TCS3 Servo Design Review - Software

Software algorithm for VTCS, RTCS and PMAC

VTCS Modes	RTCS Modes	PMAC notes	Comments
Idle	Idle	OpenServo Brakes Locked Amp Disabled	
Track	Track	Jog or PVT (Jog preferred)	Target is an RA, DEC mean coordinate
Slew	Slew	Jog to Position	Target is an RA, DEC mean coordinate
MP	MP	Jog to position	Move Position mode will move the axis to an HA, Dec mount position
MV	MV	Jog at velocity	Move Velocity mode will move the axis at a specified velocity.

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Dual Output per axis is implement using a PMAC PLC using simple algorithm

```
dac0 = PID output
dac1 = motor 1 DAC
dac2 = motor 2 DAC
base = backlash value for dac
if( dac0 < 0 )
   dac1 = -base + dac0
   dac2 = base
else
   dac1 = -base
   dac2 = base + dac0
```

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Tachometers as a velocity sensor

PMAC can accept an analog voltage as a 2nd position sensor. However, only a single input per axis is allowed.

Tachometer becomes a position sensor use to close velocity loop.

Tachometer's scaling (resolution) is TBD.

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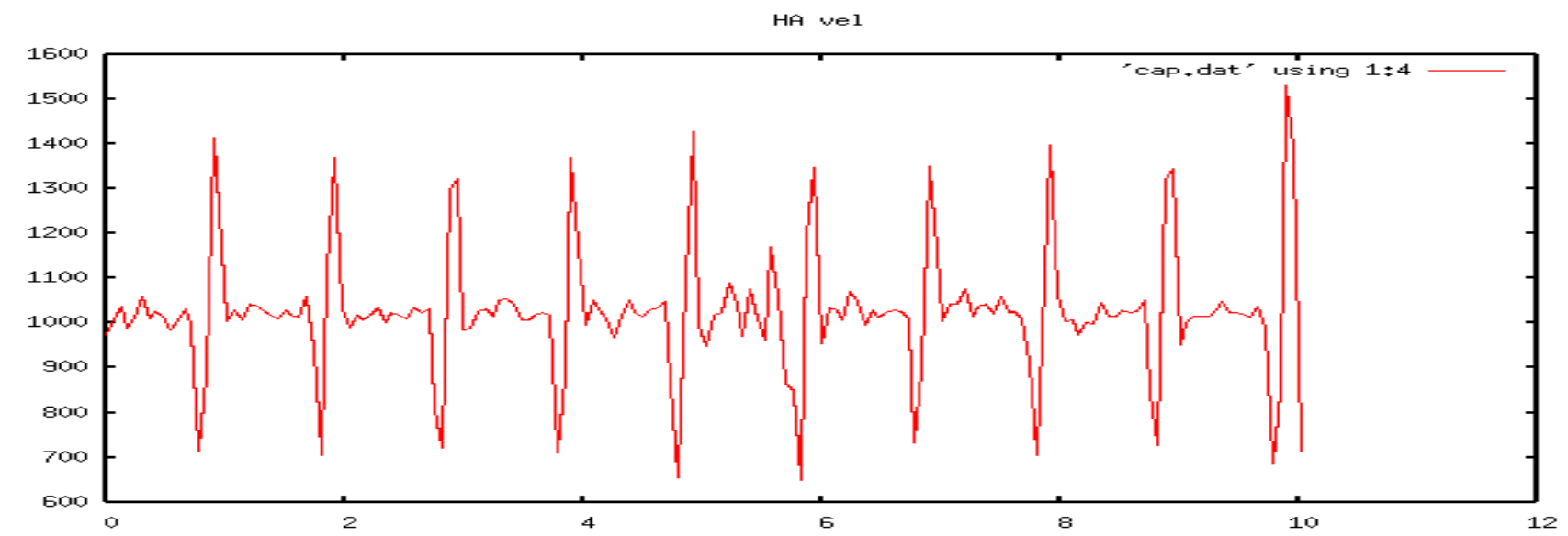
PVT Test 1 – Page 5

Note the discontinuity when switching PVT buffer on velocity graph.



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Jog vs PVT

Tracking w/ a beamswitch

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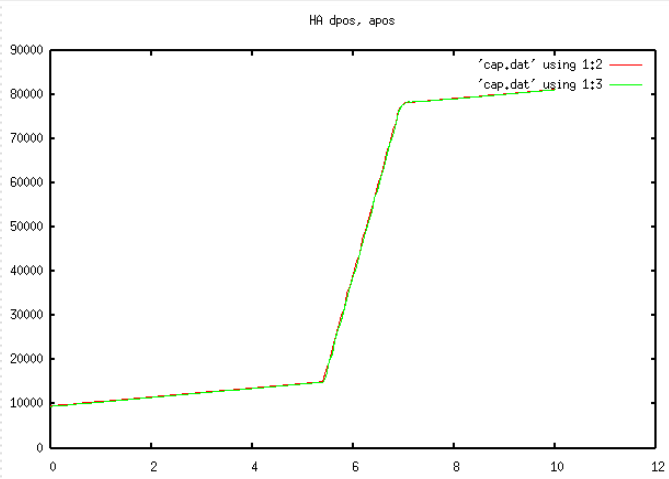
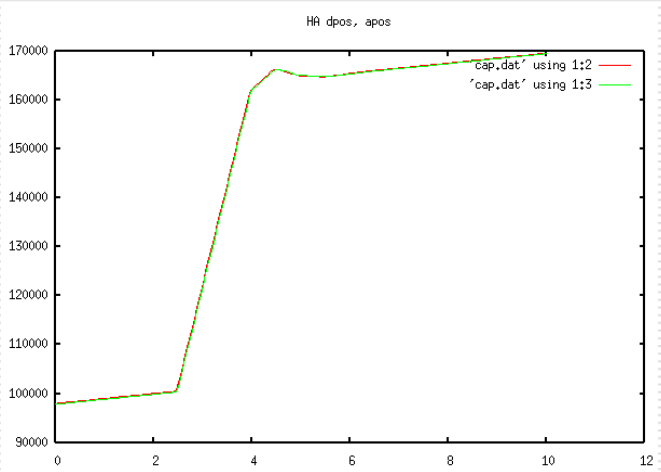
PVT Beamswitch on top. PVT updates at 0.1 ms.

JOG beam switch on bottom. Jog update at 0.5 sec.

PVT is potentially recovers better after beamswitch





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Jog vs PVT

Tracking Only

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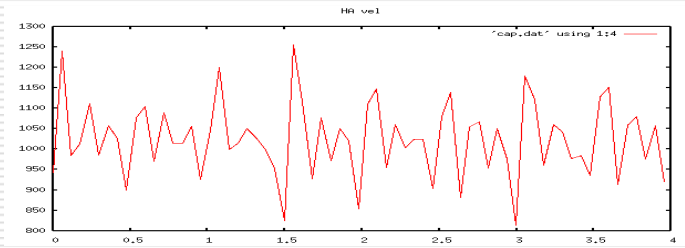
PVT velocity range is 800 to 1300 (500 counts)

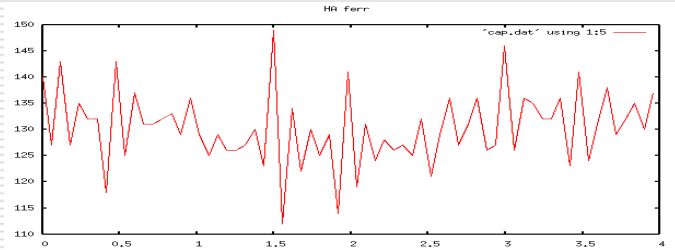
Jog velocity range is 960 to 1080 (120 counts)

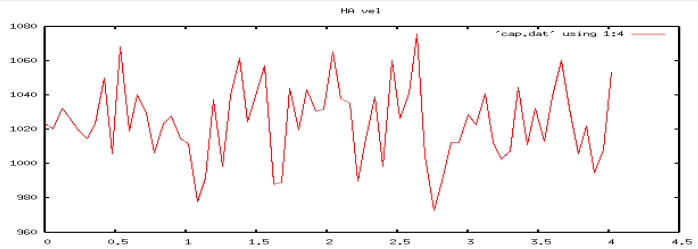
PVT Following error range is 110 to 150 (60)

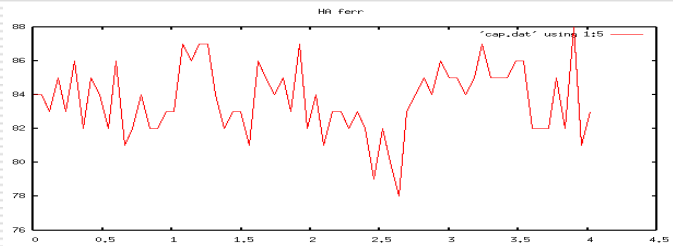
Jog following error range is 76 to 86 (10 counts)

Should be noted, PVT performance should improve with move work.









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No critical software issue with the PMAC.

Some thinking needed on how to scale the tachometer signal into the PMAC

PVT or JOG can be used to implement tracking.

Tony prefer jog method for tracking.