The Uses of Amateur Radio

A Personal View

D. B. Leeson, W6NL

May 12, 2020 ©

W6YX via N6BDE/R
Career Strategy and Amateur Radio

- **A career – A chain of contingent events**
  - Recall how you got here – What, who?
  - Experiences, relationships – Influence your career outcome
- **Strategic concepts – From my own avocations**
  - Limit competition – Multiple capabilities greatly reduce it
  - Learn from every experience, especially problems
  - Experiences in one sphere apply to others
- **Mentors & Sponsors – Behind every success**
  - Critical, but hard to find – When you find one, you must respond!
  - Common interest & experiences – Technology, projects, operating
- **Amateur Radio – Some inspiring examples**
  - Nobel laureates
  - Silicon Valley
- **Is Amateur Radio still helpful today?**
Experiment: Make It, Use It and Break It

- **Experiment trumps theory**
  - Hands-on work: Educating, rewarding, builds *practical* skills
  - Using what you’ve *made*: Satisfying, instructive

- **Radio technologies - Antennas, propagation, noise, interference**
  - Unique to radio – Added skills
  - Radios ➔ digital now – Moore’s law:
  - Systems & networks – Helpful specialties

*Moonbounce “EME”  Microwave*
My Own Journey to Stanford & Silicon Valley

- **Radio! 1941, Amateur radio 1952** – “I’ve never worked a day in my life”
  - Zero-rest-mass particles – Communications>>Transportation
  - Pacifico Radio Club K6BAG – Win FD, learn early about managing
  - Radio repair, the job I missed ➔ the bank ➔ Hughes

- **Hughes Aircraft**: Doppler radar & spacecraft 1955-64

- **Caltech** 1954-58, **MIT** 1958-59, **Stanford** 1959-62

- **ATI**: Radar countermeasures startup 1964-68
  - Phase noise committee – Journal papers 1964-71

- **California Microwave, Inc.** 1968-1993
  - Infrastructure: Radar, microwave, satellite, WiFi
  - Growth: Fund startups, components ➔ systems

- **Stanford** 1993-
  - 802.11 WiFi, teaching, writing, angel investments, W6YX
Radio & Racing Lessons Apply to Careers

- **Competition:** Strategy & project management key
- **Lessons learned:** Apply to careers
  - Strategic segmentation: Compete where you can win
  - Show stoppers first
  - Avoid compound risk
    - Components or system, not both
  - No last-minute changes
  - Check lists, mnemonics
  - Diagnostics for failures
    - Last thing touched?
  - Integration: Takes time, confirm components first

- **Never say no to adventure**
Ham Radio Mentor/Sponsor Stories

▪ **Nobel laureates** – “Amateur radio … led him”
  ‣ Joe Taylor K1JT – Bracewell books, pulsars, LIGO, WSJT
  ‣ Prof. W. E. Moerner WN6I – Molecular image, Stanford, W6YX

▪ **Career success examples** – Early days of W6YX
  ‣ Fred Terman 6AE, Herbert Hoover, Jr. 6SR, Charlie Litton 6AO
  ‣ W. W. Hansen 6CSY – Stanford klystron, linear accelerator inventor
  ‣ David Packard 9DRV – “Ham radio at Stanford led to Hewlett-Packard”

▪ **My own sponsor experiences**
  ‣ Mike Villard W6QYT - Stanford, W6YX
    ‣ His QST articles attracted me to Stanford in 1959 after Caltech & MIT
    ‣ Placed me with early regional startup 1964
    ‣ Funded my company – Blank check on an airplane 1968
  ‣ Bill Saunders –IEEE Phase Noise Committee and first company customer
But What About Now? “Do People Still Do That?”

- Yes, but things have changed – Digital, optical technology dominate
  - More than ever – wireless is the key to mobility
    - Cell, WiFi, Bluetooth, satellite, GPS
  - More wireless connections than world population

- Amateur Radio unique experiences – Strategic career advantage
  - Hands-on experimenting – The original maker culture
  - Experience in competition, project management
  - Experience – Noise, dynamic range, antennas, propagation, systems

- Amateur Radio is still a special path to scarce mentors & sponsors
  - W6YX – Unique community, equipment, freedom

- It’s up to you  – Actively seek out opportunities to enhance career
Links For Reference

- W6YX Display Update_sm.pdf
  - https://www.dropbox.com/s/j3he1os55c9f44y/W6YX%20Display%20Update_sm.pdf?dl=0

- Future of W6YX at Stanford_update.pdf
  - https://www.dropbox.com/s/hw47dw1ch5yfyhp/Future%20of%20W6YX%20at%20Stanford2_update.pdf?dl=0

- Microwaves and Silicon Valley.pdf
  - https://www.dropbox.com/s/30wnmsu8jd64zwl/Microwaves%20and%20Silicon%20Valley_sm.pdf?dl=0

- Oscillator Phase Noise: A 50-Year Review.pdf

- D B Leeson CV 5-19.pdf