	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
1	**Engineering & Technology Development Plan 2007-2011**										**5-YEAR TOTALS**					ARK 10 FEB 2006				R&Dbudget2007b2.xls	
2																					
3							FTE	FTE	FTE	FTE	Materials	Test	Outside	Computer	Computer	Line	Line	Topic Totals		Topic Totals	
4	Section					Priority	scientists	Elec/Mech	Software	technicians		Equipment	Contracts	hardware	software	Totals	Totals	**All priorities**		**Priority 1 only**	
5								engineers	engineers							$	FTE	$	FTE	$	FTE
6	**1**	**Antenna R & D**																**$1,314,000**	**51.0**	**$1,029,000**	**21.0**
7	1.1		Focal plane arrays			1	4	7	0	9	$300,000	$535,000	$150,000	$10,000	$5,000	$1,000,000	20.0				
8	1.2		Metrology			2	2.5	5	0	5	$150,000	$0	$0	$20,000	$10,000	$180,000	12.5				
9	1.2.1				Dense Metrology Sensor Infrastructure	2															
10	1.2.1				Position and Displacement Sensors for GBT	2															
11	1.3		Feed-Amplifier Integration			2	2.5	10	0	5	$75,000	$0	$0	$20,000	$10,000	$105,000	17.5				
12	1.4		Physical Optics			1	1	0	0	0	$0	$0	$0	$12,000	$17,000	$29,000	1.0				
13																					
14	**2**	**Receiver Technology**																			
15	**2.1**		**Amplifiers**			1	0	5	0	10	$100,000	$500,000	$0	$20,000	$20,000	$640,000	15.0	**$1,690,000**	**58.8**	**$1,210,000**	**26.3**
16	2.1.2				MMIC Technology	2	0	10	0	15	$250,000	$0	$0	$20,000	$20,000	$290,000	25.0				
17	2.1.3				HFET Noise Theory	1	0	2.5	0	1.25	$175,000	$0	$0	$10,000	$5,000	$190,000	3.8				
18	2.1.4				1/f noise in HFETs	1	0	2.5	0	1.25	$175,000	$0	$0	$10,000	$5,000	$190,000	3.8				
19	2.1.5				HBT Noise	1	0	2.5	0	1.25	$175,000	$0	$0	$10,000	$5,000	$190,000	3.8				
20	2.1.6				InP HBT ICs	2	0	2.5	0	5	$175,000	$0	$0	$10,000	$5,000	$190,000	7.5				
21	**2.2**		**SIS Mixers**																		
22	2.2.2				Technology Dev for 780-950 GHz Heterodyne Rx	1	2.45	0.55	0.5	1.9	$16,500	$0	$1,040,000	$4,000	$0	$1,060,500	5.4	**$1,060,500**	**5.4**	**$1,060,500**	**5.4**
36	**2.3**		**Specific Receiver Systems**																		
37	2.3.1				Continuum Radiometer Development	2	0	2.75	0	3.3	$0	$464,200	$0	$0	$0	$464,200	6.1	**$464,200**	**6.1**	**$0**	**0.0**
46	**2.4**		**LO & Signal Sources**															**$1,280,000**	**42.5**	**$0**	**0.0**
47	2.4.1				Highly integrated multiplier chains	2	0	5	0	10	$200,000	$0	$0	$20,000	$10,000	$230,000	15.0				
48	2.4.2				Photonic LO	2	2.5	10	0	15	$500,000	$500,000	$0	$25,000	$25,000	$1,050,000	27.5				
49																					
50	**3**	**Signal Processing and Transmission**																**$2,865,000**	**117.8**	**$1,765,000**	**33.8**
51	**3.1**		**Digital Signal Transmission**			2	0	5	0	10	$40,000	$0	$0	$20,000	$10,000	$70,000	15.0				
52	**3.2**		**Satellite-Based LO Reference**			2	2.5	2.5	0	5	$100,000	$0	$0	$10,000	$10,000	$120,000	10.0				
53	**3.3**		**Wide Bandwidth Digitization**			1	2.5	3.75	0	5	$100,000	$0	$0	$500,000	$25,000	$625,000	11.3				
54	**3.4**		**RFI Mitigation**																		
55	3.4.1				General	2	2.5	7.5	0	5	$150,000	$0	$0	$50,000	$20,000	$220,000	15.0				
56	3.4.2				Digital Filtering	2	0	10	0	5	$75,000	$0	$0	$0	$115,000	$190,000	15.0				
57	3.4.3				Spatial Nulling	2	5	0	0	0	$20,000	$0	$0	$10,000	$5,000	$35,000	5.0				
58	3.4.4				Blanking and Adaptive Cancellation	2	2.5	2.5	0	0	$75,000	$0	$0	$50,000	$100,000	$225,000	5.0				
59	3.4.5				Signal Propagation	2	2.5	1.5	0	2.5	$0	$50,000	$0	$10,000	$10,000	$70,000	6.5				
60	**3.5**		**Advanced Digital Correlators**			1	2.5	10	0	10	$230,000	$0	$500,000	$400,000	$10,000	$1,140,000	22.5				
61	**3.6**		**Water Vapor Radiometers**			2	2.5	5	0	5	$150,000	$0	$0	$10,000	$10,000	$170,000	12.5				
62																					
63																					
64																**Total M&S**	**Total FTE**				
65			**All projects, funds permitting**			1 & 2	**37.5**	**113.1**	**0.5**	**130.5**	**$3,231,500**	**$2,049,200**	**$1,690,000**	**$1,251,000**	**$452,000**	**$8,673,700**	**281**				
66																					
67																**Total M&S**	**Total FTE**				
68			**Priority 1 projects, minimum funding**			1	**12.5**	**33.8**	**0.5**	**39.7**	**$1,271,500**	**$1,035,000**	**$1,690,000**	**$976,000**	**$92,000**	**$5,064,500**	**86**				
69																					