

Amateur Radio at Columbia University - History to Present Day

Jacob Boxerman, KE2CZX

Contents

1. Introduction
2. Founding of W2AEE
 - a. Longest running rivalry?
 - b. 2XM
 - c. W2AEE
3. Founding of WKCR
4. Sputnik
5. Amateur TV
6. Expansion / Steel tower constructed
7. Current Status
8. Columbia Space Initiative – High-Altitude Balloons
9. APRS setup
10. Pico-Balloons

Early Beginnings

- Columbia University Experimental Wireless Station
- Founded circa 1906 (Chandler or Havemeyer Hall)
- "Wireless Telegraph Club of Columbia University" documented by 1908



ENGINEERING BUILDING

Jenkins had
ch more for
the Frank
, a family
Broadway,

is had elab-
ans to dum-
ey for his
he covered
also entries;
on the bank
and in spite
ank or stock
ore than 10
surplus to
40 per cent.
ith the con-
s, who must
5 per cent.
id that the
nt or knowl-
ken \$557,000
s amounted

ause of the
d that loans
en made to
kins broker-
ds that this
these clerks,
n regulations

WIRELESS CLUB AT COLUMBIA

Disputes With the Aero Club the Mon- opoly of Morningside Air.

The Aero Club which the students of Columbia University formed some time back is not to have an absolute monopoly of the air, hot and otherwise, on Morningside Heights. A rival appeared yesterday. The new organization is the "Wireless Telegraph Club of Columbia University," capital stock subscribed and fully paid by the students of Columbia. The wireless people burst out overnight and took the airship navigators by surprise.

"What in blazes is that?" demanded Grover Cleveland Loening, the father of the Aero Club, as he rounded the corner of the library yesterday morning and saw faintly outlined against the foggy sky between Havemeyer and University Halls the double wires that the wireless club was stringing up. Loening rushed to the superintendent's office and wanted to know what it all meant. The superintendent couldn't do anything; the wires were already up and that was all there was to it. Loening gave it up.

The wireless club had worked secretly and kept everything quiet until it was time to erect the antenna for the ra-

this country, in
this in speaking o
had during the la
meeings, wherein
ployers met on co

"When you de
you are bound t
Socialists among
leaders of labor
only about only 1
bership in labor
Socialists that su
more trouble—pe
causes more excit
rest of the 90 pe
among the labor
and that is, perh
cause all the excit

"We should lo
unrest among the
being indicative o
ditions of the da
unrest in France
here unless we can
may allay, if not c
us. When we con
five years the leg
had an opportunity
and that they did
to be wiped out wi
of the civil war, w
every sinew again
another such horr

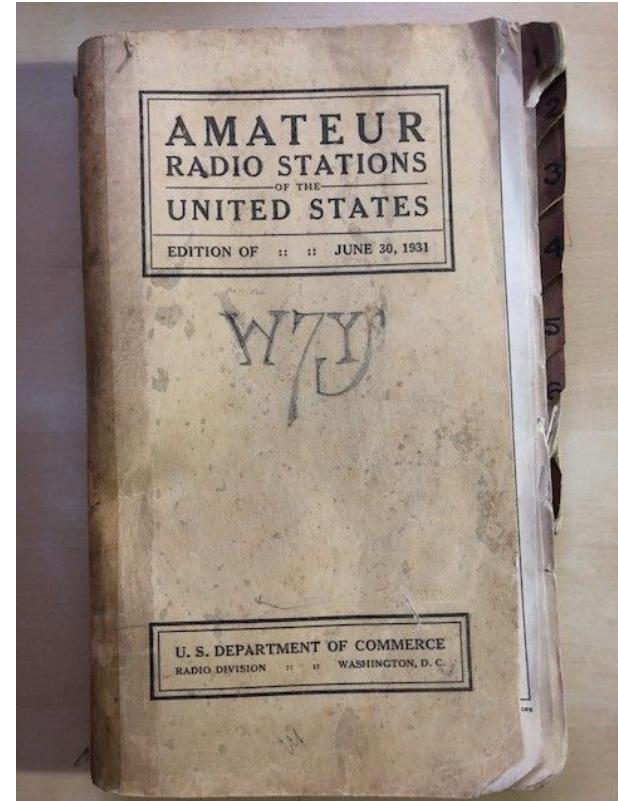
*"What in blazes is that?"
demanded Grover Cleveland
Loening, the father of the Aero
Club, as he rounded the corner of
the library yesterday morning and
saw outlined against the foggy sky
between Havemeyer and
University Halls the double wires
that the wireless club was stringing
up....*

Wireless Club at Columbia.

The sun. (New York [N.Y.]) 1833-1916, November 25, 1908, Page 2

Early Call Signs

- 1913: Call sign 2XM (Radio Act of 1912)
- 1925: 2XM reassigned; 2FK issued to CURC
- Early 1931: Adopted W2AEE (FRC rules)



FOUNDED 1913

2 XM

COLUMBIA UNIVERSITY
AMATEUR RADIO CLUB
BOX 32, ENGINEERING BLDG.
COLUM. UNIV., N.Y. 27, N.Y.

The call will consist of three items – the number of the radio district, followed by two letters of the alphabet. The first letter will be: X, for experiment stations; Y, technical and training schools; Z, special amateur stations...

W2AEE

NEW
YORK
CITY

THE 180 WATT
VOICE OF THE
ROARING LION

COLUMBIA
UNIVERSITY'S
RADIO
CLUB



W2HMF YOUR 14 MC. SIGS. WERE ROARING
IN RST 599X ON 4/25/40

Columbia

THE MOST POTENT SIG.
EVER GRACING THE
RECEIVERS OF

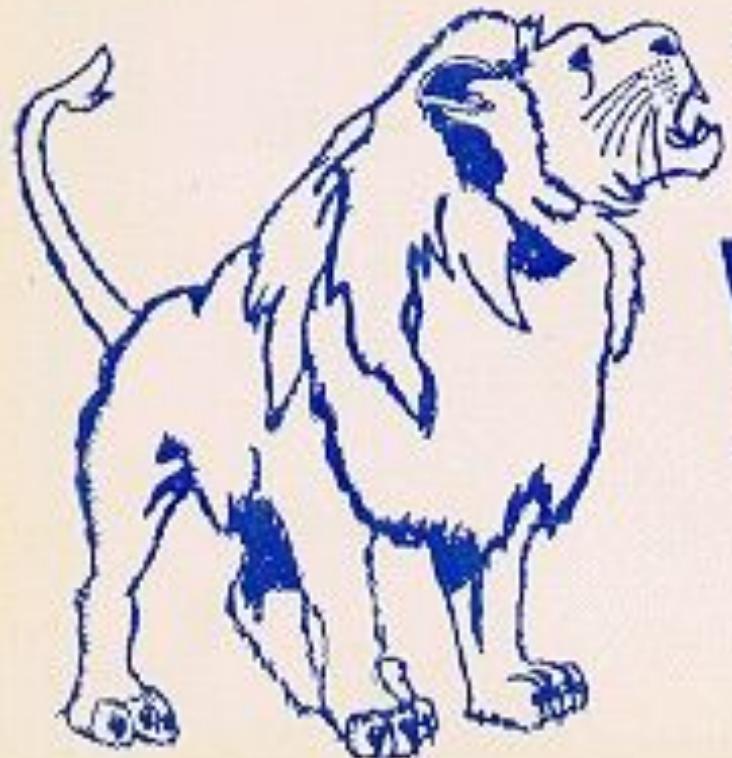
University

W 2 A E E

in the City of

New York





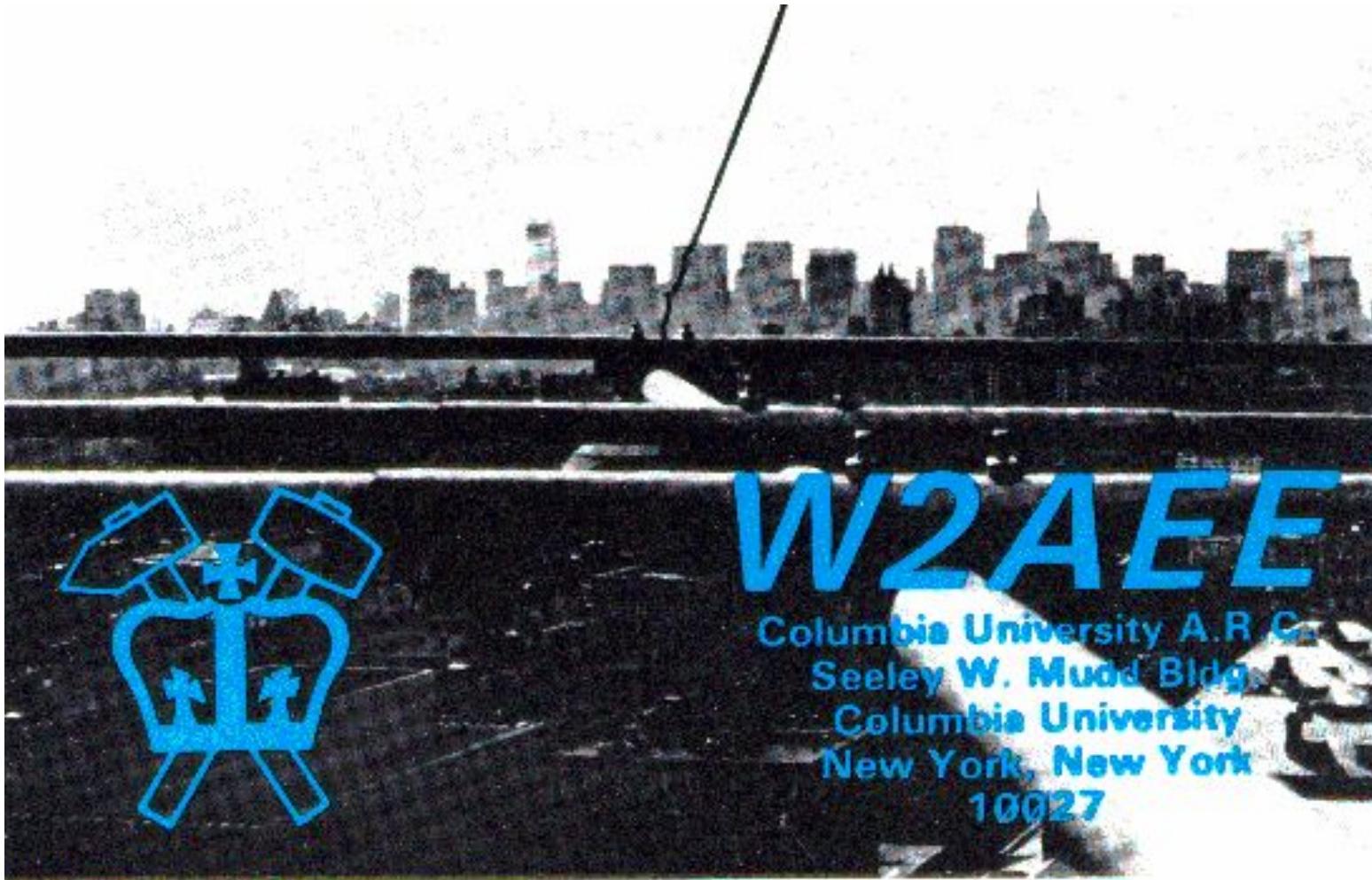
THE VOICE OF THE
ROARING LION

W2AEE

Columbia University
in the City of New York

NEW YORK 27, N. Y.

SCHOOL OF ENGINEERING



W2AEE

Columbia University A.R.C.

Seeley W. Mudd Bldg.

Columbia University

New York, New York

10027

Longest Running Rivalry?

- Decades-long friendly dispute for "America's Oldest College Amateur Station"
- Columbia vs. MIT Radio Society (W1MX)
- MIT claim: April 30, 1909
- Columbia's earlier documentation: 1908 (with earlier evidence pointing to 1906)



Radio Club's Evolution

- Columbia University Radio Club (CURC) active since c. 1936
- Initial focus: Pure radio communications technology
- Growing membership spurred expansion into campus broadcasting
- Profound influence of Edwin Howard Armstrong, W2XCR/W2XMN



Major Edwin Howard Armstrong suspended from radio tower in Alpine, NJ

Early WKCR

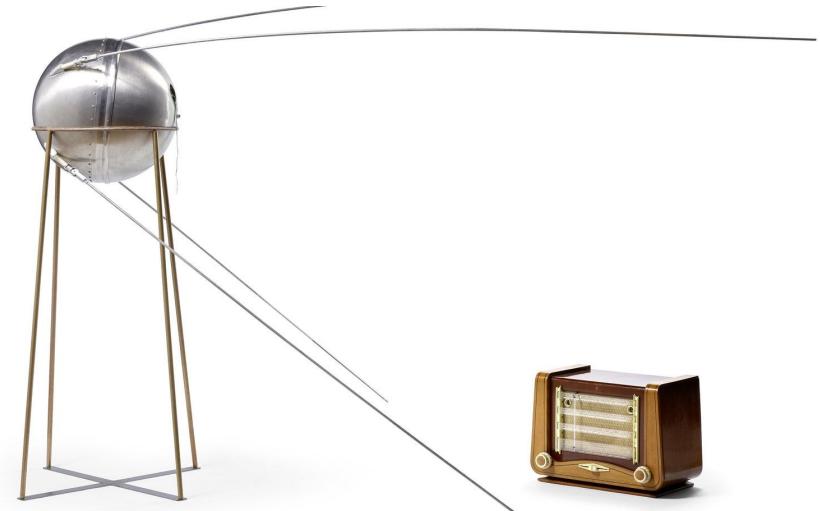
- Armstrong donated equipment (microphone, turntables)
- First studio: Dorm room (1107 John Jay)
- Early focus on FM promotion and demonstrations
- 1939-1940: Campus radio station (CURC)
- Club members designed & constructed all core broadcast equipment



Major Edwin Howard Armstrong suspended from radio tower in Alpine, NJ

Sputnik

- W2AEE's critical role in tracking Sputnik 1 (October 1957)
 - Shortwave
- Tapes of the satellite's signal recorded by W2AEE and broadcast by WKCR
- Recordings taken by FBI



Amateur TV

- 1959: CUARC conducted live telecast of Childs Cup Regatta
- Signal relayed from Harlem River to John Jay Lounge & finish line monitors
- Pioneering efforts in Amateur Slow-Scan TV (SSTV) & Fast-Scan TV (ATV)
- Pushing boundaries of visual communications via ham radio







Expansion / Steel Tower Constructed

- November 1963: Significant expansion plans for CURC announced
- Primary objective: Achieving robust "World Wide Communication" capabilities
- Project overseen by Professor John H. Bose (Armstrong's protégé)
- Construction commenced in early May 1963

Technical Upgrades

- New steel tower designed to support multiple antenna systems
- Boosting station power from 140 watts to 1,000 watts (legal limit)

New Operating QTH and Antenna Systems

- Dean John R. Dunning officiated the final connection, celebrating the expansion
- New club QTH: 14th floor of Seeley W. Mudd Hall
- Dedicated "shack" space created in elevator lobby
- Antennas partially installed on Mudd Building roof with 150-ft lead-ins
- Antenna array included: 2-meter Yagi and a "tribander" beam for 10, 15, 20m
- Rotation table

Current Status of W2AEE

- Continuous APRS digipeater operation since 2001 NYC Marathon (2m vertical)
- Active VE (Volunteer Examiner) team conducting monthly FCC exams
- VHF tower in current disrepair, slated for future removal
- Club membership revived in 2025

Columbia Space Initiative

- Largest engineering club on campus (400+ members)
- Many missions including rocketry, space microbiology, cubesat, high-altitude balloons
- The place for practical ham at Columbia



High-Altitude Balloons – Overview

- Launching research devices on high-altitude balloons
- Common ham hobby
- Excellent learning experience for college engineers



High-Altitude Balloons – History

- First mission of CSI (2016)
- 2-3 successful launches
- Died during COVID
- Revived by myself and another member in 2023





High-Altitude Balloons – Current Status

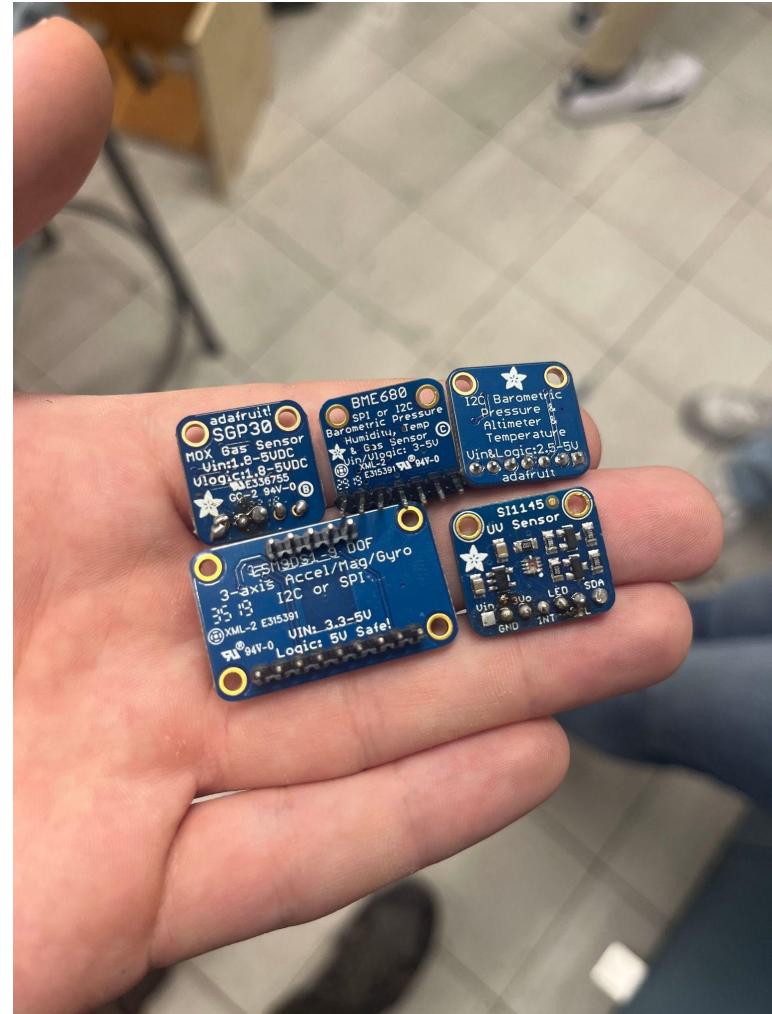
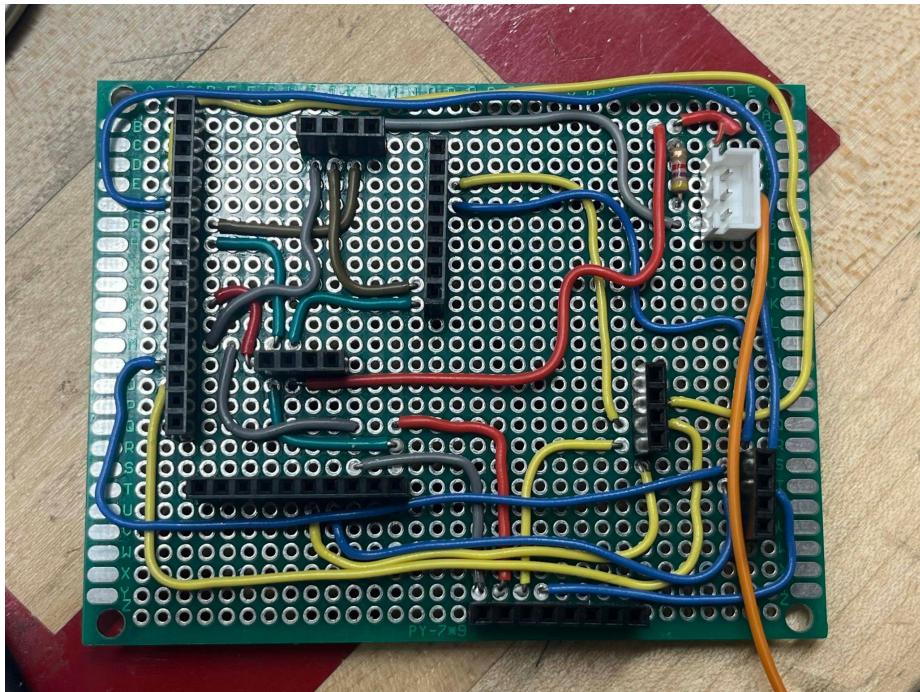
- 12-person team
- Members span computer science, mechanical engineering, astronomy, and electrical engineering
- Attempt to come up with interesting expansions within scope of 1-2 semesters
- Revive team knowledge



First Launch

- March 2023
- 1600g balloon
- Styrofoam cooler payload with:
 - Sensors: VO2, UV, accel, temp, humidity
 - GPS
 - SD card logger
 - SPOT GPS
 - APRS position transmitter

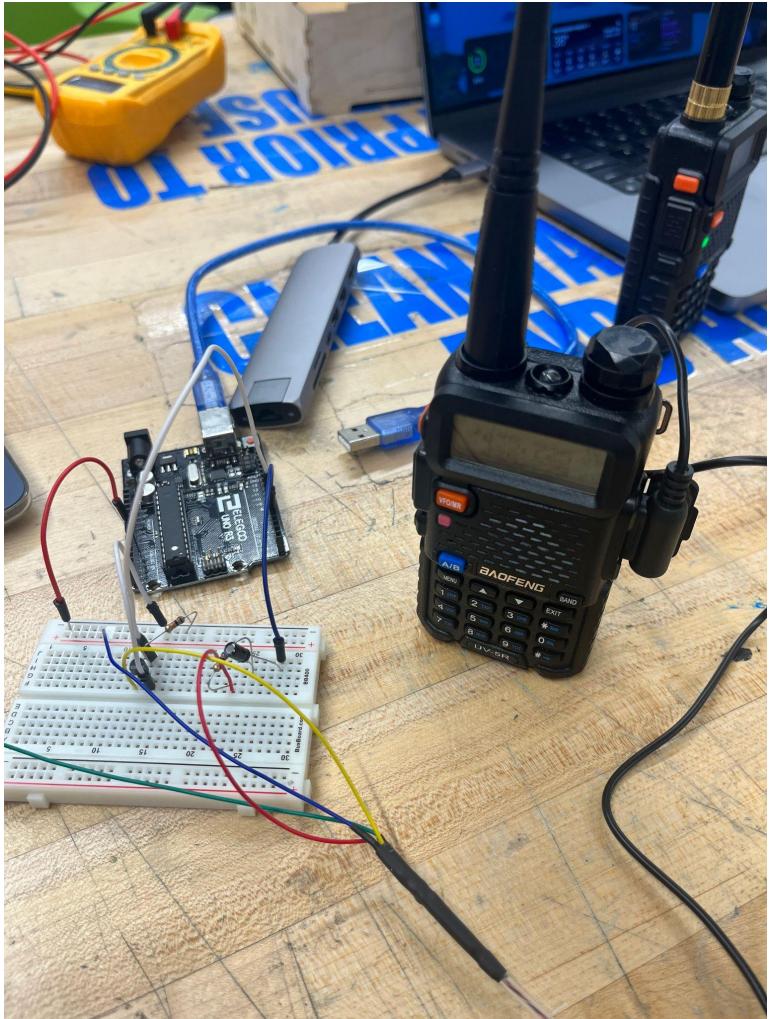




First Launch – radio setup

- Great reason to get my Ham license
- First year – low budget, required us to get creative
- Built APRS (Automatic Packet Reporting System) transmitter with Baofeng HT and mic cable (very hacky solution)
- Existing Arduino APRS solution





First Launch – success / failure?

- Great lessons learned – full integration tests are KEY
- Good story



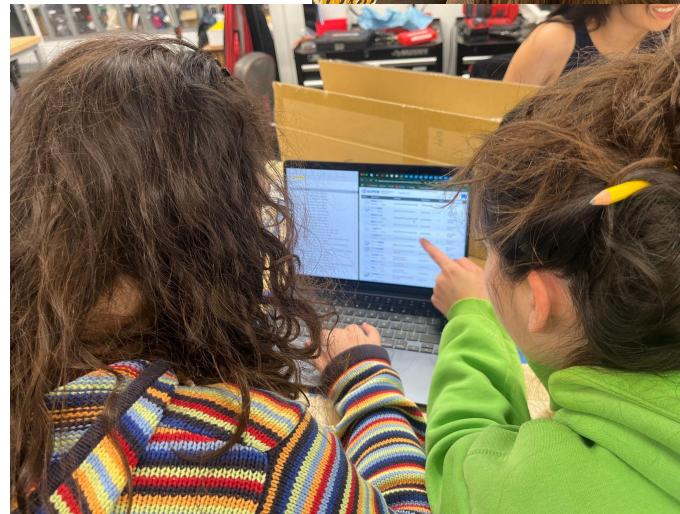
Pico Balloons

- 2024-25 project – Pico balloons
- Common Ham project
- Ultralight trackers usually using WSPR (Weak Signal Propagation Reporter)
- Complex project but enough online resources for new members to build skills

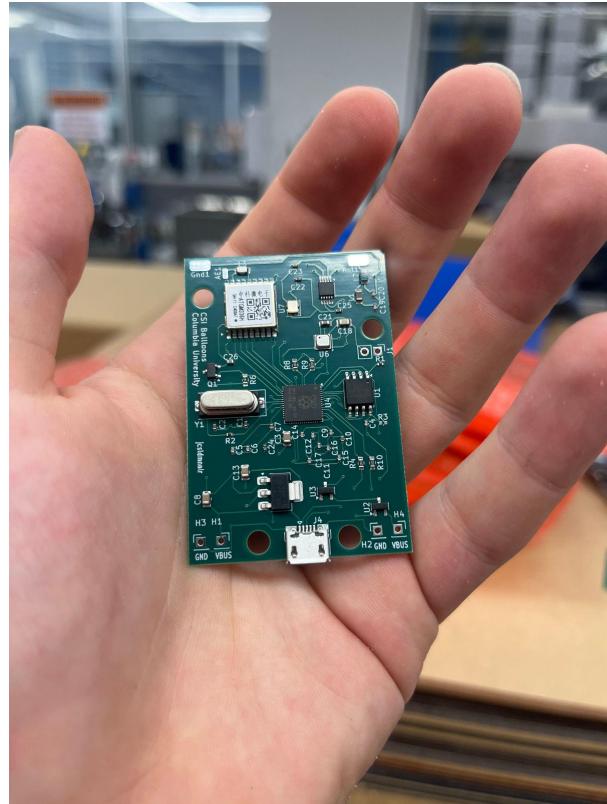
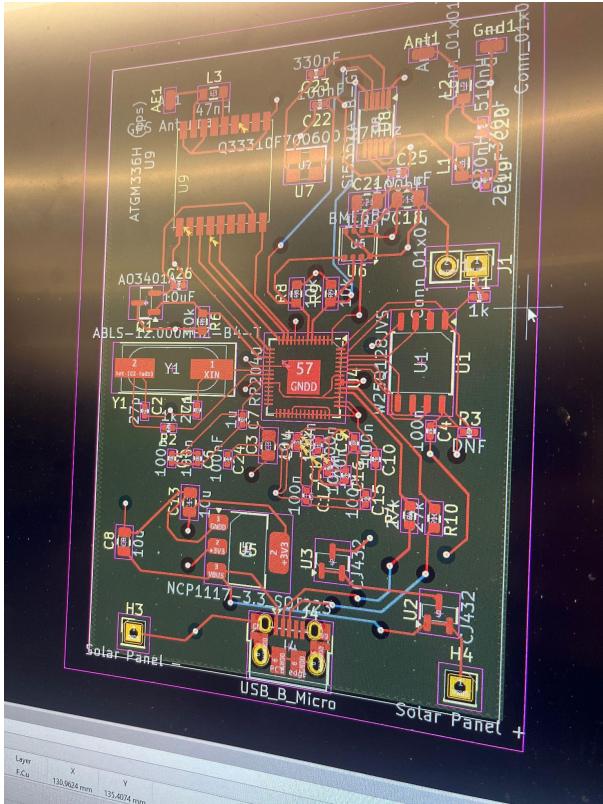


Pico Balloons as a team leader

- Excellent learning experience
- Unique experience not many people will get in a class
- Cross-discipline and interesting result
- Practical experience

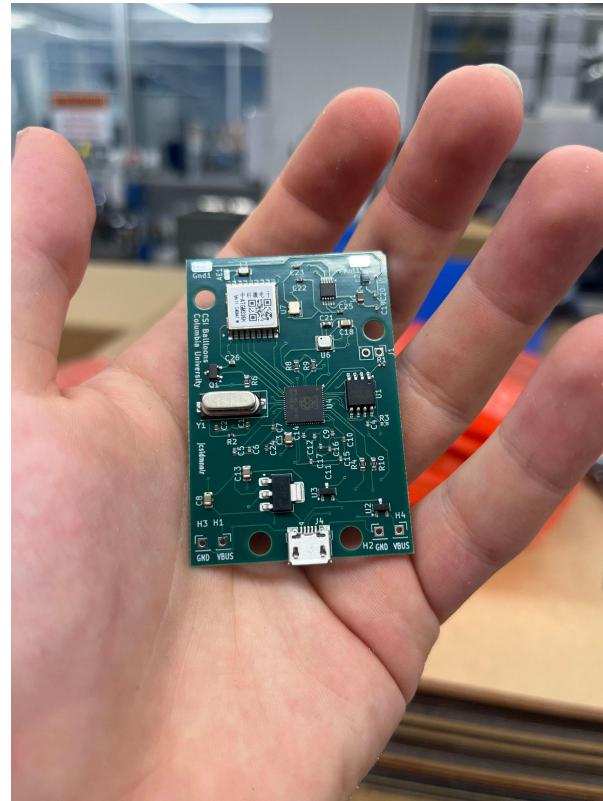


Pico Balloons – pictures



Pico Balloons – current status

- Boards arrived at end of year, no time to test
 - Will test and hopefully launch in September
 - Looking for more radio opportunities



Relevant Info

Links:

<https://www.w2aee.columbia.edu/>

<https://columbiaspace.org/>

Contact:

Jacob Boxerman KE2CZX

<https://jakebox.github.io/>