

WH6FTQ

Heather's VHF/UHF  
adventures!

# Who I am

Physicist (PhD Michigan, 2009) (specifically, an experimental physicist)

Astronomer -- previously working on PanSTARRS, currently with ATLAS now (and I discovered Comet Flewelling)

New ham -- May 2019

Amateur Extra -- June 2019

First radio is a baofeng

Lots of 'experiments' and fun in the past year of being a ham! :-)

# Why a baofeng?

It's cheap, to the point of being almost disposable

It does a lot of things!

It doubles as a flashlight and as a broadcast FM receiver

It's easy to program on the fly -  
useful when traveling



# How to experiment with a baofeng

You can't easily take it apart, and the circuitry is so tiny, you can't easily modify it

What you can do is modify the things that connect to it and the location

- Antennas
- Cables to the mic/spkr port on the side
- Change your position (nice and high, in a clear area helps!)



# My First “experiments”

Wait until someone is on the radio (a net works good for this, or some guys in a rag chew), and walk around, change the position of the radio, see how the signal changes with position. Do the same, with different antennas, see how it changes

See how far off ‘frequency’ you can be and still receive (why not?)

I’m almost always with my radio - ‘foot mobile’ so I have an internal map of what repeaters I can reach.

# Antenna experiments

position/location of antenna

Try different types of antennas





# Location experiments

(aka, annoy everyone on the repeaters, sorry! )

Attached my roll up to a stick I found

Hiked around and saw where I could reach the repeater...



# “DX”

First was to figure out how to reach the NH6XO Maui repeater on Big Island (~95 miles) - this was so I could talk to Sidik via radio while I was on Oahu and he was on Big Island

Contact Todd (WH6DWF) from Maui summit via simplex (~90 ish miles)

VOAD repeater (various locations on Oahu) - ~200 miles

Simplex from Koko crater to Maui both on analog and DMR (with WH6FXL)

All of this with either my baofeng or the gd-77 + stock antenna!

# SOTA Activations

SOTA= Summits on the Air - aka, I go to a 'summit', and try to make as many contacts on simplex as possible. There are > 20 summits on Oahu.

- Koko crater (solo, 2x)
- Diamondhead (with Todd WH6DWF, Marv WH6FTW, Sidik WH6FUS, Glenn KW4TO)





# Grid Madness

Last year: I made 17 contacts with my baofeng, plus a lot of entertaining photos

This year: Sidik made 21 contacts with his.

Location matters! Get up high to do this!



# Digital Modes with the Baofeng

WHHHYYYYYY????

Baofeng + cable is inexpensive!

You can do useful things with a baofeng + digital modes:

- Send/receive fldigi messages
- Send receive winlink messages
- Do APRS on hikes
- Send/Receive SSTV (yes, even from the ISS!)
- Weird experimental things, too!

# Either make or buy a cable, or acoustically couple

2 kinds of cables

- Both types connect the baofeng ports to a normal audio line
- Some have an additional cable that allows your computer to control the PTT switch

But depending on your plans, acoustic could be just fine, too. (acoustic= you hold radio to the computer speaker and push the PTT when needed)



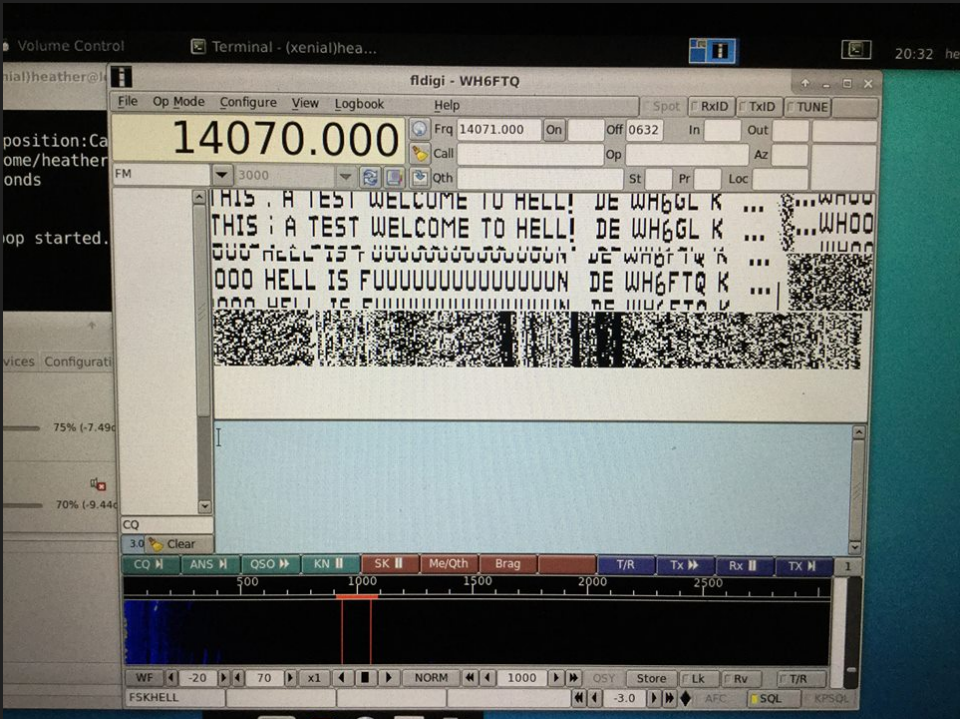
# Homebrew crazy cable ("HeatherDigi")



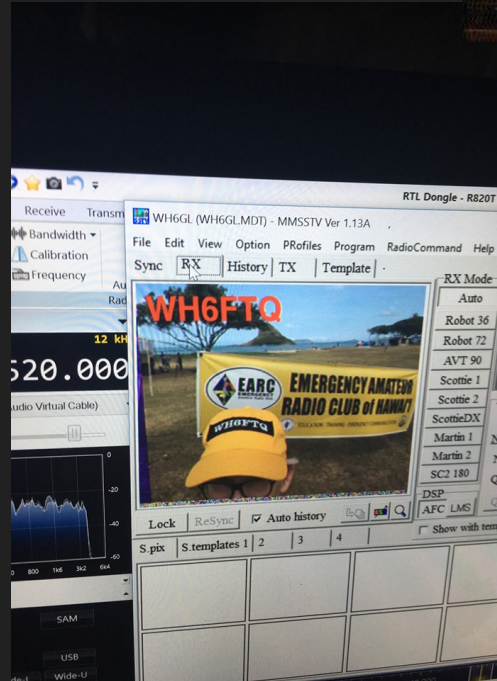


# Acoustic coupling works for flidigi and sstv

Fskhell mode



sstv



# SSTV from ISS + baofeng

Not great - green hash is wind noise (was in manoa at lunch time when ISS passed overhead)

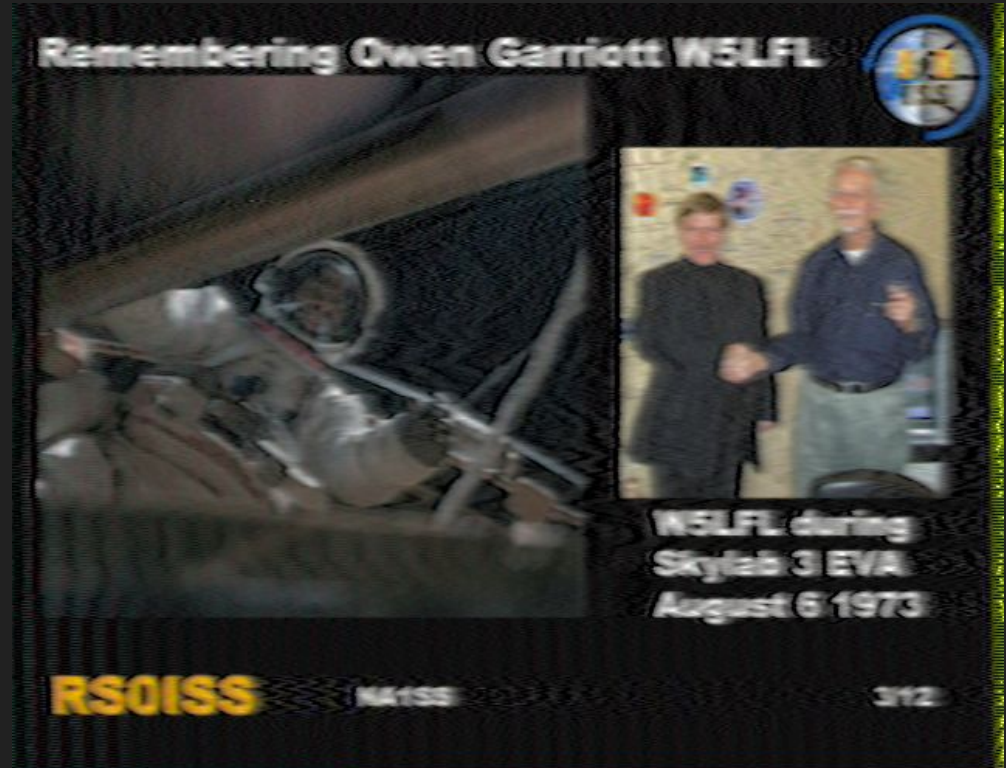
But the point is, you can do it, with just the stock radio.





# SSTV ISS + WH6FUS baofeng

Same configuration as mine, but  
much cleaner with no wind!

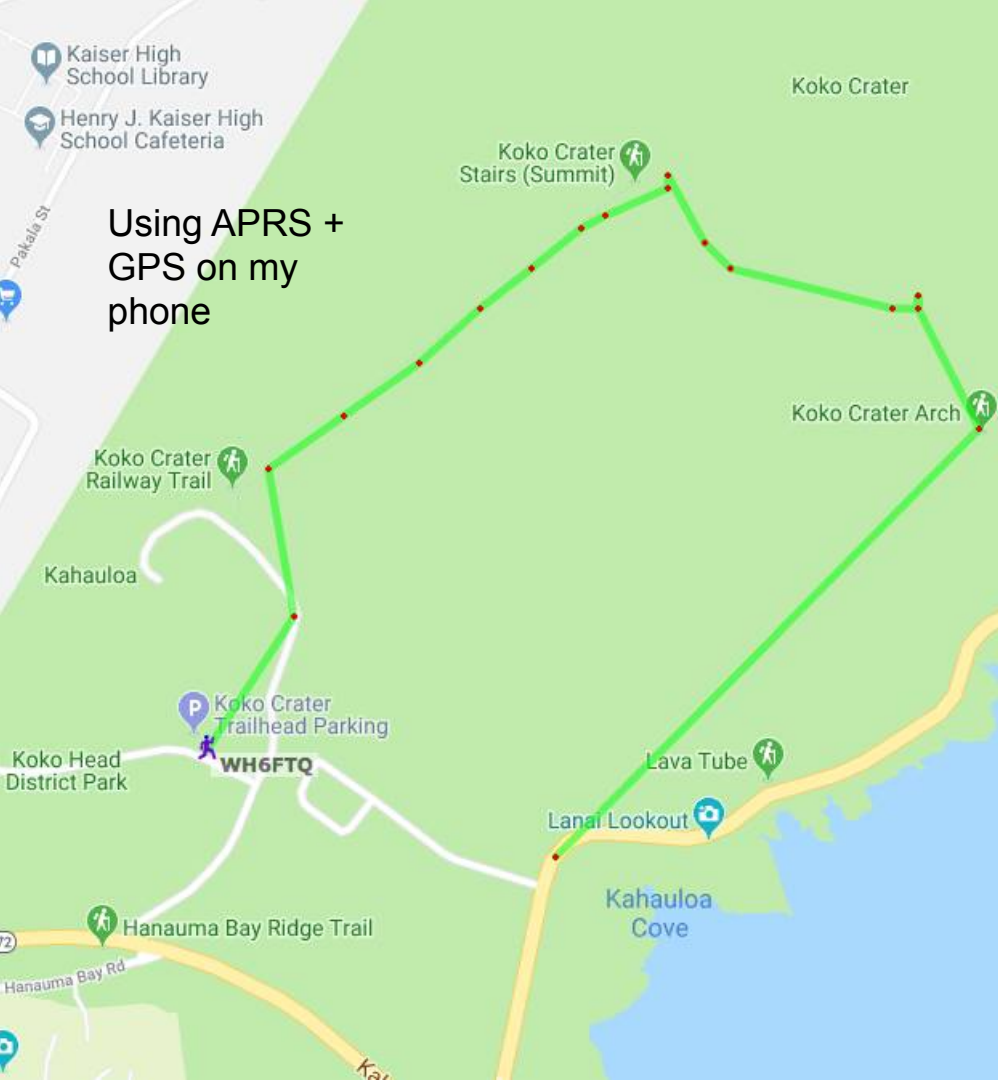


# APRS adventures

- \*need a phone - it has gps, and can send the audio for the aprs packets
- \*need a way to connect between phone and baofeng - here, using an easy digi
- \* need vox on the radio turned on - no way to control the PTT from the phone

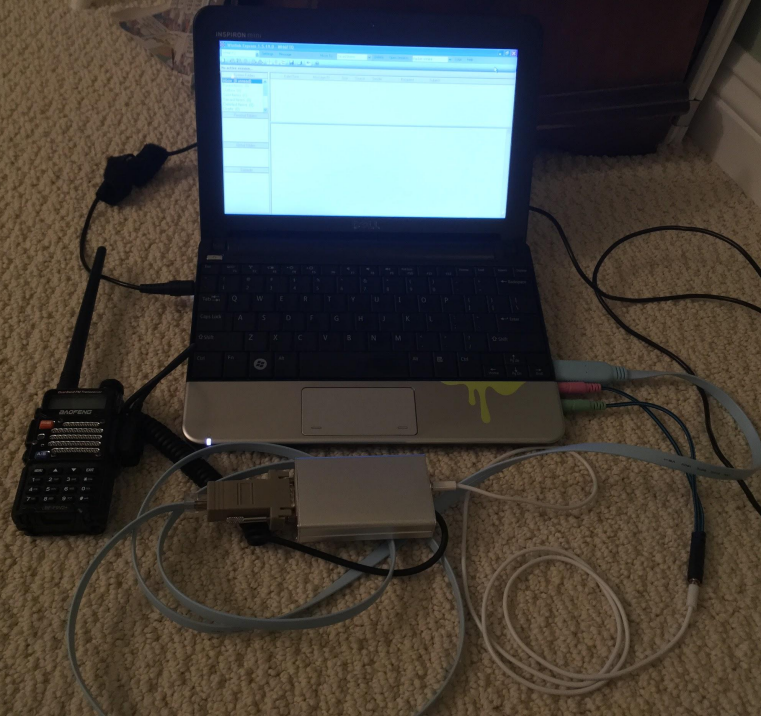






# Winlink - either vara or packet

\*needs a windows computer,  
and needs a cable that can  
control the PTT



Sound

BSLBC2ZIZ5QW - Test Message

Close Print View Attachments Reply Reply All

Message ID: BSLBC2ZIZ5QW  
Date: 2019/04/21 04:50  
From: KH6EN  
To: WH6FUS  
Source: KH6EN  
Downloaded-from: Peer-to-peer:KH6EN  
P2P: True  
Subject: Test Message

Now is the time for all good men to come to the aid of their country.

KH6EN

In Vara FM P2P session.

Date/Time	Message ID	Size	Source	Sender
2019/04/21	BSLBC2ZIZ5QW	217	KH6EN	KH6EN
2019/04/07	J1K8SOSU...	170	WH6F...	WH6FUS
2019/04/07	SEDE4UT4...	192	WH6F...	WH6FUS
2019/04/07	OU54YU90...	240	WH6F...	WH6FUS
2019/04/07	PA8394EUV...	268	WH6F...	WH6FUS
2019/04/07	LOS2U6WT...	156	WH6F...	WH6FUS

Vara FM Peer-to-Peer Session - WH6FUS

Exit Settings Switch to Winlink Session Channel Selection Start Stop Abort

KH6EN Freq: 146.565 FM Speed Mode: 1200 Bearing:

Favorites: Select Add to favorites Remove from favorites

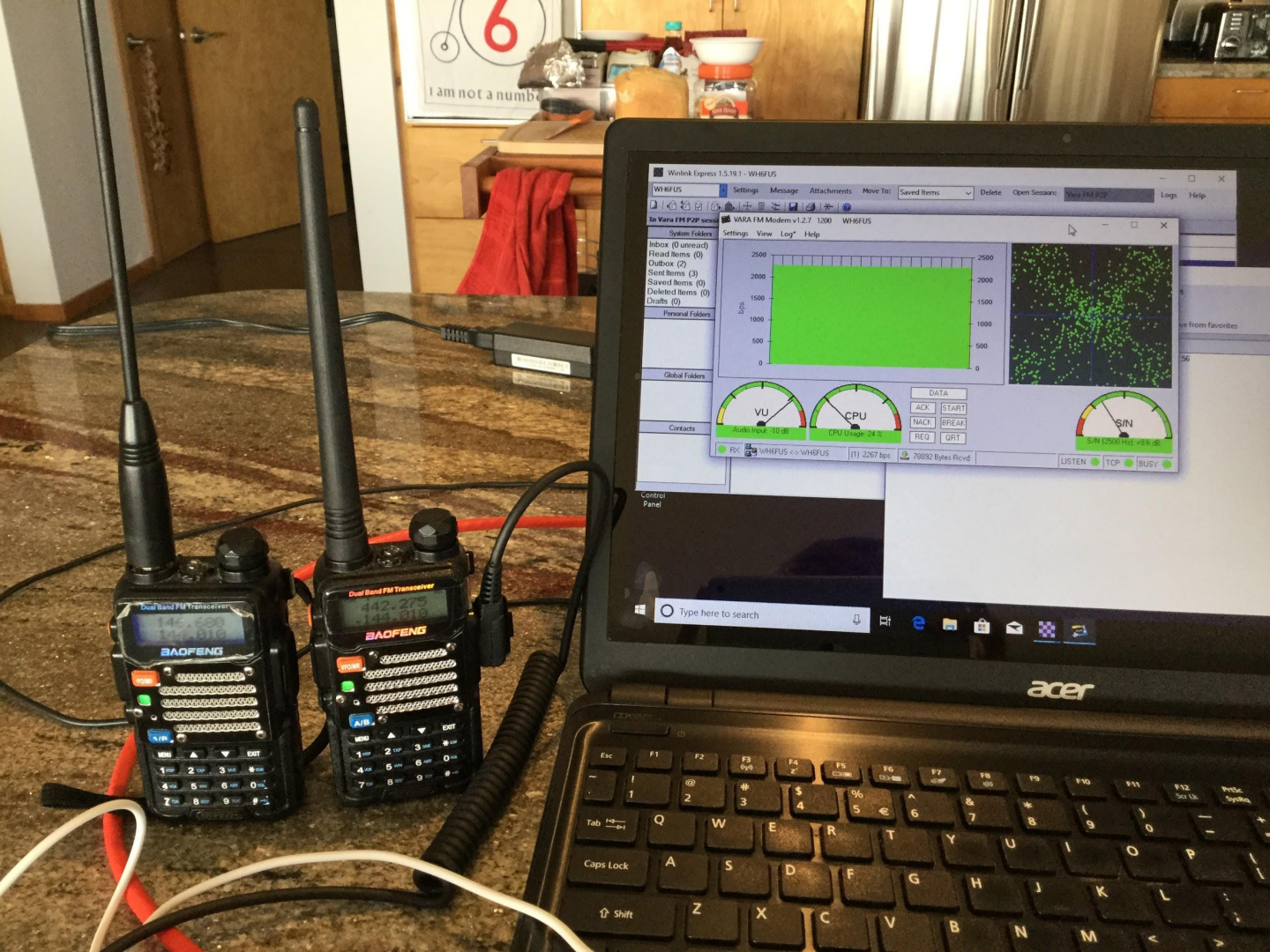
In: 0/0 Out: 0/0 BPM: 0/0 Disconnected/Listening

[RMS Express:1.520.0-B2FHMS]  
[WH6FUS DE KH6EN (BL11CH)]  
FM WH6FUS BSLBC2ZIZ5QW 196 KH6EN Test Message  
FC EM BSLBC2ZIZ5QW 221 196 0  
F> 61  
FS Y  
\*\*\* Receiving BSLBC2ZIZ5QW  
\*\*\* BSLBC2ZIZ5QW - 221/196 bytes received  
\*\*\* Bytes: 217, Time: 00:00, bytes/minute: 162750  
FF  
FQ  
\*\*\* -- End of session at 2019/04/21 04:51:48 --  
\*\*\* Messages sent: 0. Total bytes sent: 0. Time: 00:24, bytes/minute: 0  
\*\*\* Messages Received: 1. Total bytes received: 217. Total session time: 00:24, bytes/minute: 535  
\*\*\* Disconnected from Peer: WH6FUS @ 2019/04/21 04:51:49  
\*\*\* Session: 0.4 min. Avg Thruput: 0 Bytes/min. 1 Min Peak Thruput: 0 Bytes/min

VARA FM M  
Settings View

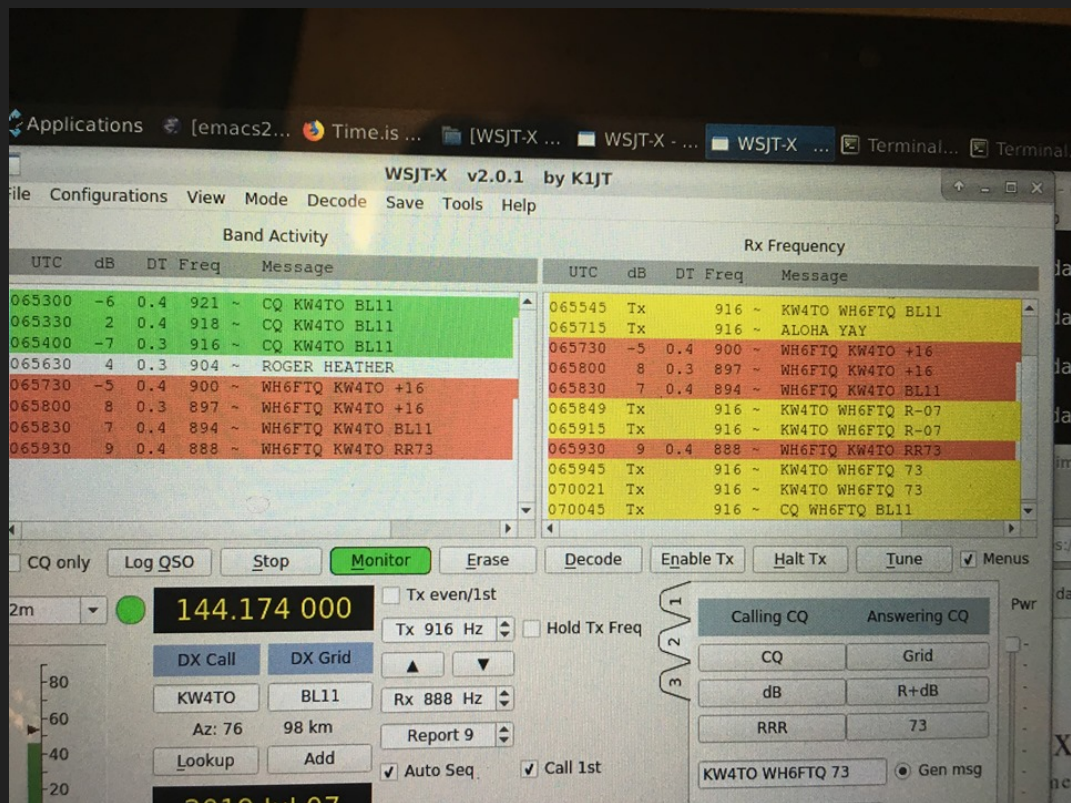
peer  
good  
bytes  
0.0  
0.2  
0.4  
0.6  
0.8  
1.0  
VU  
Audio Inp  
RX Disc







# 2m FT8



This was “acoustically coupled”

Coordinated with Glenn  
KW4TO, who was not far away

# Morse Code with the baofeng (currently experimental)

# Why? Because I can.

Parts: 2 baofengs, easydigi,  
adafruit circuit playground,  
battery, lots of wires

Can either connect a key or use the capacitive touch pads on the circuit playground





# Don't ever “repair” a baofeng

It's not worth your time.

I did it, and mine “works”

Not recommended.



# Bike mobile

Usually slow parts through  
campus with no or few cars

Not particularly safe, but it is fun



## Physics Alum Discovers Brand New Comet



**Dr. Heather A. Flewelling** (U-M Physics '09) currently works as a “planetary defense researcher” at the ATLAS (Asteroid Terrestrial-impact Last Alert System) in Hawaii. Dr. Flewelling’s U-M Advisor was Professor Carl Akerlof.

**Dr. Flewelling recently discovered a new comet which has been named after her as Comet Flewelling (Comet 2019 D1) on March 21 2019.**





