



# COMET SHOEMAKER-LEVY 9

432 MHz Observations

17 - 22 July 1994

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# The lead -up period

- Io-B pulses. Dr Tuck Choy (VK3CCA) and Max Chadwick (VK3WT).
- What they were doing on HF.
- What was known about Jupiter's' emissions.
- Results of my listening tests on 432 MHz.



# SHOEMAKER-LEVY APPROACHES

- Liaison (by phone) was set up with the following:
- Monash University..... Dr Tuck Choy
- MF receiving site at Olinda .... Max Chadwick.
- Canberra University , Sydney University and Mt Stromlo, JPL .... Rob Apaithy.
- Predictions become more defined and were being updated hourly via direct links with JPL (USA).



# What did we hope to hear ?

- No one really new!
- some scientists thought nothing.
- some others thought it would be “huge”!
- But what was huge !
- We waited with bated breath noting, that in Australia, we had a grandstand view that did not afford any one else in the **WORLD**.



# The first impact - Fragment B

- Receive / tracking configuration at the time.
- Occurred on Sunday July 17 1994 at 1247 local (UTC 0247). This as within 35 seconds of the final prediction time received a half hour earlier.
- No audio recorder running! As I thought it would be a fizzer and I had not spent sufficient time in preparation.
- But .... what a surprise !



# First Impressions

- The noise I was hearing was just too loud.
- It had to be man made (even though the elevation of Jupiter was quite high), given the strength ?
- The noise sounded “strange”. Pulses were being seen but not always heard!
- The noise sounded something like car ignition but given the rapidity of the pulse trains it did not sound man made. It sure was not a “cake mixer”!
- I was not **convinced** it was coming from Jupiter!



# The phone rang hot!

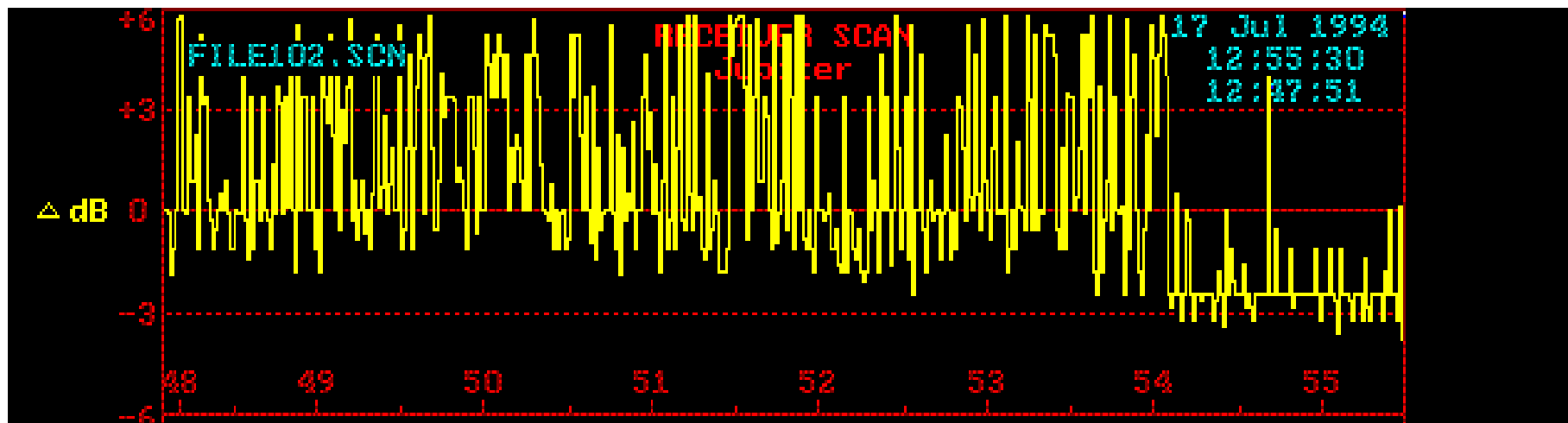
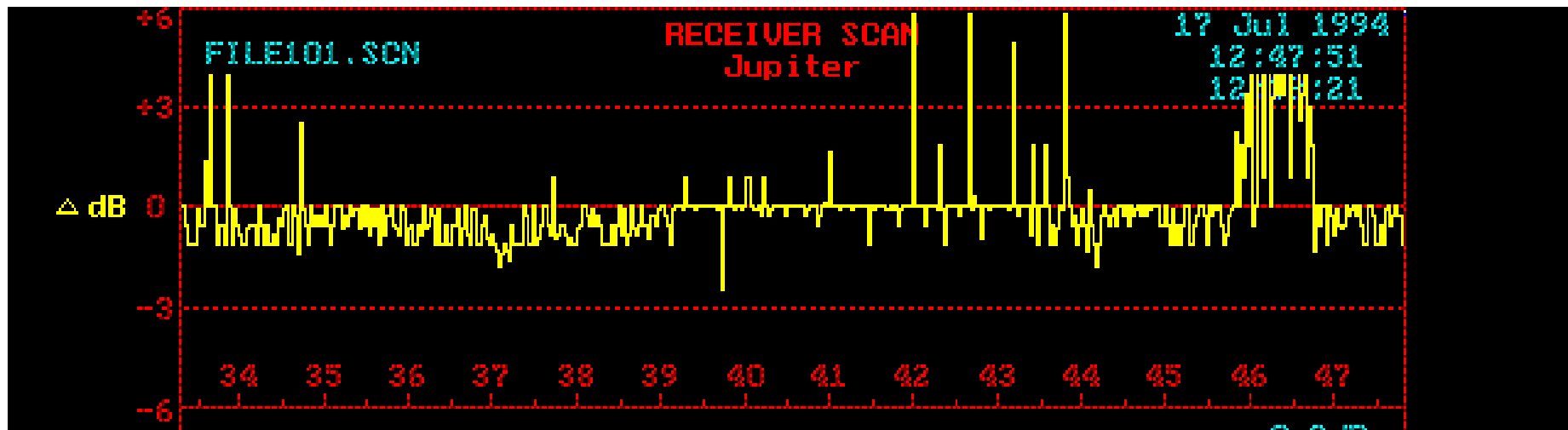
- What did you hear? What did YOU hear?
- What time and for how long? ... really !!!
- Most were “listening” with chart recorders etc .. only I was listening “real time”.
- Perhaps it was for real .. the times were obviously spot on but no one was giving anything away!



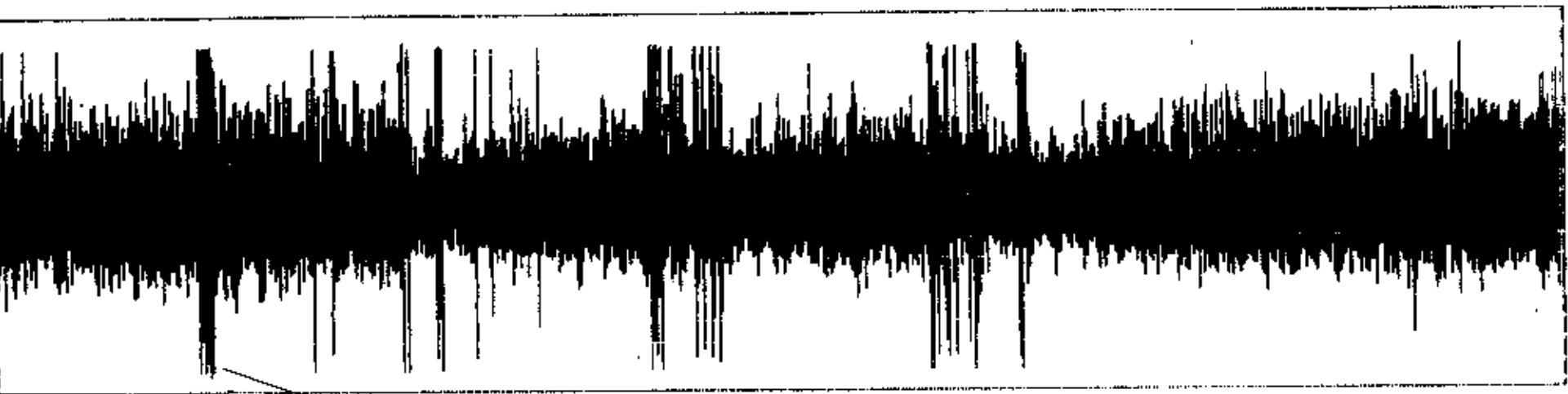
# Time to get serious !

- set up a tape recorder with one track on WWV (10 MHz) and the other on the 432 MHz receiver output.
- wrote additional software to automatically record the level and wave form of the receiver output.
- This process continued for several fragment impacts as I attempted to optimise the sampling periods and scanning rates to provide a more detailed analysis of the signals.



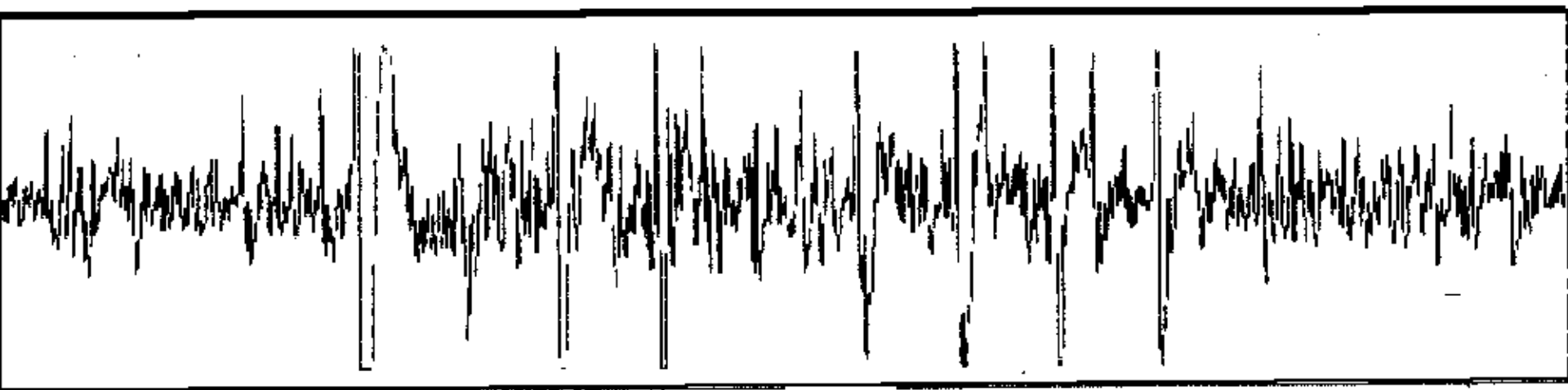


**Fragment B ... Impact Predicted 1247 (actual 1247:33.5)**



19.07 Seconds

Expanded



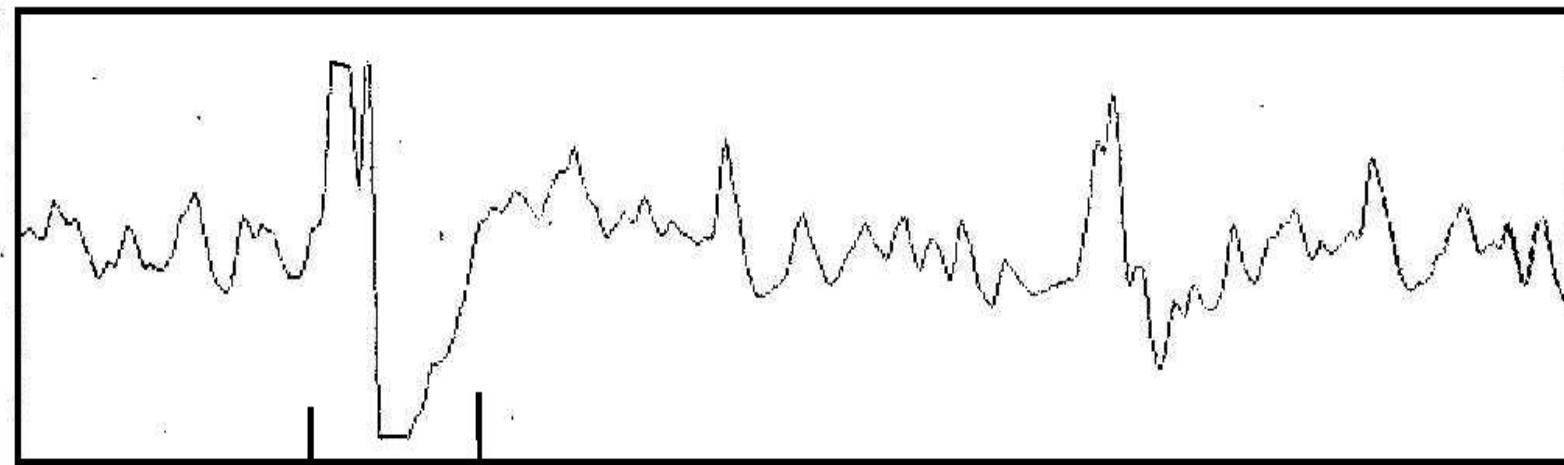
1.20 Seconds

VK3UM 19 July 1994 1222-1223 FRAGMENT K



1.01 Seconds

Expanded



1.3ms

150 ms

# SUMMARY

- Mt Stromlo validated the data, with respect to the time peaks were observed, as confirmed from other sites and on other frequencies. (Non Audio)
- The emissions received were extremely strong ( $> 30$  dB above 65k although they could have be far greater due to overload)
- Fragment K was the only observed object having an effect before impact.
- “Secondary” effects were observed up to 90 minutes following impacts.
- the ear did not always respond to the actual pulses due to their shortness.

- The pulses and frequency (repetition rate) was very short.
- pulse width was less than 1 mS.
- repetition rate greater than 35 pulses per second.
- most pulses appeared to have a ‘signature’ wave form.
- recorded pulses (audio and digital) can be seen of smaller amplitude at a cyclic rate for long periods of time and can be detected by ear as a “flutter”.
- the level of pulses saturated the recording media and probably obscured the true pulse width. (very narrow indeed).
- Higher level pulses can also be heard over WWV on 5 or 10MHz.