18.0% Less than once per week  
 /4 90 21.8% Monthly  
 /5 63 15.3% Less than once per month

Q2%C Europe multi

/B 145 35.2%  
 /1 23 5.6% More than once per week  
 /2 8 1.9% Weekly  
 /3 19 4.6% Less than once per week  
 /4 46 11.2% Monthly  
 /5 172 41.7% Less than once per month

Q2%D Grid single

/B 412 100.0%  
 /1 0 .0% Local  
 /2 0 .0% UK  
 /3 0 .0% Europe

Q3 Please specify which type of aircraft you fly multi

/B 3 .7%  
 /1 308 74.8% Single engine  
 /2 85 20.6% Twin engine  
 /3 44 10.7% Glider  
 /4 46 11.2% Rotary  
 /5 27 6.6% Microlight  
 /6 5 1.2% Balloon  
 /7 27 6.6% Other

\$F3 Other

single

/B 385 93.4%  
 /1 27 6.6% Other

Q3OTHER q3other multi

/B 386 93.7%  
 /1 6 1.5% Hang glider/Paraglider  
 /2 5 1.2% Hang glider  
 /3 1 .2% Citation II jet with IR holder as P2  
 /4 1 .2% Float plane  
 /5 7 1.7% Para glider  
 /6 0 .0% Glider  
 /7 1 .2% HS 125/Canadair Challenger  
 /8 2 .5% Motor glider  
 /9 1 .2% Turbo Prop



/10 1 .2% Ex Military  
/11 1 .2% Vintage

## Q4%A Under 1 hour multi

/B 134 32.5%  
/1 75 18.2% More than once per week  
/2 66 16.0% Weekly  
/3 81 19.7% Less than once per week  
/4 28 6.8% Monthly  
/5 28 6.8% Less than once per month

## Q4%B 1 - 3 hours multi

/B 38 9.2%  
/1 40 9.7% More than once per week  
/2 84 20.4% Weekly  
/3 97 23.5% Less than once per week  
/4 104 25.2% Monthly  
/5 60 14.6% Less than once per month

## Q4%C Over 3 hours multi

/B 168 40.8%  
/1 11 2.7% More than once per week  
/2 7 1.7% Weekly  
/3 20 4.9% Less than once per week  
/4 44 10.7% Monthly  
/5 162 39.3% Less than once per month

## Q5%A Monday-Friday multi

/B 50 12.1%  
/1 72 17.5% More than once per week  
/2 70 17.0% Weekly  
/3 93 22.6% Less than once per week  
/4 49 11.9% Monthly  
/5 83 20.1% Less than once per month

## Q5%B Saturdays/Sundays multi

/B 57 13.8%  
/1 50 12.1% More than once per week  
/2 89 21.6% Weekly  
/3 103 25.0% Less than once per week  
/4 65 15.8% Monthly  
/5 50 12.1% Less than once per month

## Q5%C Weekends away multi

/B 157 38.1%  
/1 4 1.0% More than once per week  
/2 6 1.5% Weekly  
/3 21 5.1% Less than once per week  
/4 49 11.9% Monthly  
/5 176 42.7% Less than once per month

## Q6 Please indicate your source of pre-flight and in-flight weather information multi

/B 10 2.4%  
/1 284 68.9% MetFAX  
/2 8 1.9% MIST  
/3 157 38.1% ATIS  
/4 159 38.6% VolMet  
/5 94 22.8% Airmet Area Forecasts



/6	51	12.4%	Met. Office Bracknell
/7	47	11.4%	Regional weather Centre
/8	18	4.4%	Satellite
/9	142	34.5%	Airmet TAFs/METARs Telephone service
/10	235	57.0%	Airfield/Airport/Flying Club
/11	235	57.0%	TV/Radio
/12	84	20.4%	Internet
/13	24	5.8%	Other

## \$F6 Other

single

/B	388	94.2%
/1	24	5.8% Other

## Q6OTHER q6other multi

/B	388	94.2%
/1	1	.2% Automatic stations
/2	1	.2% Marinecall (telephone)
/3	3	.7% Jeppeson
/4	1	.2% Offshore Rigs/ Platform
/5	3	.7% RAF Met Office
/6	2	.5% British Airways FICO (employee)
/7	1	.2% F.B.U.
/8	2	.5% Personal Observations
/9	1	.2% Local Observations
/10	1	.2% WeatherCall
/11	1	.2% MountainCall
/12	1	.2% Computer Met Office (US)
/13	2	.5% HF Radio
/14	1	.2% Foreign MetFax
/15	1	.2% Teletext Marine Forecast
/16	1	.2% American FT,SA & other reports
/17	1	.2% Radio Fax & RTTY
/18	1	.2% MeteoFrance

## Q7%A Currently use multi

/B	16	3.9%
/1	52	12.6% Under 1 hour
/2	192	46.6% 1-4 hours
/3	294	71.4% 4-12 hours
/4	170	41.3% 12-24 hours
/5	149	36.2% 1-4 days
/6	9	2.2% Over 4 days

## Q7%B Would like to use multi

/B	66	16.0%
/1	62	15.0% Under 1 hour
/2	145	35.2% 1-4 hours
/3	165	40.0% 4-12 hours
/4	144	35.0% 12-24 hours
/5	170	41.3% 1-4 days
/6	69	16.7% Over 4 days

## Q8%A Currently use multi

/B	58	14.1%
/1	174	42.2% None
/2	111	26.9% Under 1 hour



/3	80	19.4%	1-2 hours
/4	38	9.2%	2-4 hours
/5	18	4.4%	Over 4 hours

## Q8%B Would like to use multi

/B	92	22.3%	
/1	47	11.4%	None
/2	131	31.8%	Under 1 hour
/3	158	38.3%	1-2 hours
/4	91	22.1%	2-4 hours
/5	25	6.1%	Over 4 hours

## Q9 At what range would you cancel a flight due to adverse weather conditions or forecast adverse weather conditions multi

/B	21	5.1%	
/1	137	33.3%	Under 1 hour
/2	214	51.9%	1-4 hours
/3	130	31.6%	4-12 hours
/4	62	15.0%	12-24 hours
/5	14	3.4%	1-4 days
/6	3	.7%	Over 4 days

## Q10%A Take off multi

/B	17	4.1%	
/1	69	16.7%	0 - 500 ft
/2	146	35.4%	501 - 1000 ft
/3	120	29.1%	1001 - 1500 ft
/4	48	11.7%	1501 - 2000 ft
/5	17	4.1%	2001 - 4000 ft
/6	0	.0%	Over 4000 ft

## Q10%B Fly circuits multi

/B	21	5.1%	
/1	28	6.8%	0 - 500 ft
/2	138	33.5%	501 - 1000 ft
/3	166	40.3%	1001 - 1500 ft
/4	52	12.6%	1501 - 2000 ft
/5	13	3.2%	2001 - 4000 ft
/6	0	.0%	Over 4000 ft

## Q10%C Fly cross country multi

/B	16	3.9%	
/1	55	13.3%	0 - 500 ft
/2	59	14.3%	501 - 1000 ft
/3	75	18.2%	1001 - 1500 ft
/4	105	25.5%	1501 - 2000 ft
/5	98	23.8%	2001 - 4000 ft
/6	11	2.7%	Over 4000 ft

## Q10%D Land multi

/B	14	3.4%	
/1	92	22.3%	0 - 500 ft
/2	173	42.0%	501 - 1000 ft
/3	98	23.8%	1001 - 1500 ft
/4	28	6.8%	1501 - 2000 ft
/5	11	2.7%	2001 - 4000 ft
/6	2	.5%	Over 4000 ft



## Q11%A Planning stage multi

/B	21	5.1%	
/1	210	51.0%	Cancel flight
/2	132	32.0%	Very likely
/3	40	9.7%	Rairly likely
/4	12	2.9%	Fairly unlikely
/5	7	1.7%	Very unlikely
/6	4	1.0%	Don't know

## Q11%B During flight multi

/B	25	6.1%	
/1	76	18.4%	Cancel flight
/2	208	50.5%	Very likely
/3	73	17.7%	Rairly likely
/4	19	4.6%	Fairly unlikely
/5	13	3.2%	Very unlikely
/6	7	1.7%	Don't know

## Q12%A Take off multi

/B	9	2.2%	
/1	25	6.1%	0 - 500 m
/2	60	14.6%	501 - 999m
/3	100	24.3%	1000 - 1999m
/4	124	30.1%	2000 - 3999m
/5	70	17.0%	4000m - 7km
/6	22	5.3%	7 - 10km
/7	5	1.2%	> 10km

## Q12%B Fly circuits multi

/B	21	5.1%	
/1	11	2.7%	0 - 500 m
/2	26	6.3%	501 - 999m
/3	102	24.8%	1000 - 1999m
/4	139	33.7%	2000 - 3999m
/5	88	21.4%	4000m - 7km
/6	22	5.3%	7 - 10km
/7	6	1.5%	> 10km

## Q12%C Fly cross country multi

/B	9	2.2%	
/1	39	9.5%	0 - 500 m
/2	34	8.3%	501 - 999m
/3	50	12.1%	1000 - 1999m
/4	84	20.4%	2000 - 3999m
/5	115	27.9%	4000m - 7km
/6	61	14.8%	7 - 10km
/7	23	5.6%	> 10km

## Q12%D Land multi

/B	10	2.4%	
/1	41	10.0%	0 - 500 m
/2	66	16.0%	501 - 999m
/3	126	30.6%	1000 - 1999m
/4	96	23.3%	2000 - 3999m
/5	60	14.6%	4000m - 7km



/6 15 3.6% 7 - 10km  
 /7 4 1.0% > 10km

## Q13%A Planning stage multi

/B 12 2.9%  
 /1 208 50.5% Cancel flight  
 /2 127 30.8% Very likely  
 /3 45 10.9% Fairly likely  
 /4 15 3.6% Fairly unlikely  
 /5 10 2.4% Very unlikely  
 /6 3 .7% Don't know

## Q13%B During flight multi

/B 21 5.1%  
 /1 83 20.1% Cancel flight  
 /2 221 53.6% Very likely  
 /3 66 16.0% Fairly likely  
 /4 10 2.4% Fairly unlikely  
 /5 11 2.7% Very unlikely  
 /6 4 1.0% Don't know

## Q14%A Surface Winds multi

/1 176 42.7% 0-20kt  
 /2 143 34.7% 21-25kt  
 /3 75 18.2% 26-30kt  
 /4 29 7.0% 31-35kt  
 /5 40 9.7% over 35kt

## Q14%B Operating Height multi

/1 22 5.3% 0-20kt  
 /2 56 13.6% 21-25kt  
 /3 94 22.8% 26-30kt  
 /4 79 19.2% 31-35kt  
 /5 153 37.1% over 35kt

## Q15 Approx how often this winter have you cancelled or altered a flight due to icing related dangers multi

/B 26 6.3%  
 /1 222 53.9% None  
 /2 77 18.7% 1-2 times  
 /3 45 10.9% 2-5 times  
 /4 24 5.8% 5-10 times  
 /5 18 4.4% 10 or more

## Q16%A Main body of TAF multi

/B 8 1.9%  
 /1 260 63.1% Very Likely  
 /2 84 20.4% Fairly Likely  
 /3 37 9.0% Fairly Unlikely  
 /4 13 3.2% Very Unlikely  
 /5 12 2.9% Don't Know

## Q16%B PROB 40 multi

/B 12 2.9%  
 /1 127 30.8% Very Likely  
 /2 155 37.6% Fairly Likely  
 /3 77 18.7% Fairly Unlikely



/4	33	8.0%	Very Unlikely
/5	9	2.2%	Don't Know

Q16%C PROB 30 multi

/B	15	3.6%	
/1	79	19.2%	Very Likely
/2	139	33.7%	Fairly Likely
/3	107	26.0%	Fairly Unlikely
/4	60	14.6%	Very Unlikely
/5	13	3.2%	Don't Know



## 7.4 Topline Results - Airfields Questionnaire

Data file = airfield

Records selected = 100

Response rate 37%

Q1 Please indicate your source of pre-flight and in-flight weather information multi

/1	61	61.0%	MetFAX
/2	3	3.0%	MIST
/3	38	38.0%	AFTN
/4	47	47.0%	ATIS
/5	44	44.0%	VolMet
/6	14	14.0%	Airmet Area Forecasts Telephone Service
/7	34	34.0%	The Met. Office Bracknell
/8	15	15.0%	Broadcast Fax
/9	21	21.0%	Regional Weather Centre/Met. Office
/10	2	2.0%	Satellite
/11	29	29.0%	Airmet TAFs/METARs Telephone Service
/12	47	47.0%	Airfield/Flying Club/Airport
/13	1	1.0%	Internet
/14	25	25.0%	TV/Radio
/15	7	7.0%	Other

\$F1 Other single

/B	93	93.0%	
/1	7	7.0%	Other

Q1OTHER q1other multi

/B	93	93.0%	
/1	1	1.0%	Weather RADAR
/2	2	2.0%	OP Met
/3	1	1.0%	MARS
/4	1	1.0%	Metforms 214/215
/5	1	1.0%	Fax via SERCO
/6	1	1.0%	Artifax
/7	1	1.0%	Jepp's Met

Q2 Please indicate how the information is made available multi

/1	81	81.0%	Via notice board
/2	12	12.0%	Via database
/3	15	15.0%	Via open broadcast
/4	24	24.0%	Special request only
/5	17	17.0%	Other

\$F2 Other single

/B	83	83.0%	
/1	17	17.0%	Other

Q2OTHER q2other multi

/B	83	83.0%	
/1	3	3.0%	Local ATC
/2	1	1.0%	PC
/3	1	1.0%	Telephone weather centre
/4	3	3.0%	Flight OPs
/5	1	1.0%	By special req for non-standard weather
/6	1	1.0%	Not very well
/7	4	4.0%	MetFAX by request
/8	1	1.0%	ATIS



/9	1	1.0%	CCTV
/10	1	1.0%	Access to forecaster
/11	1	1.0%	Self briefing system at airfield
/12	1	1.0%	Get it ourselves
/13	1	1.0%	Via weather packs

## Q3%A Currently use multi

/B	1	1.0%	
/1	20	20.0%	Under 1 hour
/2	54	54.0%	1-4 hours
/3	85	85.0%	4-12 hours
/4	32	32.0%	12-24 hours
/5	12	12.0%	1-4 days
/6	0	.0%	Over 4 days

## Q3%B Would like to use multi

/B	37	37.0%	
/1	13	13.0%	Under 1 hour
/2	26	26.0%	1-4 hours
/3	28	28.0%	4-12 hours
/4	24	24.0%	12-24 hours
/5	27	27.0%	1-4 days
/6	10	10.0%	Over 4 days

## Q4%A Non IMC multi

/B	6	6.0%	
/1	33	33.0%	Under 1 hour
/2	57	57.0%	1-4 hours
/3	8	8.0%	4-12 hours
/4	3	3.0%	12-24 hours
/5	0	.0%	1-4 days
/6	0	.0%	Over 4 days

## Q4%B IMC rated multi

/B	12	12.0%	
/1	37	37.0%	Under 1 hour
/2	50	50.0%	1-4 hours
/3	6	6.0%	4-12 hours
/4	3	3.0%	12-24 hours
/5	0	.0%	1-4 days
/6	0	.0%	Over 4 days

## Q5%A 0-500ft multi

/B	2	2.0%	
/1	75	75.0%	Very likely
/2	13	13.0%	Fairly likely
/3	4	4.0%	Fairly unlikely
/4	5	5.0%	Very Unlikely
/5	1	1.0%	Don't know

## Q5%B 501-1000ft multi

/B	2	2.0%	
/1	34	34.0%	Very likely
/2	44	44.0%	Fairly likely
/3	6	6.0%	Fairly unlikely
/4	14	14.0%	Very Unlikely
/5	0	.0%	Don't know



## Q5%C 1001-1500ft multi

/B	4	4.0%	
/1	3	3.0%	Very likely
/2	33	33.0%	Fairly likely
/3	40	40.0%	Fairly unlikely
/4	20	20.0%	Very Unlikely
/5	0	.0%	Don't know

## Q5%D 1501-2000ft multi

/B	7	7.0%	
/1	0	.0%	Very likely
/2	3	3.0%	Fairly likely
/3	35	35.0%	Fairly unlikely
/4	55	55.0%	Very Unlikely
/5	0	.0%	Don't know

## Q5%E 2001-4000ft multi

/B	8	8.0%	
/1	0	.0%	Very likely
/2	1	1.0%	Fairly likely
/3	6	6.0%	Fairly unlikely
/4	85	85.0%	Very Unlikely
/5	0	.0%	Don't know

## Q5%F Above 4000ft multi

/B	10	10.0%	
/1	0	.0%	Very likely
/2	1	1.0%	Fairly likely
/3	2	2.0%	Fairly unlikely
/4	85	85.0%	Very Unlikely
/5	2	2.0%	Don't know

## Q6%A 0-500m multi

/B	1	1.0%	
/1	92	92.0%	Very likely
/2	4	4.0%	Fairly likely
/3	0	.0%	Fairly unlikely
/4	2	2.0%	Very unlikely
/5	1	1.0%	Don't know

## Q6%B 501-999m multi

/B	1	1.0%	
/1	73	73.0%	Very likely
/2	16	16.0%	Fairly likely
/3	7	7.0%	Fairly unlikely
/4	3	3.0%	Very unlikely
/5	0	.0%	Don't know

## Q6%C 1000-1999m multi

/B	2	2.0%	
/1	47	47.0%	Very likely
/2	29	29.0%	Fairly likely
/3	13	13.0%	Fairly unlikely
/4	9	9.0%	Very unlikely
/5	0	.0%	Don't know



## Q6%D 2000-3999m multi

/B	3	3.0%	
/1	12	12.0%	Very likely
/2	49	49.0%	Fairly likely
/3	17	17.0%	Fairly unlikely
/4	19	19.0%	Very unlikely
/5	0	.0%	Don't know

## Q6%E 4000m-7km multi

/B	2	2.0%	
/1	1	1.0%	Very likely
/2	20	20.0%	Fairly likely
/3	44	44.0%	Fairly unlikely
/4	33	33.0%	Very unlikely
/5	0	.0%	Don't know

## Q6%F 7-10km multi

/B	9	9.0%	
/1	0	.0%	Very likely
/2	1	1.0%	Fairly likely
/3	14	14.0%	Fairly unlikely
/4	76	76.0%	Very unlikely
/5	0	.0%	Don't know

## Q6%G &gt;10km multi

/B	8	8.0%	
/1	0	.0%	Very likely
/2	0	.0%	Fairly likely
/3	5	5.0%	Fairly unlikely
/4	87	87.0%	Very unlikely
/5	0	.0%	Don't know

## Q7%A 0-20kt multi

/B	3	3.0%	
/1	0	.0%	Very likely
/2	1	1.0%	Fairly likely
/3	19	19.0%	Fairly unlikely
/4	77	77.0%	Very unlikely
/5	0	.0%	Don't know

## Q7%B 21-25kt multi

/B	3	3.0%	
/1	3	3.0%	Very likely
/2	15	15.0%	Fairly likely
/3	43	43.0%	Fairly unlikely
/4	36	36.0%	Very unlikely
/5	0	.0%	Don't know

## Q7%C 26-30kt multi

/B	3	3.0%	
/1	14	14.0%	Very likely
/2	46	46.0%	Fairly likely
/3	19	19.0%	Fairly unlikely
/4	16	16.0%	Very unlikely
/5	2	2.0%	Don't know

## Q7%D 31-35kt multi

/B	2	2.0%	
----	---	------	--



/1	47	47.0%	Very likely
/2	36	36.0%	Fairly likely
/3	2	2.0%	Fairly unlikely
/4	13	13.0%	Very unlikely
/5	0	.0%	Don't know

## Q7%E &gt;35kt multi

/B	2	2.0%	
/1	76	76.0%	Very likely
/2	9	9.0%	Fairly likely
/3	5	5.0%	Fairly unlikely
/4	7	7.0%	Very unlikely
/5	1	1.0%	Don't know

## Q8%A Main body multi

/B	2	2.0%	
/1	35	35.0%	Very likely
/2	36	36.0%	Fairly likely
/3	14	14.0%	Fairly unlikely
/4	12	12.0%	Very Unlikely
/5	1	1.0%	Don't know

## Q8%B PROB 40 multi

/B	2	2.0%	
/1	15	15.0%	Very likely
/2	37	37.0%	Fairly likely
/3	26	26.0%	Fairly unlikely
/4	18	18.0%	Very Unlikely
/5	2	2.0%	Don't know

## Q8%C PROB 30 multi

/B	3	3.0%	
/1	3	3.0%	Very likely
/2	21	21.0%	Fairly likely
/3	42	42.0%	Fairly unlikely
/4	29	29.0%	Very Unlikely
/5	2	2.0%	Don't know



## 7.5 Figures 17 - 22 Cloud Base Cross Tabulations

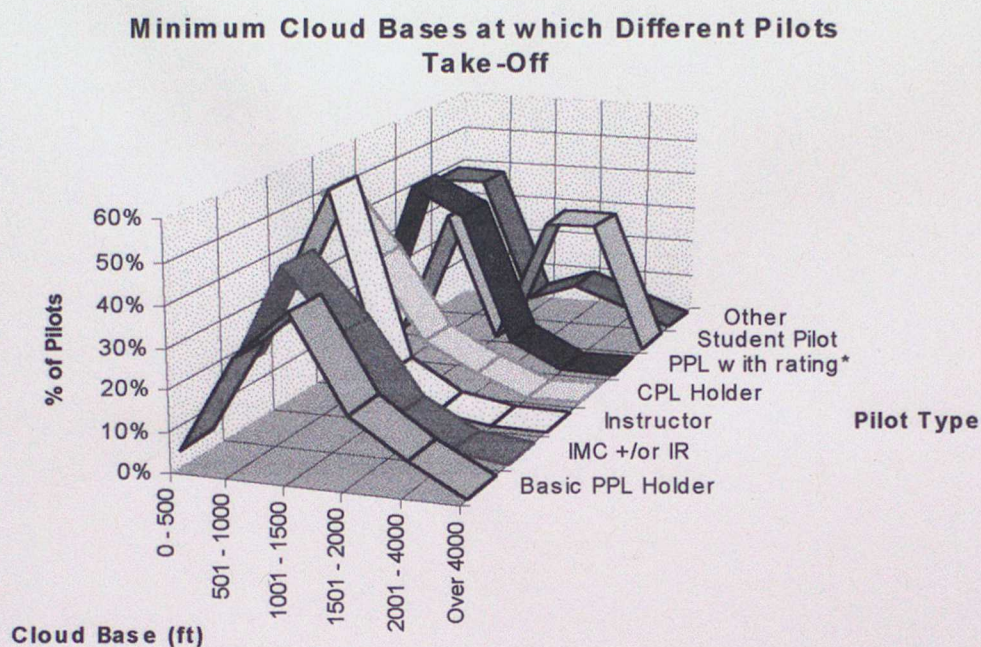


Figure 17

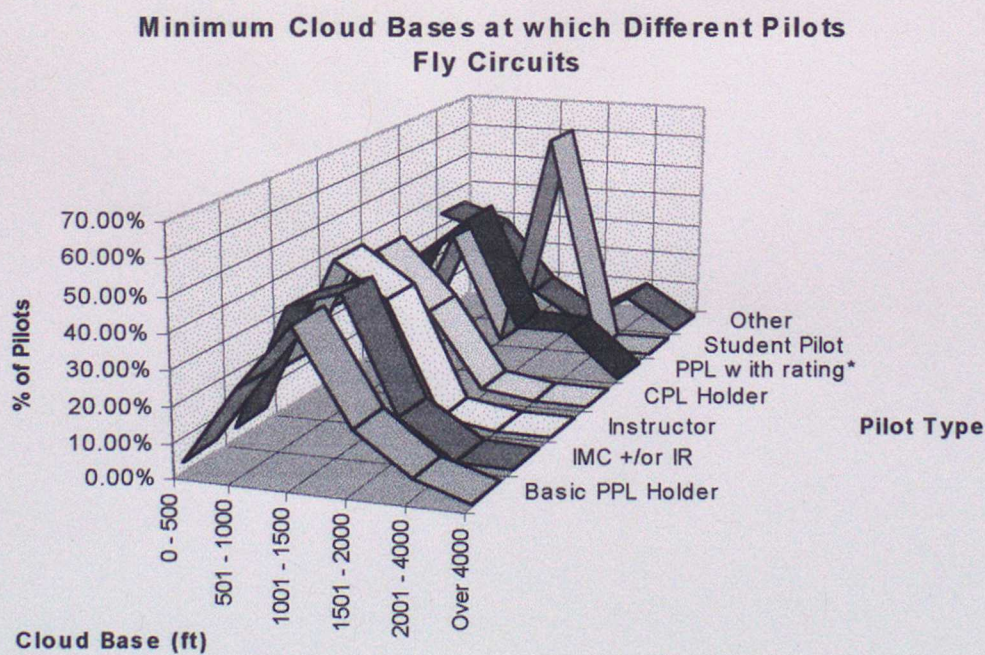


Figure 18



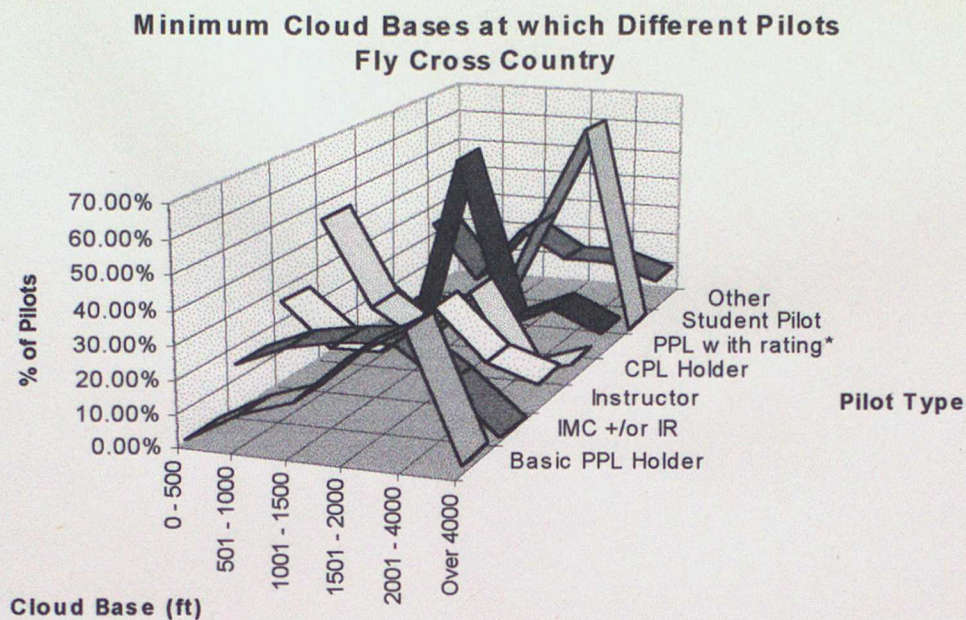


Figure 19

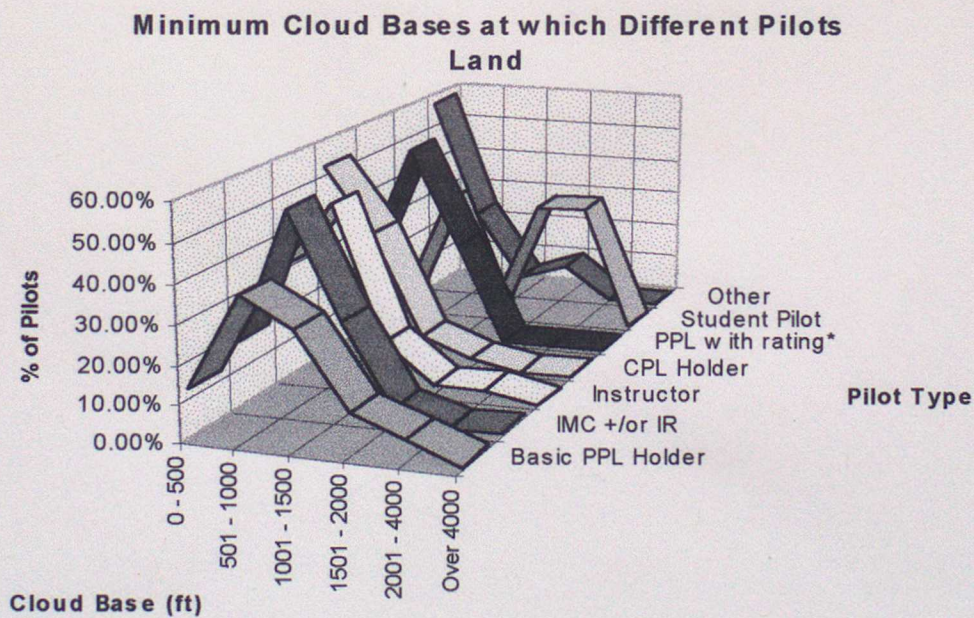


Figure 20



### Likelihood of Changing Destination at Planning Stage Given Minimum Cloud Base at Destination

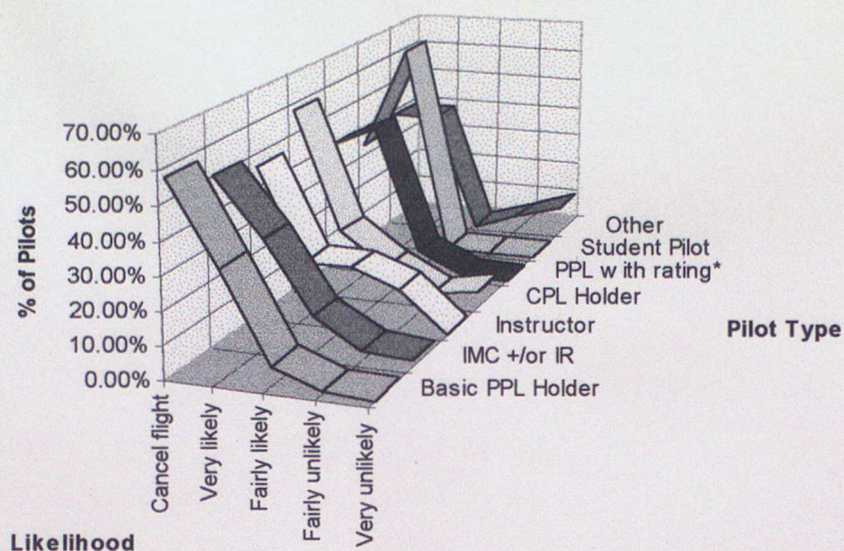


Figure 21

### Likelihood of Changing Destination During Flight Given Minimum Cloud Base at Destination

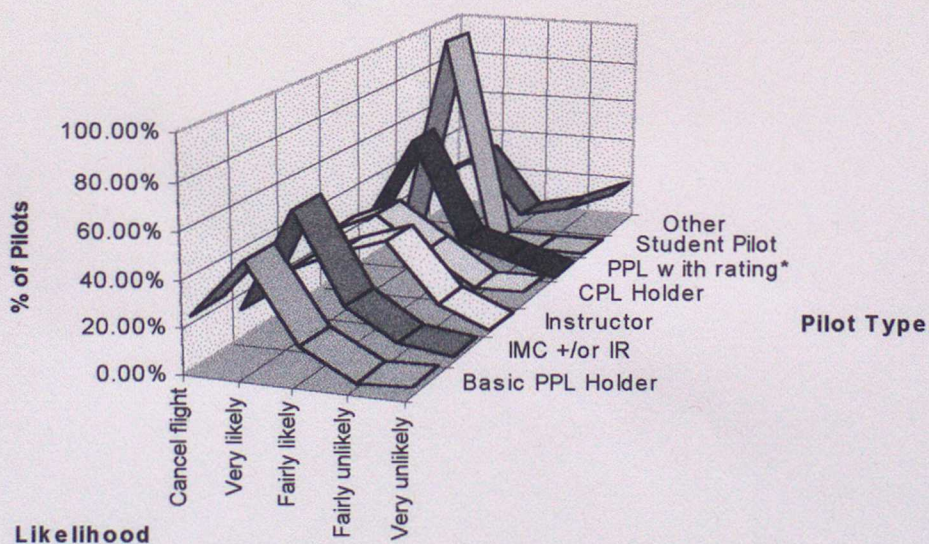


Figure 22



## 7.6 Figures 23 - 28 Visibility Cross Tabulations

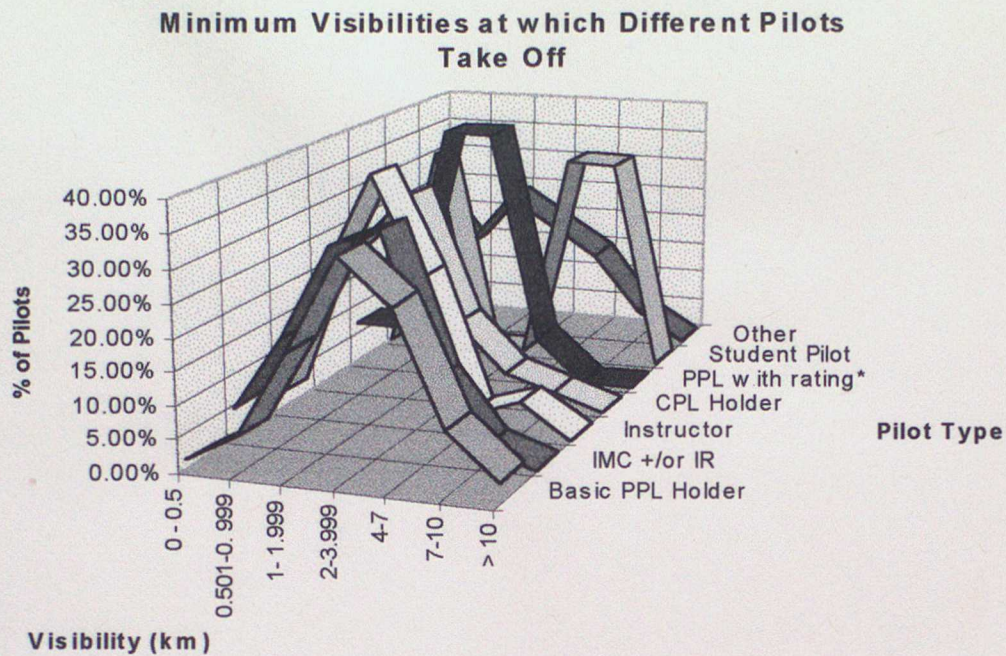


Figure 23

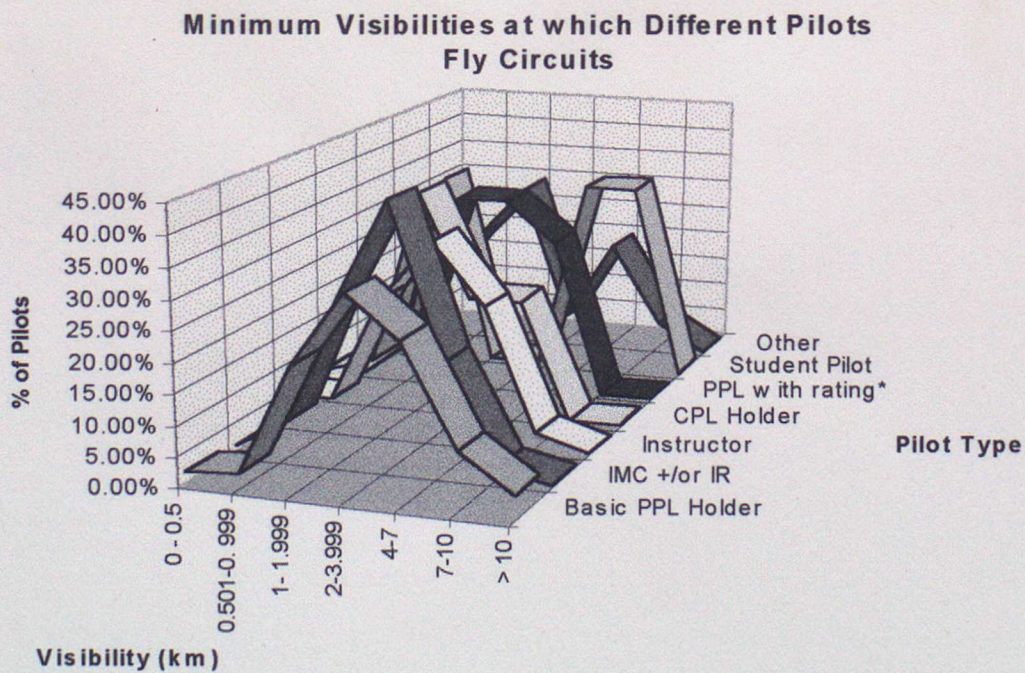


Figure 24



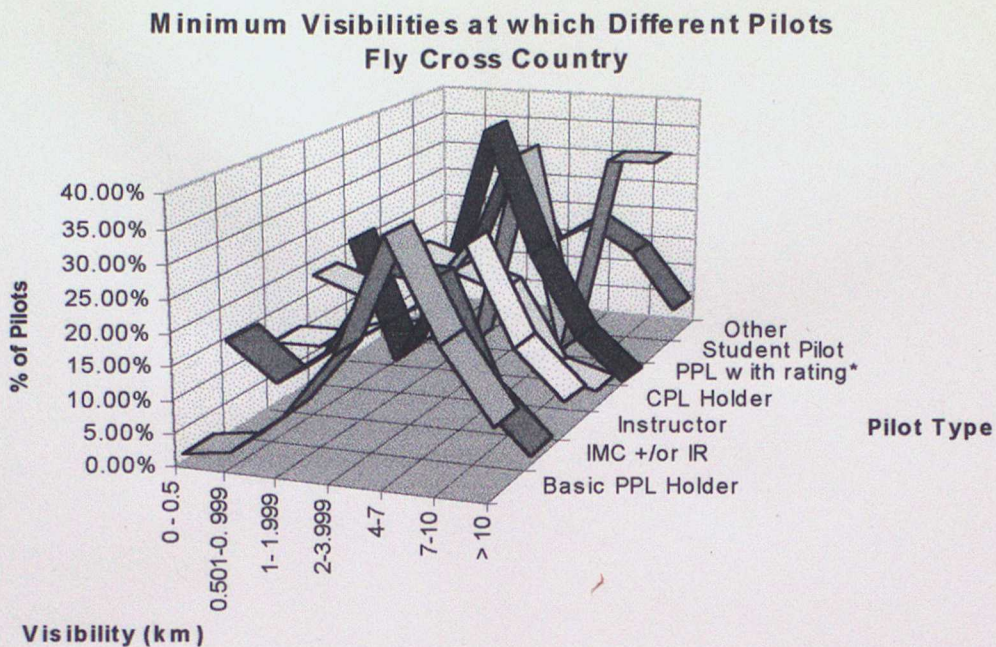


Figure 25

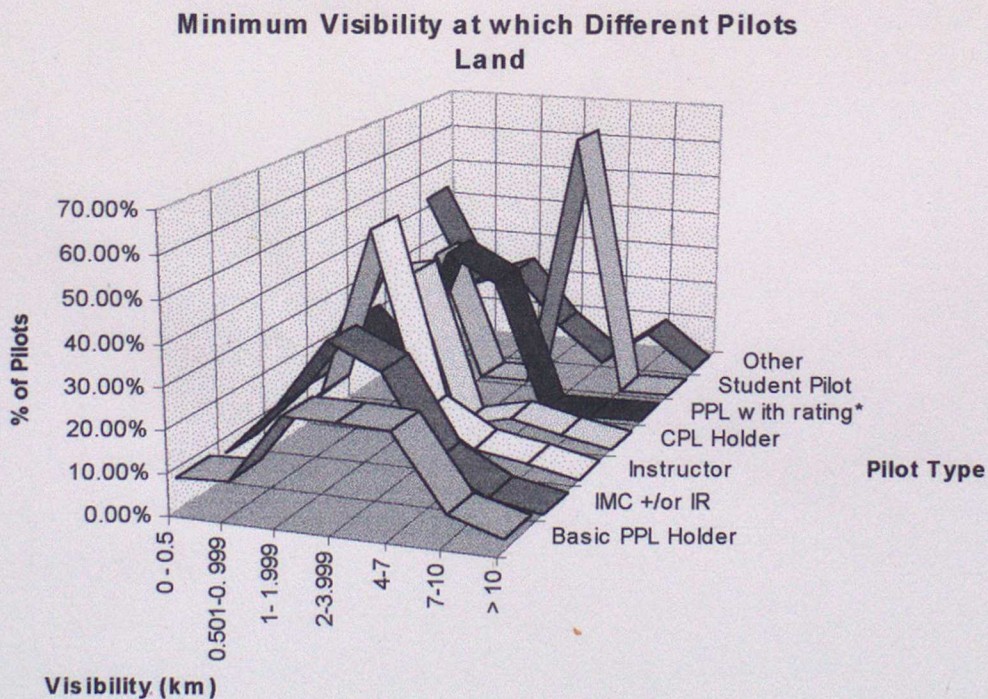


Figure 26



### Likelihood of Changing Destination at Planning Stage Given Minimum Visibility at Destination

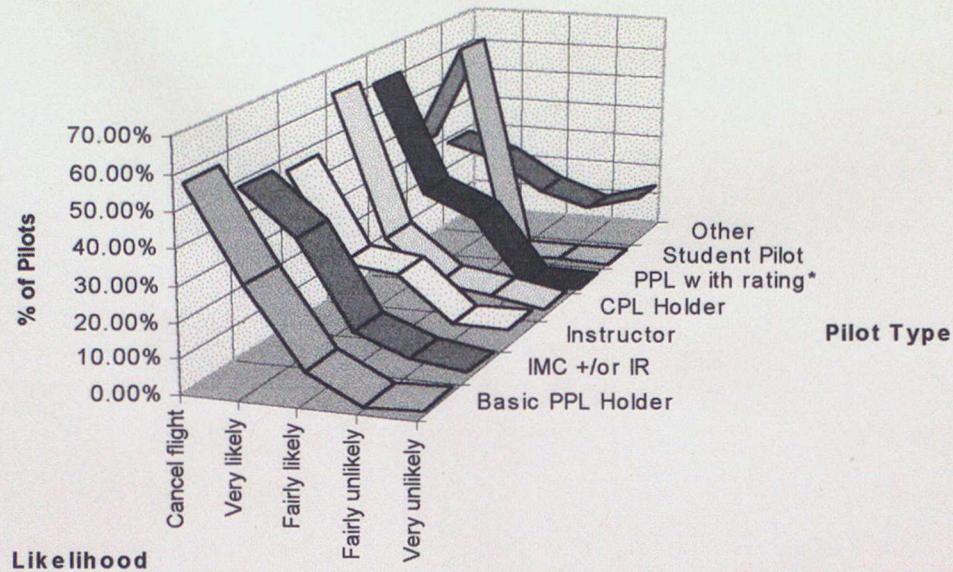


Figure 27

### Likelihood of Changing Destination During Flight Given Minimum Visibility at Destination

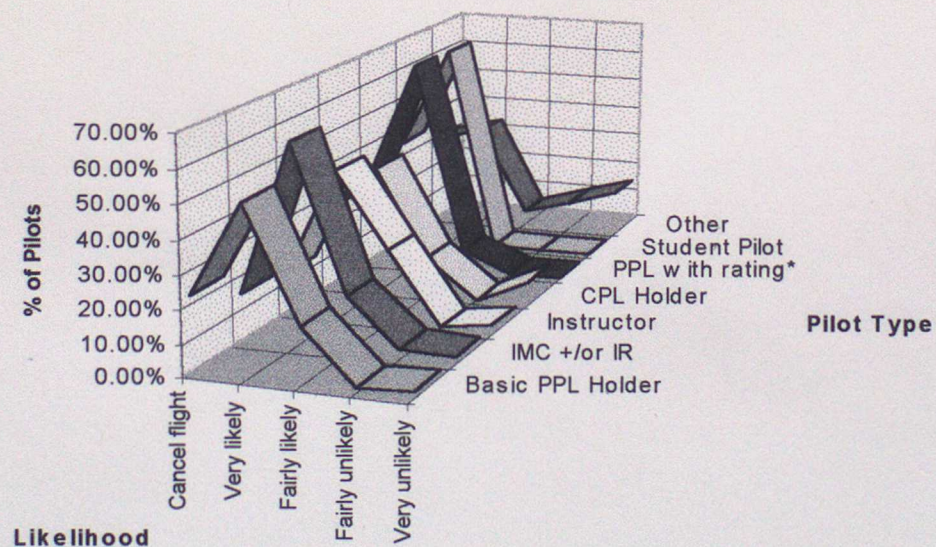


Figure 28



## 7.7 Figures 29 - 31 Cloud Base vs. Visibility Cross Tabulations

**Correlation Between Minimum Visibility and Minimum Cloud Base for TakeOff**

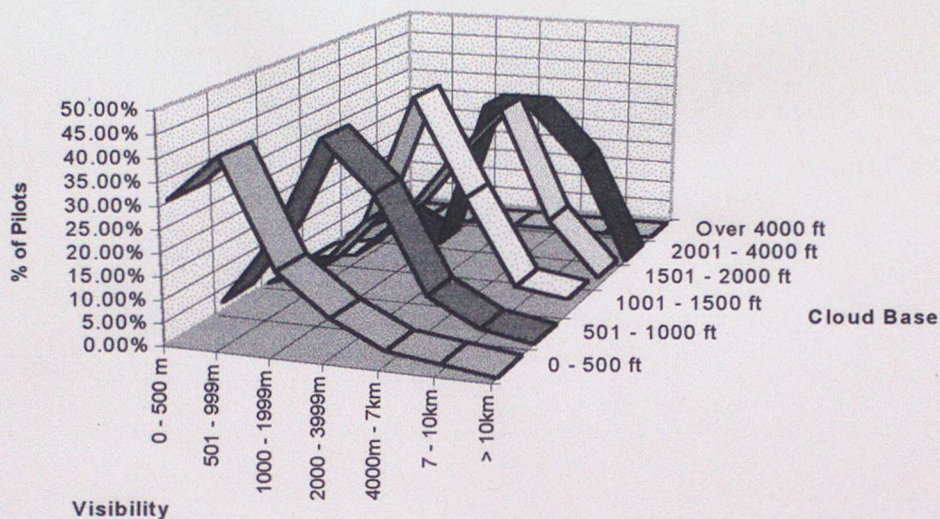


Figure 29

**Correlation Between Minimum Visibility and Minimum Cloud Base for Flying Cross Country**

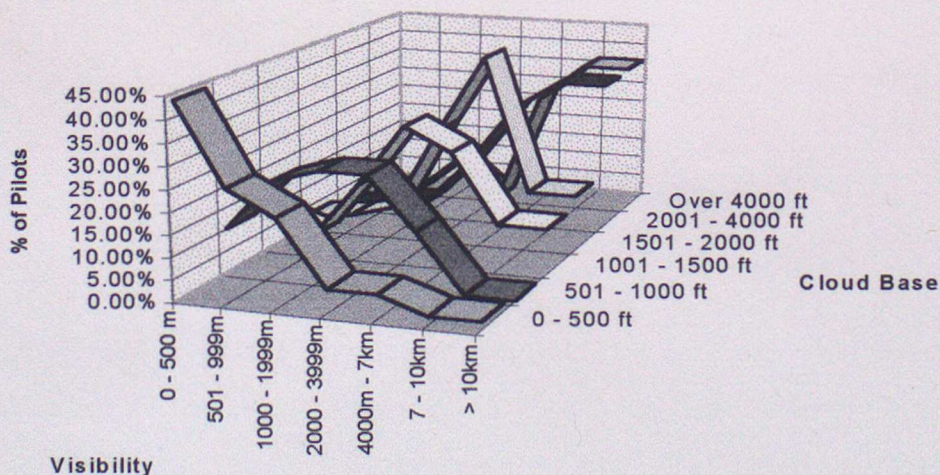


Figure 30



### Correlation Between Minimum Visibility and Minimum Cloud Base for Landing

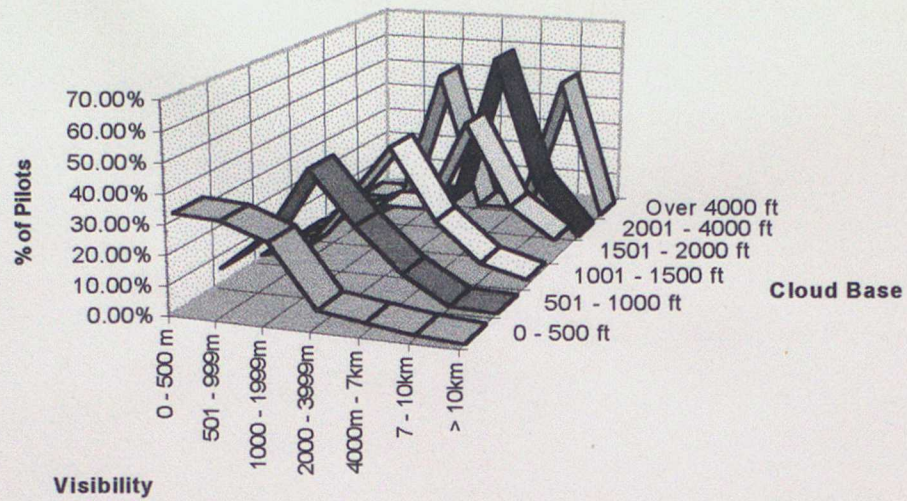


Figure 31



## 7.8 Figures 32 - 34 Thunderstorm Cross Tabulations

**Likelihood of Cancelling a Flight Given Thunderstorm Forecast  
in Main Body of TAF**

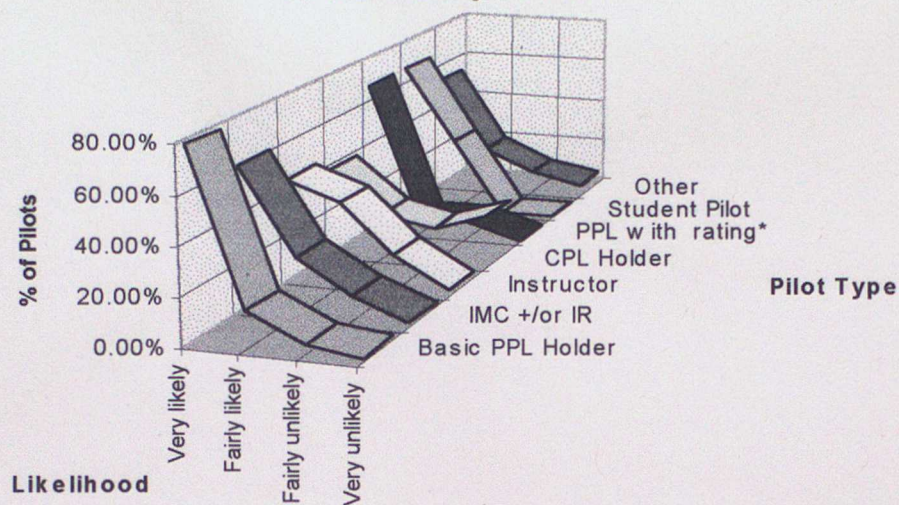


Figure 32

**Likelihood of Cancelling a Flight Given Thunderstorm Forecast in  
PROB40 Statement**

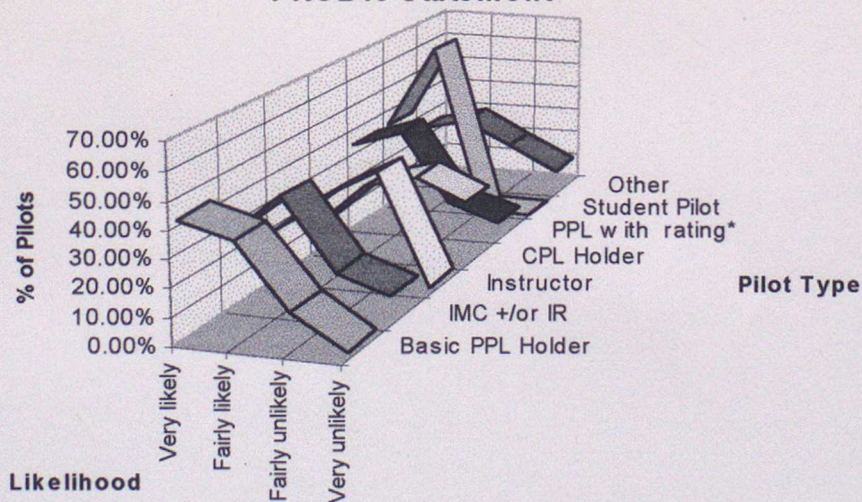


Figure 33



### Likelihood of Cancelling a Flight Given Thunderstorm Forecast in PROB30 Statement

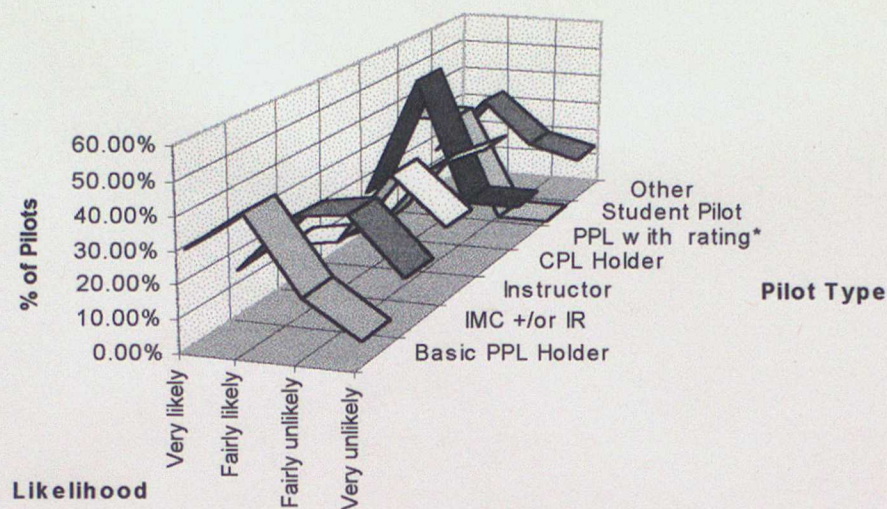


Figure 34

## 8. REFERENCES

N.R. McFarlane, M.G. Shorthose, The Benefit of Improved TAFs, Smith System Engineering Limited for Chief Scientist's Division, National Air Traffic Services, Civil Aviation Authority, London, 1994.

Civil Aviation document, CAP 360. Air operators certificates.

## 9. ACKNOWLEDGEMENTS

Many thanks go to Matt Rahman of the Marketing Information and Research Unit for his time, effort and not inconsiderable patience in the development and processing of the questionnaires.