N88-17621

Windshear Detection
Effect Of
Static Air Temperature Bias

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Reactive Windshear Detection

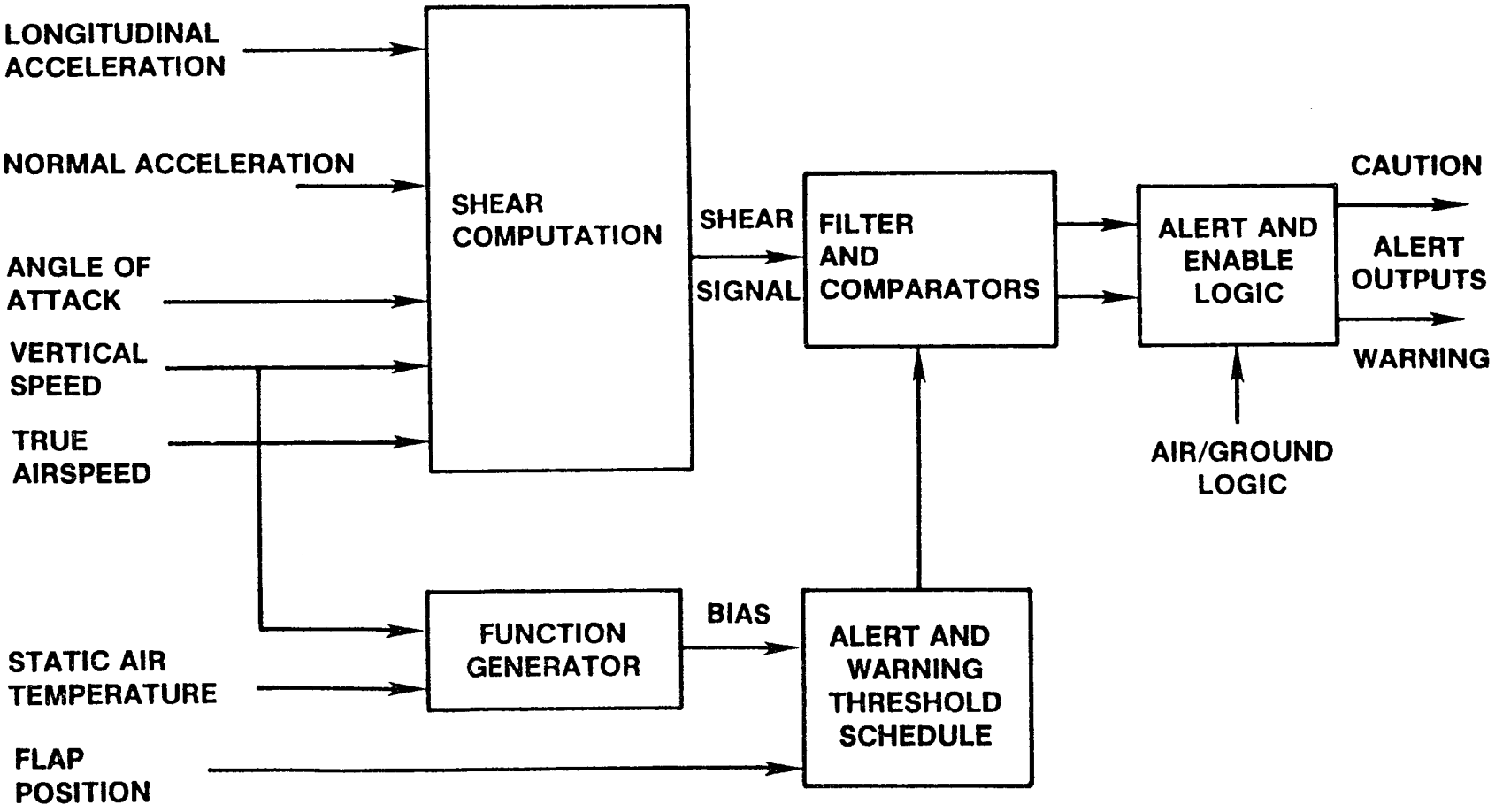
DETECTION TECHNIQUES:

- Aircraft Response To Windshear
- Atmospheric Parameters
- Combination Of Above

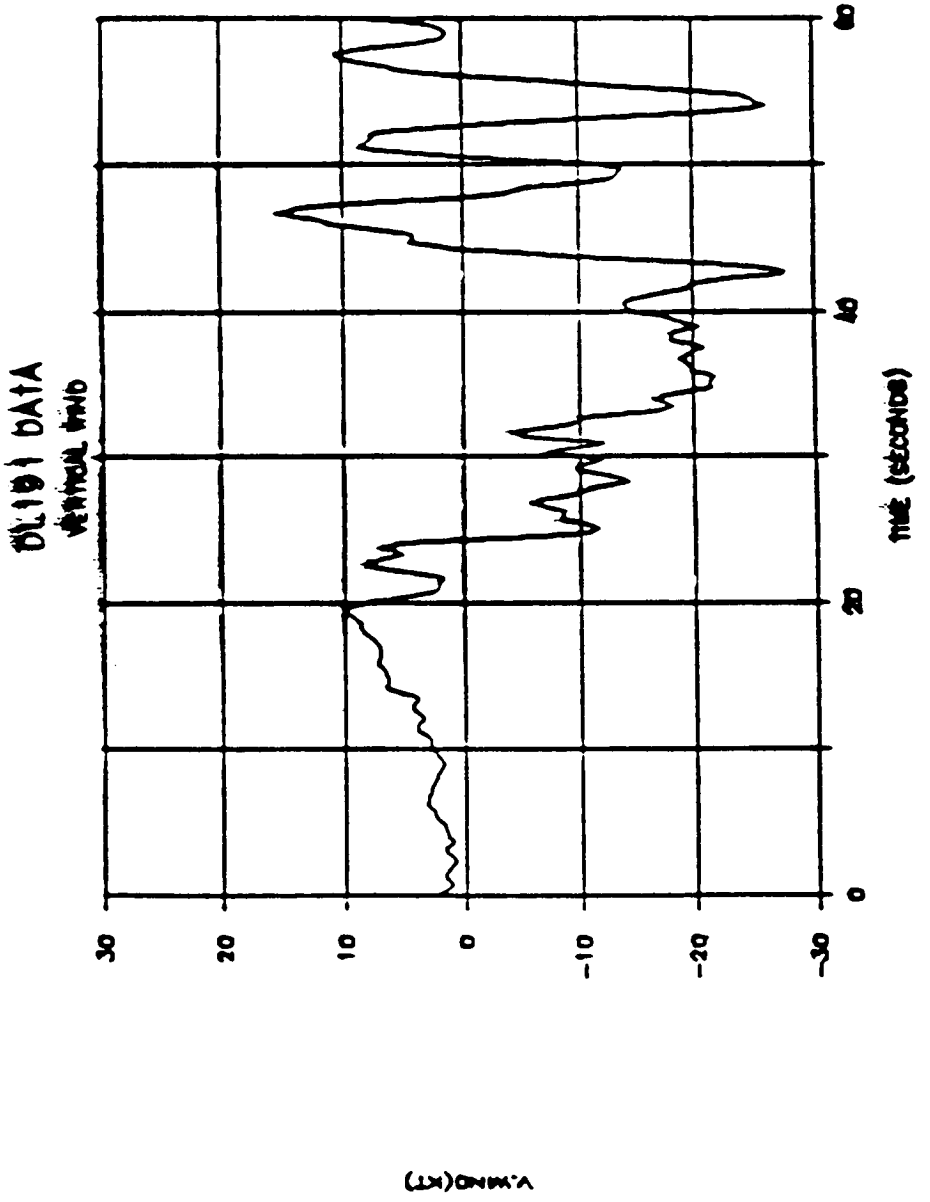
PERFORMANCE CRITERIA:

- Alerts In Time For Successful Escape
- No Unwanted Alerts

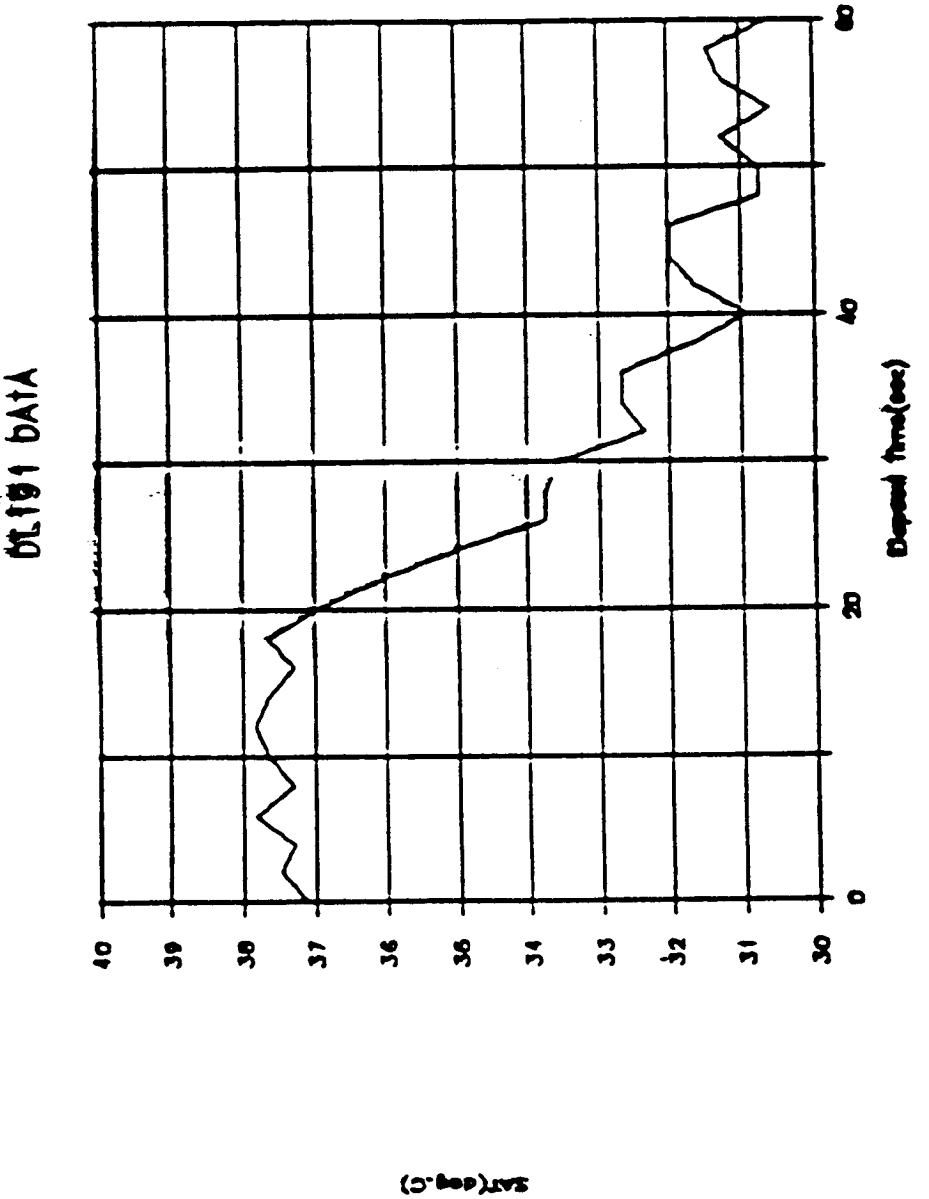
Sundstrand Windshear Detection Algorithm
BLOCK DIAGRAM



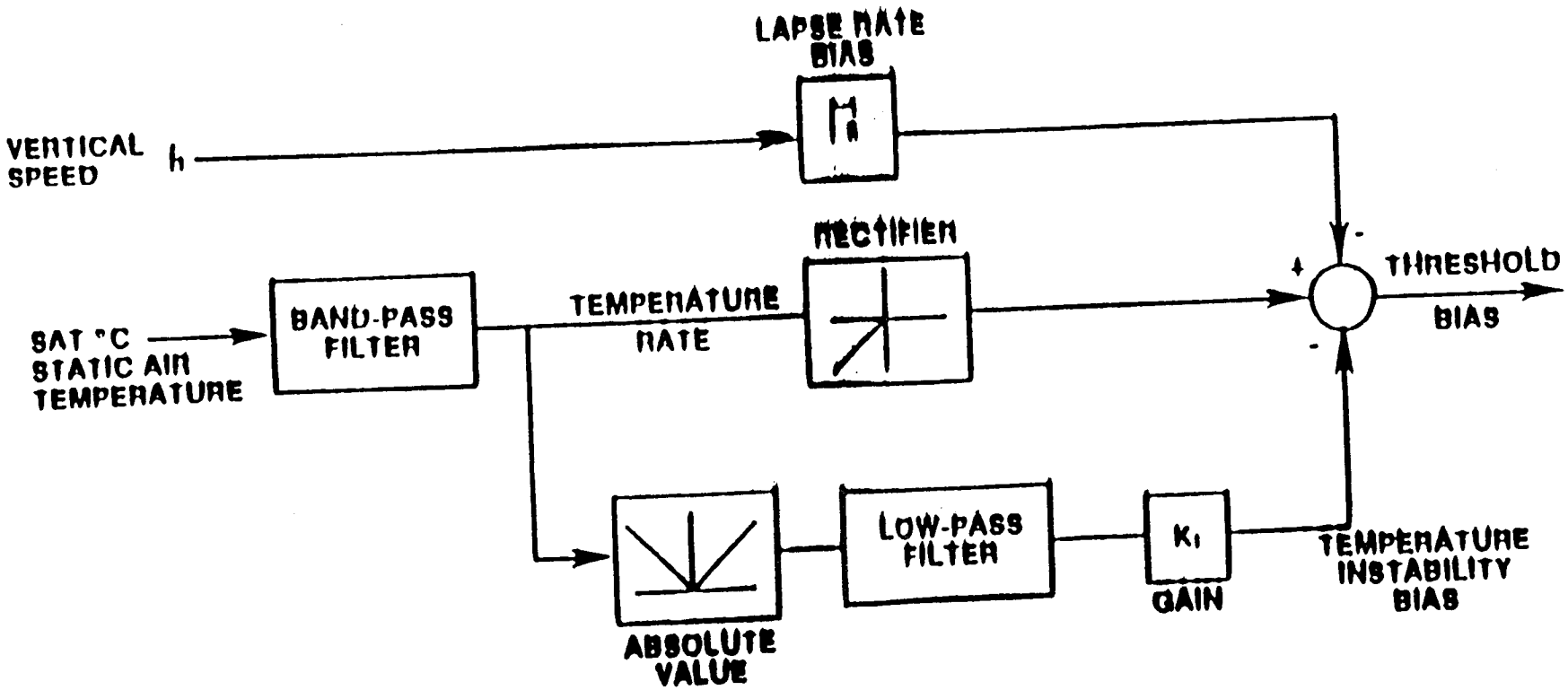
DL191 Vertical Winds



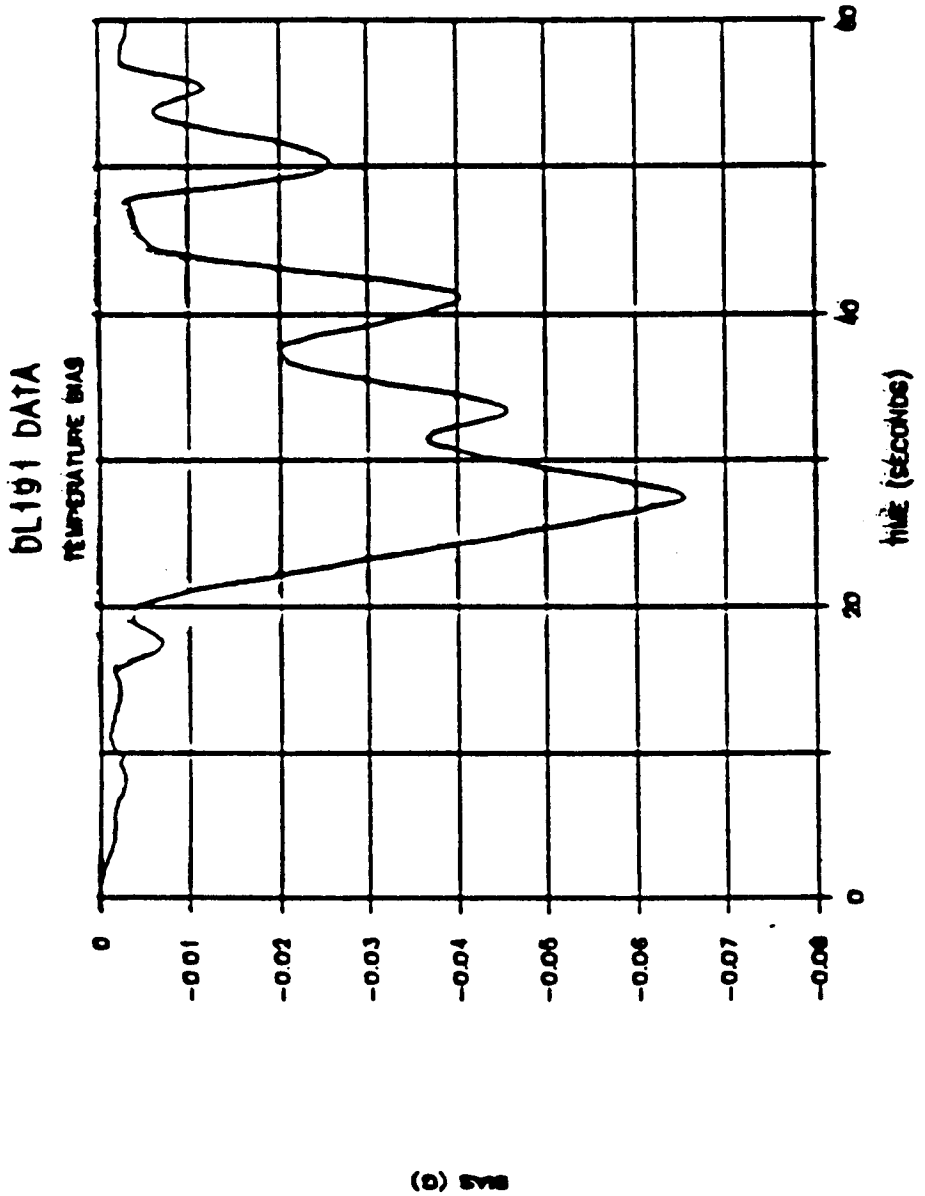
DL191 Temperature Data

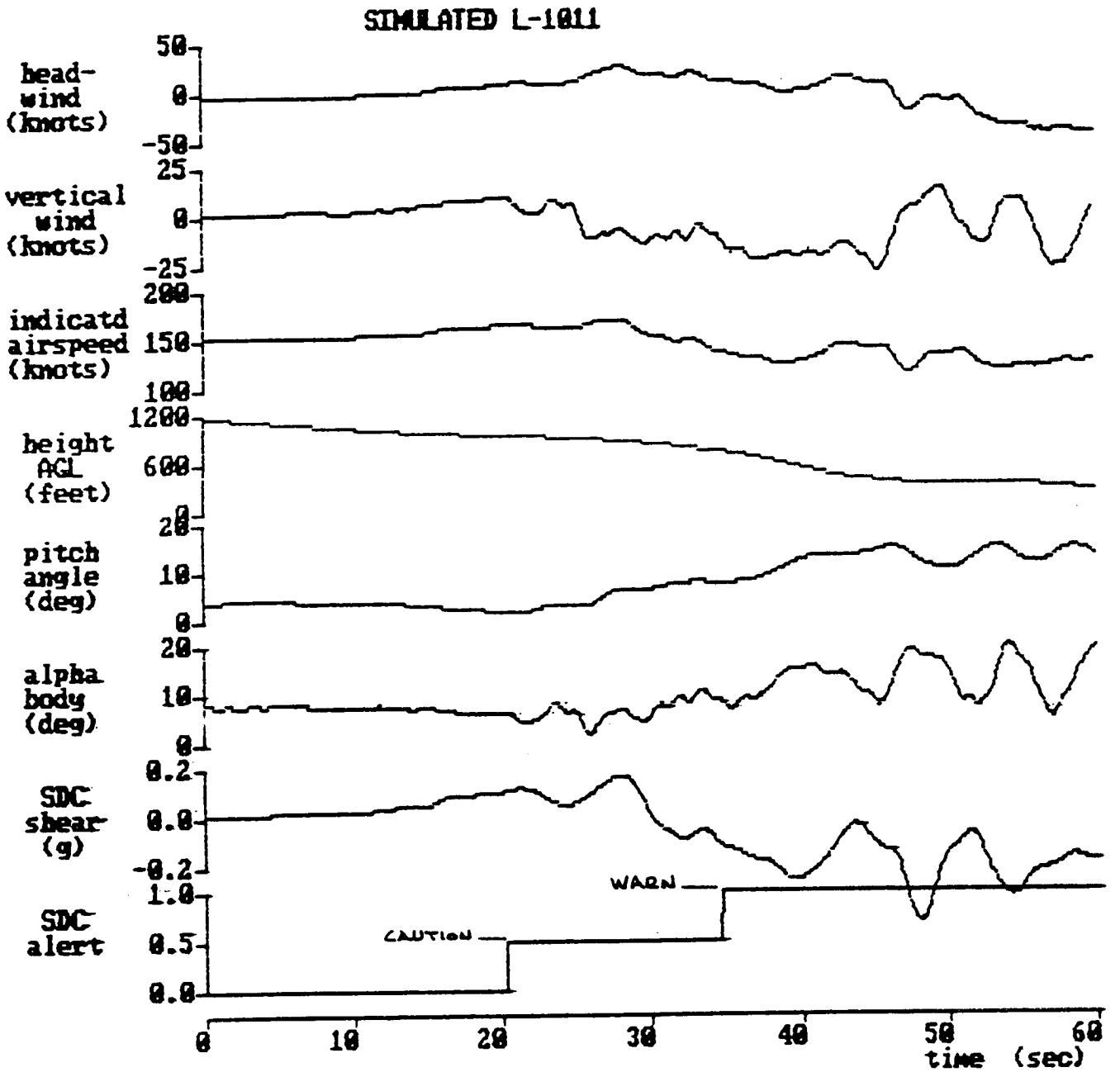


Atmospheric Temperature Bias Function



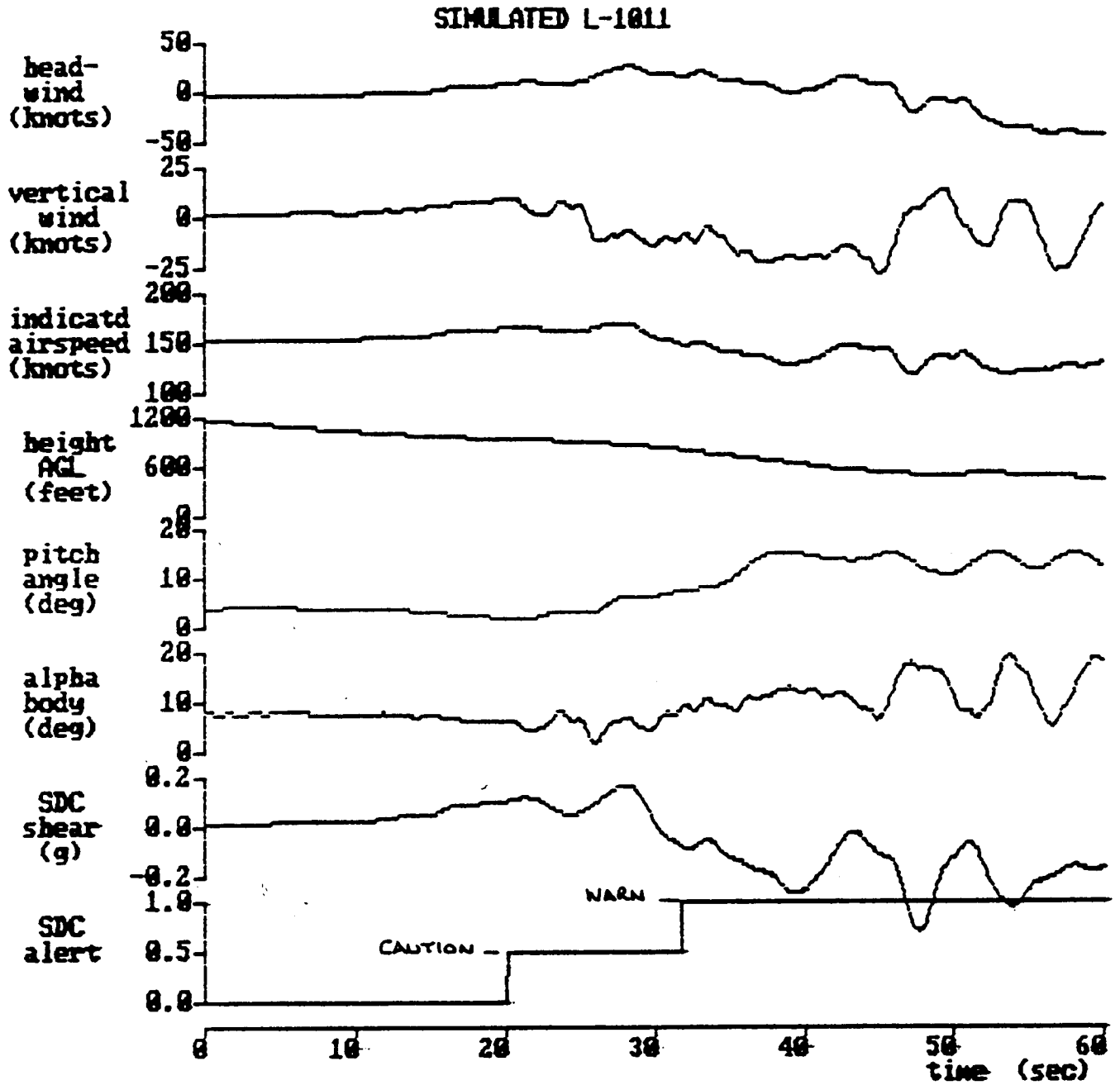
Temperature Bias Output





Simulation Without

Temperature Bias



Simulation With Temperature Bias

Conclusions

- Using Data From Dallas Accident:
  - Ratio Of Wanted/Unwanted Warnings Improved By Using Temperature Bias

- Need More Data
  - Variation Of Static Air Temperature During Normal Airline Takeoffs And Landings
  - Temperature Data For Windshear Related Incidents And Accidents

- Encourage Airline/Industry Data Collecting Program

JIM EVANS (MIT Lincoln Lab) - In the back of the handout that you will get tomorrow that Mark's talk, will be some of the TDWR results. You know there have been a lot of people who have been looking at mesonet data associated with microburst, surface sensors where they do get delta T versus velocity. I would say that it is far from a clear picture that you can always count on temperature drops. There was a little hint of that in Fred's discussion today. You know, at one point he showed a curve that showed a big thing but on the other hand there were some other situations where you wouldn't get much of a temperature change and in fact, I would say that this mesonet data, shows some temperature decrease, but it is certainly not enough that I would run around arguing that you could clearly reduce your threshold by the amount you've assumed under that circumstance. I think in the case of the planes, I am not quite sure you get data out of a plane when a plane crashes but that is a very small number of events and probably doesn't reflect the total situation.

HOWARD GLOVER (Sundstrand) - What we also need however, is data in turbulence but not severe wind shear. Boeing conducted a survey using just that kind of approach, but they were measuring essentially the F factor and at that time data on temperature wasn't gathered. Data on accelerations was, also rates of change of energy. We need something like that to leave gust turbulence in, or to disprove the usefulness of a feature like this.