$\underline{\underline{M}} = \pi L$, $\quad L = M/\pi$

$L_e = M_e/\pi$ $\qquad \underline{M_e = 264.2}$

$L_e = 84 \ W/m^2 sr$

2x transit through atmosphere

0.64 each pass $\qquad (0.64)^2 = 0.4$

$L = 84 \times 0.4 = \boxed{34 \ W/m^2 sr}$

CCD area array

512 × 512

15 μm pixel

Quantum Efficiency = 20%

$$\frac{\#\text{ freed electrons}}{\#\text{ incident photons}}$$

full well capacity (saturation) 10^5 100,000 electrons

photon energy = $h\nu$

h: planck

ν: freq. c/λ hz, cycles/sec

avg (.7-1.1)

3.243×10^{14} hz.

$Q_{full\ well} = 10^5 \times h\nu$

$= 2.15 \times 10^{-14}$ J

$V_g = \underbrace{2\pi R_e}_{\text{circumference}} / P$ 101 min.

R_e : 6367

V_g = 6601 m/s

to prevent smear, make travel during exposure $< \frac{1}{2} s$

$V_g \cdot T_e < \frac{1}{2} s$

$T_e < \frac{s}{2V_g}$

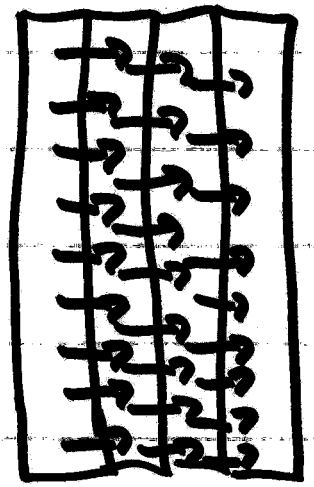
$$T_e < \frac{S}{2V_g} \qquad S = 5m \qquad V_g = 660l$$

$T_e < .0004$ sec , 0.4ms

2640 hz

assumes : slaved to orbit velocity + nadir views

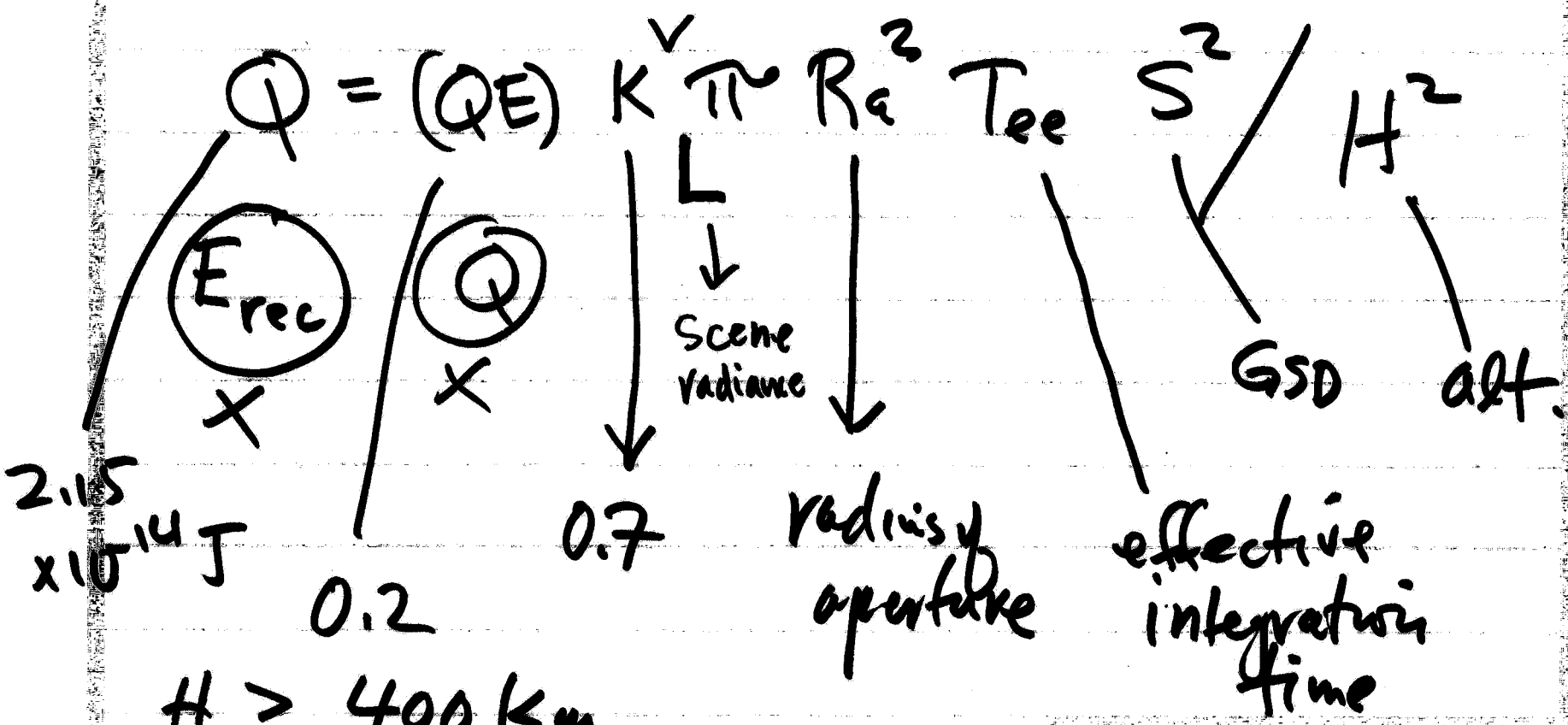
T.D.I. + time delay + integration



4 stages

Determine Te from prior analysis, then effective exposure time is

Tee = Te × no. of stages



H > 400 km

H < 900 km

R_a : no lower limit

R_a < max., weigh req.

S: consistent w/ user req.

(note: "L" was missing in lecture)

if optics are diffraction limited then resolving power is

$$\beta_{min} = \frac{1.22\lambda}{D} = \frac{1.22\lambda}{Ra}$$