

# CP6: T+2 Months and other thoughts

Bryan Klofas

AMSAT-UK Colloquium

Guildford, 25 July 2009

# Outline

- PolySat Background
- CP6
- NRL Payload
- CPX Data Decoder

# PolySat Background

- CP1
  - Alinco DJ-C7
  - DTMF
  - Sun sensor
  - Launch failure Dnepr-1



# PolySat Background

- CP2
  - Energy dissipation
  - Launch failure Dnepr-1
- CP2.1/CP4
  - Energy dissipation
  - Launched April 17, 2007
  - Brain dead, I<sup>2</sup>C issues



# PolySat Background

## ■ CP3: Camera

- Launched April 17, 2007
- Receiver is a little deaf
- No pictures successfully taken

## ■ CP6: Camera/Plasma experiment

- Launched June 17, 2009
- Fixed receiver with LNA/filter
- Pictures successfully taken
- NRL plasma experiment still to be deployed

# CP6

## ■ Reflight of CP3 satellite

- Used flight spare model
- Minor bus software upgrades
- MAX2640 LNA and filter added
- 1200 baud FSK AX.25 437.365MHz
- 420km 42degree

## ■ Doing fine!

- Camera working fine, downloading pictures

# CP6 Launch

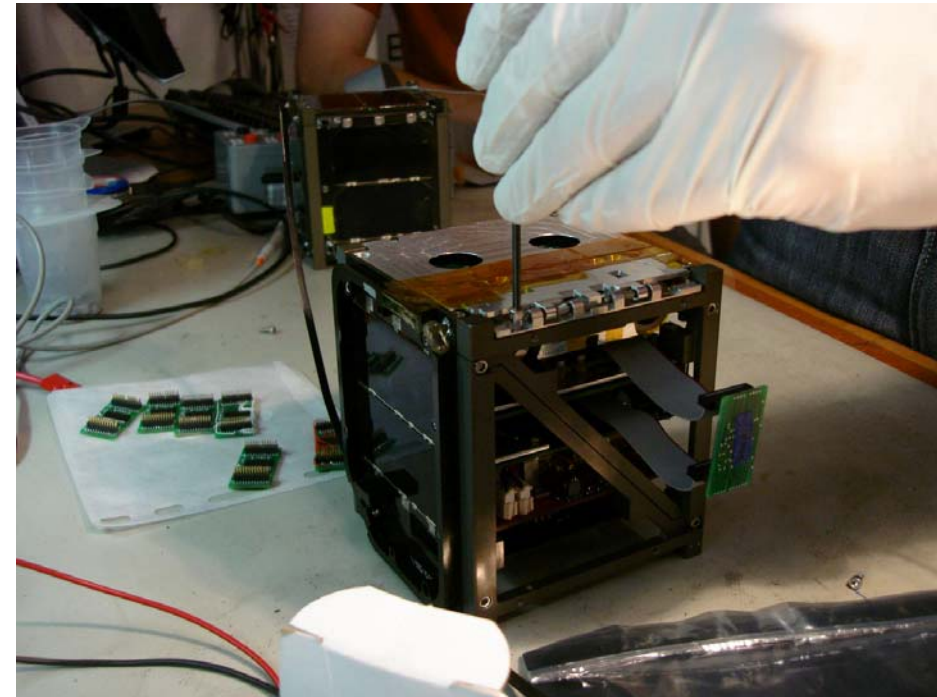
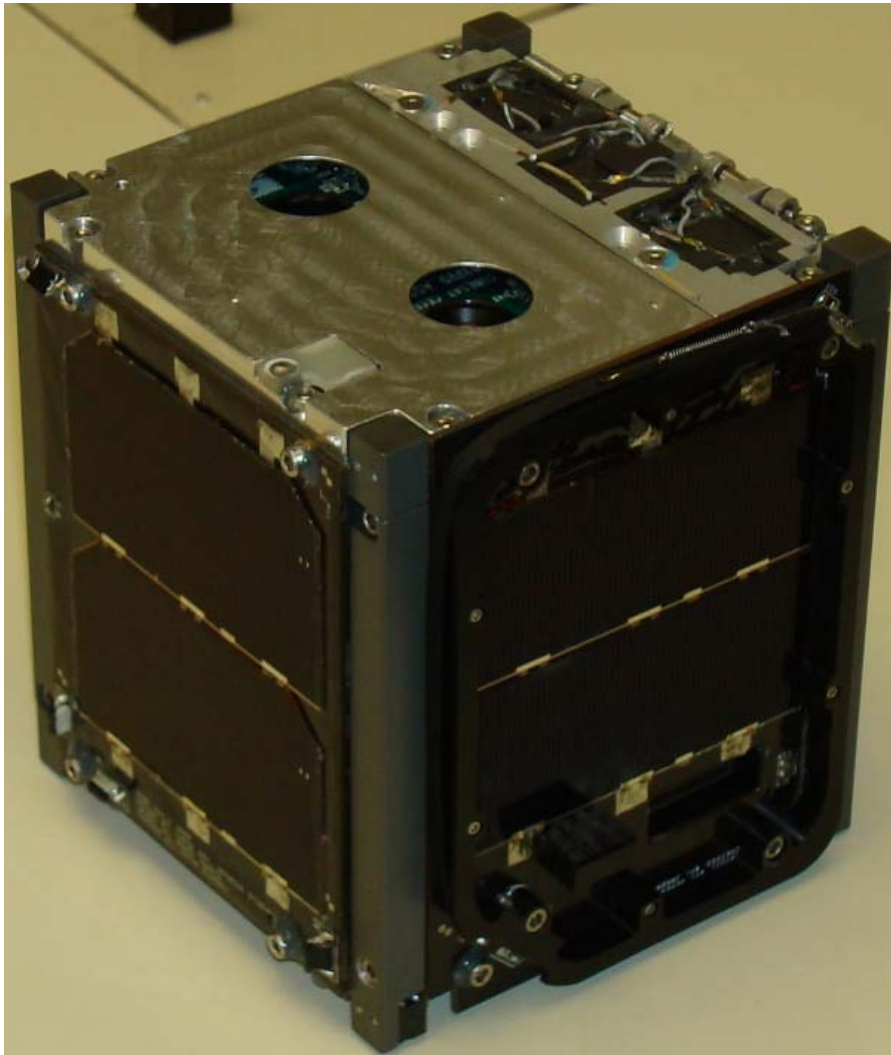


# NRL Payload

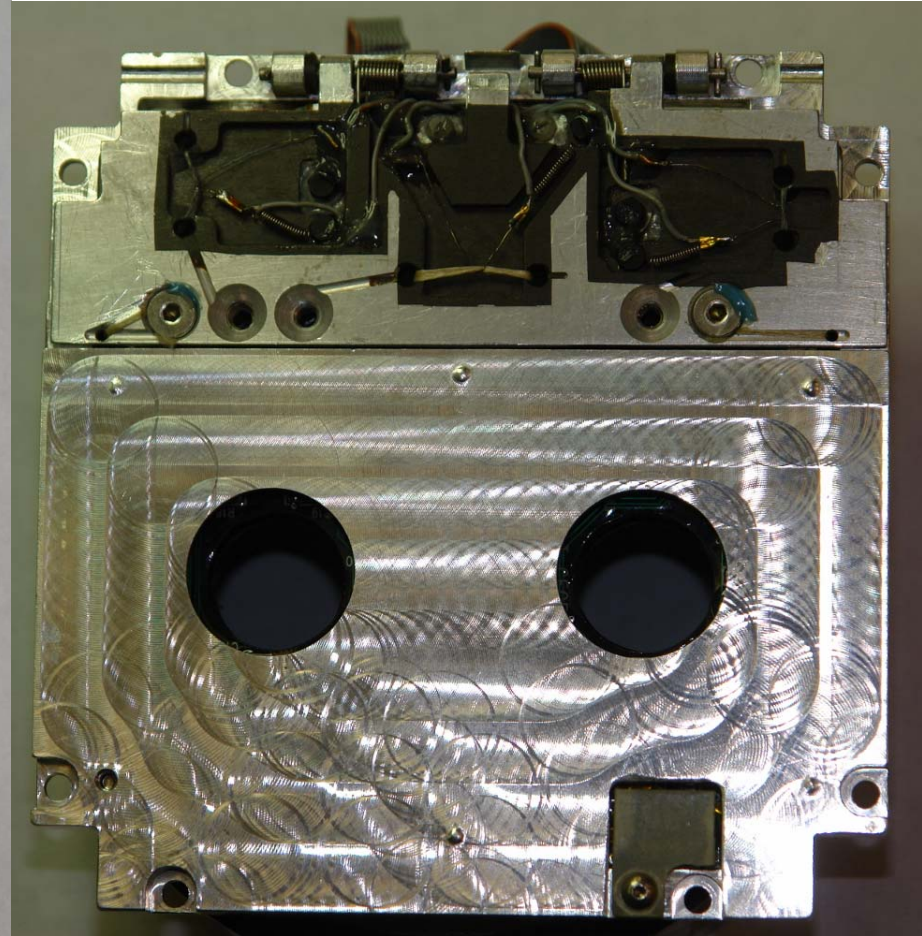
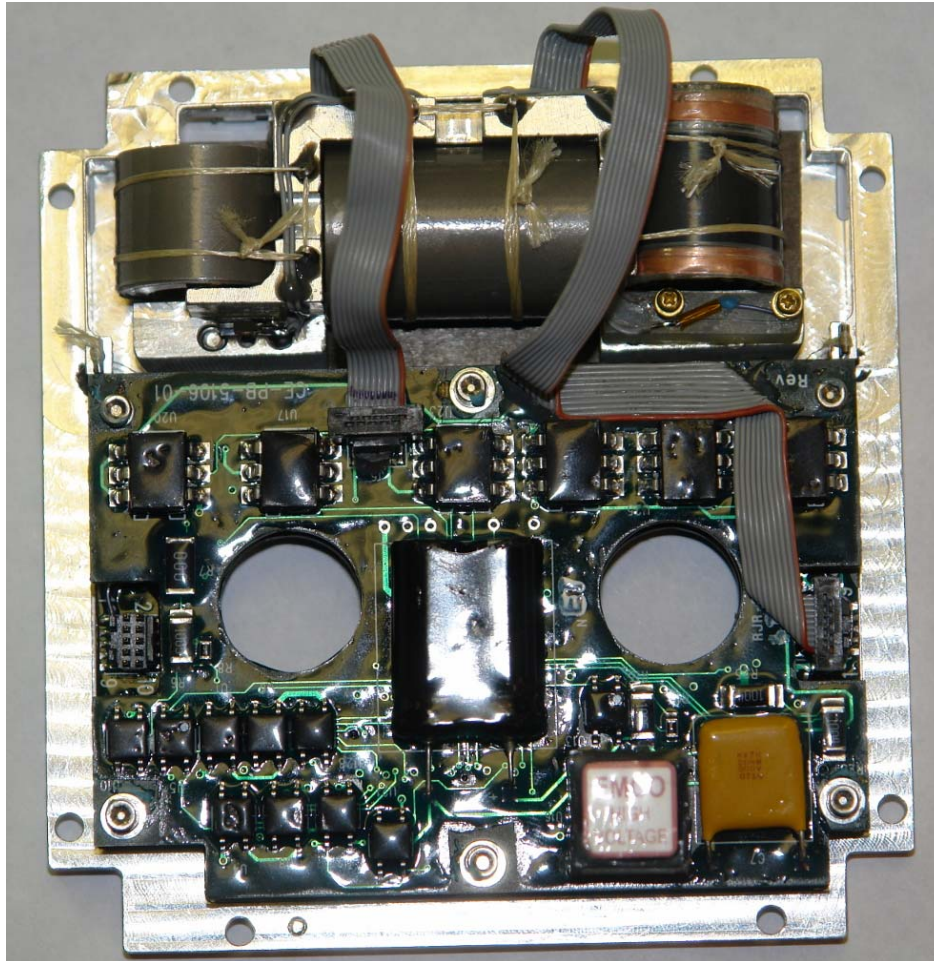
- Measures the effectiveness of electron collection and plasma measurement devices in space
  - Two tungsten filaments 1.4m and 1.7m long charged to  $>200V$  (electron emitter)
  - One electron collector steel tape 1.1m long
- Fits over the cameras – no modification to any of the CP3 boards
- 10 x 10 x 2.5 cm volume with cutouts



# NRL Payload Pictures



# NRL Payload Pictures



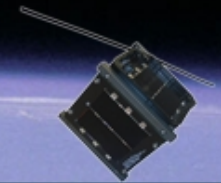
Pictures from: CE2: A CubeSat Electron Collector Experiment, AAS09239

# CPX Data Decoder

- Designed to collect data from the TNC and display it in parsed form
- Written in Ruby/PHP/MySQL/Python
- <http://moredbs.atl.calpoly.edu>

# CPX Data Decoder

MORE DBS



[Satellite Data](#)

[Download](#)

Welcome, Guest  
[Register](#) [Login](#)

## CP6 Pass Log

Page 1 of 133.

First Prev [1](#) [2](#) [3](#) [4](#) [5](#) [6](#) [7](#) [8](#) [9](#) [10](#) ... [Next](#) [Last](#)

| AOS Time             | Operator | Notes | Packets |                         |
|----------------------|----------|-------|---------|-------------------------|
| 25-Jul-2009 06:35:18 | ja6pl    |       | 1       | <a href="#">Details</a> |
| 25-Jul-2009 04:57:56 | jh4xsy   |       | 0       | <a href="#">Details</a> |
| 25-Jul-2009 04:57:47 | JH1BCL   |       | 7       | <a href="#">Details</a> |
| 25-Jul-2009 04:56:44 | satsuki  |       | 11      | <a href="#">Details</a> |
| 25-Jul-2009 04:56:05 | ja6pl    |       | 7       | <a href="#">Details</a> |
| 25-Jul-2009 03:19:17 | JA0CAW   |       | 12      | <a href="#">Details</a> |
| 25-Jul-2009 03:18:26 | satsuki  |       | 12      | <a href="#">Details</a> |
| 25-Jul-2009 03:17:48 | ja6pl    |       | 5       | <a href="#">Details</a> |
| 25-Jul-2009 01:41:06 | ja1gde   |       | 2       | <a href="#">Details</a> |
| 25-Jul-2009 01:39:10 | ja6pl    |       | 2       | <a href="#">Details</a> |
| 25-Jul-2009 00:02:24 | ja1gde   |       | 4       | <a href="#">Details</a> |
| 25-Jul-2009 00:02:15 | JH1BCL   |       | 5       | <a href="#">Details</a> |
| 25-Jul-2009 00:00:16 | ia6pl    |       | 13      | <a href="#">Details</a> |



# CPX Data Decoder Stats

- | operator  | packets | bytes_downloaded |
|-----------|---------|------------------|
| SRI       | 3357    | 358347           |
| Anonymous | 2881    | 228672           |
| abonk     | 1774    | 200147           |
| jfoley    | 2004    | 198763           |
| JA0CAW    | 1693    | 117528           |
| satsuki   | 1516    | 117436           |
| ZL2BX     | 1509    | 104275           |
| atwillia  | 920     | 85802            |
| dcuddeba  | 634     | 68725            |
| vk5hi     | 994     | 67002            |
| sfitzsim  | 535     | 65338            |
| VK5HI-1   | 846     | 64258            |
| ja6pl     | 934     | 59435            |
| jelcvl    | 692     | 49843            |
| WA4SCA    | 512     | 47855            |
| jbowen    | 385     | 42917            |
| Alan      | 595     | 40785            |

# CPX Data Decoder Stats

|            |     |       |
|------------|-----|-------|
| JH1BCL     | 432 | 37752 |
| jalgde     | 483 | 30997 |
| kd8cao     | 305 | 28783 |
| jabhatti91 | 206 | 22201 |
| dk3wn      | 250 | 15356 |
| N8MH       | 120 | 12109 |
| JO1PTD     | 83  | 4851  |
| WB2OQQ     | 73  | 4444  |
| ibland     | 71  | 4413  |
| mbryant    | 65  | 4261  |
| je9pel     | 47  | 2891  |
| jh4xsy     | 43  | 2679  |
| jilizr     | 13  | 719   |
| jabel      | 9   | 441   |
| rnugent    | 7   | 415   |
| gmanyak    | 6   | 408   |
| KB9ZWL     | 6   | 404   |
| IK1ODO     | 5   | 401   |
| VK5DG      | 5   | 157   |
| polysat    | 3   | 143   |
| denneny    | 7   | 57    |

# CPX Decoder Survey

- Survey given to registered users
- 14 responses so far
- Disclaimer: I am not a pollster



# Survey Results

## ■ Doppler Tuning:

- 65% automatic
- 15% manual
- 20% automatic with fine-tune manually

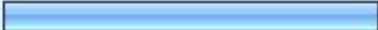

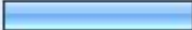


## ■ Antennas:

- 50% high gain with az/el rotators
- 30% low gain with az/el rotators
- 20% manual

# Survey Results

## 2. What model radio are you using?

 [Create Chart](#)  [Download](#)

|  |   | Response Percent   | Response Count           |
|--|---|--|--------------------------|
| Icom IC-910H   |  | 28.6%  | 4                        |
| Yaesu FT-847   |  | 14.3%  | 2                        |
| Kenwood TS-2000  |  | 14.3%  | 2                        |
|  <a href="#">Hide replies</a> | <b>Other (please specify)</b>   |  | <b>42.9%</b><br><b>6</b> |

- 1. IC-375D Fri, Jul 3, 2009 8:11 PM  [Find...](#)

---

- 2. IC-911D Wed, Jul 1, 2009 2:25 PM  [Find...](#)

---

- 3. Icom IC-821 Tue, Jun 30, 2009 6:01 AM  [Find...](#)

---

- 4. Icom IC-820 Mon, Jun 29, 2009 4:49 PM  [Find...](#)

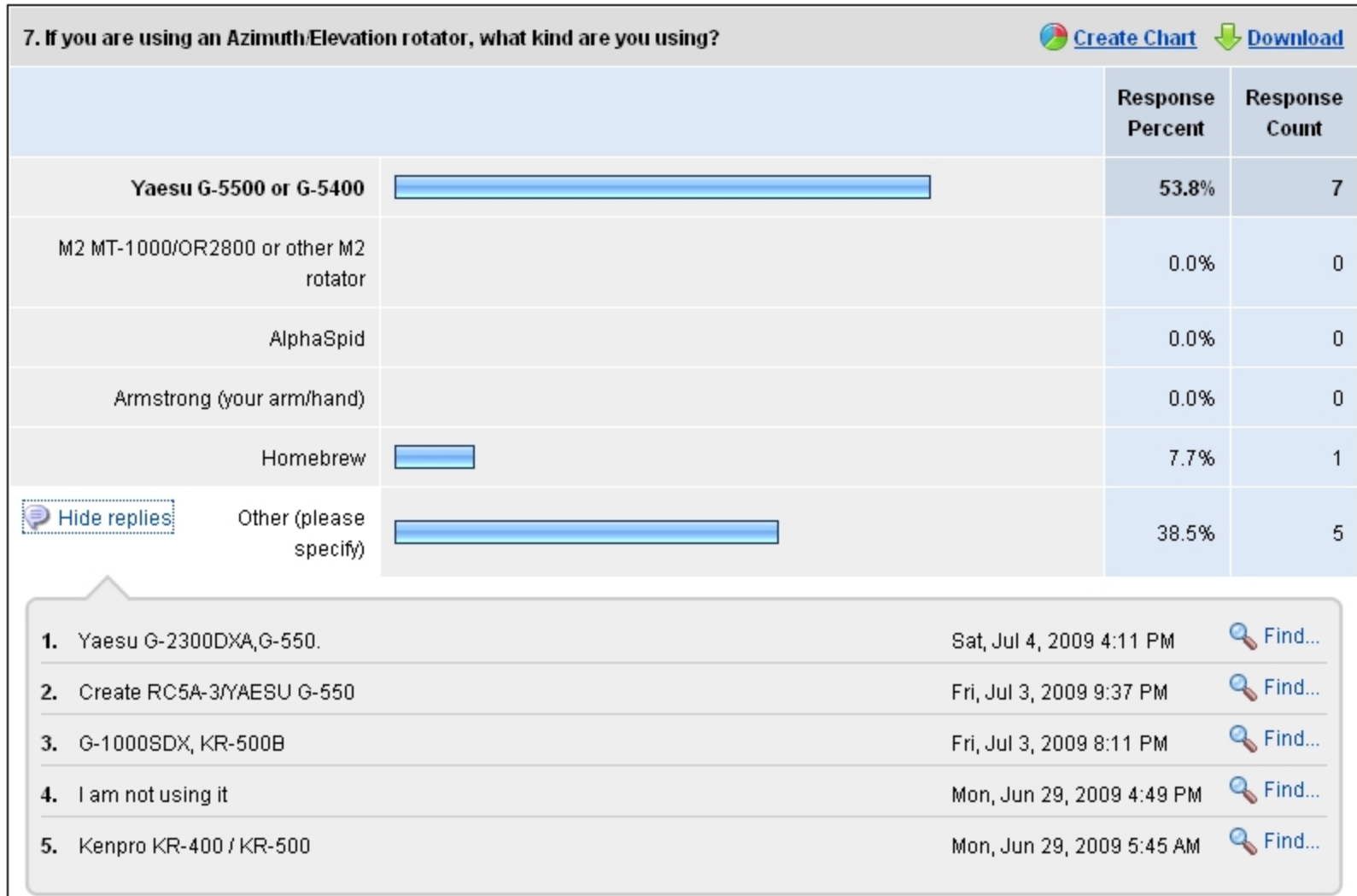
---

- 5. Icom IC-970D Mon, Jun 29, 2009 9:44 AM  [Find...](#)

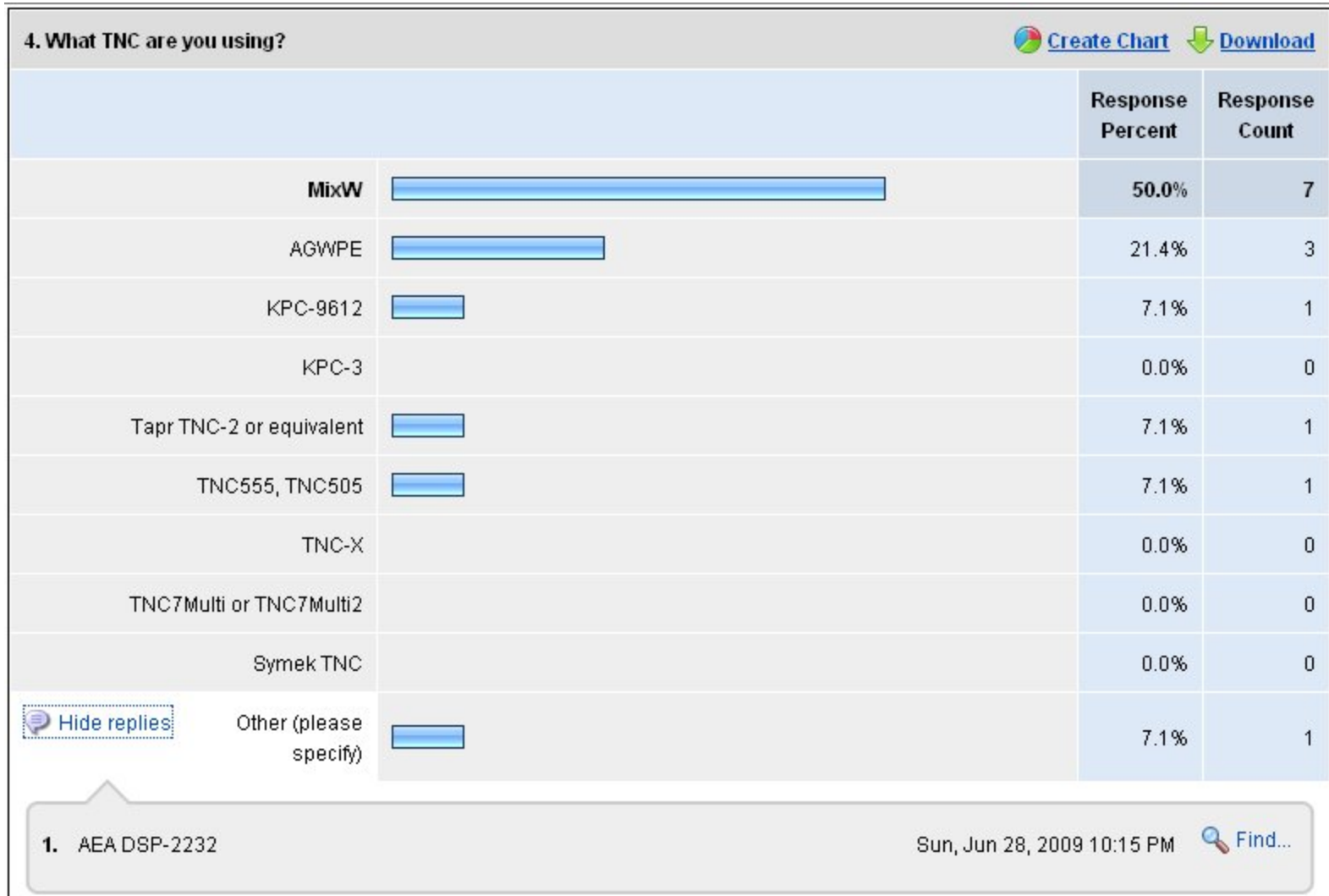
---

- 6. PCR-1000 Mon, Jun 29, 2009 5:45 AM  [Find...](#)

# Survey Results



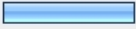



# Survey Results



# Survey Results

## 9. What pass prediction software are you using?

[Create Chart](#) [Download](#)

|   | Response Percent | Response Count |
|---|------------------|----------------|
| MacDoppler   | 14.3%            | 2              |
| Nova  | 0.0%             | 0              |
| SatPC32    | 14.3%            | 2              |
| Orbitron  | 0.0%             | 0              |
| InstaTrak   | 0.0%             | 0              |
| Predict or variants    | 7.1%             | 1              |
| SCRAP   | 0.0%             | 0              |
| <a href="#">Hide replies</a> <b>Other (please specify)</b>  | <b>64.3%</b>     | <b>9</b>       |

- Homebrew software Sun, Jul 5, 2009 5:59 AM [Find...](#)
- Calsat32 by JR1HU0. Sat, Jul 4, 2009 4:11 PM [Find...](#)
- Ksat or Calsat Fri, Jul 3, 2009 9:37 PM [Find...](#)
- Winorbit ,Calsat99 and Calsat32 Fri, Jul 3, 2009 8:11 PM [Find...](#)
- homebrew Thu, Jul 2, 2009 10:11 PM [Find...](#)
- CALSAT32 Wed, Jul 1, 2009 2:25 PM [Find...](#)
- Calsat32 Mon, Jun 29, 2009 4:49 PM [Find...](#)
- CALSAT32 Mon, Jun 29, 2009 6:08 AM [Find...](#)
- Wisat (SatPC32 auxillary program) Mon, Jun 29, 2009 5:45 AM [Find...](#)

# CPX Decoder vs. GENSO

- CPX Decoder is meant as a temporary solution
- When GENSO is operational, we will use it and put our ground stations on the network
- GENSO testing already happening at Poly
- Neil Melville PA9N will be giving a presentation on GENSO (tomorrow?)

# Thanks

Bryan Klofas

[bklofas@gmail.com](mailto:bklofas@gmail.com)

[polysat.calpoly.edu](http://polysat.calpoly.edu)