Column headings – **ops**: NRAO operations and technical staff time; **sci**: NRAO / SAO scientist time; **ant**: antenna time, 1, 2, 4, or all available antennas, as noted; **correl**: correlator time in line or continuum mode; **sao**: SAO engineering and technical staff time away from Cambridge. Time notation – **1h**: 1 hour; **1d**: 1 day shift; **(n)** at night, starting after sunset; **(d)** during the day starting after ionization; **vis#**: visit #.

Single Aperture VHF Testing

Feb/Mar 2005

task	ops	sci	ant	correl	sao
Install Prototype-1 w/ loaded dipole -Bench test dipole assembly & VHF RF module (prototypes 1 & 2) -Plan activities -Terminate input ports on VHF module	2d				2d vis1
-Fully retract subreflector -*PM*: **record** output power of 4m-band RF modules in vertex room -*S/A*: **record** sweep of 4m-band output -Disconnect heliax from 4m-band RF module input -Drill P-band balun plate -Thread cables to barrel -Clamp standoffs, mount VHF dipoles -Disconnect P-band RF module power and cal. control cable -Bolt VHF RF module to base plate -Connect power and cal control cable -*PM*: **record** VHF output while toggling cal cntrl; **stable?** -Attach dipole cables to VHF module -*PM*: **record** VHF output; **stable?** Pad VHF RF module as required -Connect pass-thru power cable to P-band -*PM*: **record** P-band RF module output -Connect pass-thru signal cable to P-band -*PM*: **record** combined signal at VHF module output port; **stable?** -Connect heliax to VHF output port ***Barrel work finished***	1d		1d		1d vis1

task	ops	sci	ant	correl	sao
-Remove input and output cables from 4m-band RF module; set toggle cal control line off -*PM+VHF BPF*: **record** heliax power -PM+P-band BPF: **record** heliax power -*S/A*: **record** sweep at heliax output -Connect heliax to 4m-band RF input -*PM*: **record** output power of 4m-band RF module -*S/A*: **record** sweep; **stable?** -Check balance among bands using PM and S/A results; connect to A-rack -Configure IF system for VHF band -*S/A*: **record** sweeps in control bldg for 4m, VHF, and P-bands. compare to vertex room measurements; **stable?** *Pointing:* establish model	1d cont'd	3h	1d cont'd 3h (d)		1d vis1 cont
Assess P/L/X impact *-Full array correlation:* of compact source and ratio of CALIB gains w/w/o VHF dipoles, w/w/o shorted and open dipoles (continuum: L/X, line:P) -*Sync detectors*: confirm above results via ratio of noise powers w/w/o VHF dipoles, at zenith and low elv (L/X/P); -*Holographic mode:* Measure 2D **P-band** LCP/RCP beam pattern vs reference antenna w/,w/o VHF dipoles	6h 6h 2h	6h 6h 2h	6h (n) *all ant.* 6h (n) 2h (d?) *2 ant.*	6h 2h	2d vis1 2d vis1
VHF Performance -$T_{sys}(\nu)$, A_e, *spillover:* measure using ND, sync detector, BPF, and tip; estimate A_e w/ flux cals; evaluate solar interference -*S/R rotation:* re-estimate A_e, repoint as required -*Beam:* measure rough 2D VHF beam pattern or cuts, scanning VirgoA, >1x -*Focus:* experiment w/ long standoffs	4h	6h 3h	3h(d) 3h(n) 3h (n) 3h (n) 4h (n)		2d vis2 2d vis2

RFI environment -*S/A:* **record** sweeps at various pointings; check linearity -*S/A:* **record** sweeps and pointing azel over 24h, multiple days	 1d eng.		 2h (n) 2h(d) piggy back		

Single Baseline VHF Testing

Feb/Mar 2005

task	ops	sci	ant	correl	sao
Install Prototype-2 w/ loaded dipole -Repeat mech/electrical connection	1d		1d (d)		1d vis3
Assess P/L/X impact -Repeat P/L/X impact testing	 6h 6h 2h	 6h 6h 2h	 6h (n) 6h (n) 2h (d?) *2 ant.*	 6h 2h	 2d vis3
Fringe test -Unpolarized sources; phase stability of RCP w/r to LCP		 2h	 1h (n) 1h (d)	 2h	
VHF performance *-Repeatability:* repeat performance tests compare T_{sys}, A_e, spillover to previous; use single dish and cross-power data; - *Leakage:* assess RL/RR RL/LL		 8h	 4h(d) 4h(n)	 4h	 2d vis4
RFI environment -*cross-power spectra:* 12 MHz and 780 kHz @ 178-208 MHz, various pointings *-S/A:* compare sweep with above, various pointings		 2h 2h	 2h (n) 2h (n)	 2h	
Beam pattern -*Holographic mode:* measure 2D **VHF** beam pattern for each antenna vs the other; characterize squint; frequency dependence		 4h	 4h (n)	 4h	

Subarray (4) VHF Testing

Mar/Apr 2005

task	ops	sci	ant	correl	sao
Install Prototypes-3/4 -Repeat mech/electrical connection	1d		1d (d) maint		1d vis5
Fringe test -*closure:* unpolarized compact sources		1h	1h (n)	1h	
RFI environment -*cross-power spectra:* 12 MHz and 780 kHz @ 178-208 MHz, various pointings -*S/A:* compare sweep with above, various pointings		2h 2h	2h (n) 2h (n)	2h	
VHF performance -*Repeatability:* repeat performance tests compare T_{sys}, A_e, spillover to previous; use cross-power data only; - *Leakage:* assess RL/RR RL/LL -*Synthesis:* image noise; spectral baselines; D-terms and stability		4h	4h(n) 3x6h 4 ant.	4h 3x6h	

SAO=17d in 5 visits with 10 travel days (1 person). Estimate 5 monthly 2d trips during deployment following delivery of every 6 systems.