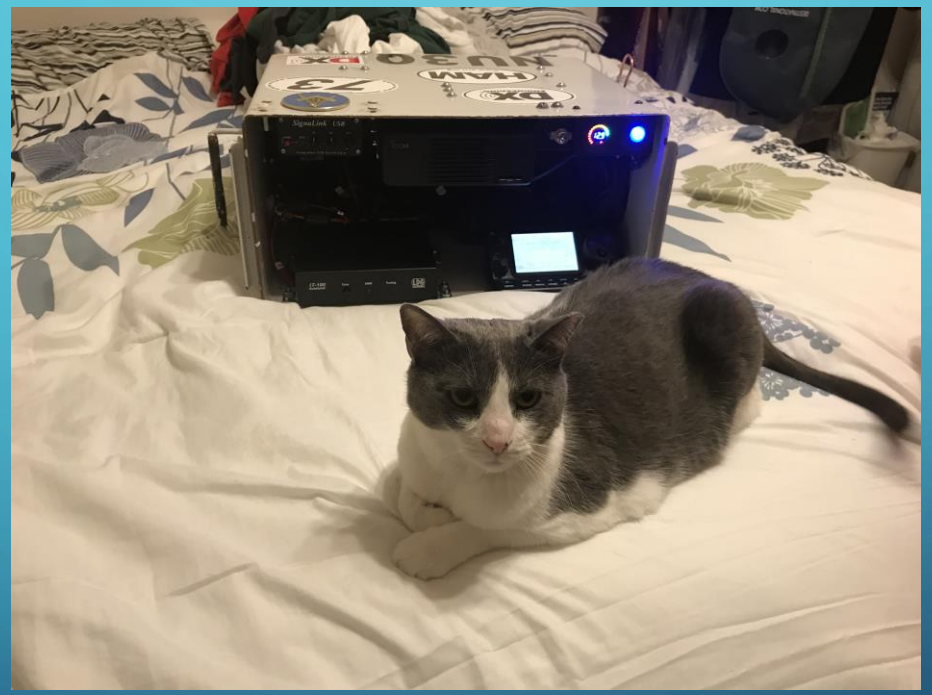
NU3Q LABS PRESENTS

HOMEBREW HF GO BOX



"K1TTY" APPROVED

tbs
"YOU'LL RF YOUR EYE OUT!"
DE NU3Q LABS

TRIVIA

What is the amateur radio connection with the foregoing picture?

TRIVIA ANSWER

Jean Shepherd, K2ORS (SK), was the narrator of *A Christmas Story*. He was the adult Ralphie in the movie. There are clips on You Tube where he talked about operating his shack

"The soft glow of electric sex gleaming in the window"

MY MOTIVATION FOR BUILDING THE BOX

- Quick Deployment – ready to go at a moments' notice!
- No wasted time connecting radio to tuner, sound card, battery, etc.
  - All components needed are self contained and already connected!
- Self contained power for extended operation
- Extra port for external power

MY FIRST CHOICE FOR A CASE

- My first choice was a 6RU ABS 19” flight rack case:

MY FIRST CHOICE FOR A CASE

HOWEVER…..

- Very pricey – around $150!
- Extra expense – need to buy shelf – extra charge!
- Shipping was expensive as well – oversize item!
- Grounding was a concern for me!
  - ABS Plastic – non conductive…

UNTIL ONE DAY I SAW THE ANSWER!

THE ANSWER…

- Vietnam Era Surplus Army Ammunition Box – 50 caliber (dated 5/15/66).
  - Confirmed by a Masonic Brother who served in the jungles of Vietnam.
- Purchased locally at Ralph's Army Surplus in Monroeville for $70.
- More cost effective solution.
- All metal construction – makes for better ground!

HANDLE

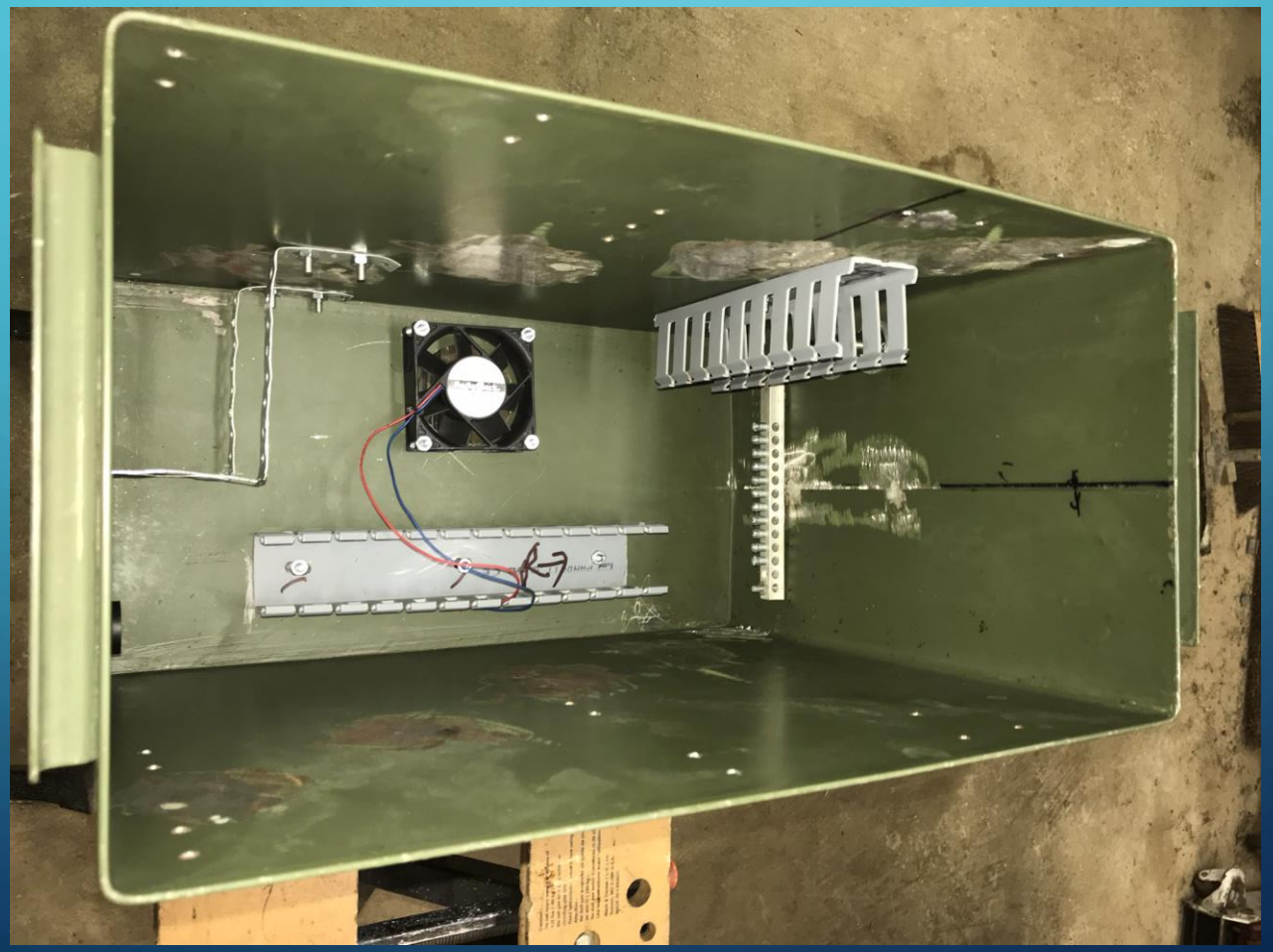
- Added handle to lid

REMOVAL OF SLOTS (BOTH SIDES)

COOLING FAN

POWER SWITCH/VOLTMETER MOUNT

WIRE MANAGEMENT & GROUNDING



SO-239 CONNECTORS

EXTERNAL POWER PORTS

FINAL MOCK UP

PAINTING THE BOX

- Used Rust-Oleum® Primer and Farm Implement Enamel – brushed on
  - 3 coats each
- Between coats – sand with 600 grit wet sandpaper
- Why did I select Ford Gray as my color choice?
  - Draw suspicion away from me so I don't get questioned by law enforcement
  - AND…

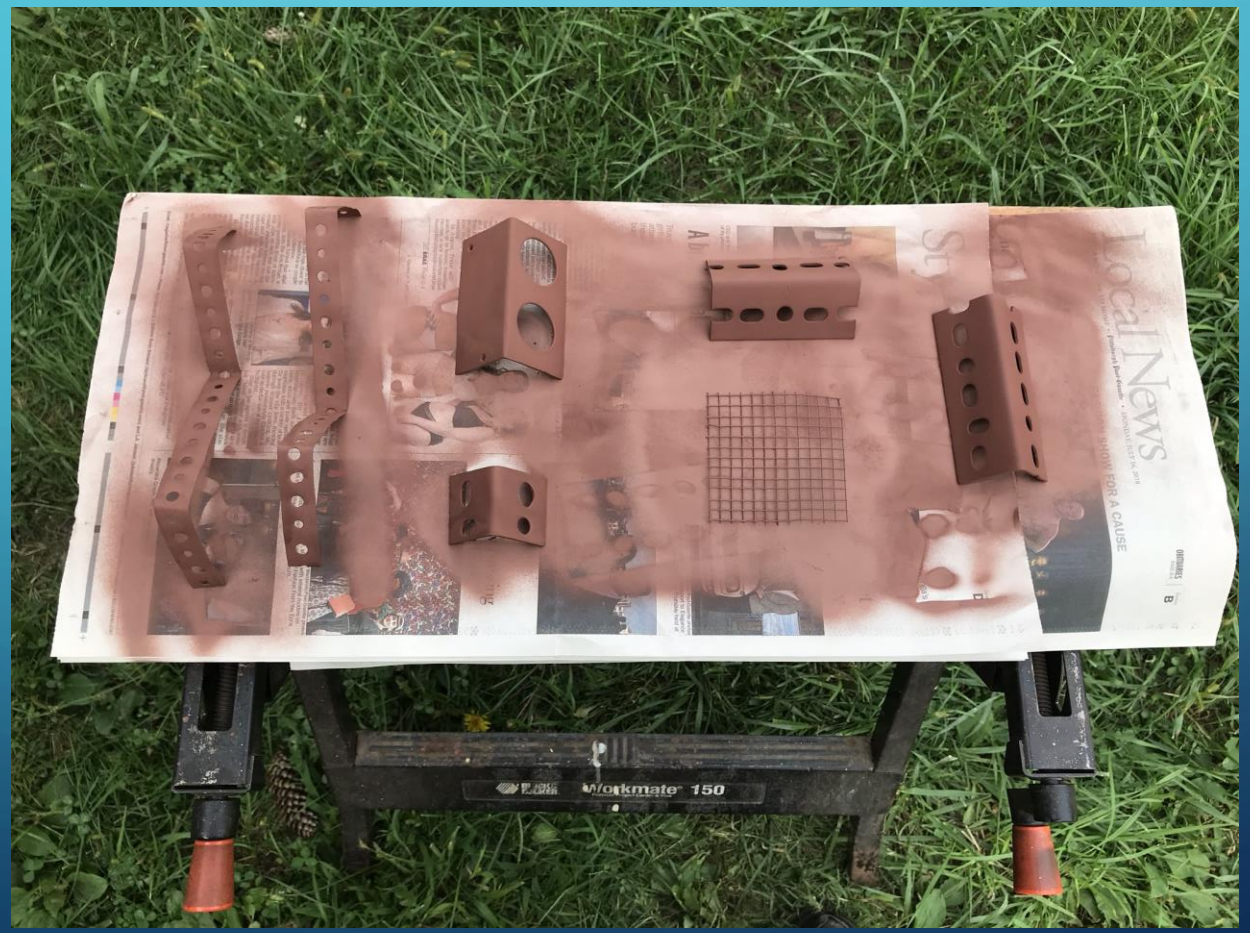
1948 FORD 8N TRACTOR

- Celebrate the 70th birthday of my grandfather's tractor:

PREP WORK

PRIMER COAT - BOX

PRIMER COAT - MOUNTS



FINAL COAT - BOX

FINAL COUNT - MOUNTS

BATTERY

- Bioenno Power BLF-1215A LiFePO4 battery @ 15Ah
- Built-in PCM – overload protection
- **Approximate** run time per Bioenno tech support is 7.5 hours @ 100 watts

RUNTIME CALCULATION

General: I'm a Ham, I have an Amateur Radio; which battery do I get?

You'd need three pieces of info: 1) Transmit Power in Watts, 2) Receive Power in Watts and 3) Percentage of time spent transmitting. Follow this formula:

(Transmit Watts x Percentage of Time Transmitting) + (Receive Watts x Percentage of Time Receiving) = Weighted Average Draw

RUN TIME CHART

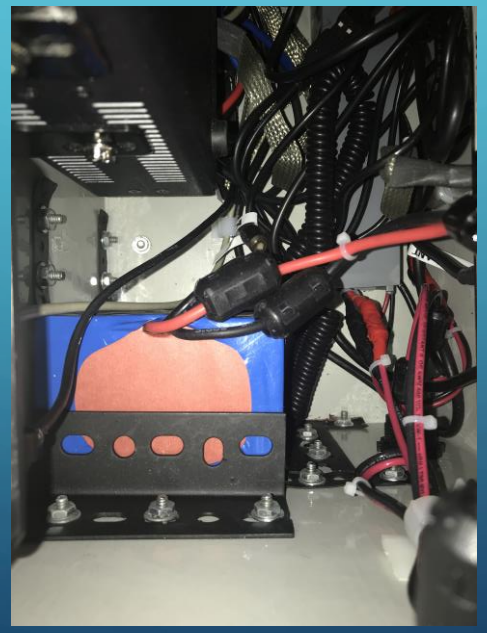
BIOENNO POWER LIFEPO4 STANDARD 20-80 DUTY CYCLE BATTERY RUNTIME CHART

Transmit	Receive [1]	Total Draw	Battery [2]	CAPACITY	Runtime
5 Watts	5 Watts	5 Watts	BLF-1203A	36 Watt Hours	7.2 Hours
			BLF-12045W	54 Watt Hours	10.8 Hours
			BLF-1206A	72 Watt Hours	14.4 Hours
			BLF-1209A/AS	108 Watt Hours	21.6 Hours
			BLF-1212A/AS	144 Watt Hours	28.8 Hours
10 Watts	5 Watts	6 Watts	BLF-1203A	36 Watt Hours	6 Hours
			BLF-12045W	54 Watt Hours	9 Hours
			BLF-1206A	72 Watt Hours	12 Hours
			BLF-1209A/AS	108 Watt Hours	18 Hours
			BLF-1212A/AS	144 Watt Hours	24 Hours
			BLF-1215A/AS	180 Watt Hours	30 Hours
20 Watts	5 Watts	8 Watts	BLF-1206A	72 Watt Hours	9 Hours
			BLF-1209A/AS	108 Watt Hours	13.5 Hours
			BLF-1212A/AS	144 Watt Hours	18 Hours
			BLF-1215A/AS	180 Watt Hours	22.5 Hours
			BLF-1220A/AS	240 Watt Hours	30 Hours
25 Watts	5 Watts	9 Watts	BLF-1206A	72 Watt Hours	8 Hours
			BLF-1209A/AS	108 Watt Hours	12 Hours
			BLF-1212A/AS	144 Watt Hours	16 Hours
			BLF-1215A/AS	180 Watt Hours	20 Hours
			BLF-1220A/AS	240 Watt Hours	26.7 Hours
50 Watts	5 Watts	14 Watts	BLF-1209A/AS	108 Watt Hours	7.7 Hours
			BLF-1212A/AS	144 Watt Hours	10.3 Hours
			BLF-1215A/AS	180 Watt Hours	12.8 Hours
			BLF-1220A/AS	240 Watt Hours	17.1 Hours
75 Watts	5 Watts	19 Watts	BLF-1209A/AS	108 Watt Hours	5.6 Hours
			BLF-1212A/AS	144 Watt Hours	7.5 Hours
			BLF-1215A/AS	180 Watt Hours	9.4 Hours
			BLF-1220A/AS	240 Watt Hours	12.6 Hours
100 Watts	5 Watts	24 Watts	BLF-1212A/AS	144 Watt Hours	6 Hours
			BLF-1215A/AS	180 Watt Hours	7.5 Hours
			BLF-1220A/AS	240 Watt Hours	10 Hours
			BLF-1230A/AS	360 Watt Hours	15 Hours
200 Watts	5 Watts	44 Watts	BLF-1220A/AS	240 Watt Hours	5.4 Hours
			BLF-1240A/AS	480 Watt Hours	10.9 Hours
			BLF-1260AS	720 Watt Hours	16.3 Hours
			BLF-12100AS	1200 Watt Hours	27.2 Hours

MY BATTERY

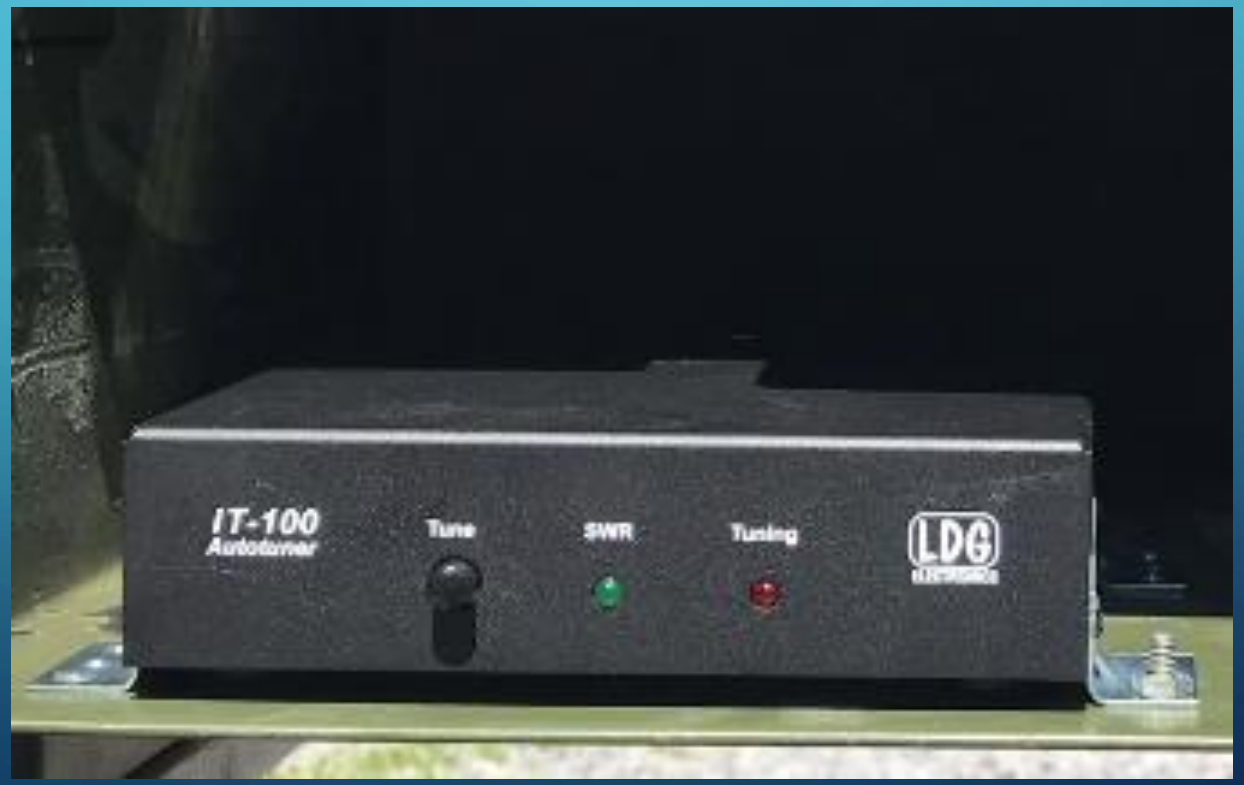
HOMEBREW BATTERY MOUNT

- Custom bent two metal straps from roll
- Cut two pieces of scrap angle from my workshop



TUNER MOUNTING

- Attached four angle brackets to tuner using existing four cover screws:



RADIO MOUNTING

- Used optional MB-62 transceiver mounting bracket for radio
  - Used screws from kit to mount bracket to ammo box and radio to bracket
- Used optional MBA-1 mounting kit for control head
  - Used MBA-1 bracket as template to drill holes in ammo box
  - Used screws from MBA-1 kit to mount control head to ammo box

SPEAKER

- Drilled holes in ammo box for speaker bracket:

SIGNALINK SOUND CARD MOUNTING

SIGNALINK SOUND CARD MOUNTING

- Used two brackets (same ones used to mount tuner)
  - Attached bracket to upper portion of Signalink™ case (after removing circuit board and covers!) by drilling holes using Pop Rivets to secure
  - Drilled holes in ammo case to mount Signalink™
- Used plastic screws and fiber washers
  - Signalink™ has its' own ground isolation – consult schematic diagram
  - Avoid ground loops with ammo case RF ground
  - Separate the Signalink™ ground from the ammo case RF ground
  - Transmit clean digital audio

RF GROUNDING

- Used ground bar for circuit breaker panel
  - Ground for IC-7100 and LDG IT-100 auto tuner

CLEAN GROUNDS

RF GROUNDING

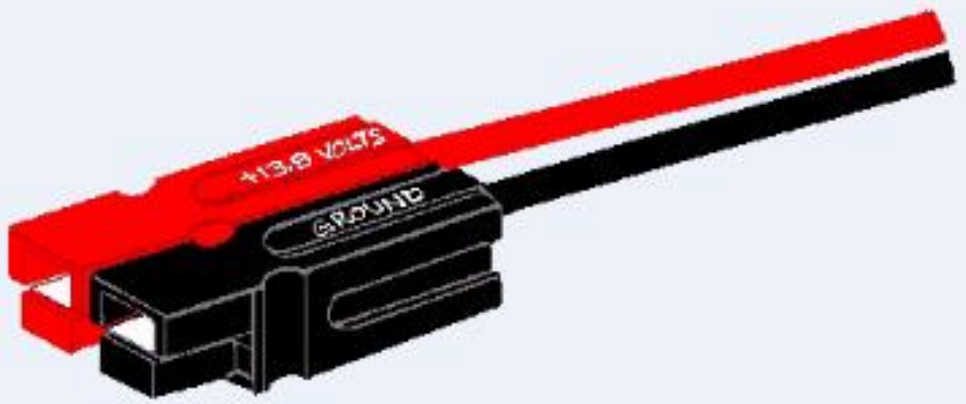
- 3/8-16 bolt to connect ground wire to external ground:

GROUND WIRE LENGTH

- Should be no longer than 7.8 feet
- Based on ¼ wave at 10 meters
  - 234/29.700 MHz = 7.8 feet (approximate)
- My ground wire is slightly under 7 foot long
- Over 7.8 feet – becomes resonant antenna

POWERPOLE ARES STANDARD

NOTE: We have adopted the same POLARITY STANDARD as seen in the above web pages. That is, when viewed from the contact side (opposite the wiring side) with **tongue down and hood up**, the **RED is on the LEFT** and the **BLACK is on the RIGHT**. This is the same polarity standard that the majority of groups use. The red and black plastic housings slide together with molded-in dovetails. (See picture Below)



FAN SWITCH

FAN SWITCH WIRING

- I wired the fan switch AHEAD of the master power switch
  - Independent control of fan – cool radio while master power switch is OFF
- Switch is wired “hot”
  - One lead to battery (feed)
  - Other lead to fan + lead (load)

MASTER POWER SWITCH & VOLTMETER

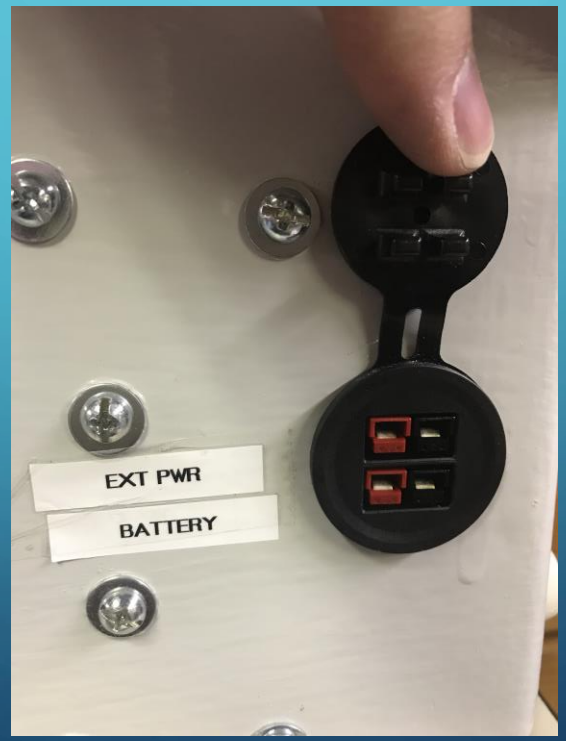
MASTER POWER SWITCH WIRING

- Three wire system
  - Black (common) tied to other black wires
  - Top (red) – connects to battery + (feed)
  - Middle wire (orange) – switched feed
    - Connected to radio + and voltmeter +

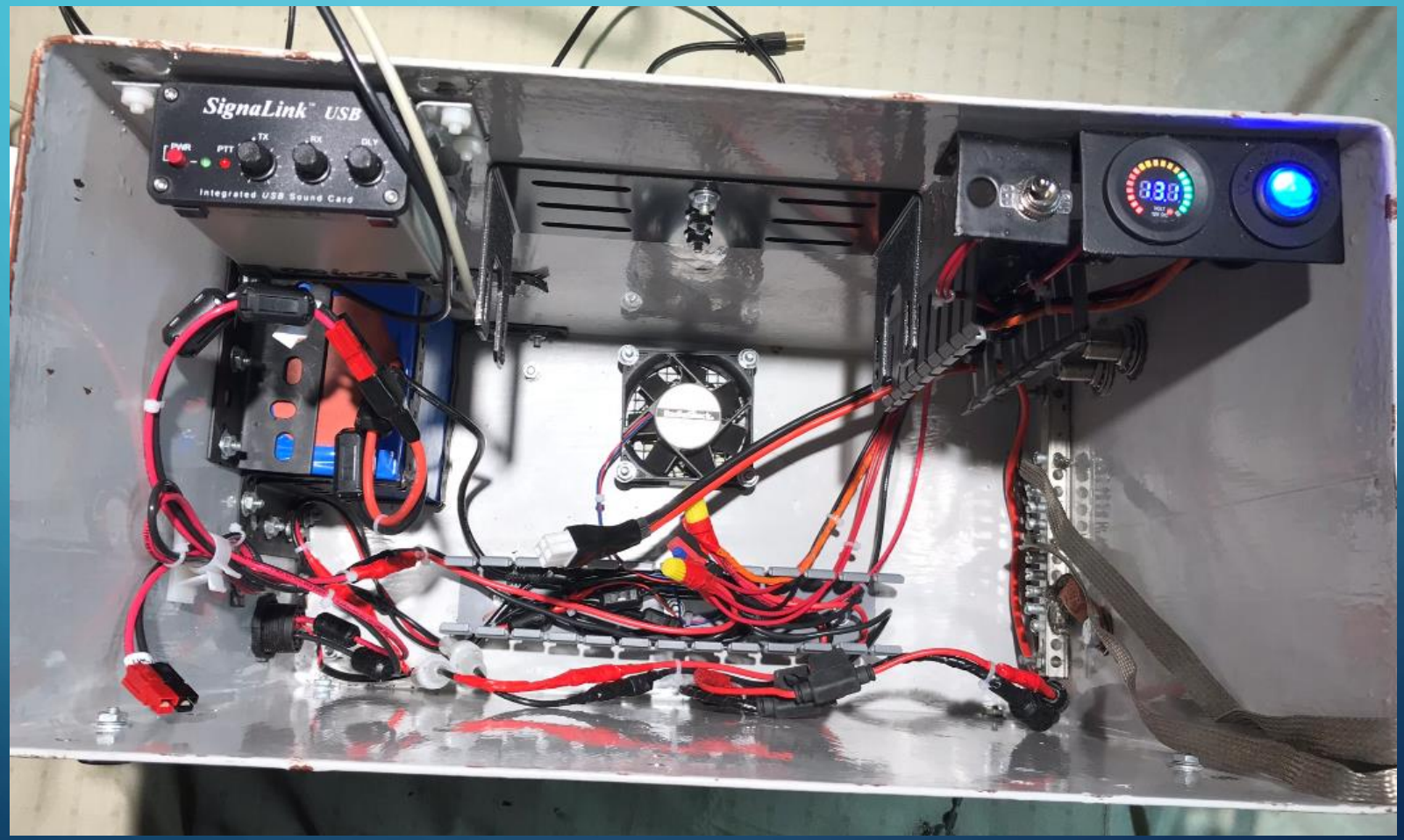
WIRING HARNESS

EXTERNAL POWER

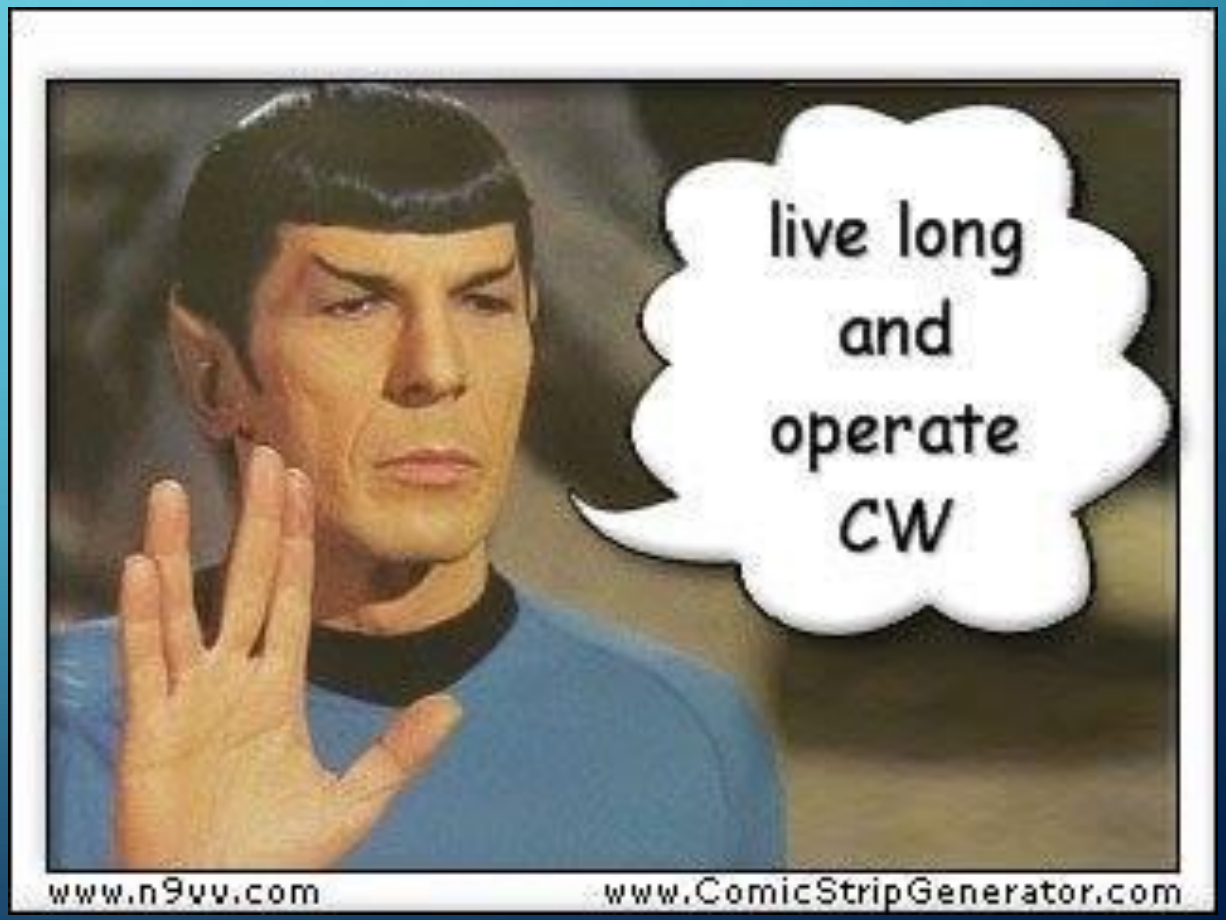
- Battery Charger on bottom
- Connect to external power source, e.g. solar panel, on top



BOX WIRING



PARTING THOUGHTS



Q & A

- Questions?
- Thank you for your time!
- Link to pictures: https://bobmente.smugmug.com/NU3Q-Go-Box/
- Link to presentation: https://www.dropbox.com/sh/01ogdhy6j95rcm7/AACuwmSxOsnCx3NX2VCMZSPra?dl=0
- nu3q@nu3q.us
- (412) 279-9016