

EVLA Feeds CDR

Project Schedule & Budget



EVLA Schedule

Baseline Plan Caveats 1

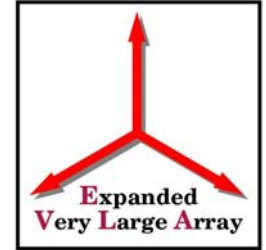


- *Baseline Plan* calls for outfitting 4 to 5 new EVLA antennas per year thru 2010.
- New EVLA antennas must provide same (or wider) frequency coverage during the *Transition Phase* in the Core Receiver Bands (L, C, X, K & Q-Band).
- New EVLA L-Band Rx's will have the new broadband 1-2 GHz OMT and wide-dynamic range balanced cryo amps.
- New EVLA C-Bands Rx's will use the gestating 4-8 GHz OMT which is scaled from the L-Band design.
- EVLA K & Q-Band Rx's will be upgrades of the existing VLA Rx's.



EVLA Schedule

Baseline Plan Caveats 2

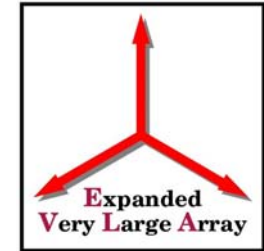


- As soon as possible, begin providing the new frequency bands (Ka & S).
- Existing Ku-Band capability will be sacrificed during early stages.
- New broadband X-Bands will come at the very end of the Project; until then (and maybe forever?) will use old *Transition* X-Band Rx's & Feeds.
- A number of early L, C, K & Q-Band Rx's will be *Interim* systems that will be upgraded later (with new Card Cages, wideband polarizers, etc.) or replaced with brand new EVLA designs.



EVLA FE & Feed Schedule

Baseline Plan (~4 Antennas/Year)



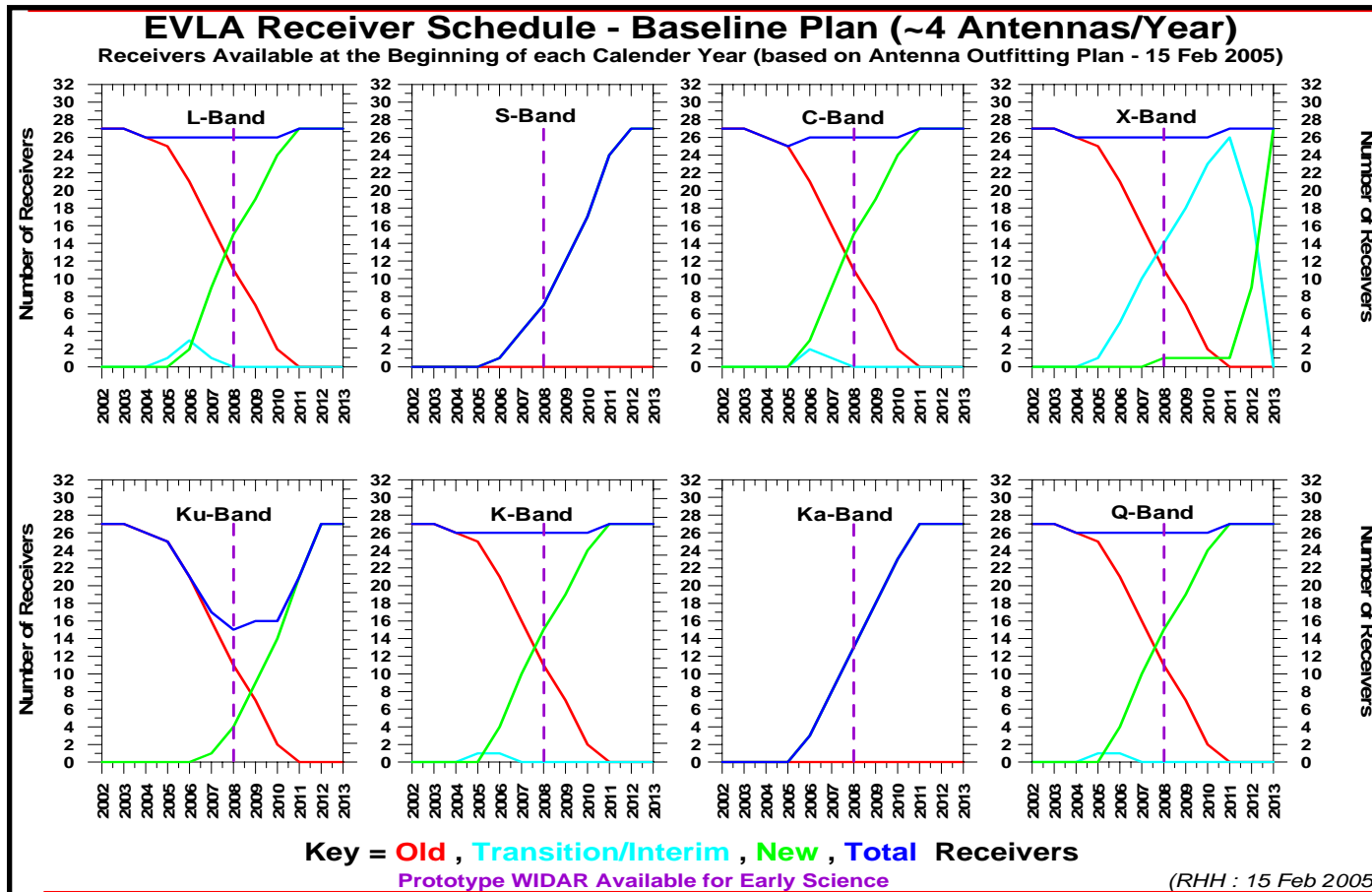
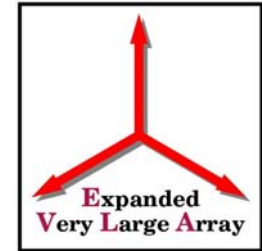
Key : T1 = Test Ant #1 , T2 = Test Ant #2 , P3 = Production Ant #3 ,
 P = Prototype Rx , U = Upgraded Rx , T = Transition Rx ,
 R = Retrofit Rx , N = New Rx

Calendar	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	
Antennas		>---T1---	>---T2---	>---P3-5---	>---6-10---	>---11-15---	>---16-19---	>---20-24---	>---24-28---			
K -Band		>---PT---	>---1T---	>---3U+1R---	>---5U+1R---	>---5U---	>---4U---	>---5U---	>---4U---	>---2U---		= 32
Q -Band		>---PT---	>---1T---	>---3U+1R---	>---5U+1R---	>---5U---	>---4U---	>---5U---	>---4U---	>---2U---		= 32
L -Band		>---PT---	>---1T---	>---1T+2N---	>---5N+1R---	>---5N+1R---	>---4N+1R---	>---5N---	>---4N---	>---2N---		= 33
X -Band		>---PT---	>---1T---	>---3T---	>---5T---	>---4T+PN---	>---4T---	>---5T---	>---4T---	>---8N---	>---21N---	= 57
C -Band		>---PT---	>---1T+3N---	>---5N+1R---	>---5N+1R---	>---4N---	>---5N---	>---4N---	>---2N---			= 32
Ka-Band		>---PN---	>---2N---	>---5N---	>---5N---	>---5N---	>---5N---	>---4N---	>---3N---			= 30
S-Band			>---PN---	>---3N---	>---3N---	>---5N---	>---5N---	>---7N---	>---6N---			= 30
Ku-Band				>---PN---	>---3N---	>---5N---	>---5N---	>---8N---	>---8N---			= 30
No. of	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	
Transition Rx's		0	4	10	5	4	4	5	4	0	0	= 36
Upgraded Rx's		0	0	6	10	10	8	10	8	4	0	= 56
New Rx's		0	0	9	19	22	23	25	27	29	21	= 175
Retrofitted Rx's		0	0	2	4	2	1	0	0	0	0	= 9
Total per year		0	4	27	38	38	36	40	39	33	21	= 276



EVLA Receiver Schedule Baseline Plan (~4 Antennas/Year)

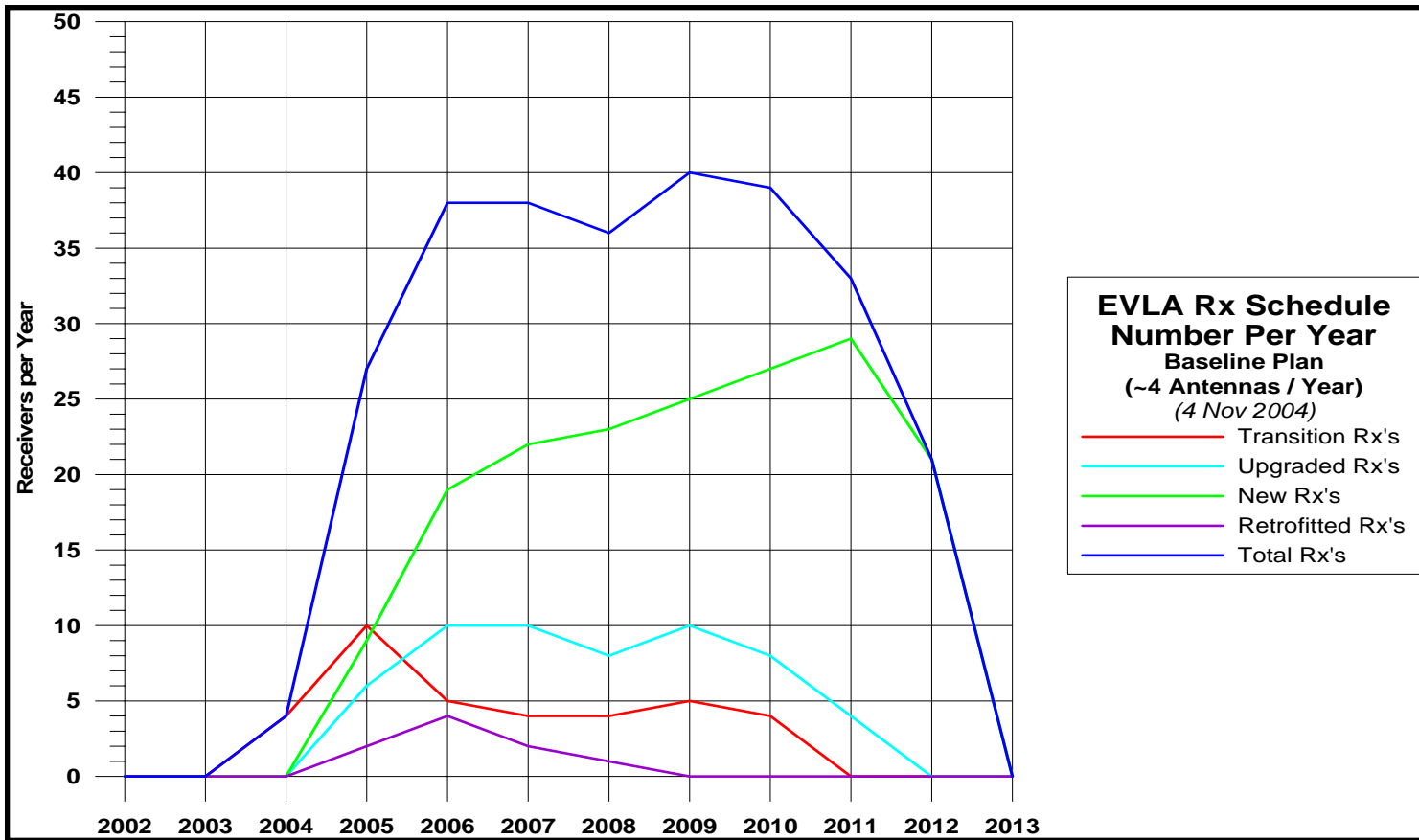
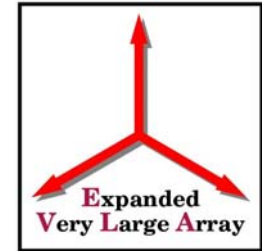
*Number of Receivers Available at the
Beginning of each Calendar Year*





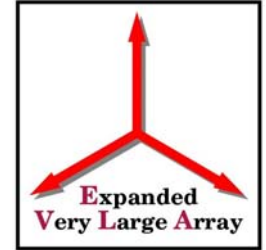
EVLA Baseline Plan

Number of FE Systems / Year





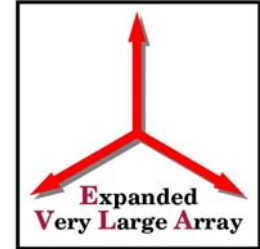
Feed Procurement



- Feeds will be procured at the same rate (or faster) than the receiver construction rate.
- External contract for the L & S-Band Laminated Feeds calls for a delivery rate of up to 6 per year.
- Full production orders will be made for all the Centrifugal-Cast components, although delivery at the manufacturer's schedule is allowed (need > 6 per year).
- Final "Finish" machining & fabrication of remaining components done (largely in-house) at the yearly antenna rate.



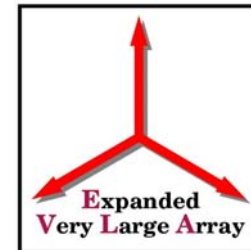
L-Band Feed Production Estimates



L-Band Production Costs	For 27 Units
Lamination	\$492K
C-Cast Components	\$273K
Machining (NRAO @ 150 hrs/feed)	\$75K
Total	\$840K



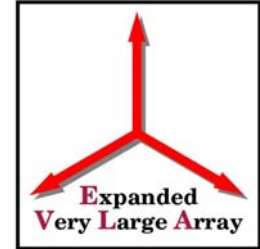
L-Band Feed Total Cost Estimates



Feed	Cost of Prototype & Testing	Cost of 27 Production Feeds	Average Cost Per Feed
L-Band	\$62K	\$840K	\$32.2K



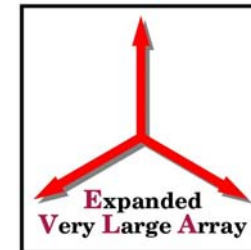
C-Band Feed Production Estimates



C-Band Production Costs	For 27 Units
C-Cast Components (@ \$8.1K / feed)	\$219K
Machining (NRAO @ 230 hrs / feed)	\$339K
Total	\$558K



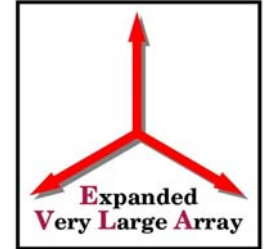
C-Band Feed Total Cost Estimates



Feed	Cost of 2 Prototypes & Testing	Cost of 27 Production Feeds	Average Cost Per Feed
C-Band	\$20K	\$578K	\$19.9K



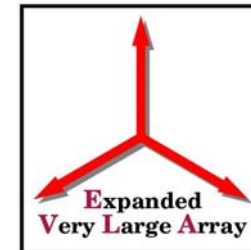
Ka-Band Feed Production Estimates



Ka-Band Production Costs	For 28 Units
Material (@ ~\$1K / feed)	\$29K
Machining (NRAO @ 125 hrs / feed)	\$82K
Total	\$111K
Average Cost Per Feed	\$4.0K



Total EVLA Feed WBS Cost Estimates



Feed	M & S	Machining (FTE)
L-Band	\$825K	1.8
S-Band	\$593K	1.5
C-Band	\$244K	1.3
X-Band	\$135K	3.0
Ku-Band	\$66K	2.4
K-Band	\$28K	1.6
Ka-Band	\$29K	1.1
Q-Band	\$6K	0.2
Totals	\$1,926K	12.9 FTE