

UK observations of 2018:

Successes, new CCD users, and a lunar graze project.

[70 Tau 2016 Jan 19 0.2 sec](#)

[Faint comets 2018 5.5 sec >>](#)

[\(130\) Elektra 2018 April >>](#)

Tim Haymes

BAA Assistant Director, Asteroids/Lunar Occultations

ESOP XXXVII Rokycany, CZ

This is the very successful Elektra observation

Prediction was highlighted by Oliver at ESOP XXXVI Freiberg, 2017

The observation from my Home observatory was made with 30cm F4 Newtonian, WAT-910HX and GPSBOXSPRITE2-U. (Time checked with radio)

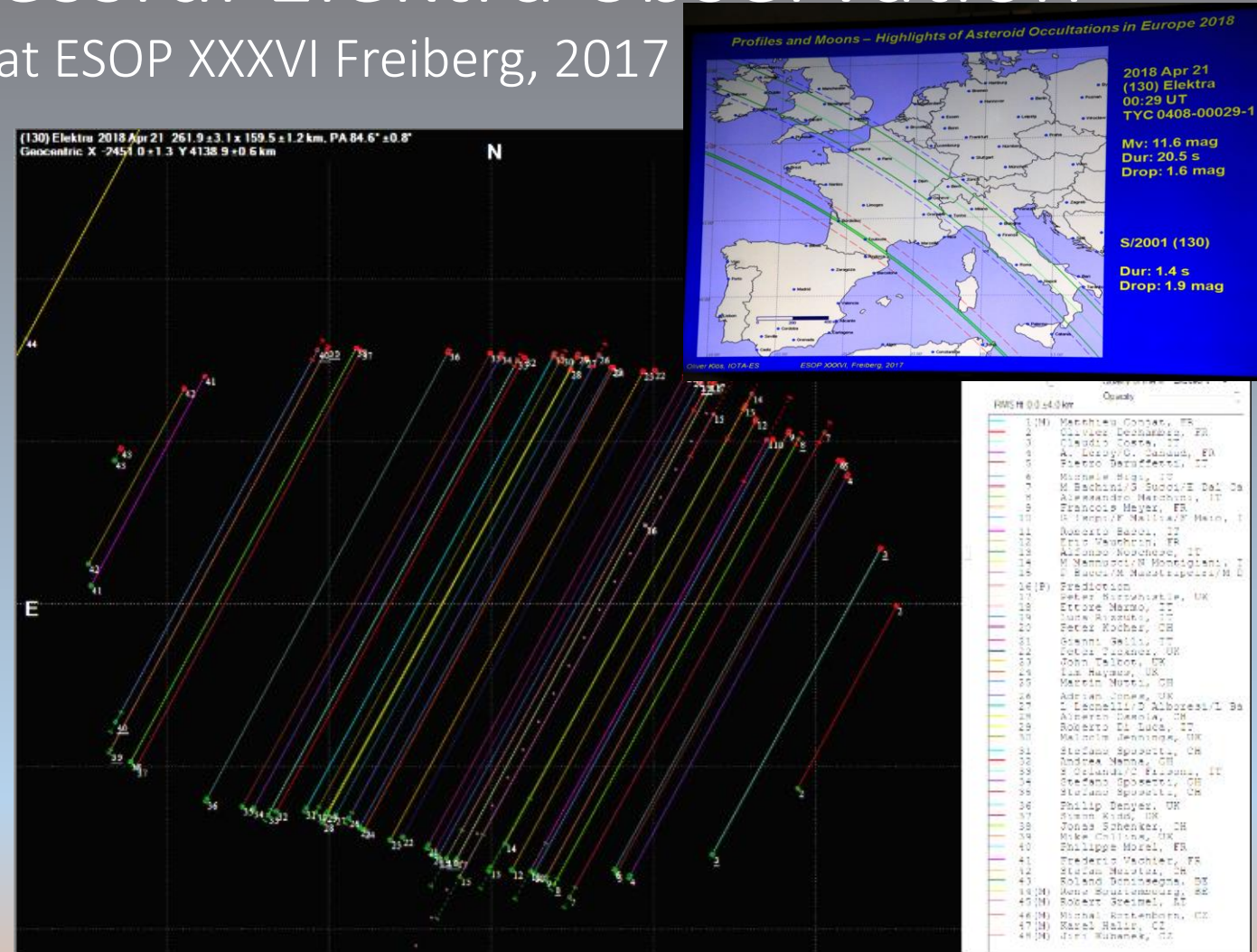
Recording was to digital tape (Sony TRV33E camcorder) and transferred to laptop by fire-wire.

Analysis with TANGRA

Exposure 0.04s (25fps) Duration 16.48 s

An audio recording with DCF 77 pips was also obtained as a backup.

FR 7 CH 9 CZ 3
BE 2 UK 9
IT 12 AT 1 Total 48
(EURASTER.NET)



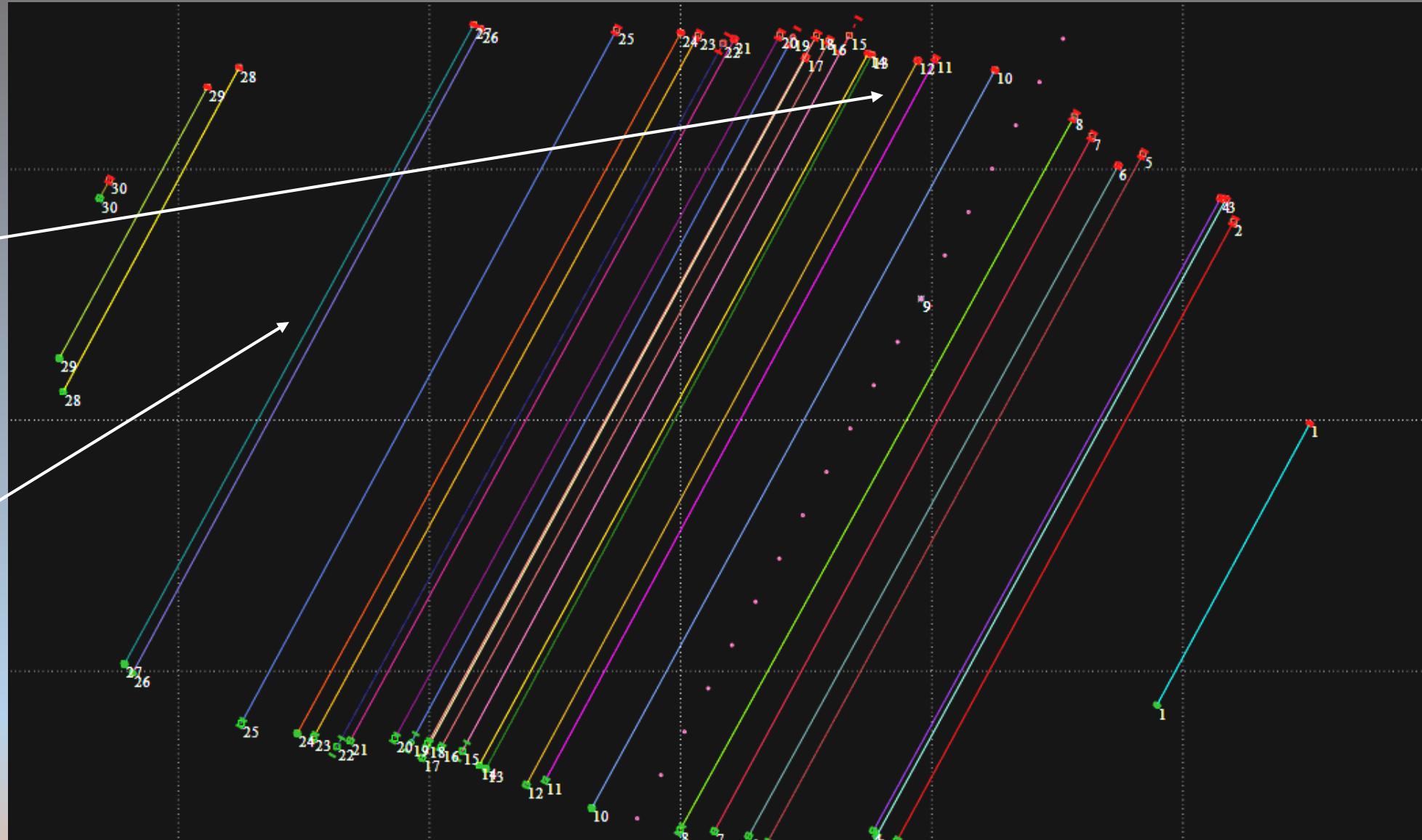
CHORDS Courtesy of Eric Frappa

VID v CCD are compared

11 Tickner CCD (UK) 16.66
12 Talbot VID (UK) 16.72

13 Haymes VID (UK) 16.48s
14 Mutti VID (CH) 16.42s

26 Kidd CCD (UK) 14.88
27 Schenker VID (CH) 14.76

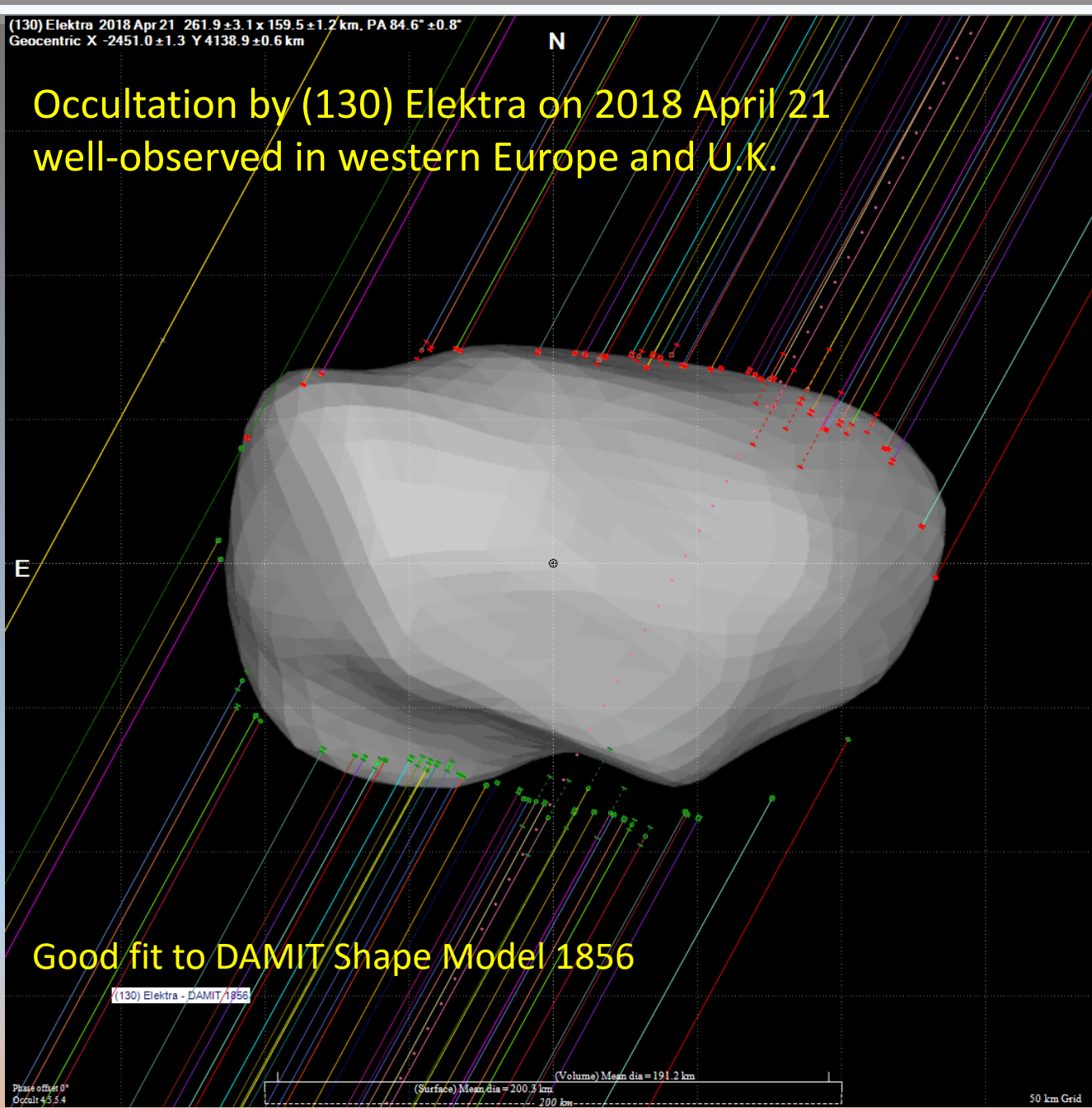


SLIDE from David Dunham

Also on EURASTER.NET

(130) Elektra 2018 Apr 21 261.9 ± 3.1 x 159.5 ± 1.2 km, PA 84.6° ± 0.8°
Geocentric X -2451.0 ± 1.3 Y 4138.9 ± 0.6 km

Occultation by (130) Elektra on 2018 April 21 well-observed in western Europe and U.K.



Find best fit

Center X 132.0 ✓ 0.0
Center Y -76.1 ✓ 0.0

Major axis (km) 261.9 ✓ 0.0
Minor axis (km) 159.5 ✓ 0.0
Orientation 84.6 ✓ 0.0

a/b=1.64
dM=-0.54
Motion 8.63km/s, Y

Double star or double asteroid
Sepn (masec) 0.0 ✓ 0.0
PA of 2nd 0.0 ✓ 0.0

Show: Both Primary Secondary
A= 10.0 B= 10.0 PA= 0.0

Circular Include Miss events

Plot scale Quality of the fit Excellent
Opacity

RMS fit 0.0 ± 4.0 km

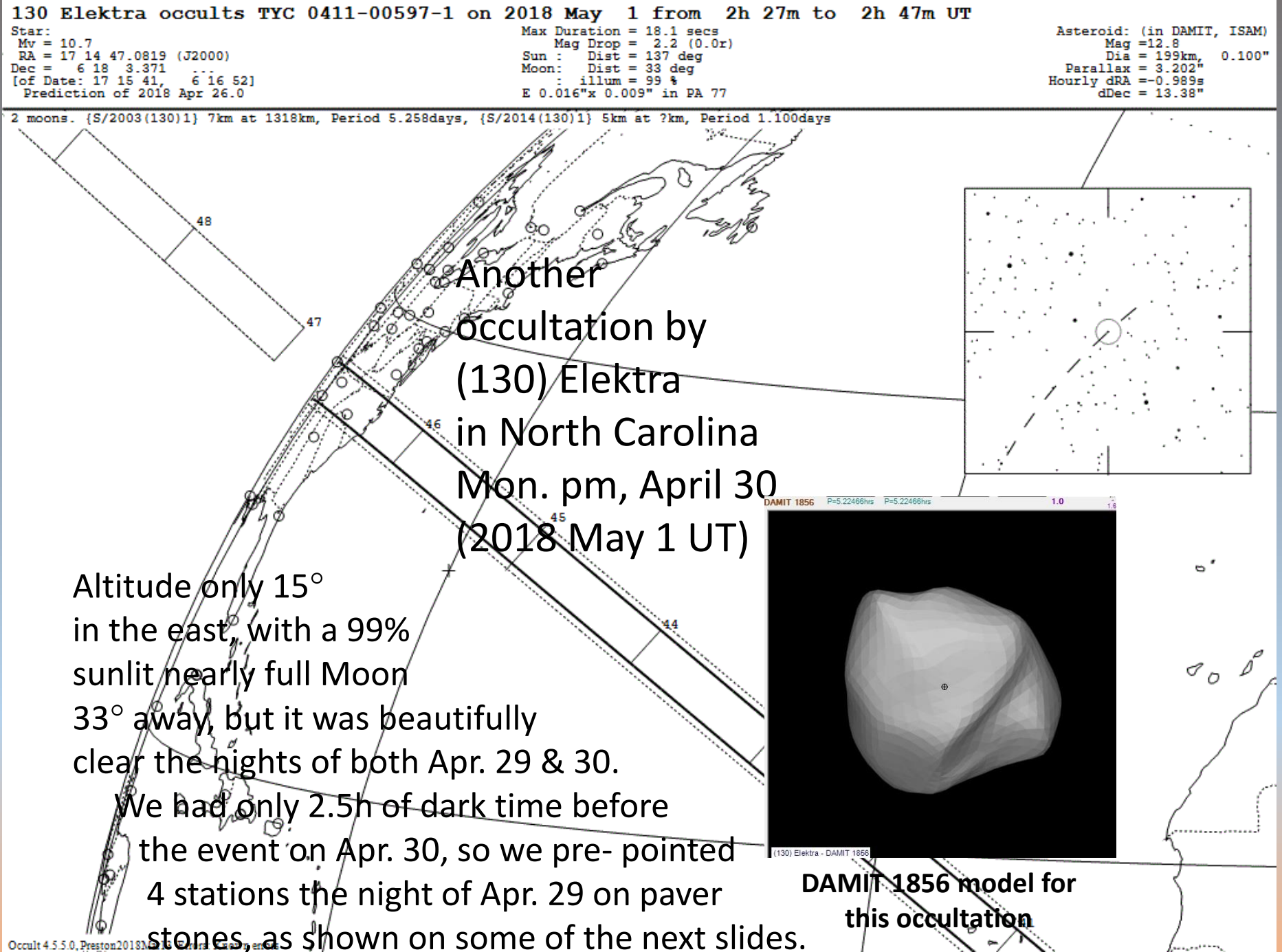
1 (M)	Matthieu Conjat, FR
2	Olivier Dechambre, FR
3	Claudio Costa, IT
4	A. Leroy/G. Canaud, FR
5	Pietro Baruffetti, IT
6	Michele Bigi, IT
7	M Bachini/G Succì/E Dal Ca
8	Alessandro Marchini, IT
9	François Meyer, FR
10	G Isopi/F Mallia/F Maio, I
11	Roberto Bacci, IT
12	Eric Vauthrin, FR
13	Alfonso Noschese, IT
14	M Mannucci/N Montigiani, I
15	P Bacci/M Maestripeiri/M D
16 (P)	Prediction
17	Peter Birtwhistle, UK
18	Ettore Marmo, IT
19	Luca Rizzuti, IT
20	Peter Kocher, CH
21	Gianni Galli, IT
22	Peter Tickner, UK
23	John Talbot, UK
24	Tim Haymes, UK
25	Martin Mutti, CH
26	Adrian Jones, UK
27	L Leonelli/D Alboresi/L Ba
28	Alberto Ossola, CH
29	Roberto Di Luca, IT
30	Malcolm Jennings, UK
31	Stefano Sposetti, CH
32	Andrea Manna, CH
33	S Orlandi/C Frisoni, IT
34	Stefano Sposetti, CH
35	Stefano Sposetti, CH
36	Philip Denyer, UK
37	Simon Kidd, UK
38	Jonas Schenker, CH
39	Mike Collins, UK
40	Philippe Morel, FR
41	Frederic Vachier, FR
42	Stefan Meister, CH
43	Roland Bonisegna, BE
44 (M)	Rene Bourtembourg, BE
45 (M)	Robert Greimel, AT
46 (M)	Michal Rottenborn, CZ
47 (M)	Karel Halir, CZ
48 (M)	Jiri Kubanek, CZ

SLIDE from
David Dunham

7 stations
1 miss
1 fail
5 pre points +ve

Full details here:

http://iota.jhuapl.edu/2018June_occultations.ppt



Observers with CCDs

ZWO174mm USB3



- We have three (or 4) new observers in England using CCDs:..
- These are USB planetary cameras deployed for asteroid occultations.
- Two observers (P Tickner and S Kidd) have established *through experiment* that GPS disciplined NTP time servers are reliable to 1 to 10ms, but quote accuracy of 10 to 100ms due to potential variations in their recording systems.
- P Tickner is moving to Windows 10 due to its *improved* time handling.
(or so it is said...)

Timing and cameras:

Observer Camera

Software UT source

Recording

P Tickner USB3 ZWO ASI 174mm

Genika GPS "TimeBox" Stratum-1

W7 i7 SSD

S Kidd ZWO ASI 224 colour

Fire Capture GPS 1pps-disciplined (RasPi) / Dimension-4



S.Kidd RasPi NTP time server



P Tickner "TimeBox" USB



UT/USB testing

- S Kidd: Established the UT was at the start of the frame. He recorded the LED on the RasPi GPS time server at 100 and 500 sub-frames / sec.
- Time stamp variation was in the 1 to 10ms error range.
- P Tickner: Used an MSF receiver with LED (made by T Haymes) to establish the start of the frame. The time stamp accuracy was also good, and he purchased the “Time Box” USB GPS add-on to Genica software. He does not use NTP.
On Windows 7 he says there is a 15ms write delay onto a SSD.

There is a written description from Mr P Tickner available from me – please ask

Double star lunar occultations

Team APT : Alex Pratt, Phil Denyer and Tim Haymes
(assisted by Brian Loader)

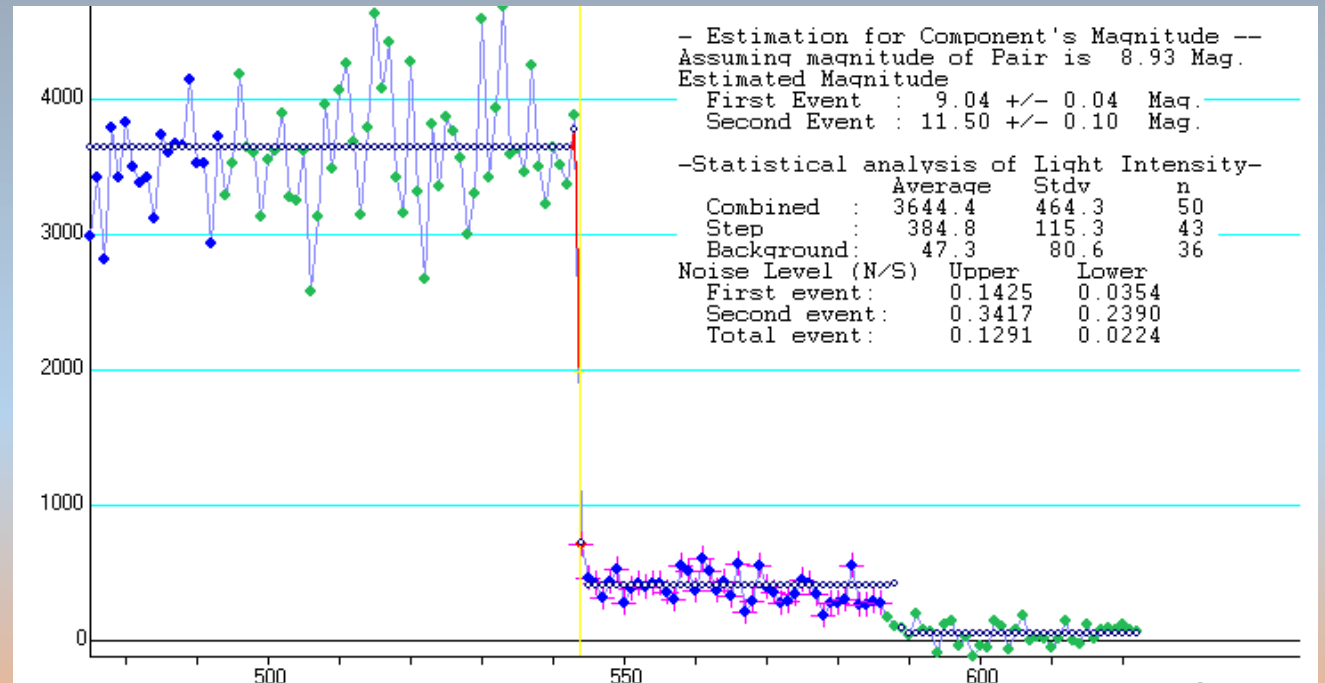
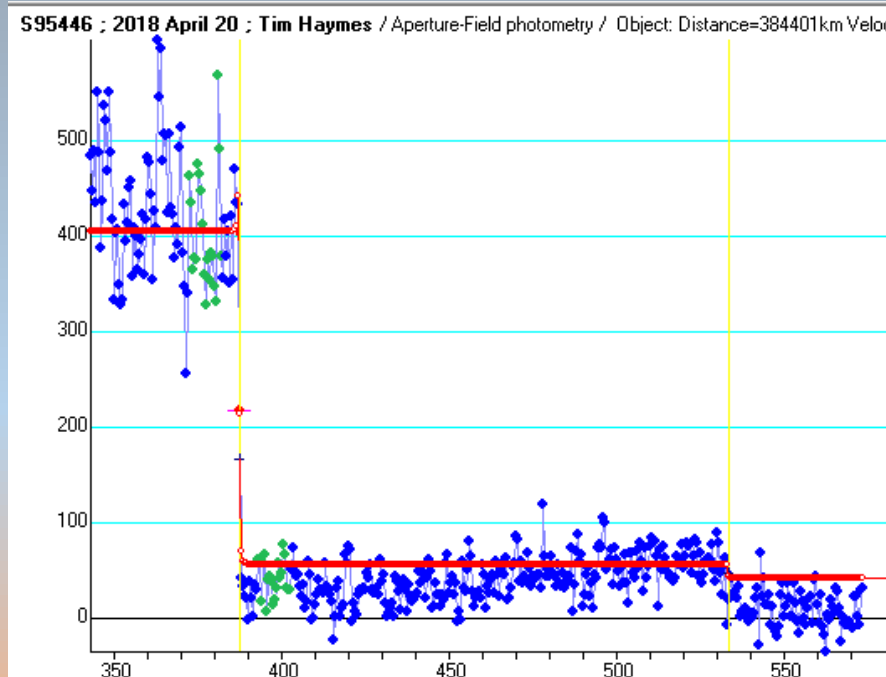
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18 Apr 20 21 35 17.1 d 95446dA2 9.0 8.9 27+ 63 23 273 65S
95446 is double: AB 9.0 11.5 2.9" 102.8, dT = +6sec
95446 is a close double. Observations are highly desired
    
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SAO 95446 on 2018 Apr 20
dT +5.8s - T Haymes

SAO 95446 magnitude differential
9.0 and 11.5 – A Pratt (Partial recording)



“Unreported” Lunar Graze Project:

ZC 3465 S. Limit on 1988 Jan 22 from East Sussex, England.

- Originally reported in *The Astronomer Magazine* (6411) Tamaga [founded in 1964 for rapid reporting: Editor is Guy Hurst.]
 - Rapidly reported Lunar Obs didn't all reach RGO or ILOC.
(detailed reporting to the recognised astronomical *body* was not always followed up.)
- Mr J. A. Burger was contacted and he confirmed his location and visual timings.
- The observations were not in Dave Herald's Occult Database.

Observation by Mr Burger in TA Vol25 , No290, Page42

Grazing Occultation of ZC 3465 on 1988 Jan 22

J.A.Burger: The grazing occultation of this mag 6.5 star was observed from a site near Heathfield, East Sussex, in excellent conditions- a totally cloudless sky, no wind, the Moon 17% illuminated and the graze some 10 deg from the cusp.

Two events were timed using a 0.215-m reflector x125, tape recorder and Y3S time signals:

disappearance (dark limb) 1988 Jan 22 19h 57m 06.4s

re-appearance (dark limb) 1988 Jan 22 19h 57m 14.2s

Observing co-ordinates:

Longitude 0deg20'07"E

Latitude 50 56'54"N

Altitude 122m

-13, Norwood Road, Effingham, Surrey, KT24 5NT



Preserved Nauen transmitter building, dating from 1920

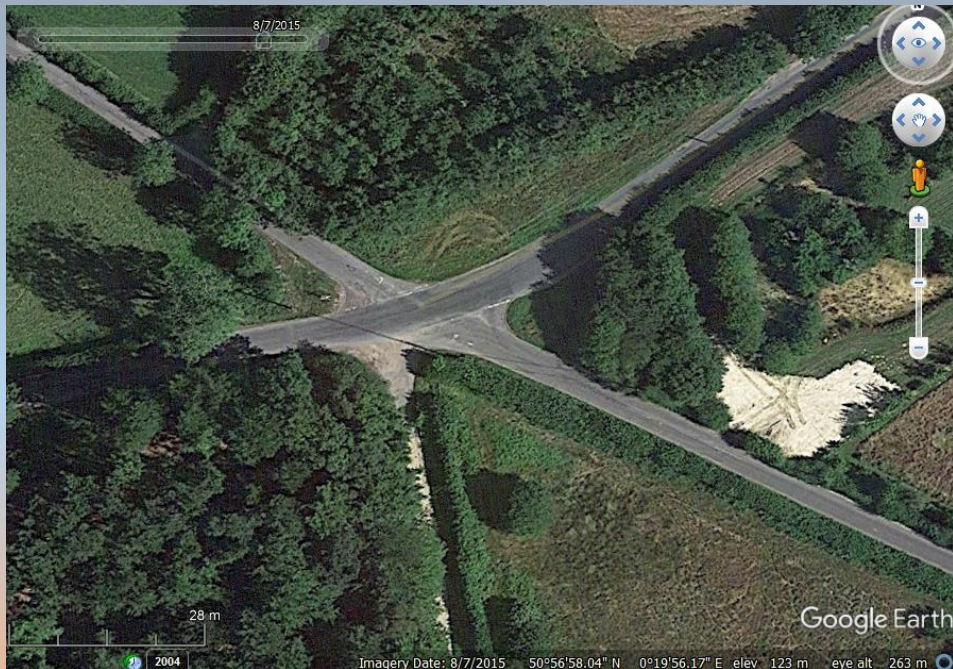
NOTE:

Y3S was the call sign for East German Radio Time Signal at Nauen – no longer transmitted.

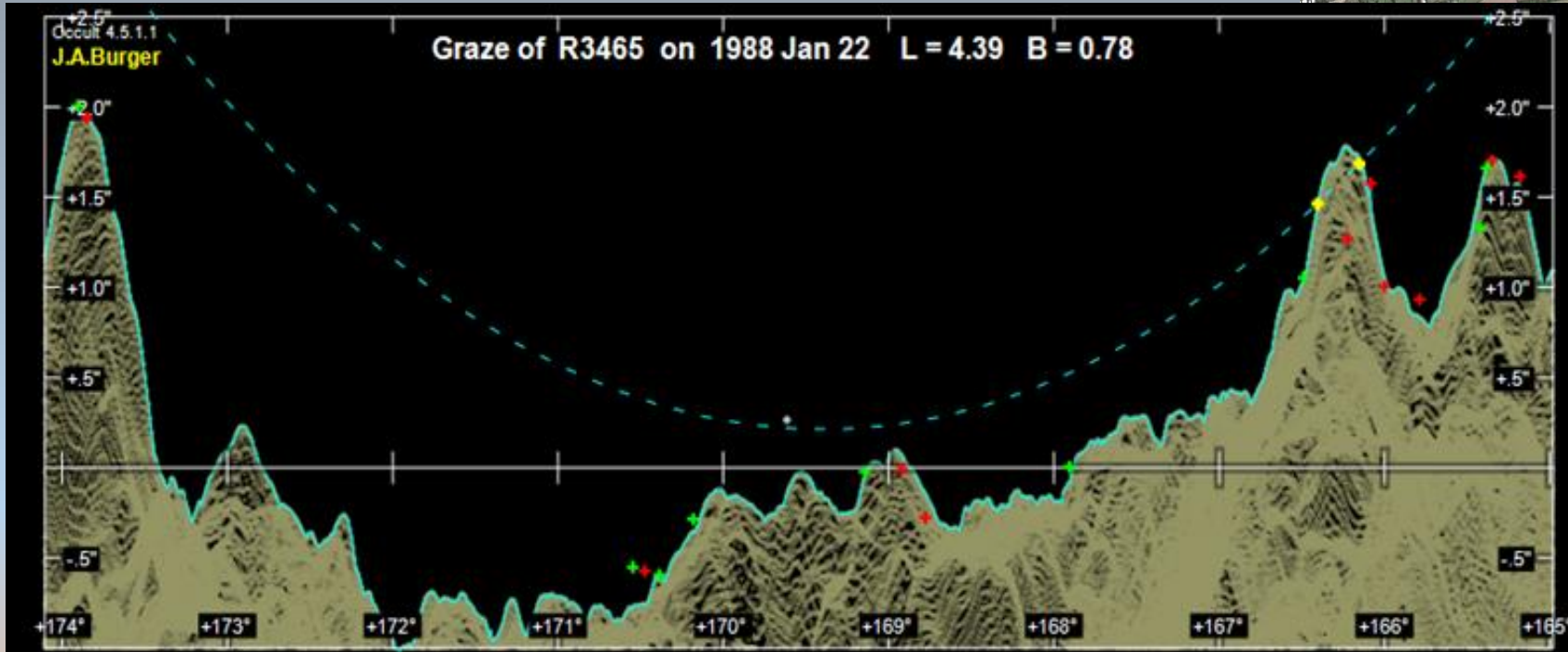
Is the oldest continuously operating radio transmitting installation in the world. It was founded on 1 April 1906

Location of J Burger at Heathfield, W.Sussex

- His OSGB coordinates placed him in the circle, but his location on GE (WGS84) was at the road side X



Corrected to WGS 84 Datum



Google Earth and Occult mean limb

Mr Burger's timings plotted on the Occult4 display

UK observation summary... (2017-2018) with Positive chords

Haymes T	nnnpnnpnnnnppnnnnnnnnnnnnnnnnnnnnnnnn	5/37	vid
Kidd S	nnpnpnppnnpn	5/12	ccd
Ward D	nnnn	0/4	ccd
Talbot J	nnnpnnnnpnnpnnnnnnnnnnpnnn	4/27	vid
Denyer P	pnnpnnnn	2/8	vid
Tickner P	npnppppnp	6/8	ccd
Sargent R	n	0/1	vid
Stuart	n	0/1	vid
Pratt A	nnnnnnnnpnnnpnnnpnnp	4/21	vid
Hubbard	n	0/1	vis
Birtwhistle P	pp	2/2	drift
Briggs D	n	0/1	vid
Jennings	npnppnnnnnnnnnn	3/15	vid
Jones A	pp	2/2	vid
Collins M	p	1/1	eye

THANK YOU

PAVER mount: Attach the side rail with two thumb screws. The bottom is held with a screw through a single hole, the top is in one of two ranges. This is the coarse altitude adjustment. Fine adjustment is made by turning the knob on the back end.

Designed by
John Broughton (AU)

