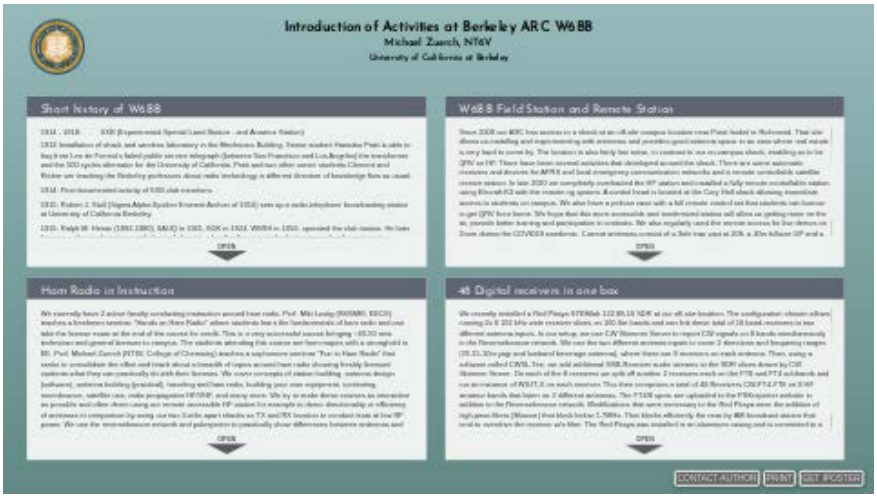
Introduction of Activities at Berkeley ARC W6BB



Michael Zuerch, NT6V

University of California at Berkeley

PRESENTED AT:

SHORT HISTORY OF W6BB

1914 - 1918: 6XB (Experimental Special Land Station - and Amateur Station)

1913 Installation of shack and wireless laboratory in the Mechanics Building. Senior student Haradan Pratt is able to buy from Lee de Forrest's failed public service telegraph (between San Francisco and Los Angeles) the transformer and the 500 cycles alternator for the University of California. Pratt and two other senior students Clement and Rieber are teaching the Berkeley professors about radio technology, a different direction of knowledge flow as usual.

1914: First documented activity of 6XB club members.

1915: Robert J. Stull (Sigma Alpha Epsilon Eminent Archon of 1916) sets up a radio-telephone broadcasting station at University of California Berkeley.

1915: Ralph M. Heintz (1892-1980), 6AUQ in 1921, 6GK in 1924, W6RH in 1959, operated the club station. He later became a chemical engineer and physical chemist, a leading figure in early electronics and radio engineering.

1916: First mentioning of the University Radio Society in Daily Cal. Club broadcasts the Big Game (with Washington) from bleachers. Club enters Carnegie foundation sponsored League of University Wireless Clubs to relay news, sports, etc.

1917: Club helps government radio inspector to rid Bay Area of pesky, interfering unlicensed radio stations

1920 or before: 6BB Univ of California Radio Club (Amateur Station)

1920: Shack in the Mechanics Building. Report in Pacific Radio News of weekly 1/2 KW spark transmissions from station 6BB on 500KC.

1920: The University of California Radio Club participates as one of sixteen major radio clubs at the Pacific Coast Radio Convention in San Francisco.

1921: Barbara Stoddard Burks (1902-1943) operates the club station during her college year at UC Berkeley. She receives a commercial telephone radio operator license from the Department of Commerce in 1921 (Student is First Woman to Get License As Commercial Wireless Operator, Oakland Tribune Jan 8., 1921).

1921, June 4th: Ratification of the official affiliation of the University of California Radio Radio Club with the Amateur Radio Relay League (together with the following other school clubs: Radio Club of the Carnegie Institute of Technology, University of Virginia Radio Club) - from QST 1921.

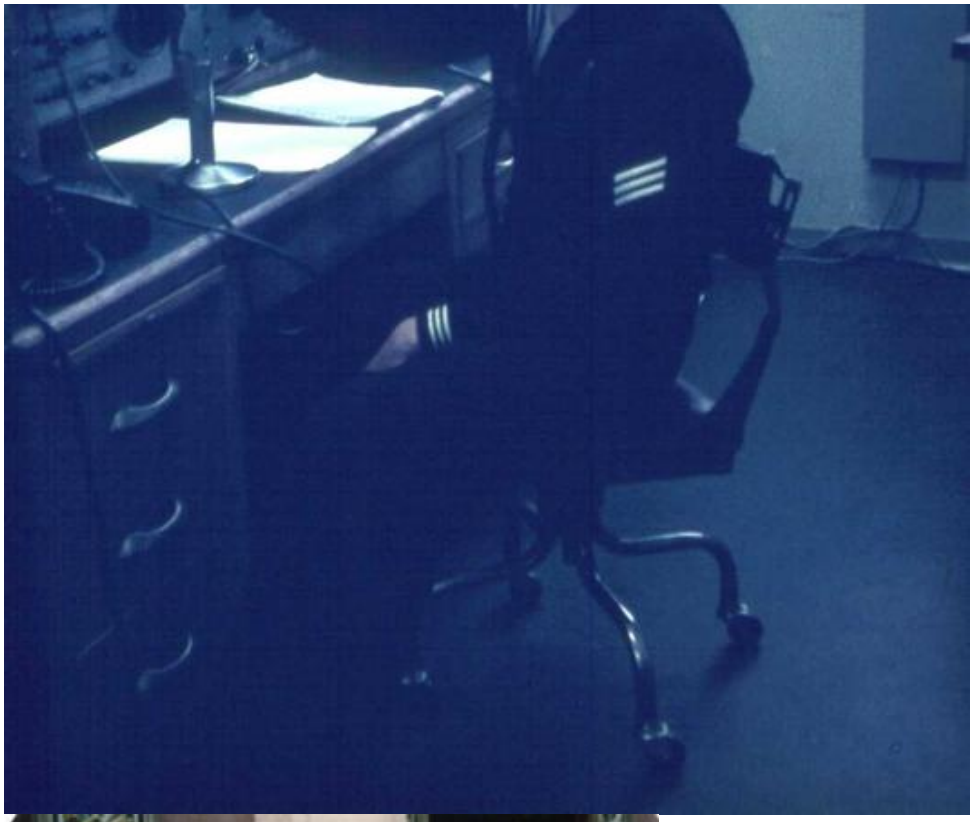
1946: Club reactivated after WW2; gets donated Signal Corps equipment and shack in the men's gym.

1950-51: Shack in Men's Gym with donated Signal Corps equipment, Room 143. Trustee George M. Welles

Since 1952 shack with good presence in Cory Hall, EE Department.

2008-present: W6BB Shack at Richmond Field Station


UCARC




IN MEMORY OF
PEDER SATHER
1810 - 1866

HAM RADIO IN INSTRUCTION

We currently have 2 active faculty conducting instruction around ham radio. Prof. Miki Lustig (KK6MRI, EECS) teaches a freshmen seminar "Hands on Ham Radio" where students learn the fundamentals of ham radio and can take the license exam at the end of the course for credit. This is a very successful course bringing ~40-50 new technician and general licenses to campus. The students attending this course are from majors with a stronghold in EE. Prof. Michael Zuerch (NT6V, College of Chemistry) teaches a sophomore seminar "Fun in Ham Radio" that seeks to consolidate the effort and teach about a breadth of topics around ham radio showing freshly licensed students what they can practically do with their licenses. We cover concepts of station building, antenna design (software), antenna building (practical), traveling and ham radio, building your own equipment, contesting, moonbounce, satellite use, radio propagation HF/VHF, and many more. We try to make these courses as interactive as possible and often demo using our remote accessible HF station for example to demo directionality or efficiency of antennas in comparison by using our two 3-mile-apart shacks as TX and RX location to conduct tests at low RF power. We use the reversebeacon network and pskreporter to practically show differences between antennas and also propagation. For a few seminars we invite external speakers to share their perspectives on expert topics. For example, John K6MM, a seasoned DX-Peditioner, introduced us to traveling and being on the air and why people get on the air from far away places. As a fun activity we learn morse code in 15min sessions at the beginning of each class. Surprisingly, many students state that this fun approach learning a "new language" and the mystery of morse code motivated to take the course. From both courses we regularly have students conduct summer research on dedicated topics relating to radio. For example, one student currently designs and builts an efficient antenna for rocket-to-ground communications in collaboration with the rocket science club.

W6BB FIELD STATION AND REMOTE STATION

Since 2008 our ARC has access to a shack at an off-site campus location near Point Isabel in Richmond. That site allows us installing and experimenting with antennas and provides good antenna space in an area where real estate is very hard to come by. The location is also fairly low noise, in contrast to our on-campus shack, enabling us to be QRV on HF. There have been several activities that developed around the shack. There are some automatic receivers and devices for APRS and local emergency communication networks and a remote controllable satellite receive station. In late 2020 we completely overhauled the HF station and installed a fully remote controllable station using Elecraft K3 with the remote rig system. A control head is located at the Cory Hall shack allowing immediate access to students on campus. We also have a pelican case with a full remote control set that students can borrow to get QRV from home. We hope that this more accessible and modernized station will allow us getting more on the air, provide better training and participation in contests. We also regularly used the remote access for live demos on Zoom during the COVID19 pandemic. Current antennas consist of a 3ele trap yagi at 20ft, a 40m fullsize GP and a 200 ft beverage receive antenna.

48 DIGITAL RECEIVERS IN ONE BOX

We recently installed a Red Pitaya STEMlab 122.88-16 SDR at our off-site location. The configuration chosen allows running 2x 8 192 kHz wide receiver slices on 160-6m bands and can link these total of 16 band-receivers to two different antenna inputs. In our setup, we use CW Skimmer Server to report CW signals on 8 bands simultaneously to the Reversebeacon network. We use the two different antenna inputs to cover 2 directions and frequency ranges (20-15-10m yagi and lowband beverage antenna), where there are 8 receivers on each antenna. Then, using a software called CWSL-Tee, we add additional SSB-Receiver audio streams to the SDR slices drawn by CW Skimmer Server. On each of the 8 receivers we split off another 2 receivers each on the FT8 and FT4 subbands and run an instance of WSJT-X on each receiver. This then comprises a total of 48 Receivers CW-FT4-FT8 on 8 HF amateur bands that listen on 2 different antennas. The FT4/8 spots are uploaded to the PSKreporter website in addition to the Reversebeacon network. Modifications that were necessary to the Red Pitaya were the addition of high-pass filters (Mouser) that block below 1.7MHz. That blocks efficiently the near-by AM broadcast station that tend to overdrive the receiver w/o filter. The Red Pitaya was installed in an aluminum casing and is connected to a quadcore i7 computer via gigabit ethernet. The computer runs 2 instances of CW skimmer server and 32 instances of WSJT-X. The Red Pitaya is fed through the RX-Out of the Elecraft K3 transceiver which automatically protects the front-end in case of QRO transmissions from the station. The solution provides constant band coverage and spots while the station from a K3 radio point of view can be used ad-hoc without paying any attention to the existence of the SDR. We are reporting as W6BB for the 3ele yagi and NU6XB/W6BB-1 for the beverage antenna. We currently report ~10000 stations a day on FT4/8.

Links to RBN/PSKreporter

http://www.reversebeacon.net/dxsd1/dxsd1.php?f=0&c=w6bb&t=de (http://www.reversebeacon.net/dxsd1/dxsd1.php?f=0&c=w6bb&t=de)

http://www.reversebeacon.net/dxsd1/dxsd1.php?f=0&c=w6bb-1&t=de (http://www.reversebeacon.net/dxsd1/dxsd1.php?f=0&c=w6bb-1&t=de)

https://pskreporter.info/pskmap.html?preset&callsign=nu6xb&txrx=rx&obscure=0.4&hideunrec=1&blankifnone=1&hidepink=1&hidelight=1&showsnr=1&maptype=aea&azcenter=c (https://pskreporter.info/pskmap.html?preset&callsign=nu6xb&txrx=rx&obscure=0.4&hideunrec=1&blankifnone=1&hidepink=1&hidelight=1&showsnr=1&maptype=aea&azcenter=c

https://pskreporter.info/pskmap.html?preset&callsign=w6bb&txrx=rx&obscure=0.4&hideunrec=1&blankifnone=1&hidepink=1&hidelight=1&showsnr=1&maptype=aea&azcenter=cı (https://pskreporter.info/pskmap.html?preset&callsign=w6bb&txrx=rx&obscure=0.4&hideunrec=1&blankifnone=1&hidepink=1&hidelight=1&showsnr=1&maptype=aea&azcenter=cı