



## Confidential Human Factors Incident Reporting Programme

# FEEDBACK

JULY 1991

NUMBER 24

## CONFIDENTIALITY

*It has been necessary several times in the past to clarify CHIRP's policy on confidentiality. It seems to be necessary again.*

*The impetus this time comes from adverse comment provoked by recent media treatment of an IFALPA survey. The survey dealt with aircrew health issues, including drinking habits. For the record, RAFIAM assisted IFALPA by analyzing some of the data. An interim report was passed to IFALPA (and only IFALPA). The media response when IFALPA released some of the interim findings was unfortunate, but beyond our control. Nevertheless, The Institute's role has been called into question and the issue of confidentiality raised, so here is a restatement of policy regarding CHIRP and questionnaires (whether or not they are distributed through CHIRP):*

- 1. The identity of reporters to CHIRP will always be protected.*
- 2. When CHIRP reports are used in FEEDBACK, every effort will be made to disidentify the source of the report.*
- 3. If a CHIRP report can be used to improve flight safety by informing or influencing an airline, the CAA, or another agency, then it will be used only after steps have been taken to protect the reporter's identity and only with the reporter's permission.*
- 4. Where confidentiality has been offered to questionnaire respondents, it will be preserved. The purpose of surveys is to collect data on attitudes, opinions, or behaviour of sections of the population and to report general findings. The findings will be reported responsibly, and individual identities will be protected.*

## SOME CONTRIBUTIONS

*Some examples of the contributions to safety made by CHIRP over the last year:*

- improve flight deck lighting of a 30 year old aircraft*
- modification to full seat harness on a new aircraft*
- review of ATC conditions at a specific airfield*
- improved radar switching and display problems for ATC*
- several areas of helicopter operations highlighted*
- application of CAP371 by some operators*

## Automation Questionnaire

*The total number of responses to this questionnaire is about 1800. Of these some 400 resulted from internal distribution by member airlines of IATA. We are most grateful for the cooperation of IATA in this important area of flight safety research.*

*These data provide the most comprehensive sample of pilot opinions on automation now available. The final analysis is nearing completion and it is expected that the results will be known by the end of September 1991.*

### Roger Green

*Roger Green has left the IAM. He had been involved in CHIRP from the very beginning. Where there has been improvement in flight safety resulting from CHIRP it has often been as a result of his perseverance, and he has frequently had to take the "flak" for us all. The CHIRP Team wish him all good fortune in his new appointment.*

### IN THIS EDITION:

*Your words appear like this  
and CHIRP speak appears like this*

# VISUAL APPROACHES

*A Visual Contact Approach has been defined as "An approach by an IFR flight when either part or all of an instrument approach procedure is not completed and the approach is executed in visual reference to the terrain." This procedure, and the application of circling limits, has been the subject of some crew room debate. In response to a reporter we have sought clarification.*

*The current situation is described in the MANUAL OF AIR TRAFFIC SERVICES Part 1., Chapter 1., Paragraph 12*

## "VISUAL APPROACH

To expedite traffic at any time, IFR flights may be authorised to execute visual approaches if the pilot reports that he has the aerodrome in sight, can maintain visual reference to the surface and

(a) the reported cloud ceiling is not below the initial approach level, or

(b) the pilot reports at any time after commencing the approach procedure that the visibility will permit a visual approach and landing, and a reasonable assurance exists that this can be accomplished.

Standard separation shall be effected between such aircraft and other arriving and departing aircraft."

*If you really are thinking of taking advantage of this rule as a way of "getting in", then perhaps you should give consideration to diverting to your alternate.*

\*

## IN A RUSH BUT NO FLAP

The crew had been on duty for 6 hours. After an uneventful leg we were vectored towards the first point of landing and, after having identified the locator, given own navigation in the expectation of a locator approach. At approx 5 miles from the beacon, and at about 5000ft, the controller passed us to tower.

At this point the airfield was in sight but air to air visibility was restricted by the haze. The tower instructed us to call "field in sight" which I immediately did. The tower then said "clear visual approach, call finals".

The Co-pilot, who was operating for that leg (he had been on the aircraft for 18 months by this point) elected to drop everything quickly and descend as quickly as he could to achieve a straight in approach. I was not entirely happy, as I thought the v. high rate of descent required to achieve a position from which the final 200ft of the approach could be executed normally, on such an

approach, was stretching the Co's abilities a little. As a result I concentrated mainly on altitude against ROD and IAS on the approach.

The Co called for the gear and flap together, as we turned left to establish on the centre line, which I operated as I was talking him around the turn until he could see the field again. He called for the checks, which were read. As we started the checks, we were told that we were No1 to an aircraft which had just turned downwind in the visual circuit. As I was looking for the other aircraft I listened to the responses to the checks - which all came as normal. We were still a little hot as we crossed the threshold and the stall warners activated in the flare. Once clear of the runway - we realised that, though selected to the correct position, the flaps had remained up (a circuit breaker had tripped - presumably immediately as they were selected). And that we had flown a flapless approach using normal with flap speeds.

None of the three of us in the cockpit had made our usual final safety glance across the services just prior to touchdown. I had been too preoccupied with the ROD and the Co with flying what was a difficult approach profile. All self induced pressures!

*Whenever you recognise that you are operating outside your normal pattern, try to double check the essentials. That recognition and action could be the only thing left to save you.*

\*

## "WHO DAT UP DERE?"

Planned Oceanic NAT UNIFORM LANDFALL AKIL - re-cleared at Vysta on track VICTOR LANDFALL CRK thence UR37 to MERLY LATCC AD2D UB40 to BCN then re advised UR37 SAM/OCK/DVR UGI etc.

Several days later I checked with ATC supervisor as to what happened at MERLY causing many heading changes and general confusion - the bottom line after much research is that our F/O, although ethnic has distinct "North American" accent and called us Barbadian 1234 - evidently OCEANIC passed us over to SECTOR as "Canadian" 1234 - hence heading changes to separate two aircraft when there was only one! All on board were a bit giddy too!

The main point is that English spoken with accents showing two different nationalities was involved - so please all speak clearly! especially after long shift/fit when concentration is at a low ebb.

*Elocution improves communication.*

## FOR THE RECORD...

FEEDBACK 23:REF:- TWO CREW 747-400 (page 2)

I was in command of the flight and feel I must put the record straight. Contrary to your report, the workload was not excessive, since, although we were handflying the aircraft, no action was initiated to rectify the fault until we were well established in the cruise with the only workload being 20 or 30 min position reports.

We did not, glibly, pull circuit breakers as is implied by your report, but were advised by our Flight Technical Manager, after he had been in consultation with Boeing in Seattle, as to which breakers to pull. The whole exercise was very low keyed, highly professional and successful.

I have flown 747-100 and 200s with flight engineers for 19 years and very much appreciate their expertise. However the 747-400 is a 2 man aeroplane and the avionics are such that it is a delight to operate with two people.

Since you have published my co-pilot's, rather biased report, on this incident, I hope you will publish my reply. You may publish my name.

*As you are all aware CHIRP makes it a strict rule never to pass on the name of correspondents so we are unable to comply with the last request. However we did get a number of comments on automatics and circuit breakers, so there is no guarantee that these two chaps were actually flying together.*

### **TWO MORE AUTOMATION COMMENTS**

With automatics there are a lot of false warnings (EICAS) continually intermittent through some flights which on long hauls and on final descent are annoying. You could be set up if the warning is a real one "maybe the tenth time it comes up".

Some systems going to sleep with micro-chips etc. when you pull the circuit breaker and reset it, you don't completely know what circuits are involved by pulling a breaker. You could drop valuable information which you cannot get back.

\*

The problem here is a question of philosophy. As an example, on the 707/747, the engine driven generators are driven via a constant speed drive unit (CSD) utilising an oil filled hydraulic motor. These are prone to overheating from time to time for various reasons such as oil leakage etc. On the aircraft with an F/E, his

systems panel has gauges indicating the temperature of this oil and he is able to monitor this. If a CSD overheats, the drill is to first open the generator breaker (GB) so as to offload electrical power from the generator and, therefore, reduce the torque on the CSD which can, quite often, result in a reduction in temperature. The generator can, therefore, be left on idle so to speak for, who knows, it may just come in handy to provide electrical power for 4 or 5 minutes at a critical moment in the event that another generator fails.

If offloading the generator has no effect and the CSD continues to overheat then the second drill is to physically disconnect the drive by means of another switch. The difference between the two drills, however, is that once the drive has been physically disconnected, it cannot be reset until the aircraft is on the ground whereas, after offloading the generator by means of the GB, the power supply can be re-instated in the air by simply closing the GB switch.

What is all this leading to I hear you ask. Let us now consider the philosophy on the 737/757.

The 737-200 (I cannot speak for the -300 and -400 as I have never flown them) is fitted with exactly the same type of CSD/GB/temperature gauge combination but the difference lies in the philosophy of the drills for the same situation. In case of a CSD overheat on this aircraft, the recommended drill is to immediately disconnect the CSD, an irrevocable step. No call to open the GB first and monitor the temperature as before, just disconnect it and this on an aircraft with only two engine driven generators where a second failure will result in a complete loss of electrical power unless the auxiliary power unit (APU) can be started, a situation which cannot always be guaranteed after cold soak on a long flight despite the manufacturers claims.

So what is the difference between the two situations? The thinking is that two pilots do not have enough time to fly the aircraft and monitor the systems gauge as well so the best thing to do is to immediately disconnect the drive. I hasten to add that if these drives do overheat and cannot be cooled, a serious fire can result if they are not physically disconnected.

The 757 of course takes us one step further. This aircraft has the same CSD set-up but no temperature gauge, just a sensor which brings us up an EICAS message if the unit gets too hot. Now we have no choice. If the message comes up we must immediately disconnect the CSD as we have no information available to us with which to monitor the temperature. An option has been taken away from us, an option which may just, one day provide us with 5 minutes of electrical power when we most need it. This I consider to be a retrograde step.

# THE MANY FACES OF FATIGUE

The co-pilot was fiddling about between radio frequencies and boxes and forgetting to call box changes. As a result we ended up listening to different frequencies on a couple of occasions. The intercomm didn't help as when he spoke he was so loud as to blot out radio traffic. (It is not possible to control intercomm and radio volumes independently.) A number of minor snags had made schedule keeping a losing battle. We continued our approach, radar vectors to SRA. Checks complete I began the descent to maintain a 3 degree glideslope as instructed. In the descent something bothered me, we seemed very high for our range from touchdown. It was only when the controller said "900ft" that I realised we were at 1900ft. We carried out the miss and started again. Somewhere in there we must have been cleared from 2500ft to 1500ft but had missed

it completely. There were a couple of other errors, minor, but still not good.

I believe fatigue has a lot to do with it. We had just done a minimum rest nightstop (10hrs between 15mins after landing and pick up at the hotel by the taxi. It's a good hotel but adjacent to the main railway line, with services passing at 1130 and 0300) The previous day we did 5 sectors, this was our second of 7 sectors. We had two days off previously but had flown the 6 days prior. Within the preceding 7 days I had flown 23 sectors, preceding 28 days 78 sectors. In discussion with one other captain and 3 co-pilots all agreed that errors were very common on the days following the minimum rest nightstop. I believe there should be a sector limit as well as duty hour (8hrs) limit before and after a minimum rest nightstop.

\* \* \* \* \*

## CAA COMMENT

*The appearance of FEEDBACK 23 has prompted a response from Captain J. Mumpriss, Head of Flight Ops (Public Transport), Policy and Standards Dept of the CAA, following the CHIRP policy of 'equal air time' for debate, part of the correspondence is reproduced below.*

**Deck dazzle:** "Deck Dazzle" on page 6, gives the impression that a large number of helidecks suffer from excessive white light whereas in fact, this particular problem is confined to a few decks in the Southern North Sea which are equipped with a proprietary lighting system. The helidecks concerned are on "not normally manned" installations where supplementary lighting is often inadequate.

Far from considering "that this is a recognised problem with which pilots can cope without difficulty", the Authority has been sufficiently concerned to recommend to the Department of Energy (not the Department of Transport) who are responsible for lighting criteria on offshore installations, that this type of strip lighting is not used unless supplementary discrete floodlighting is provided to illuminate the installation substructure, legs and vent booms (etc) to enhance visual cues. This recommendation has been confirmed by flight trials conducted by the Flight Operations Inspectorate. If this and other measures are considered to be inadequate for the safe conduct of night operations at specific helidecks, restrictions will be placed on their use until remedial measures to improve visual cues are taken.

Contact with the Department of Energy continues with a view to improve acceptability of the problem lighting."

**CAP 371:** "A report on FEEDBACK No. 23 considered pilots A and B one of whom worked for 12 hours on and 12 hours off for 2 consecutive weeks, and because these overlapped into 2 duty weeks a limit of 96 hours could go to 84 hours."

"criticism (of the part concerning CAP 371) which is based on the use of selective facts (in this case incorrect) does not form the basis for a persuasive argument. The workload of A is spread over 2 weeks, B works for one week. What is required in CHIRP is what A and B have done prior to starting their 7 day work period and what happens afterwards, in the quoted paragraph (22.1), a limit is placed on the duty hours allowed in any two consecutive weeks which when combined with the required number of days off is considered sufficient to prevent the onset of fatigue."

**Bader defended:** "Regarding the footnote to your "Old and Bold" article, I must express my concern about the subjective and flippant nature of your comment. In the Authority's opinion Bader was in no way bemused by the conflicting pressures. He understood them only too well, but recognised that any solution was bound to be a compromise. The "compromise" has stood the test of time exceptionally well, having been the base reference document for all UK FTL schemes developed over the last twenty years, and is the basis for the JAA FTL scheme currently under development. Change has been required to the regulations but only in order to accommodate change from within the industry."

# THE NEED FOR SKILLS

*Here is a selection of reports dealing with attitudes towards the maintaining of flying skills in modern aircraft.*

*The new instruments don't always work as advertised...*

Exactly on touch down the captain's side complete EFIS display (EADI and EAHSI) failed - went blank - and then lots of words, error codes - and sentences appeared! I showed this to the F/O, who stared in amazement. Taxying in, I recycled the EFIS No1 normal No2 switch - and presto, everything came to life again. I don't know the cause of the problem. I phoned a friend of mine - and he had had identical problem on more than one occasion. Something to do with the squat switch (ground/flight) on touch down. What if it happened on lift off!! That's why raw data skills MUST be kept up - not merely discussed.....

*If you try to maintain the skill it may be frowned upon*

Within the constraints of commonsense airmanship, I personally try to keep basic handling of aeroplane skills current, by hand flying raw data about 40% of climbs-descents/ILS - devoting remainder to glass cockpit procedures.

F/Os find it difficult to monitor my raw data flying, as they themselves never are required to fly raw data. Non-auto pilot - because local standard operating procedures require 100% flight director and auto pilot (MS, engaged shortly after take off (1000feet) - to disengage auto pilot at 1000 feet on final approach. Visual circuits are all done on auto pilot, auto throttle, flight director, and planned on EHSI/MAP mode.

And it's incredible that raw data skills - including manual flight - are actively discouraged in the modern well equipped airline. I often declared a circuit at 12000 ft descent and using - initially - the basic planning TIME versus altitude, and because my basic skill is foreign to FMS computer outputs (it spitters), first officers become concerned because one is different.....

*But where and when to do the practicing - a problem*

Perhaps I should try and put this subject of automation versus practice at non-automation in perspective. My view is that even though FMS systems, with associated auto throttles, autopilots and Flight Director Systems are all extremely reliable, there will always remain a fundamental need to be able to physically and skillfully fly the aircraft. In other words, the Captain or F/O, should, for example be capable of accurately hand flying say a 737-400 at 33,000ft, at a desired airspeed, with any or all of the automatics inoperative. At the same time, the pilot should be entirely confident of his ability to track a navigation aid, within the limits of accuracy

demanding by the CAA on an I/R test, whilst on instruments raw data. And I'm not talking about flogging down an air route on limited panel bat and ball, no artificial horizon stuff - but simply manual flight - smooth and accurate.

Many airline and commuter aircraft (737-200, ATR 42 etc.) do not have glass cockpit technology - but they do have excellent autopilots. And this reluctance to regularly disengage the autopilot / F/D, is still noticeable, because either the company SOP is to "use all available automatics" at all times (in theory to allow a relaxed pilot to monitor flight path progress), or simply the pilots are less than confident in their own handling skills, and prefer not to expose their inadequacies to the second/third crew member, for fear of nudge nudge wink wink - the old fella is a bit rusty eh ... chuckle chuckle - another point scored.

Believe me, point scoring is a subtle, oft played game in the cockpit. The question is now, does one need to practise, or keep one's hand in on hand flying modern jet aircraft. For example - I haven't used a Jeppensens' Computer to work out track / G/S or W/V problems, for many months. I recall the basics, but not how to work out a Point of No Return, anymore. I merely plug into the FMCS, and out pops a remarkably accurate solution. But many pilots assiduously practise their triangle of velocity skills, just to keep confident in former abilities. And that's where the rub is in glass cockpit technology. It is so reliable, as are today's automatic pilots, and many airline Check Captains, who themselves may have gradually lost pure flying skills, in favour of gaining more speed and skills on CDU keyboards, frown on those pilots that have personal views favouring hands on flying skills.

It is fine to say that simulator sessions are the place for raw data, non-auto flying - and that with passengers aboard, safety dictates full use of all aids. Simulator flying is expensive and squares have to be filled in - i.e. lots of blood and guts emergencies, criticism, rare and mystical failures of the No 2 AC standby bus at 250 feet on a CAT 3A - what do you do now, friends! Thus raw data hand flying is really only available on line flying.

Computer knowledge is fine - these skills can be tested by verbal means on the ground, or in the calm or cruise flight. But when situations deteriorate in the air, late ATC clearances etc., then airmanship demands a reversion to basics, if the computer problem becomes too involved and lengthy. It is why, basic skills of hand flying, non-automatics must be encouraged by operations managers, to enable safe expeditious recoveries to be made from computer lag. It takes time to type in CDU instructions, especially if ATC radio calls are coming thick and fast - and instant reversion to Tiger Moth basic skills are often the safest way to put the aircraft

EXACTLY where you want it to be. It is easily done in any contemporary jet transport.

I've met pilots who consider hand flying on raw data as a tiny bit unsafe, compared to using all automatics.

*Two rather more pointed comments ....*

Re Automation in Aircraft: The comments on having to hand fly automatic aircraft in order to demonstrate skills (in the simulator) every six months highlight something that has been bothering me for years, i.e. that we use the aeroplane to practise for the simulator!.....

*and*

I was particularly interested in your No. 23 with regard to the erosion of handling skills as a result of increasing automation. Unlike many airline managements I have always actively encouraged hands on flying and that old fashioned word AIRMANSHIP.

Needless to say, I am an Ex RAF A2 QFI!

*These comments seem to come from pilots who have experience of more traditional aircraft cockpits. Do the less experienced pilots feel the same problems affect their flying abilities?*

\* \* \* \* \*

## SLOTS MADE CLEAR

### An ATCO explains:

The Slot Allocation Procedures are "designed" to ensure that an individual controller is not placed in the position of being unable to ensure the safe separation of aircraft in the sector. A figure is produced as a guide to the number of aircraft permitted to enter a sector under the flowplan. From these individual sector loadings a further complication is reached, namely the interaction between sectors. In addition to this capacity problem there is superimposed the added parameter of how this traffic is presented to the sector from the EUROPEAN interface. At the moment the procedure is that a flow rate is given to the FEED EUROPEAN sector. This is expressed in a flow rate, either per hour, or such lesser time interval which has been agreed, usually twenty minute intervals. These parameters are dependent on ICAO agreements, which unfortunately do not correspond with the controller's requirements.

The result of this is the bunching of aircraft through the

entry points, resulting in controller overload in a short period of time followed by a below capacity flow for the remainder of the time. This inability of the system to achieve a steady flow of traffic is the main determinant of the poor acceptance of the system. As controllers both in the UK and in EUROPE we even compound this bunching by trying to help aircraft on an individual basis by offering or arranging direct routeings which, although they may be reasonable in the initial sector, have a horrendous knock on effect on a later sector.

There are a few attempts to forecast the expected rate but these are all extremely crude and inefficient. Obviously all the information is available somewhere in the system as all departures are notified somewhere; but there is no central databank which will provide a progress of traffic update to receiving sectors. This results in overkill of sector flowrate acceptances in order to ensure the ultimate safety of a sector.

As far as Departure Slots are concerned, the situation is once again a hotch potch of restrictions throughout EUROPE. Each ATC agency will provide information on "choke points" where a flow rate has to be applied. Collating these "choke points" for an individual flight is a nightmare which is attempted by using a board for each "choke point" and finding a critical path for each flight through them. This is then very often defeated by the complicated restrictions imposed by airfields on departure rates. Some airfields will be subject to a departure time + six minutes, others will have different parameters, for example a slot of departure time + ten minutes.

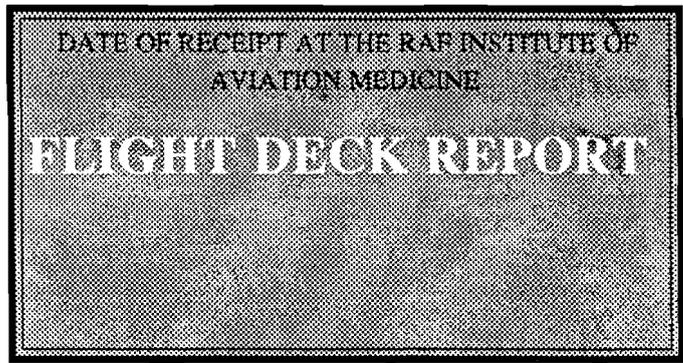
Aircraft will, sometimes through security or technical problems, miss a slot by a minute or so and the airfield will request an extension. This may be granted subject to the flow regulators judgement referred to previously. If an aircraft cancels its departure due to any reason, there is no means of transferring that slot to another aircraft in the UK except in exceptional circumstances. In addition this information is not generally notified in time to other agencies and so a slot goes by default.

Other problems complicating the situation are the increased use of minor airfields within the TMA's for which no adequate procedures are in existence. Many of the constraints are imposed due to the interaction of Military and General Aviation Airspace requirements. All of this means that the individual controllers have of necessity to devise ad hoc means of integrating this traffic into the general mainstream traffic.

Those pilots and controllers who try to buck the system may achieve short term advantage but the interests of all will best be served by a concerted attempt to find an automated system which will give a continuous update of traffic flow.

**GUARANTEE** NO RECORD OF YOUR NAME AND ADDRESS WILL BE KEPT

NAME \_\_\_\_\_  
 ADDRESS \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 PHONE No \_\_\_\_\_  
 \_\_\_\_\_



We ask that you give your identity only to enable us to contact you if we are not clear about any part of your account. In any event this part of the form will be returned to you, as soon as possible, to confirm that we have received your report.

YOURSELF	THE FLIGHT	THE INCIDENT
CREW POSITION	DATE	TIME (PLEASE STATE LOCAL/GMT)
TOTAL FLYING HOURS	FROM:-	DAY/NIGHT
HOURS ON TYPE	TO:-	LOCATION
<b>THE AIRCRAFT</b>	IFR/VFR	PHASE OF FLIGHT
TYPE	TYPE OF OPERATION	WEATHER (IMC/VMC)
No OF CREW		

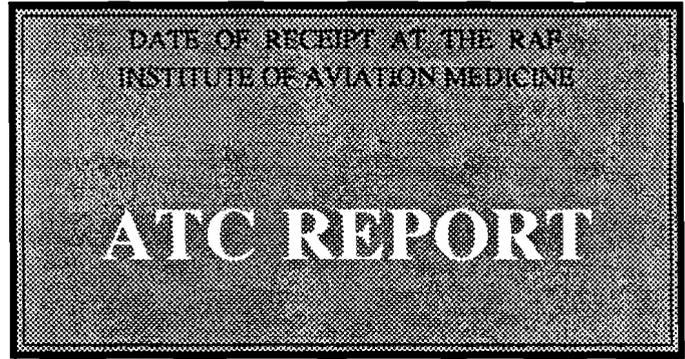
Please use this space to write your account, using extra paper if you need to

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 ADDRESS -----  
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 PHONE No -----  
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YOURSELF	THE INCIDENT	
HOW LONG AN ATCO	DATE	ATC SERVICE(S) BEING PROVIDED
HOW LONG AT PRESENT UNIT	TIME	IN WHAT TYPE(S) OF AIRSPACE
ON DUTY AS	LOCATION & NEAREST REPORTING POINT	USING WHAT TYPE(S) OF RADAR
	TYPE(S) OF AIRCRAFT INVOLVED	WEATHER
HOW LONG VALIDATED ON THIS POSITION	AIRCRAFT IFR OR VFR	

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