

If JFK WAS a HAM

Hello Everybody
I am Nick
the Ragin Cajun from Louisiana
and consummate tinker

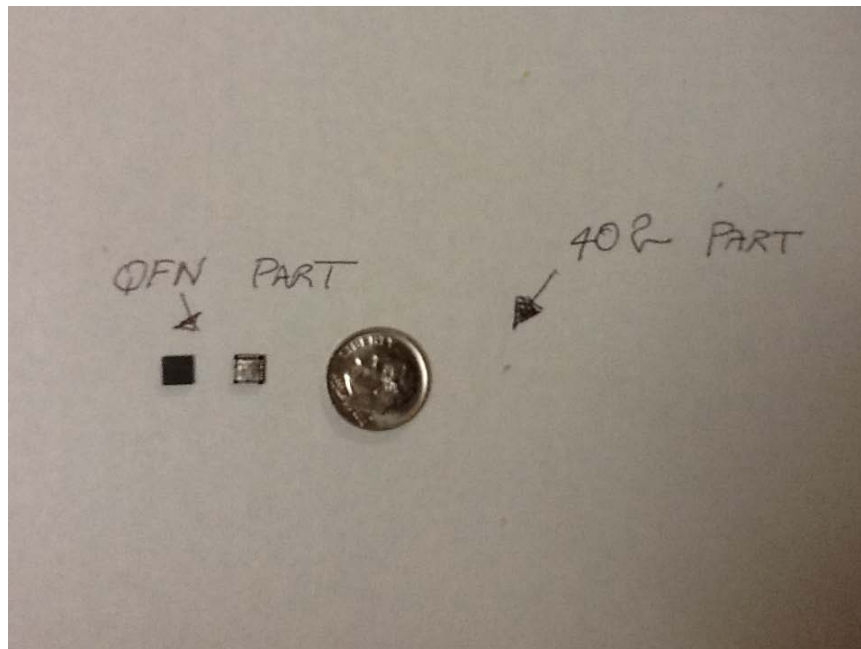
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You might be a tinker if...

- Plug yourself in the wall before you could crawl
- Figured out fly back transformer the hard way
- Sniffed hot solder before you tried smoking
- Built something that caught on fire
- You **ARE** a tinker if you built something that caught on fire on purpose

You know you still got it if...

- You can solder part where the leads are underneath it
- You can solder 402 parts



You know you are loosing it...

- Use a tree as a ladder to erect an antenna and forget where to step



If JFK were a ham,
here is what he might say...

We choose to go to HEO. We choose to go to HEO in two years and do the other things, not because they are easy, but because they are hard, because that goal will serve to organize and measure the best of our energies and skills, because that challenge is one that we are willing to accept, one we are unwilling to postpone, and one which we intend to win, and the others, too.

Ham have a rich history in adding to the satellite state of the art

- AO-1 first NGO to orbit 1961
- Probably the 1st ride share
- Convince NASA and DOT we can build sats that do not comprise the primary
- Micro sat with COT part can go to space

Our Last Major contribution was
micro sats 2 decades ago

it time to get off our duff and start
contributing

SO What it take to get to HEO?

- Like all engineering challenges
 - Ignorance
 - Brute force

So what it really take?

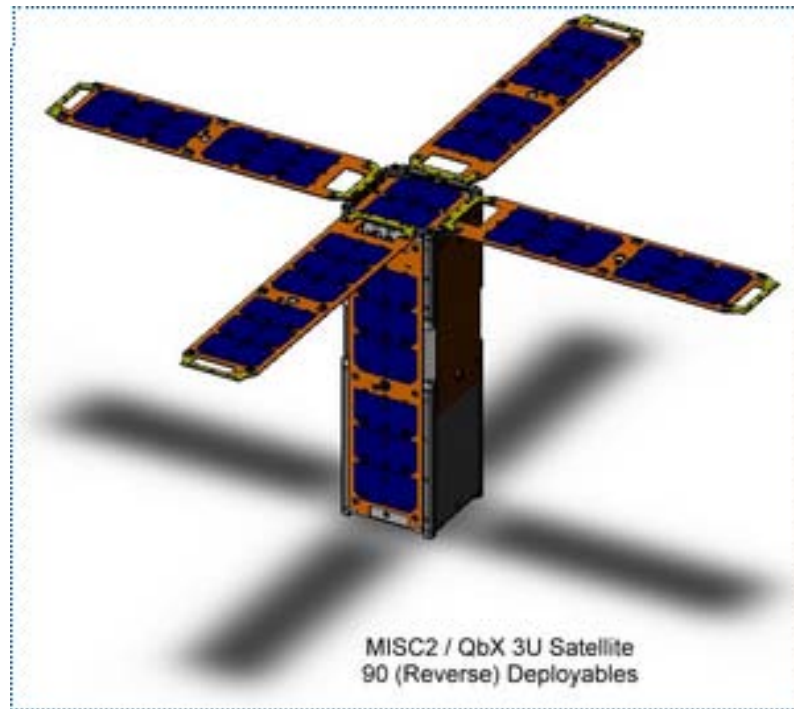
- Rocket
 - NASA via the ElaNTA program makes a 3 U cube ride to LEO doable i.e. FOX, Fund cube, CAPE etc

What is a 3 U Cube & is it big enough ?

- A 3 U cube is a 12X 4 in sat
- Weight < 6 pounds
- Is it big enough? **YES**

How Much Power Can It Generate?

- You can buy a 50 watt solar panel-Pumpkin Inc
- More power if we build it ourselves



Guidance systems ?

- Buy or scrounge off the shelf GPS
- Buy or scrounge reaction wheels system
- Magnatarques
- Sun sensors
- All of the above have form factor < 1 U
- All of the above have flight heritage low risk

Link Budget

- Assume distance 50,000 km
- Downlink frequency 145 Mhz
- Bandwidth 2.4 Khz
- Power out on SC 1 watt
- Ant gain on SC 6 dbi
- Ant gain GS 14 dbi
- SNR at GS 16 db
- Form factor $< \frac{1}{2} U$
- Remember, we have 50 Watts of DC

FRAME

- Composite i.e. Print Sat
- Saves 600 grams over aluminum frame

Propulsion ?????

- Ion engine
- Propellant
 - Water
 - Teflon
 - Some sort of benign fluid

This is the Challenge!

ION ENGINE ??



Next Step

- Affirm our vision “GO TO HEO”
- Elect Leaders that will lead us to HEO
- Submit grant to ELaNTA by Nov 26, 2013
 - Money & ITAR are very solvable issues

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- 73'S Nick K5QXJ