

<u>mass estimate</u>									
mu =	3.986E+14 m^3/s^2				<u>thruster:</u> R-40B				
r_earth =	6,378,136 m				type: Biprop				
g_0	9.80665 m/s^2				fuel NTO (MON-3)/MMH				
parking orbit altitude =	200 km	P =	5309.64 s	1.47 hrs	ISP = 293 s				
insertion accuracty =	30 km	mass = 6.80 kg							
HST altitude in 2020 =	532 km	P =	5,717 s	1.59 hrs					
reboost altitude =	616 km	P =	5,821 s	1.62 hrs					
de-orbit altitude =	120 km	P =	5,213 s	1.45 hrs					
HST mass =	12,273 kg								
HSTRV final mass =	705 kg	(dry mass + evasive maneuver reserve + 20% fuel reserve) - iterated on 'mass estimate' tab							

mission phase	initial altitude (km)	final altitude (km)	V_initial (m/s)	a (m)	V_1 (m/s)	ΔV_1 (m/s)	V_2 (m/s)	V_final (m/s)	ΔV_2 (m/s)	Total ΔV (m/s)	m_i/m_f	final mass (kg)	initial mass (kg)	prop mass (kg)	maneuver time (s)	maneuver time (hr)
de-orbit (ellipse)	616	120	7,549	6,746,136	7,409	-140				-140	1.050	705	740	35	2,757	0.77
re-boost (HT)	532	616	7,595	6,952,136	7,618	23	7,526	7,549	23	46	1.016	13,013	13,221	209	5,769	1.60
rendezvous & dock (cold gas)										25	1.036	949	982	(34)		
parking to rendezvous	170	532	7,802	6,729,136	7,906	104	7,492	7,595	103	207	1.075	982	1,056	73	5,494	1.53
evasive maneuver (guess - low estimate from SMAD w/o HST attached) (iteratively added to final mass)										150	1.054	1,002	1,056	54	10,619	2.95

total propellant mass for main thruster:

371 kg

3.89