Amateur Radio Skills and Robotics

30 September 2017

Presented by:

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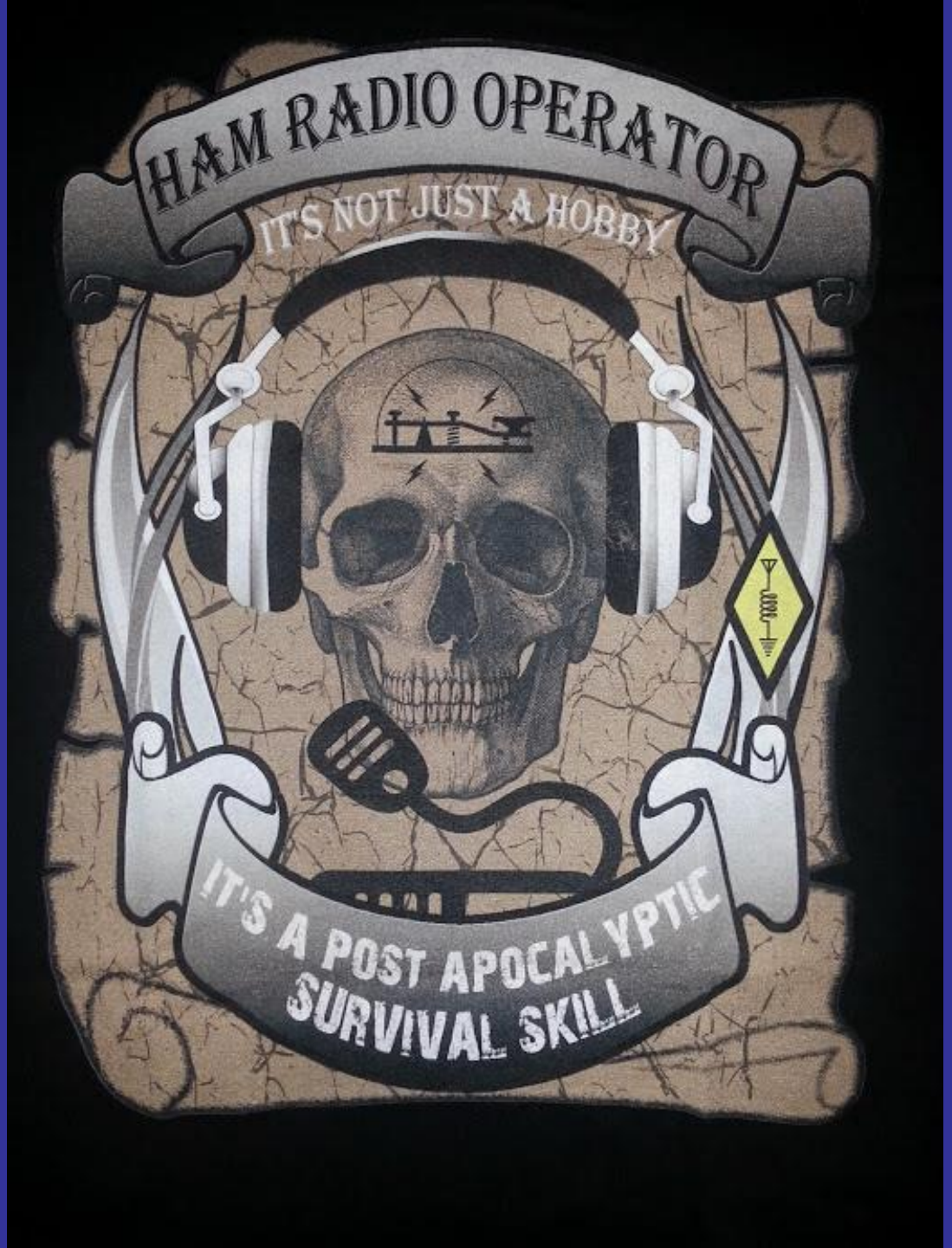
Communicate, Experiment, Interact, Compete

- Amateur radio is a regulated, non-commercial radio service. Unlike other radio services, such as CB or GMRS, hams can transmit with as much as1500 watts PEP. (1.5 Kilowatts)

- Experimentation is not only allowed, but it's encouraged. Ham radio is truly a hobby, but often one that makes a difference especially in emergency or disaster situations. It is an activity of Self-Learning, Inter-Communication, and Technical Investigation.

- Amateurs talk to local friends over the radio waves using hand-held transceivers, communicate digitally using packet, to exchange personal messages, or vital information in an emergency, talk to other hams anywhere in the world, or engage in contests over the airwaves.

- There is truly something for everyone. In the U.S. there are over 700,000 licensed radio amateurs, and this number is steadily increasing.


HAM RADIO OPERATOR
IT'S NOT JUST A HOBBY
IT'S A POST APOCALYPTIC
SURVIVAL SKILL

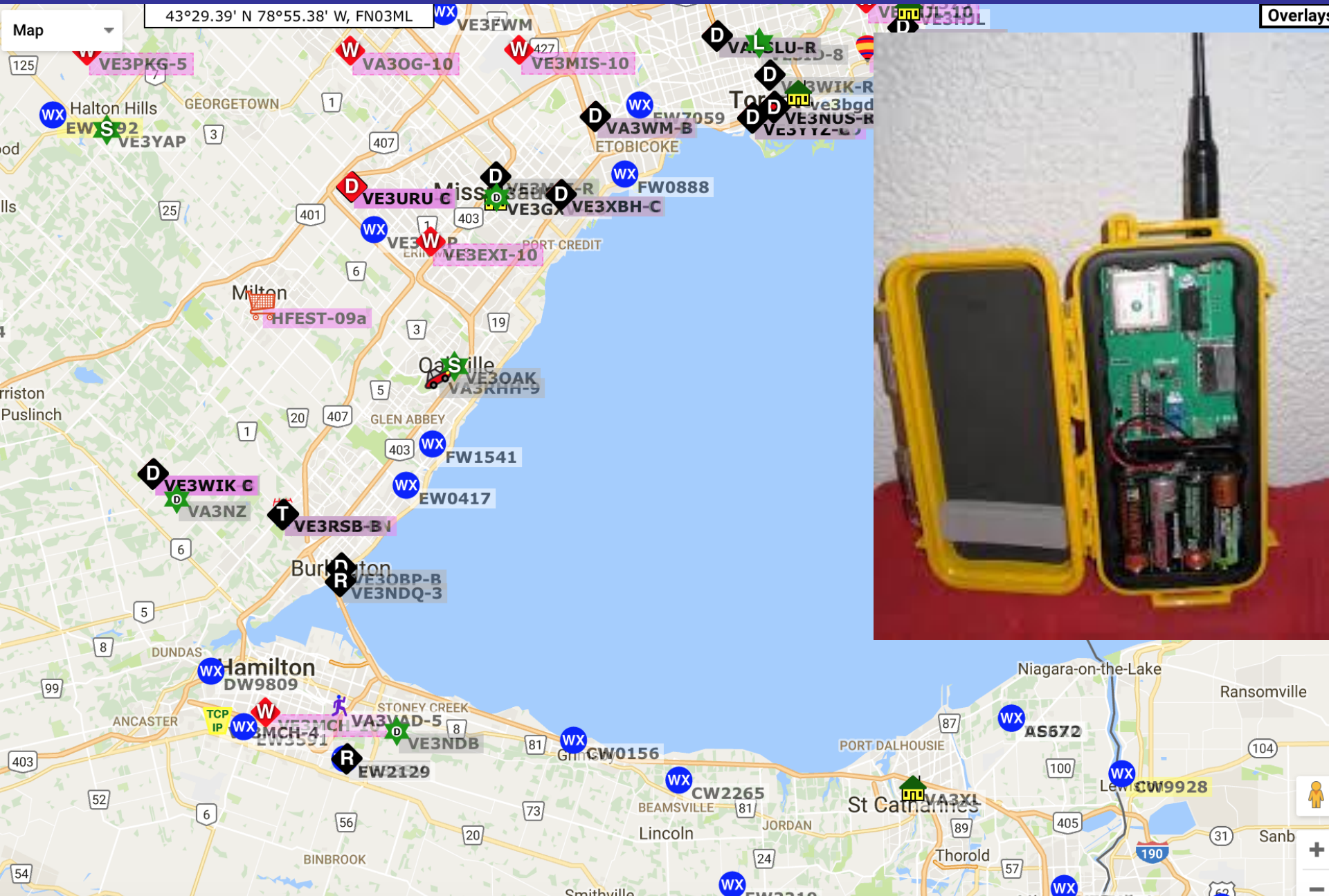
Syllabus

1. Experimental Skills in Amateur Radio
2. Remote Robotics
3. Assistive Robotics
4. Competitive Radio
5. What's Next

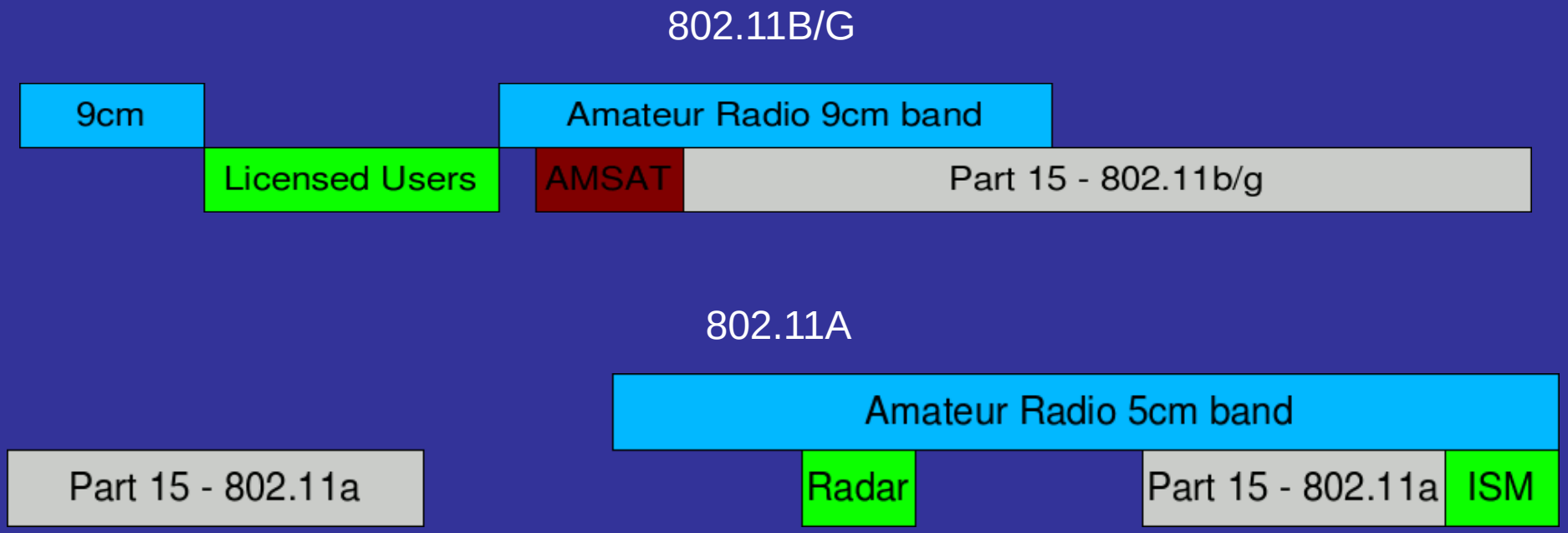
Ham Radio Skills

FD17
ARRL FIELD DAY
WWW.ARRL.ORG

APRS


Map
43°29.39' N 78°55.38' W, FN03ML
Overlays
VE3PKG-5
VA3OG-10
VE3MIS-10
VA3SLU-R
VE3WIK-R
ve3bgd
VE3NUS-R
Halton Hills
EW3592
VE3YAP
GEORGETOWN
VA3WM-B
EW7059
ETOBICOKE
FW0888
VE3URU C
VE3XBH-C
VE3EXI-10
PORT CREDIT
Milton
HFEST-09a
VE3OAK
GLEN ABBEY
FW1541
EW0417
VE3WIK C
VA3NZ
VE3RSB-B
VE3OBP-B
VE3NDQ-3
DUNDAS
Hamilton
DW9809
STONEY CREEK
VA3WAD-5
VE3NDB
EW2129
CW0156
CW2265
BEAMSVILLE
Lincoln
JORDAN
St Catharines
VA3XL
PORT DALHOUSIE
AS672
CW9928
Niagara-on-the-Lake
Ransomville
Thorold
BINBROOK
Puslinch

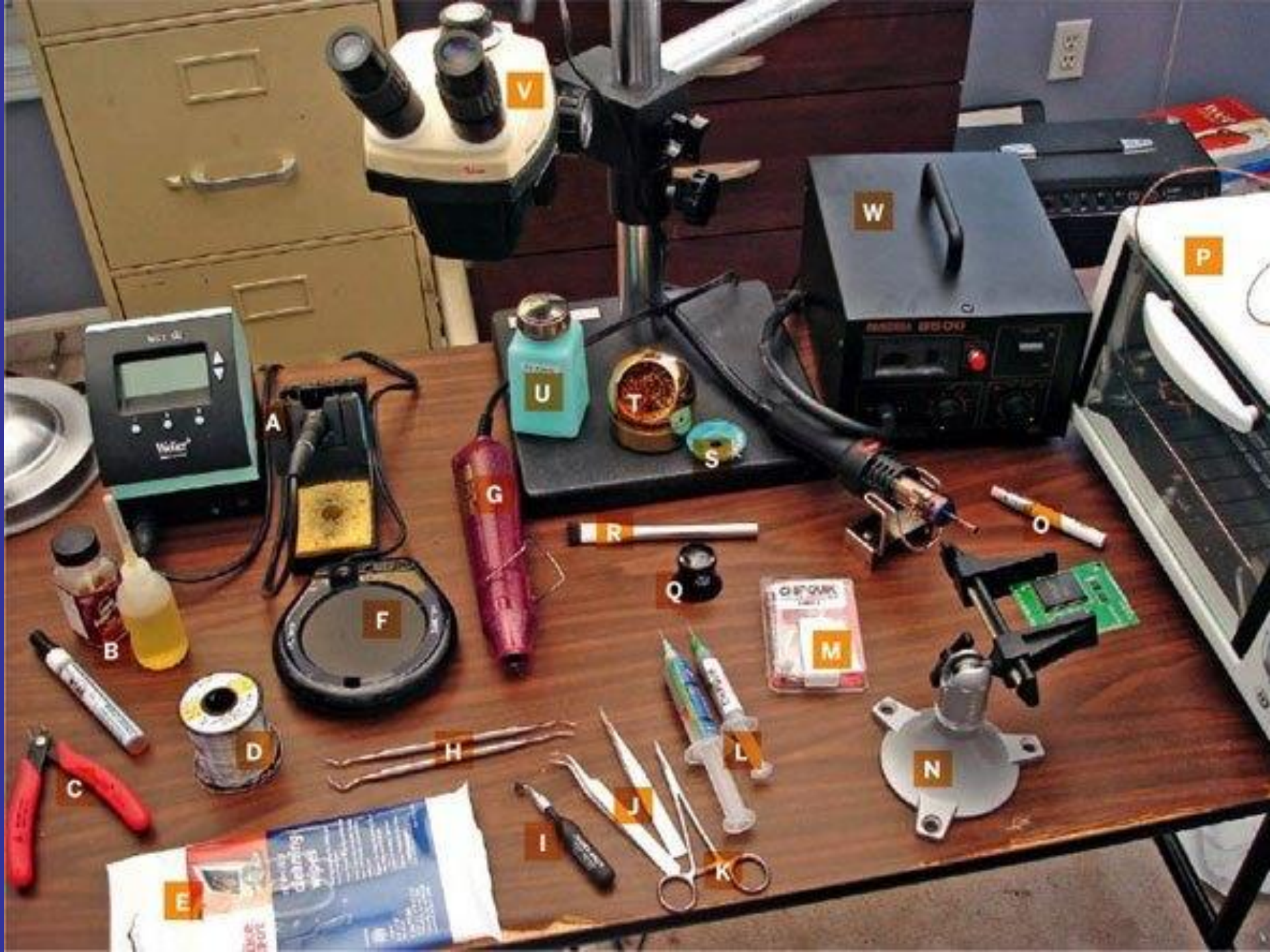
WiFi Frequencies and Power



Remote control (Power)

72 MHz (Channelized 72,00-72,99(For Model Aircraft Use ONLY
75 Mhz

Ham Bands
53 Mhz (6 Meter)
Distance, Power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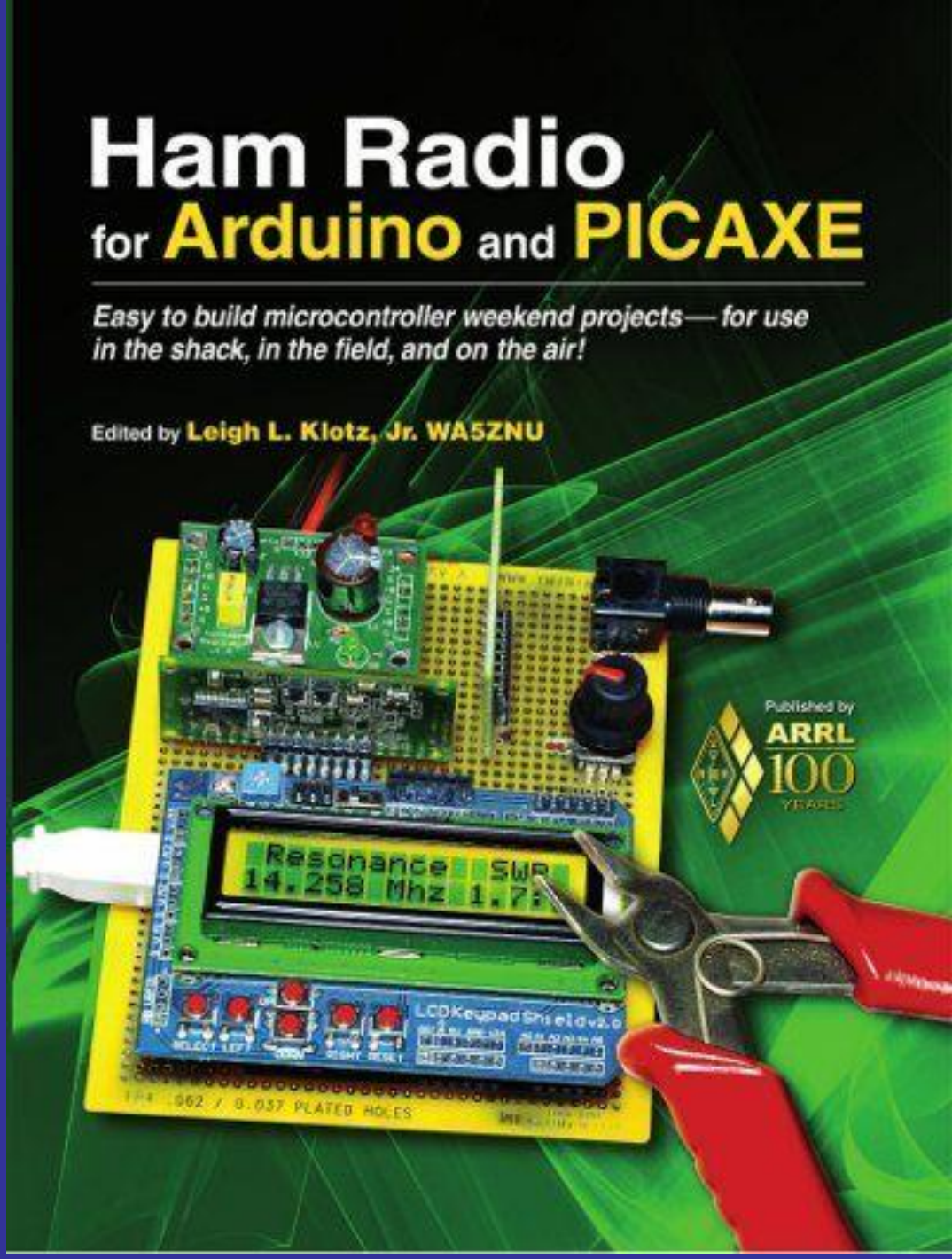
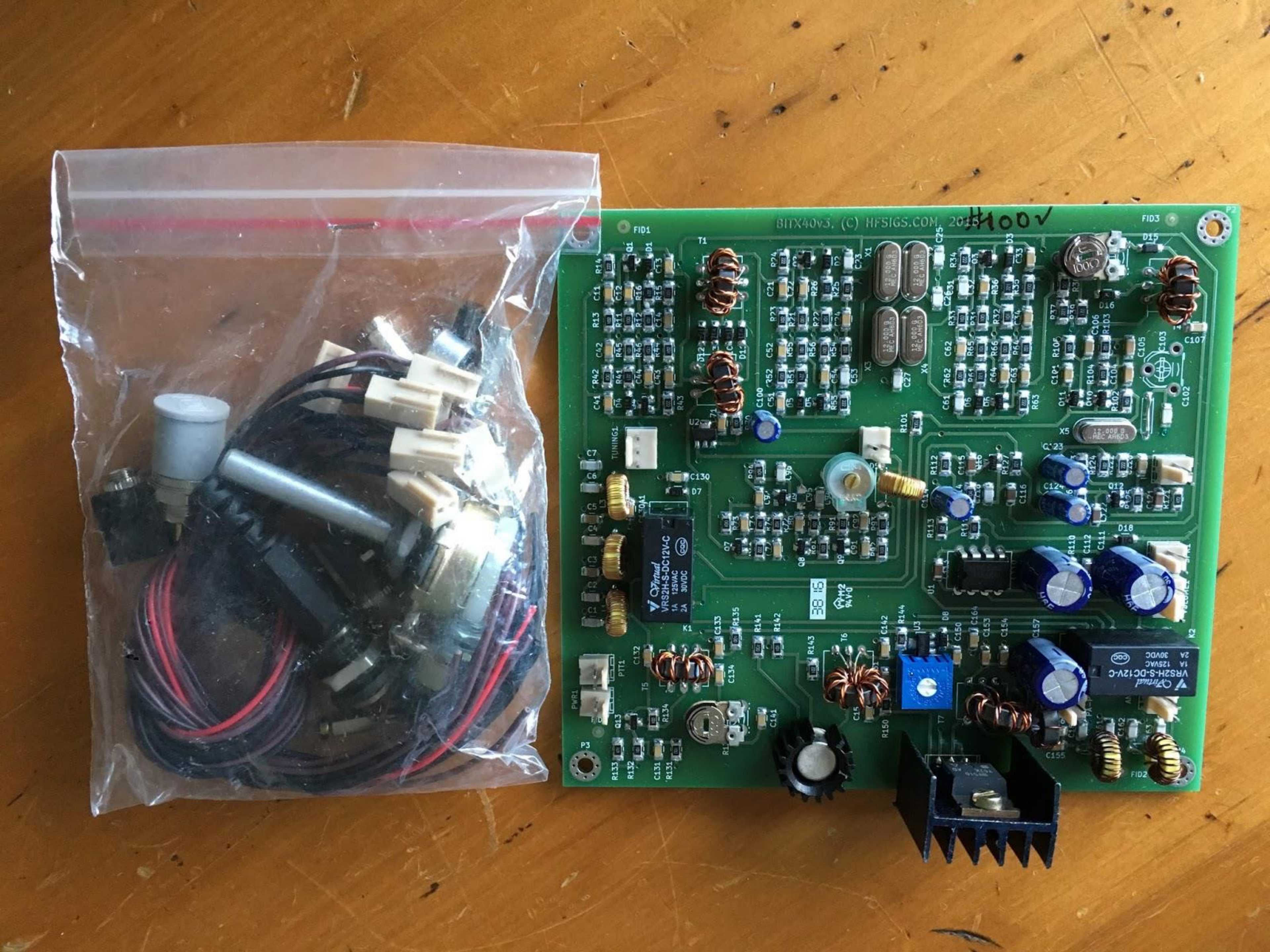
Ham Radio Skills

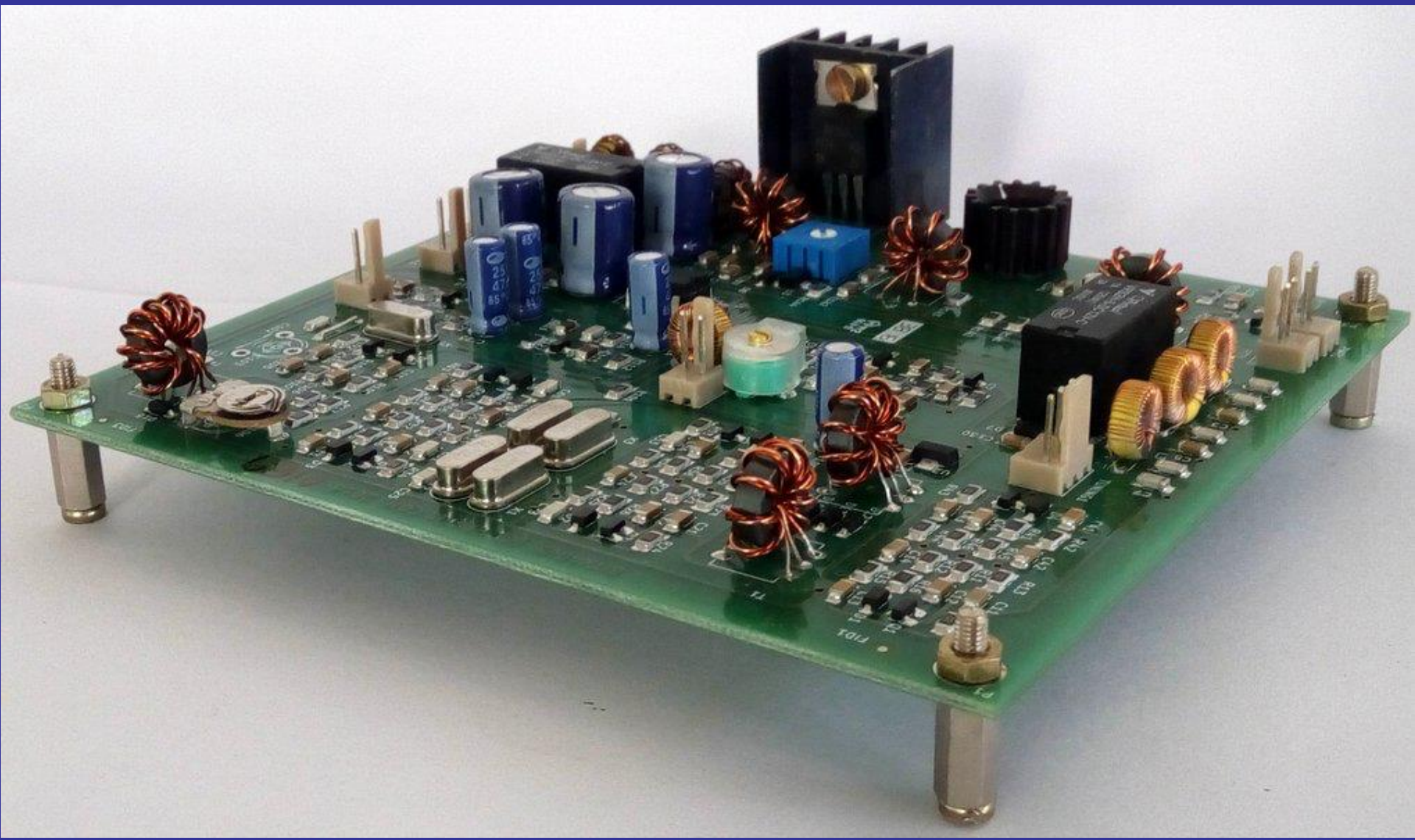


Ham Radio Skills – Kit Building


BITX40v3, (C) HFSIGS.COM, 2016
#100✓
VRS2H-S-DC12V-C
1A 125VAC
2A 30VDC

Ashhar Farhan, VU2ESE

BITX40 www.hfsigs.com

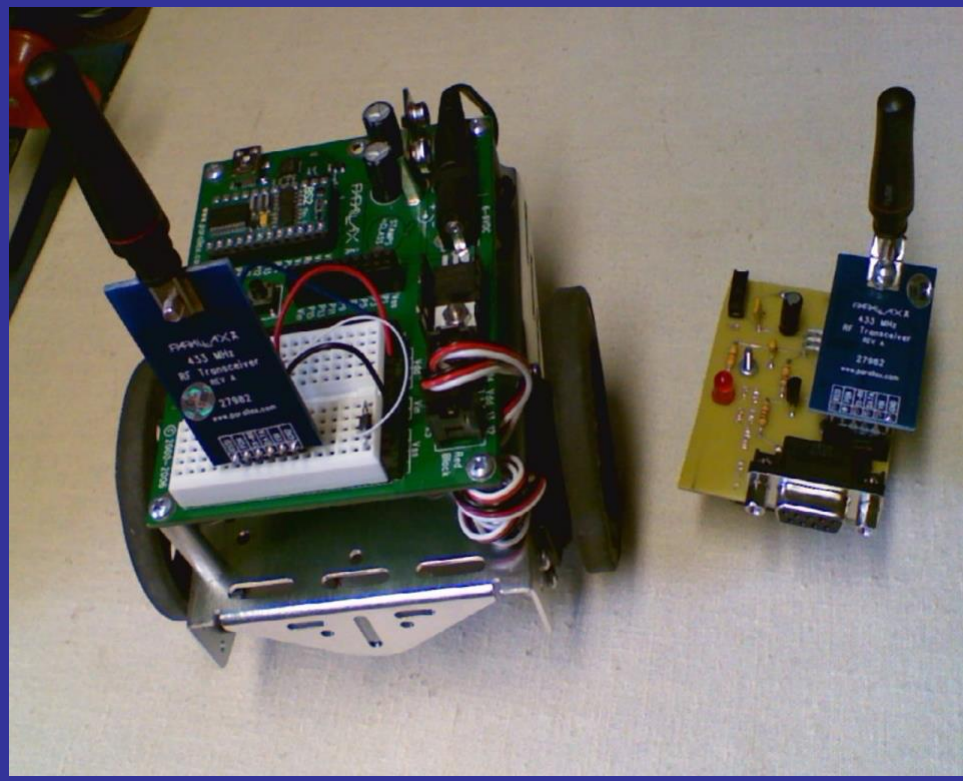


MAREA: Ham Radio Robotics

A classroom simulation for hands-on learning of radio and robotic concepts.

NASA has been doing some exciting explorations of Mars with robots,
currently *Opportunity* and *Curiosity*, which are maneuvered on the Martian surface by remote control.

Why not let students experience the same thrills as the NASA scientists and engineers through a simulation that they conduct in their own classrooms?



MAREA: Ham Ra

MAREA uses robotic movement commands that are attached in the text portion of an Automatic Position Reporting System (APRS) packet transmission. The APRS packet with the attached commands is sent from a “mission control” school via the terrestrial APRS network or, when possible, even via the Amateur Radio station on the passing International Space Station (ISS), to a “ground station” school. At the ground station school the command packet is received and the command data is linked by UHF radio to the “Mars” robot for execution.

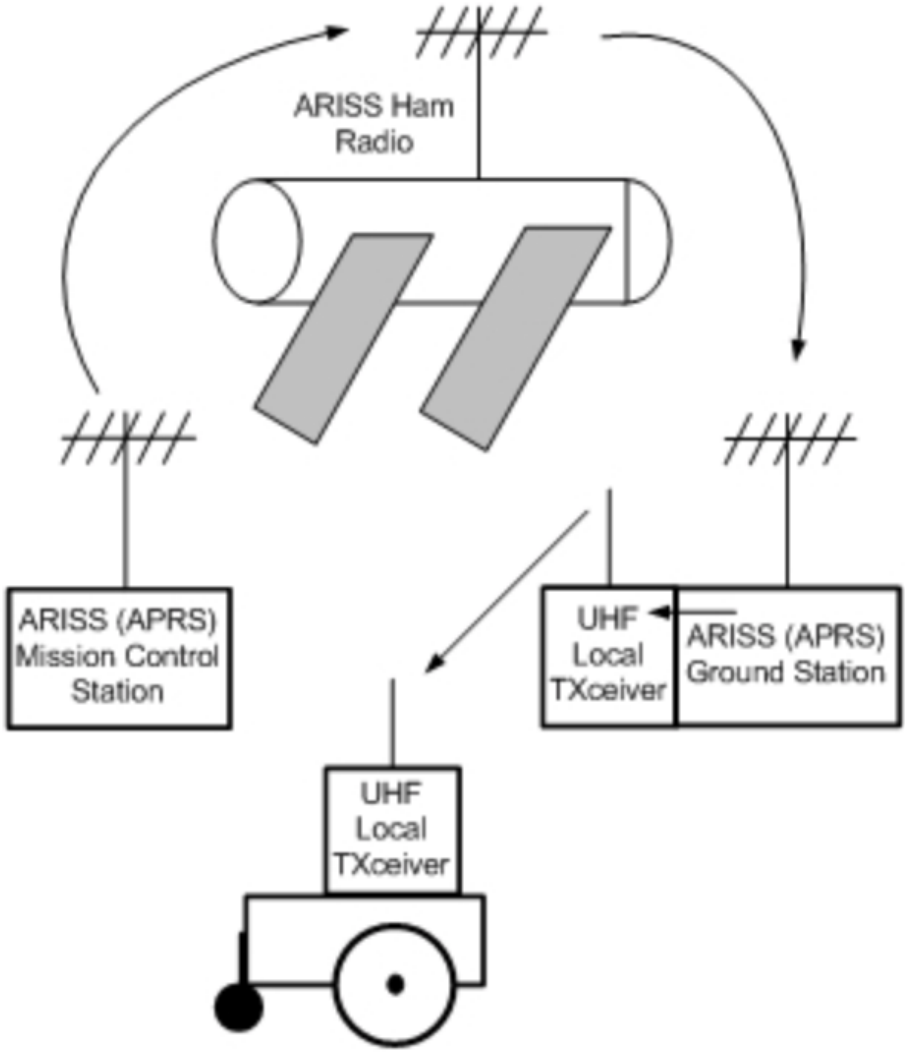
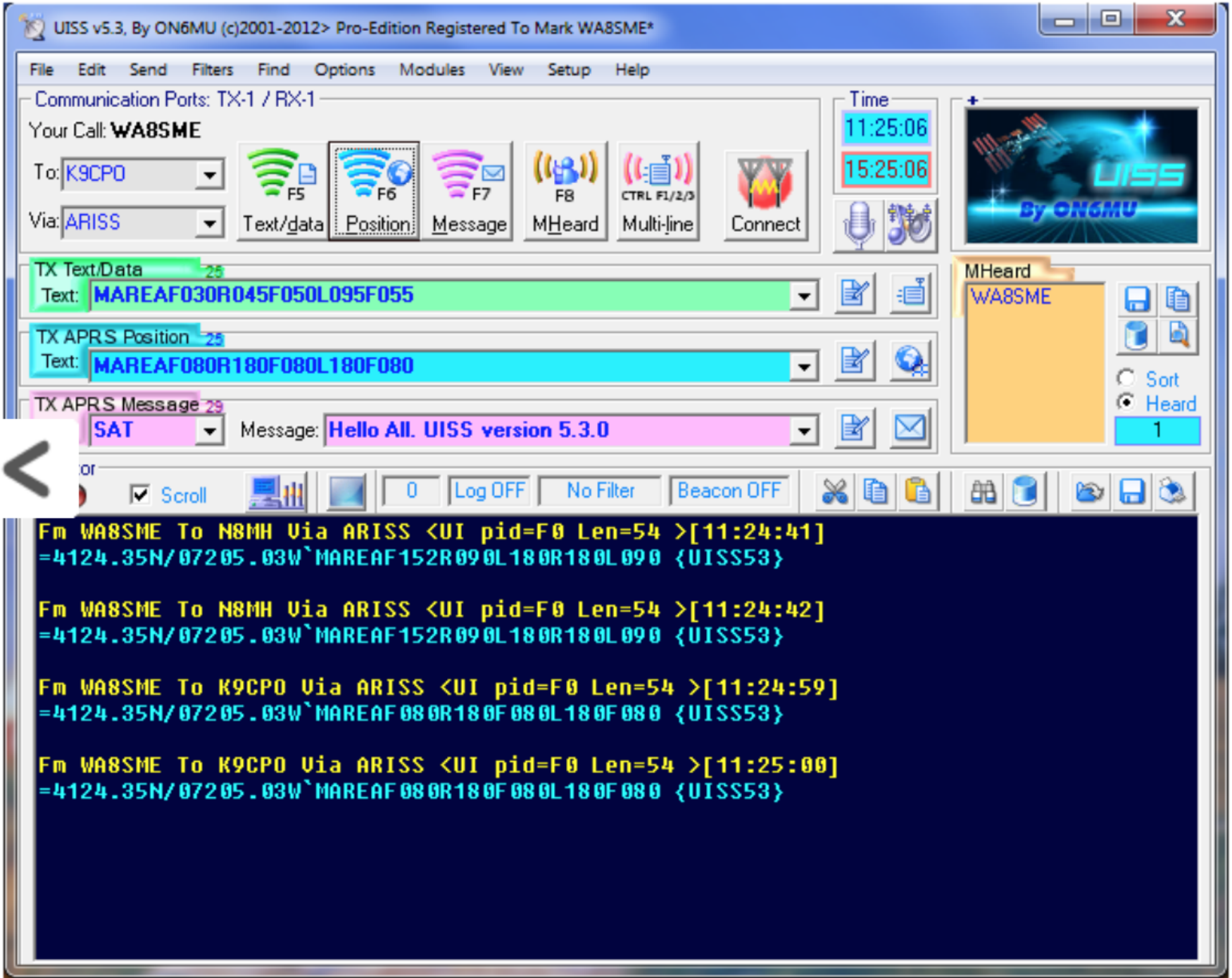
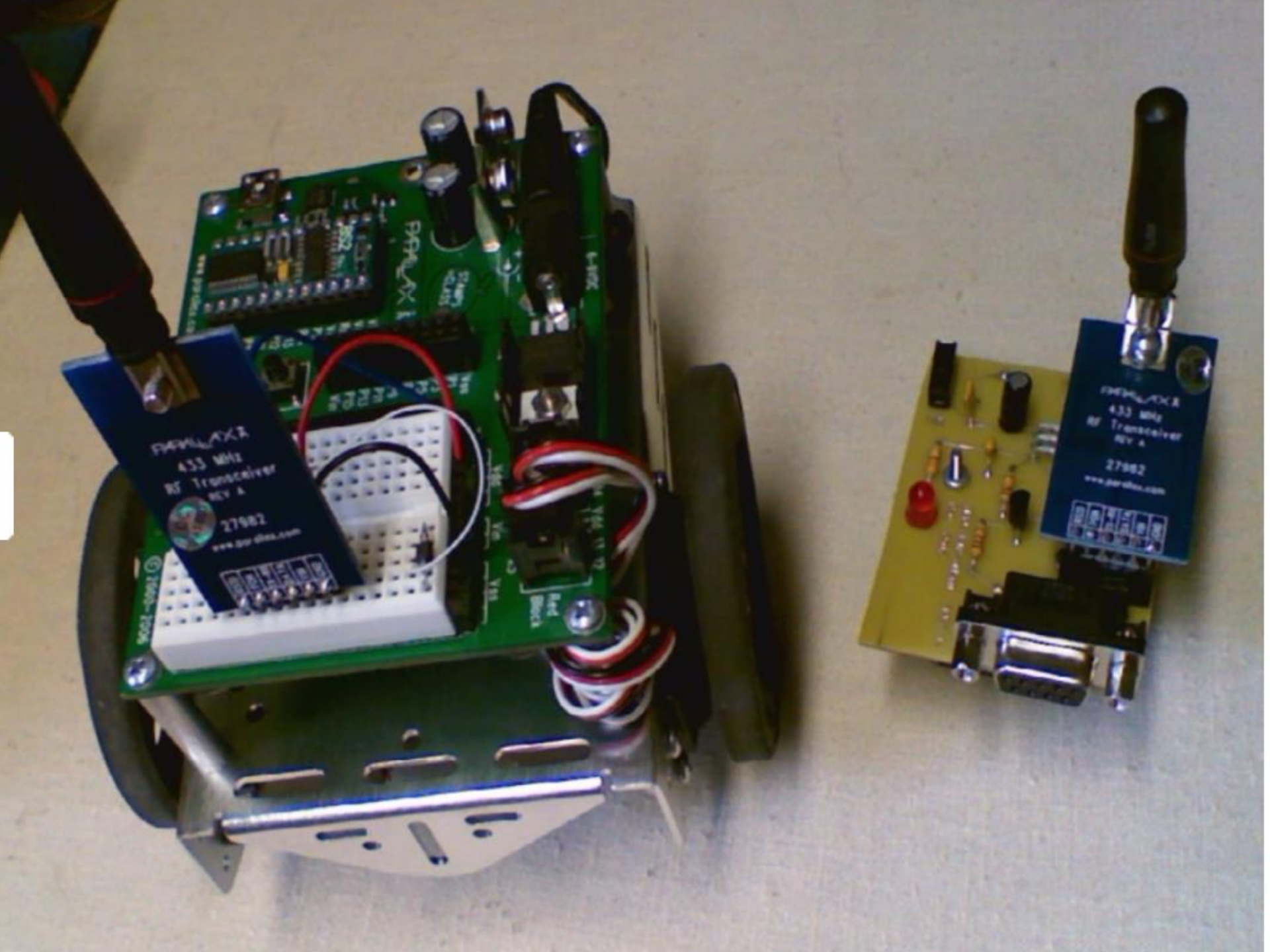


Figure 1 — MAREA connects two schools by ham radio. One develops the mission plan and the other programming. They then use APRS packets to run the mission.

CLOSE


UISS v5.3, By ON6MU (c)2001-2012> Pro-Edition Registered To Mark WA8SME*
File Edit Send Filters Find Options Modules View Setup Help
Communication Ports: TX-1 / RX-1
Your Call: WA8SME
To: K9CPO
Via: ARISS
F5 Text/data
F6 Position
F7 Message
F8 MHeard
CTRL F1/2/3 Multi-line
Connect
Time
11:25:06
15:25:06
UISS By ON6MU
TX Text/Data
Text: MAREAF030R045F050L095F055
TX APRS Position
Text: MAREAF080R180F080L180F080
TX APRS Message
SAT
Message: Hello All. UISS version 5.3.0
MHeard
WA8SME
Sort
Heard
1
Scroll
0
Log OFF
No Filter
Beacon OFF
Fm WA8SME To N8MH Via ARISS <UI pid=F0 Len=54 >[11:24:41]
=4124.35N/07205.03W`MAREAF152R090L180R180L090 {UISS53}
Fm WA8SME To N8MH Via ARISS <UI pid=F0 Len=54 >[11:24:42]
=4124.35N/07205.03W`MAREAF152R090L180R180L090 {UISS53}
Fm WA8SME To K9CPO Via ARISS <UI pid=F0 Len=54 >[11:24:59]
=4124.35N/07205.03W`MAREAF080R180F080L180F080 {UISS53}
Fm WA8SME To K9CPO Via ARISS <UI pid=F0 Len=54 >[11:25:00]
=4124.35N/07205.03W`MAREAF080R180F080L180F080 {UISS53}


PARALLAX
433 MHz
RF Transceiver
REV A
27982
www.parallax.com

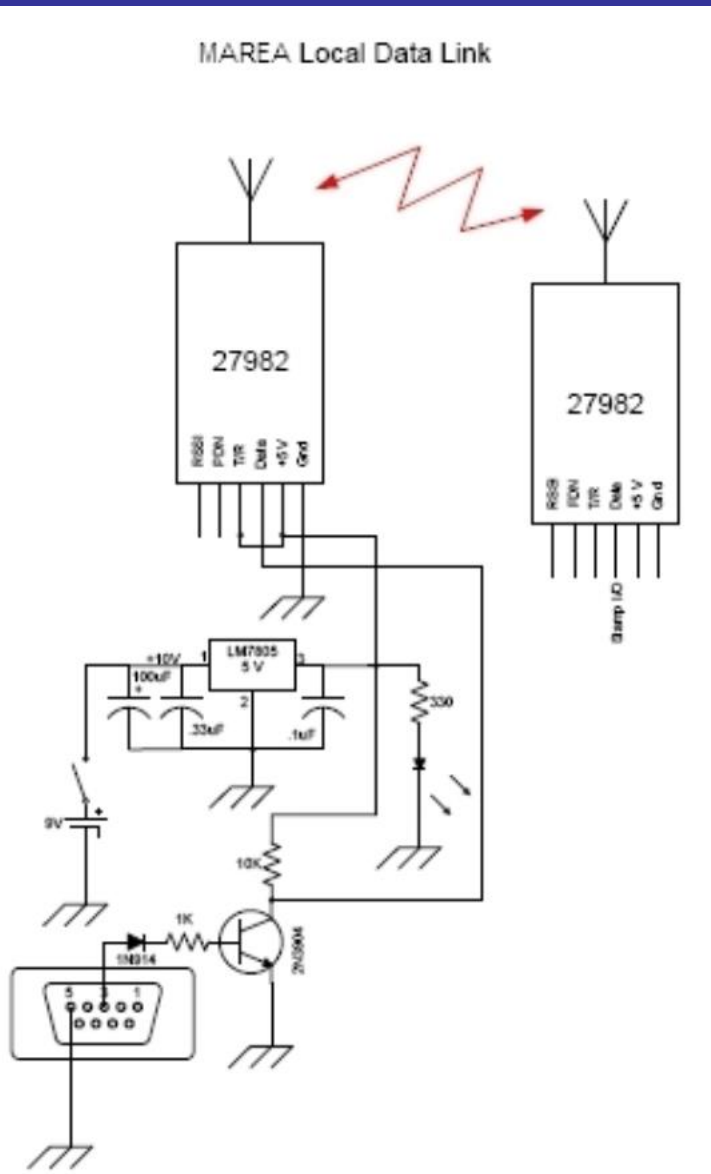
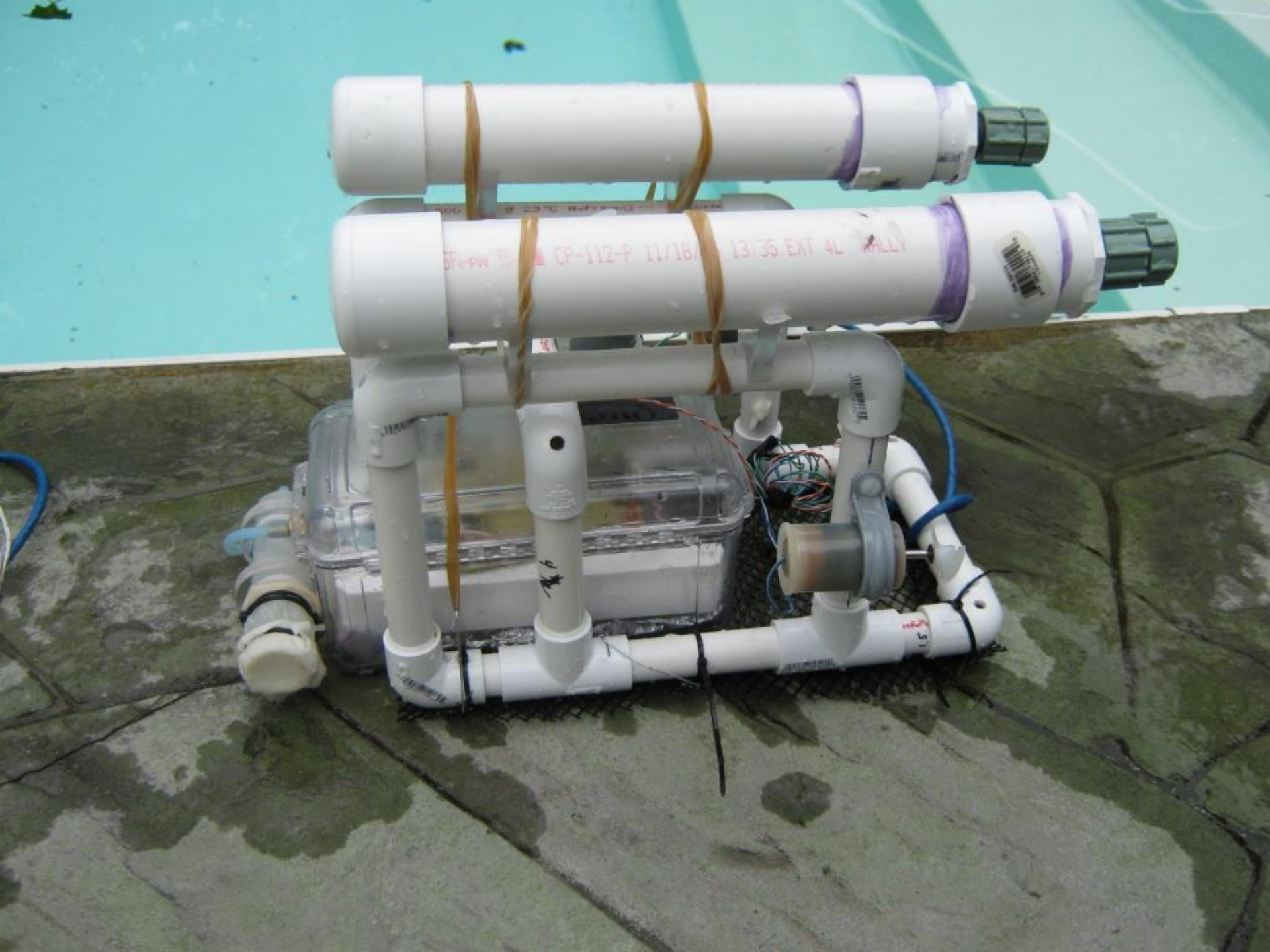
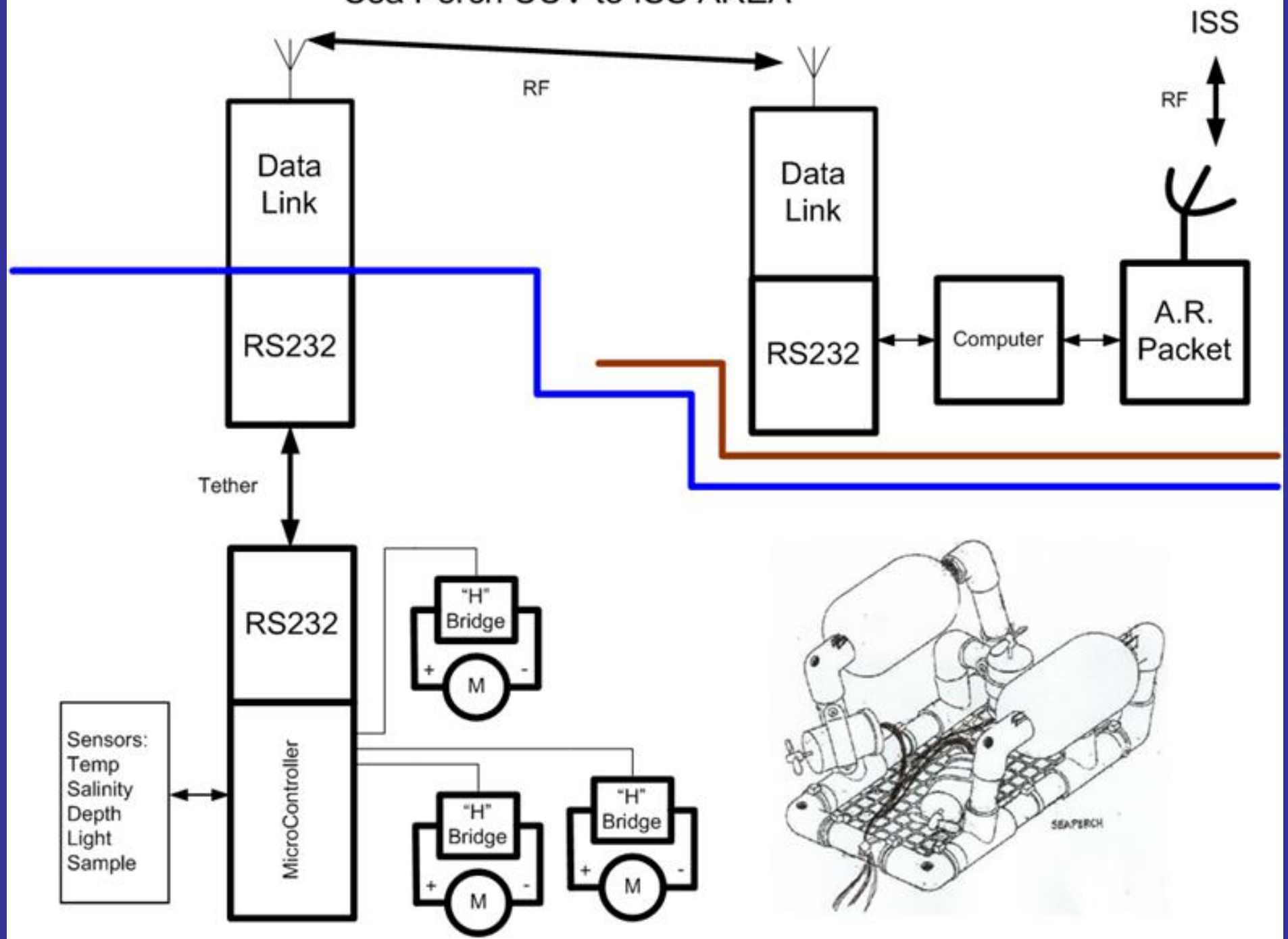


Figure 4 — Here is the Parallax UHF Transceiver Module using an RS-232 interface. To use a USB interface, a USB to serial converter is needed.

CLOSE



Sea Perch UUV to ISS AREA



MAREA: Ham Radio Robotics

Want To Try MAREA?

The MAREA concept is being included in the portfolio of activities being supported by the ARRL Education & Technology Program. There will be a time commitment to participate in the webinars. It is anticipated that up to five 1-1/2 hour webinar classes will be conducted to guide if you would like to become involved with MAREA, we would like to hear from you. Contact Debra Johnson, ARRL Education Services Manager, at **djohnson@arrl.org** or at 860-594-0296.

If you have specific or detailed questions about MAREA, contact Mark Spencer, WA8SME, at **mspencer@arrl.org** or 860-381-5335.

WHEN ALL ELSE FAILS...

AMATEUR RADIO


SPARC2
SEC 1223
SWR
Tuning
LDG
13.98v


VE7SCC
Proudly supports the
BCWARN Network
Emergency Communications
Coquitlam Amateur Radio
www.ve7scc.com
Funding provided by
the City of Coquitlam
Coquitlam
Satellite Service
provided by DRhPro
Media Services


Phoebe & Ralph Shotwell
4-H Educational
Exhibit Hall

Competitive RadioSport

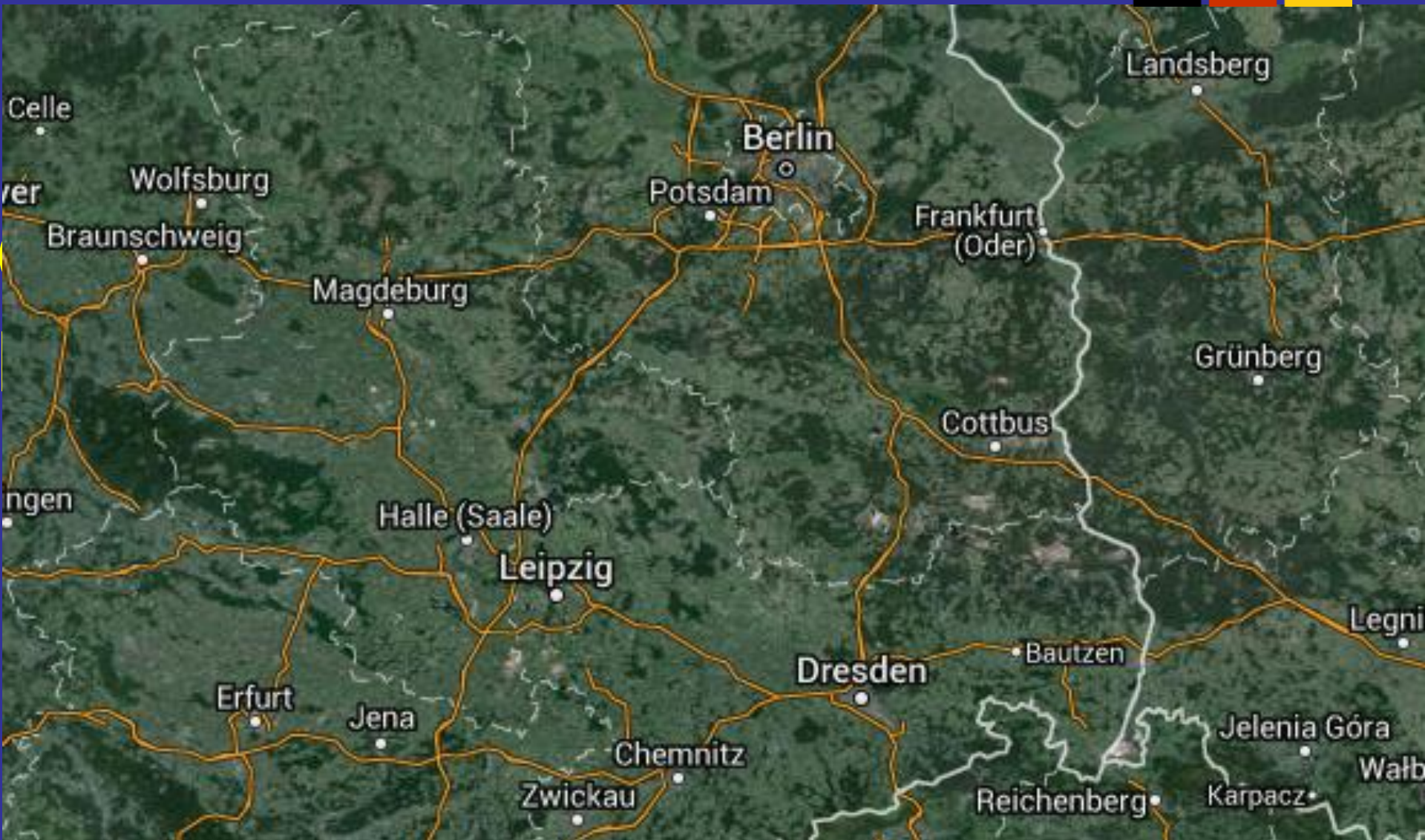

WRTC
2018

2006 WRTC BRASIL

World Radiosport Team Championship 2010 RUSSIA

WRTC 2014 World Radiosport Team Championship

WRTC 2018



WRTC Skills

CW (Morse)

Phone (Voice)

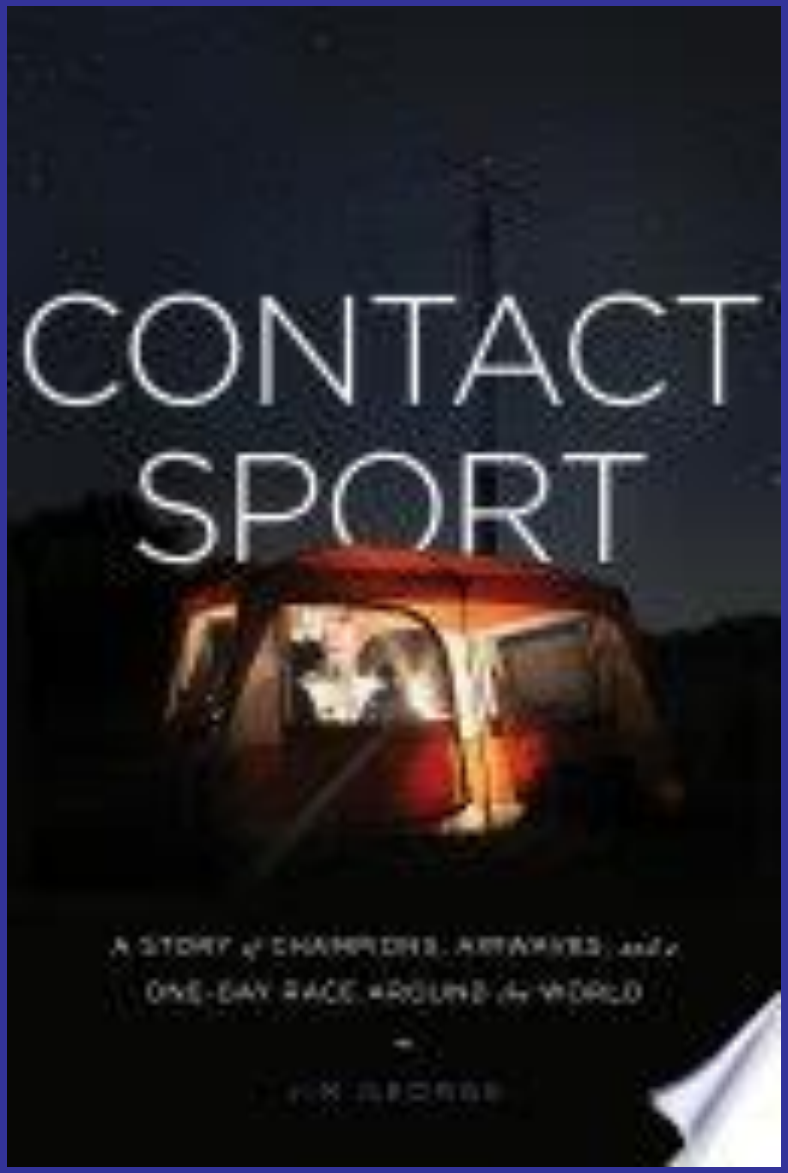
Contest Logging

Propagation

Band Management

Field Operations

Field Repairs



WRTC 2018

49 teams through **Qualification**

1 team **Defending Champions**

Up to 5 **Sponsored** Teams

Up to 5 **Wildcard** Teams

3 **Youth** Teams (under 25)

Ham Radio Operator

What My Friends Think I Do

What My Wife Thinks I Do

What Society Thinks I Do

What My Kids Think I Do

What I Think I Do

What I Actually Do

hamhijinks.com

What's Next?

Thanks!