

Agenda

- Call to Order
- Secretary's Report NJ1F
- Treasurer's Report -N8RA
- Announcements
- •ED8X CQ WW 2015
- ARRL DX in Review W2JU
- Discover the HF Experience— W1VE
- •Break/Buy Raffle Tickets!
- New Members
- PolEx The Road to a Better Kilowatt K1LI/K1KP
- •EI1Y K1CC
- Adjourn



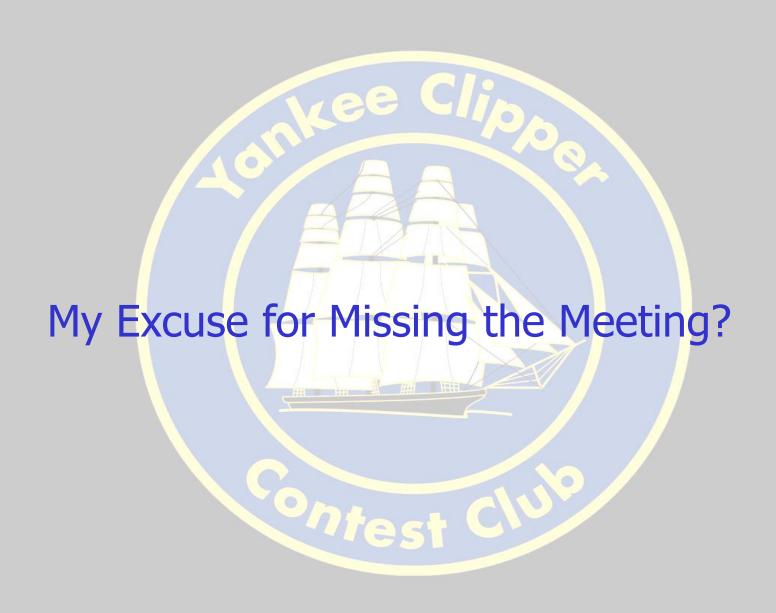
Brian Szewczyk, NJ1F, Secretary

Meeting Minutes

The December 2015 Meeting Minutes were published in the February Scuttlebutt

Roster Updates

- The Roster on the Website was last updated on January 18th 2016
- Please see if your information is correct
- Send updates and corrections to Secretary@yccc.org



My XYL had plans to Celebrate My a few days early





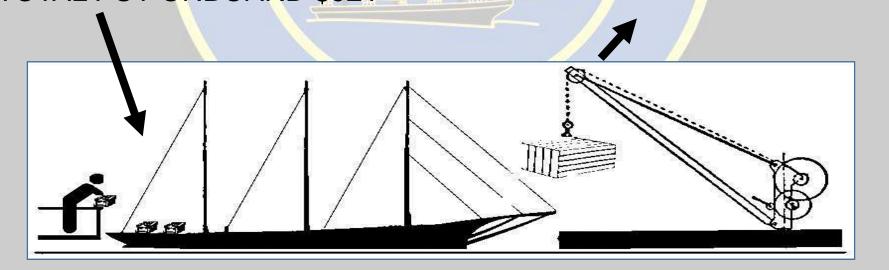
Chet Slabinski, N8RA, Treasurer

Treasury: Dec 2 thru Feb 2, 2015

\$ 10,549 Treasury balance \$10,233 (Dec 1) (Feb 2)

Dues paid \$890
Badges \$ 26
Other \$ 5
TOTAL PUT ONBOARD \$921

Bank Fees \$ 1
Reserve Framingham 'fest table\$ 20
Dec holiday meeting \$ 216
WWROF donation \$1000
TOTAL DISPATCHED \$1237



Scholarship Raffle

Ticket sales at December meeting: \$600

Balance Feb 1: \$600

K3s-100 kit





Next Scholarship Raffle

Tickets: again only \$25 each!

K3s-100 kit











Announcements

- YCCC WRTC2018 Matching Gift Update
- yccc.org email addresses
- April Meeting Special Program

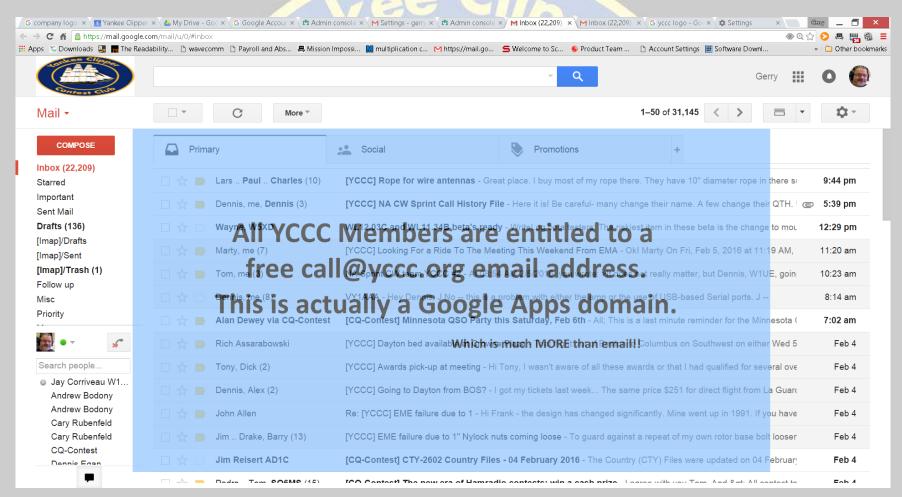
ontest

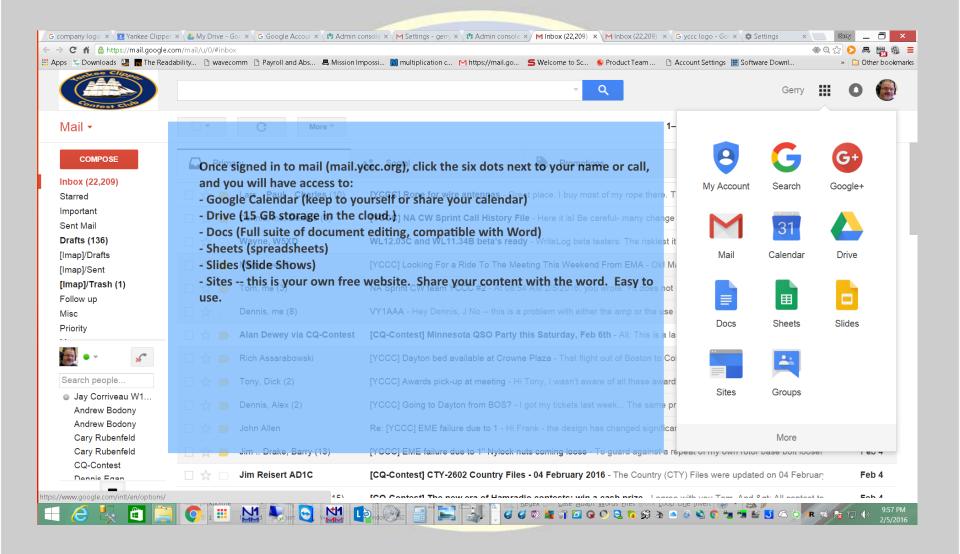
- New Area Managers
- Local Meetings (WCT, ECT)
- New Club Position Scholarship Manager

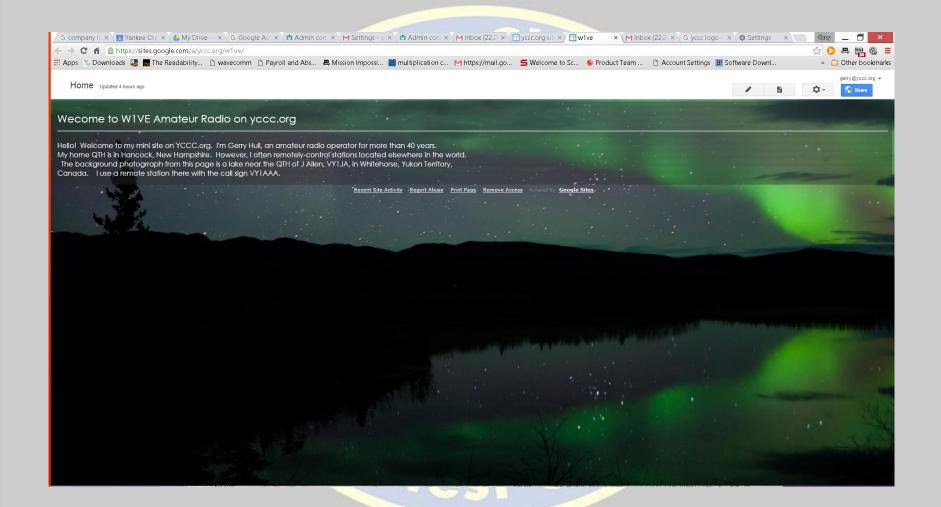
WRTC2018 Donation - \$1000 Matching Gift

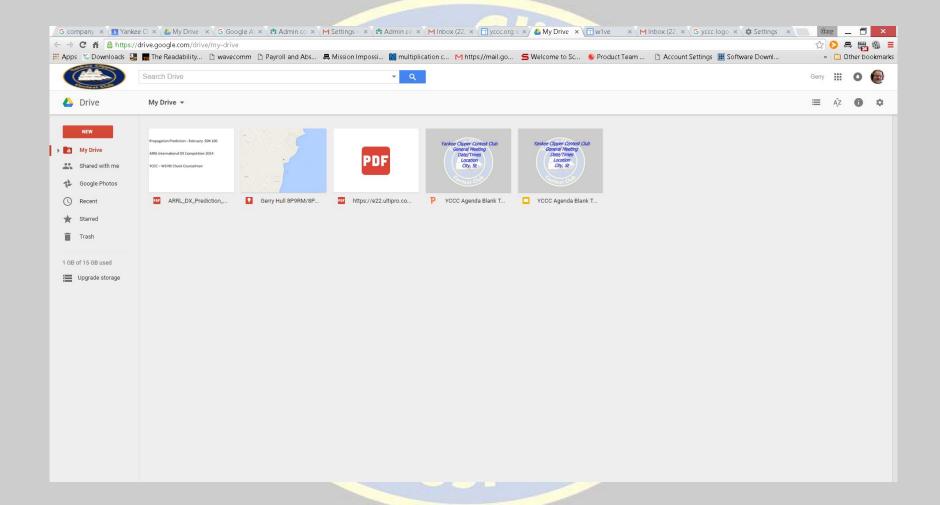
- Matching Gift was approved at the December 2015 Meeting
- So far, \$850 in donations have qualified for YCCC matching funds
- A few more dollars available!

Member Service Announcement











Upcoming General Meeting April 10, 2016

- •This year, the Yankee Clipper Contest Club (YCCC) will join the **Framingham ARA Annual Spring Flea Market** by holding an Open Meeting from 12:30-4 pm at the Keefe Technical School the day of the flea market.
- •The YCCC program will be themed "Discover HF Amateur Radio". Sponsored by YCCC, & the Port City ARC (NH), the goal is to help get new hams excited about HF Amateur radio operation. We will have live, remote stations and talks about all aspects of HF operation. This program is designed to help hams who have never operated HF get on HF for the first time and experience the fun it encompasses.
- Looking for volunteers to help out with the program see Gerry, W1VE

New Area Managers



Local Meetings

- ECT Area Meeting
- 11:30 AM on Monday, Feb 8, 2016
- Bear's Smokehouse BBQ in Windsor
 - •2152 Poquonock Ave (near Rt. 20 / Rte 75)
 - •Windsor, CT 06095
 - •https://bearsbbq.com/contact/

Local Meetings

- WCT Area Meeting
- Saturday February 13, 9am
- Athenian Diner
 1064 Boston Post Rd
 Milford, CT
 - •Breakfast meeting... Come with an appetite, and bring your plans for ARRL DX. Or anything else. (Spring antenna repairs, brags about K5P, VP8STI, etc.)

Local Meetings

- Boston Area Meeting
- Tuesday February 9, 6:30pm
- Clay Center for Science and Technology
- Dexter and Southfield Schools
- 20 Newton St, Brookline, Ma.
- Sign in with the guard and take the elevator to the 5th floor.

http://www.dextersouthfield.org/Page/ABOUT/Clay-Center/Clay-Center-Calendar

New club job: Scholarship Manager

- Responsible for all aspects of the YCCC ARRL Youth Scholarship program including:
 - Selling tickets, keeping records of sales
 - Distributing tickets to Local Meeting Hosts
 - Collecting proceeds, working with Treasurer
 - Arranging for prize cost estimate, purchase, delivery
 - Expect to attend December, February, April meetings



Paul Young, K1XM



Alec W2JU, YCCC Scorekeeper

FINAL SCORES (SSB+CW)

YCCC FRC

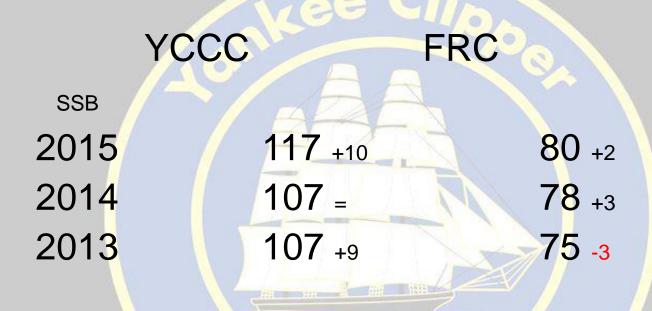
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2015 -2% 287,309,709 -7% 292,895,208 +7% 2014 +13% 309,551,424 +11% 274,550,130 +14% 2013 +16% 280,011,087 +14% 241,516,347 +13%
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SSB FINAL SCORES

YCCC FRC

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2015 -10%116,022,690 -3% 128,260,242 -4% 2014 -11%119,056,050 +5% 133,821,876 +23% 2013 +4%112,856,742 +24% 108,934,662 +19%
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LOGS



Contest Club

CW FINAL SCORES

YCCC FRC

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2015 4% 171,287,019 -10% 164,634,966 +17% 2014 35% 190,495,374 +14% 140,728,254 +6% 2013 26% 167,154,345 +8% 132,581,685 +8%
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2015 126 +8 88 +21

CW

2014 118 +11 67 -8

2013 107 +4 75 +3

Contest Club

2015 FINAL SCORES

YCCC

FRC

CW +4% 171,287,019

164,634,966

SSB -10% 116,022,690

128,260,242

TOT -2% 287,309,709

292,895,208

NEW* MEMBER CONTRIBUTION

YCCC CW 6,526,890 SSB 13,082,163 TOT 19,609,053

^{*} Joined or rejoined in 2014/2015

WITHOUT NEW MEMBERS

YCCC FRC

CW +.08% 164,760,129 164,634,966

SSB -20% 102,940,527 128,260,242

TOT -9% 267,700,656 292,895,208

WITH NEW MEMBERS

YCCC FRC

CW +4% 171,287,019 164,634,966

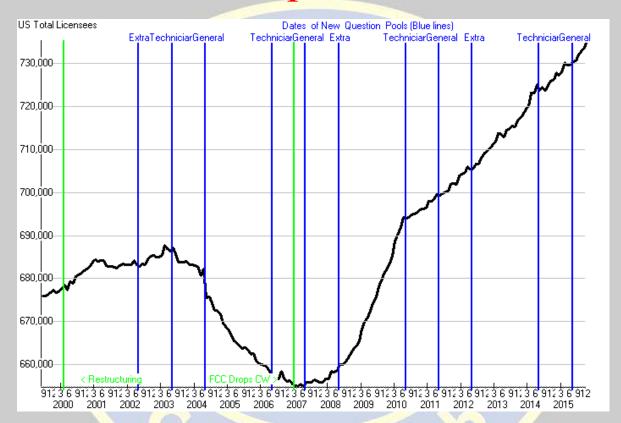
SSB -10% 116,022,690 128,260,242

TOT -2% 287,309,709 292,895,208

ONE LAST POINT - DXPEDITIONS 2015 2013 2014 FRC 34M 32M 30M YCCC 19M 16M 27M



Gerry Hull, W1VE



 The Amateur radio population in the US is exploding, and is higher than it has ever been.

- However, new hams are not being exposed to HF like they used to be.
- Many technician-class licensees are staying VHF-only, and have peers that are like-minded V/U FM repeater types.
- The elmering experience many of us had in the past has gone.

- In the past 100 years, the thrill we all experience as HF ops has not changed.
- HF is still as compelling an activity as it was in the beginning. In fact, with the expansion of technology, there are many new facets to experience.

- Contesters "get" HF!
- Let's show new hams, and those with no HF experience What it's all about!
- "Discover the HF Experience" is a pilot outreach program we will put on at the April 2016 YCCC "open house" meeting.
- The goal is to get new hams excited about HF and increase the population of HF licensees.

Key Elements:

 Ham Radio is experiential. People get excited by seeing and doing. We want them to experience HF at it's best. Therefore, we will have 3 to 4 remote stations during the April meeting event. These will include K1TTT, W1KM, VY1AAA and possibly others.

Key Elements:

 We will need volunteers to elmer and operate these remotes. Along with each remote, we will have a slide show of the actual stations. Each participant should make a contact or two!

Key Elements:

- Along with the remotes, we need speakers to present topics which are:
 - Basic
 - Enthusiastic
 - Helpful

Key Elements:

- Suggested topics might include:
 - HF Bands and Propagation
 - Antennas What can I make QSOs with?
 - Radios Basics for HF
 - Operating DX, Contesting, Digital Modes, QRP
 - How the internet enhances your HF experience
 DX Cluster, RBN, etc.

Next Steps:

- If you would like to present a topic, or help out with operating/elmering, please contact me: w1ve@yccc.org
- If you are interested in helping in any capacity, please let me know.
- I cannot do this alone!

Co-sponsors/Publicity:

- The Framingham ARA and the Port City ARC will be co-sponsors of the event.
- Once we have a good sense of what we will have for presenters, I'll publish an information sheet, which we can pass along to other clubs.

2016 Scholarship Raffle

Tickets: again only \$25 each!

K3s-100 kit





Raffle Details

Prize: Elecraft K3s/100 Kit!

Street value \$2650!

Thanks Elecraft for your support!

Tickets are \$25 per chance

Tickets ONLY sold at meetings

Drawing at April meeting (assuming enough tickets are sold)





New Members

- Application to Dennis, W1UE
- Dues to Chet, N8RA
- Introduce yourself
 - Interests, Contest activity, Rig, Antennas

Motion to Accept these new members?

Polar Explorer: The Road to a Better Kilowatt

The SSB Transmitter of the Future - Cheap, Clean, Efficient!

Brian Machesney K1LI Tony Brock-Fisher K1KP

Motivation

- I love my amplifier...
 - Served me pretty reliably for nearly twenty years
 - Doesn't sweat putting out legal limit
- ...and I hate my amplifier!
 - Loooong wait for warm up
 - Big, heavy and noisy
 - Relay "QSK", no computer interface, SO1R only
 - Tubes not available
- I don't want to spend \$5,000 to \$10,000 to replace it



Project Goals

- Prove feasibility of polar modulation driven amplifier
- Extend switching amplifier technology to 160-10 meter bands (6m TBD)
- 1500W output, all modes
- Reduce size, weight, noise
- Improve spectral purity beyond contemporary rigs
- Reduce cost: How low it can go?



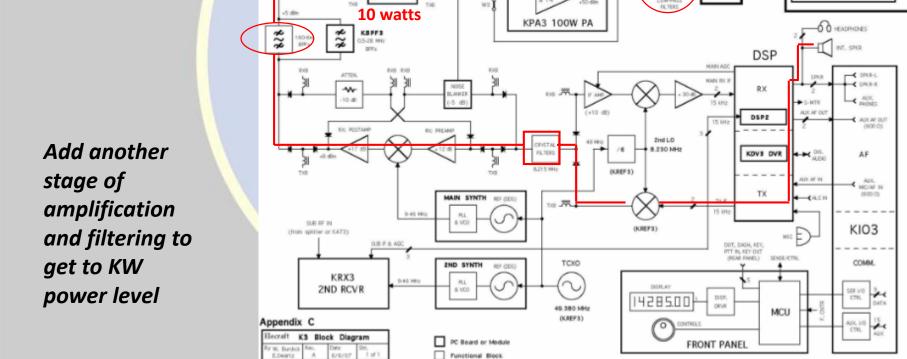
Why is High Power So Expensive?

- HF operation covers four to five octaves of frequency
 - 1.8-MHz to 30-MHz or 50-MHz
 - Five or six switched filters needed to control spurious emissions
 - Custom-wound inductors and ceramic capacitors are expensive
- Transceiver architecture: reuse physical filters
 - Generate signal at very low power, heterodyne to operating frequency
 - Typically, three stages of power amplification with attendant filtering!
- Almost half of the generated power is wasted
 - It costs money, weight and space to generate the DC
 - PA devices must be packaged to tolerate waste power
 - Waste power must be transported away from PA devices

Example: Elecraft K3

Classic Crystal Filter-based Design

KXV3



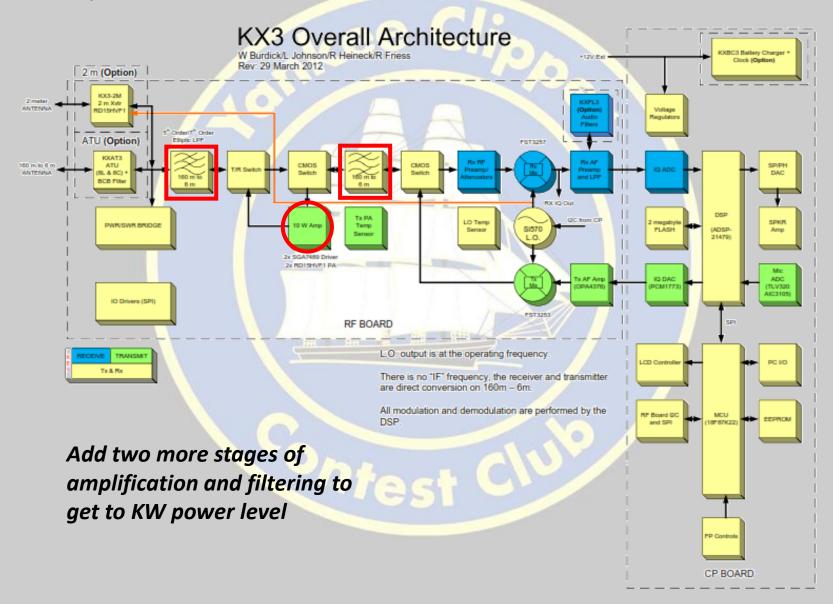
100 watts

KAT3

SELF-RESETTING

Example: Elecraft KX3

No Crystal or Mechanical Filter

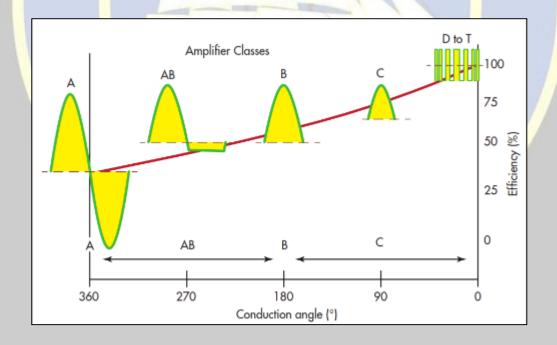


Opportunities for Cost Reduction

- Reduce number of stages of (linear) amplification
 - Less complexity → lower cost
 - Reduce repetition of harmonic filtering
- Reduce number of physical filters
 - Directly generate signal to be transmitted via DSP
 - Allow separate focus on receiver: cost, performance, flexibility
- Reduce wasted power
 - Lower size, weight and cost of generating power to PA
 - Cheaper PA transistors use plastic-packaged parts intended for high-volume markets
 - Smaller, quieter, lighter, cheaper means to exhaust waste heat

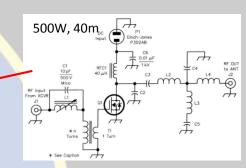
Amplifier Efficiency

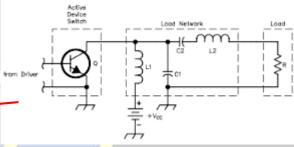
- Dissipated power = voltage across element x current through element
- High efficiency: minimize overlap between voltage and current
- Bias and output network establish amplifier "class"

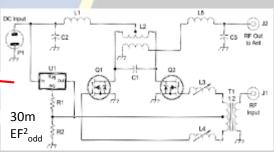


Class E in Amateur Radio Literature

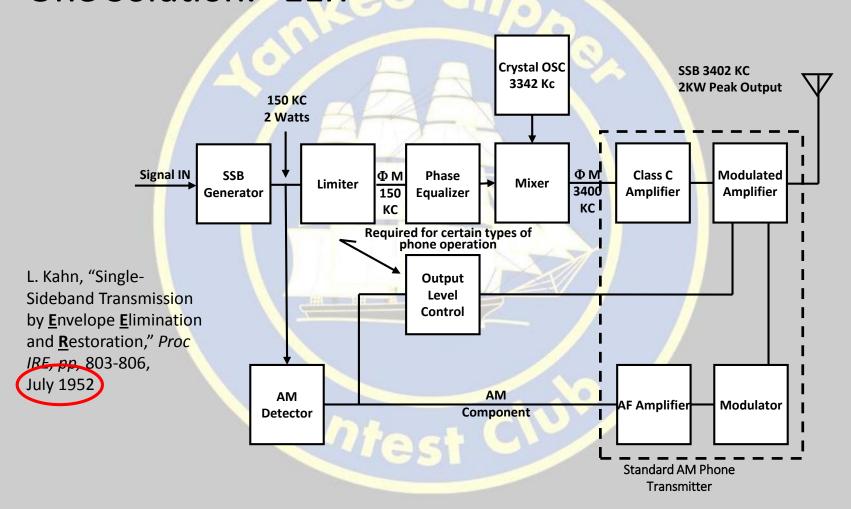
- David Rutledge et al, "High-Efficiency Class-E Power Amplifiers--Part 1", QST May 1997
- QST Jan 1998 Technical Correspondence mentions Sokal's EER 1981 paper
- Nathan Sokal, "Class-E RF Power Amplifiers", QEX, January 2001
- Takahiro Taniguchi et al, "A 200 W Power Amplifier", QEX Jan 2004







Linear Amplification with *Nonlinear* Amplifiers? One Solution: "EER"



"Homebrew Challenge II Co-Winner – the Lowest Cost Entry"

- 5W SSB in, 50W out
- 40m only
- Total cost: \$32
 - Class E with EER
 - Very efficient: little power to be dissipated
 - Major savings: used wire for heat sinks!

David Cripe, NMØS QST, Oct 2010, pp. 37-41

NS-40 Class E Transmitter (NMØS)



SGC Mini Lini™ QST "New Products", November 2005

MINI LINI 500W IF AMPLIFIER

The worlds smallest, most efficient 500 Watt HF linear amplifier.

The patient-pending MINI LINI from SSC has 500W output and weight only 4 pounds including AD power supply. It's compact enough to hold in one hand. The MINI LINI is extremely efficient due to its unique design based on the innovative use of Dates Extendingly. The unit operates on single HE enables bands via plug-in modules. The first of its kind, the MINI LINI also leafures the reliability, self protection and simple operation you expect from SSC productor, Just plug in the AC power cable, connect RF, select your band, power-on and transmit.

The MINI LINI uses class Electrology, that is capable of efficiency close to 90%. The high efficiency others many advantages, in fact, the heat produced is less than 146 that of a consectional linear amplifier at the same cutting bower. And, All power consumption is about 1/3 less than a conventional amplifier. This means that the MINI LINI will work well on any normal 120 WAC outful.



Mini Lini Fackage with 2001 Models

	Specifications
Gutput Power.	500 Watts average and peak
Operation from AC Moins.	105 to 130 VAC, 50 to 60 Hz. 8 Amps maximum
Amplifier Efficiency:	Near 90%
Harmonics and Spurious.	Less than -90 dBc
Linearity:	Third order distortion products, less than -30 dSp
Fault Protection	Overcurrent protection from a mis-marched load Protection from excessive drive gower Protection from exercising Required to any fault is for event to pass through operation and light the PRULL LED. The amplifier is result by proting prover)
TXMIT/RCV Switching:	Manual switching from transceiver wa S Volt logic line. Automatic switching from an RF sense cloud with suitable delay Automatic switching with delay disabled.
Dimensions:	Apx. 5"W x 8"L x 6"H
Weight:	Less than 5 pounds

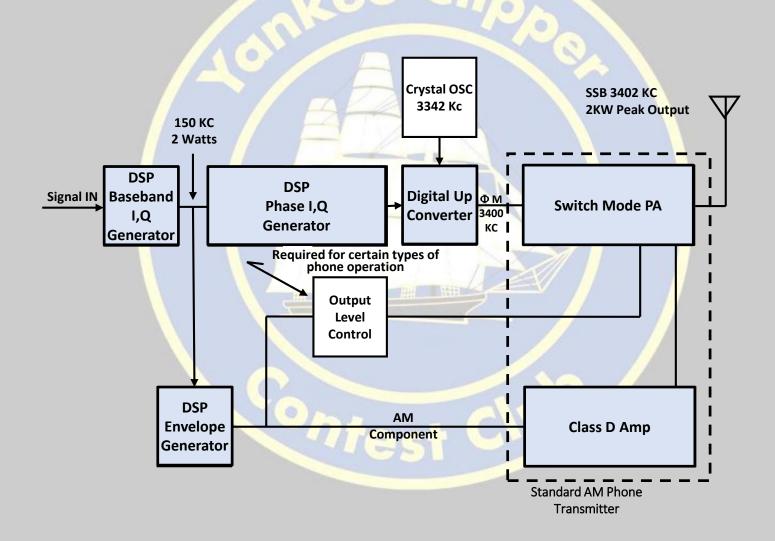
- Near 90% Efficiency
- · Less than 5 Lbs.
- Includes AC Power Supply

- Class E
- Bandmodular
- •5" x 8" x 6"
- 5lbs including supply
- "Muffin" fan
- Never sold

test



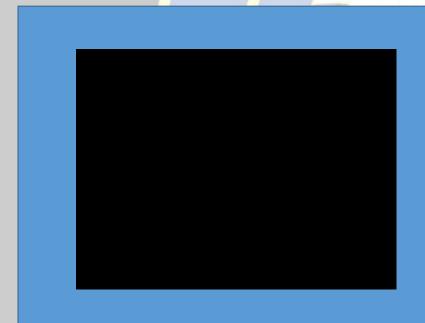
Modernizing Kahn's Approach



What's All This "I,Q" Stuff, Anyway?

There are two ways to describe the state of a wave:

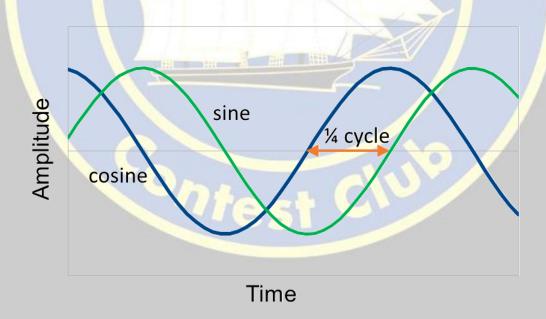
- Using amplitude and time
- Using amplitude, frequency and phase angle



- Phasor's rate of rotation is its (angular) frequency
- Phasor's length is its amplitude
- Phasor's angle with x-axis is its phase

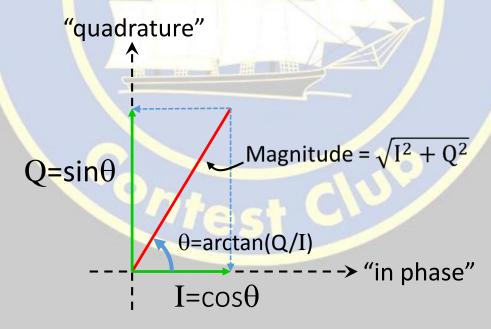
What's All This "I,Q" Stuff, Anyway?

- Early 1700's: mathematicians learn any periodic wave is weighted sum of a sine and a cosine wave
- Sine and cosine waves at the same frequency are said to be "in quadrature", separated by 1/4 cycle

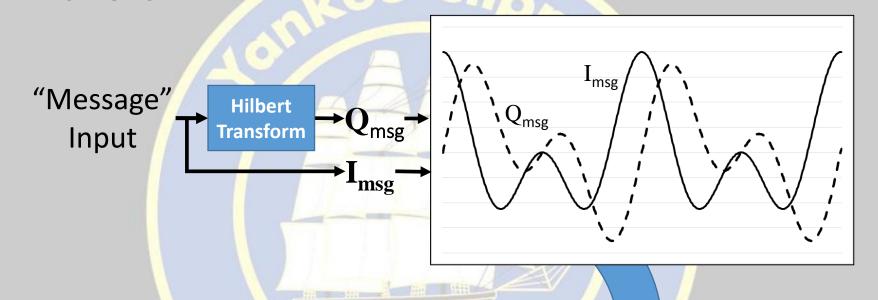


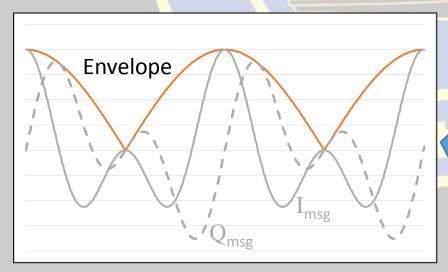
What's All This "I,Q" Stuff, Anyway?

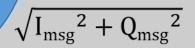
- $f(t) = I \cos(2\pi ft) + Q \sin(2\pi ft)$
 - An "in phase" component: I cos(2πft)
 - A "quadrature" component: Q sin(2πft)
- I and Q are obtained from the phasor diagram:



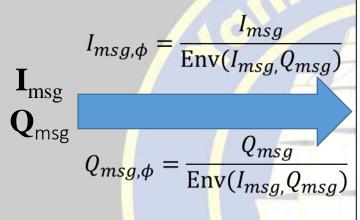
Calculating the Envelope Modulation Waveform

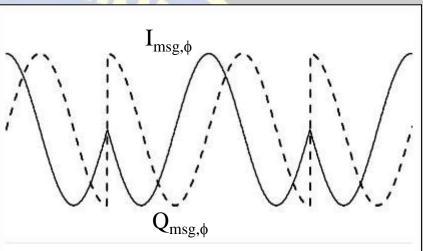


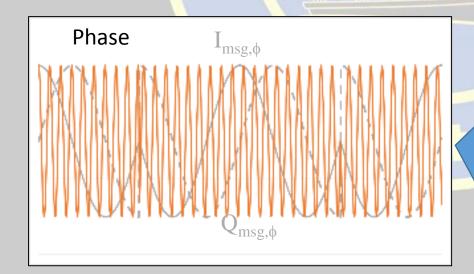




Calculating the Phase Modulation Waveform

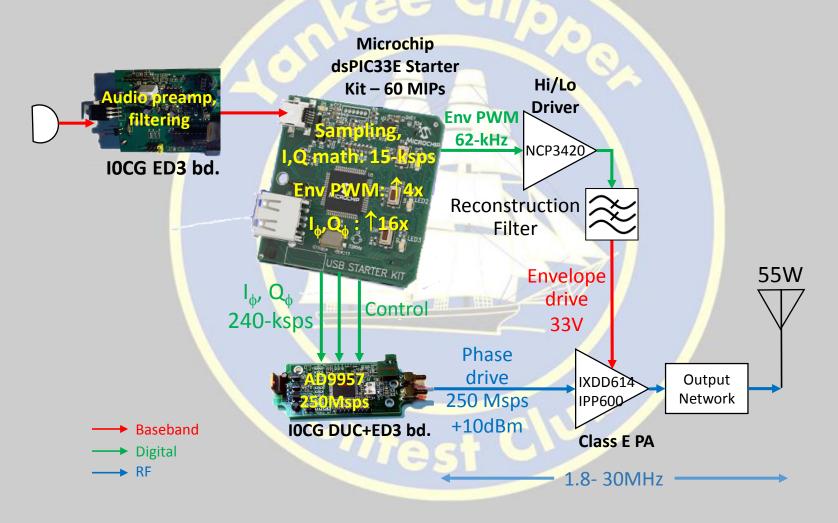






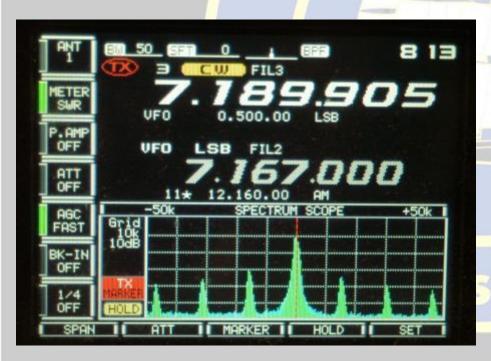
 $I_{msg,\phi} cos (2\pi f_c t) - Q_{msg,\phi} sin (2\pi f_c t)$

Polar Explorer Prototype Block Diagram



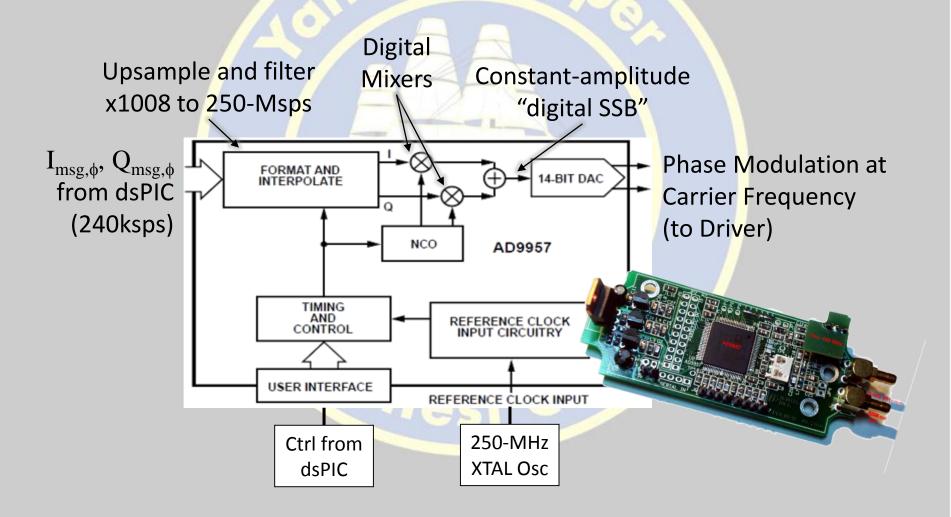
Why Upsample Phase Data?

- Digital phase updates cause spurs in output spectrum every f_s
- Must increase f_s so spurs are out of band



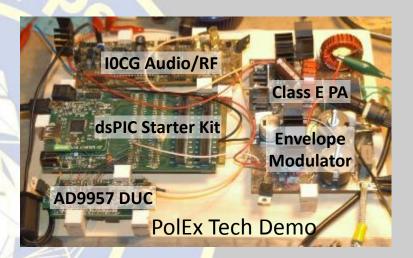


What's a Digital Upconverter? It's a digital phasing-type SSB generator!



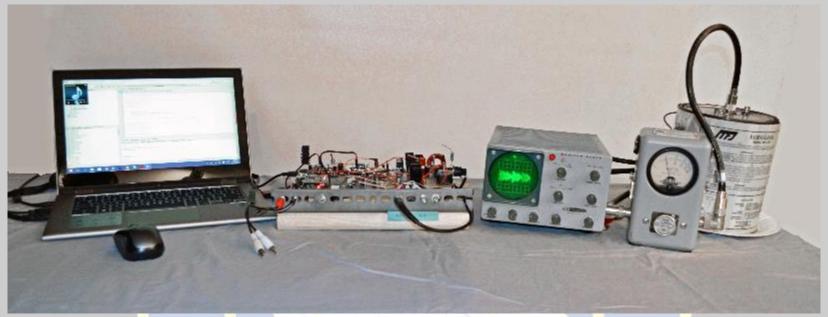
Project Planning

- Research
 - Generate envelope and phase modulating signals via DSP
 - Amplify envelope and phase drive signals
 - Switch-mode PA alternatives



- Phase I: Technology Demonstration (today's demo)
- Phase II: More Power!
- Phase III: Legal Limit

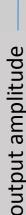
Demo and Screen Shots

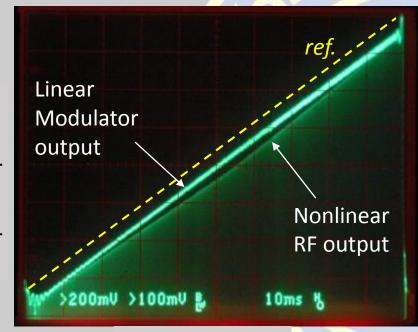




Normal Speech

Two-tone test pattern

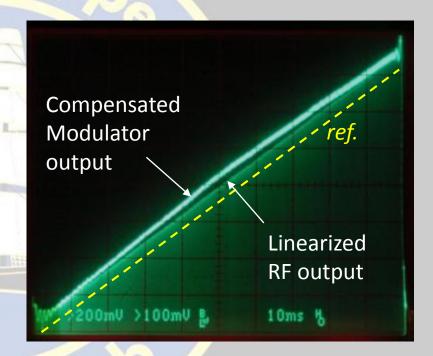






Uncompensated Envelope & PA (RF) Signal

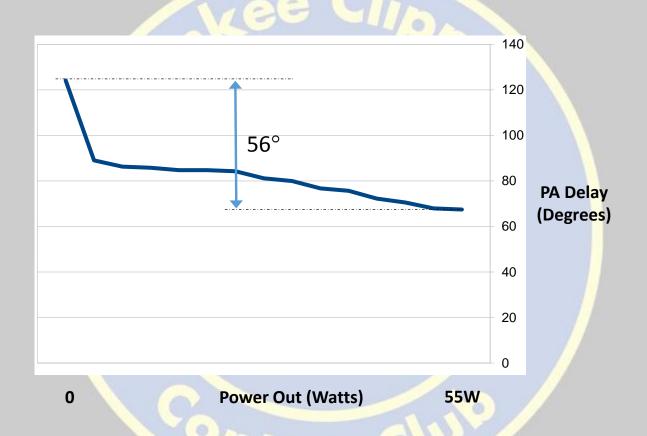
- Modulator output (Envelope) signal is linear (compare to yellow "ref" line)
- PA output amplitude produces IMD3



Compensated Envelope & PA (RF) Signal

- Modulator output (Envelope) signal is modified to compensate for PA nonlinearity
- PA output is linear (compare to yellow "ref" line)

PA Delay Depends on Power



- Substantial phase change over power domain
- Produces AM-PM conversion, contributes to TX IMD3
- 15-point compensation added in software

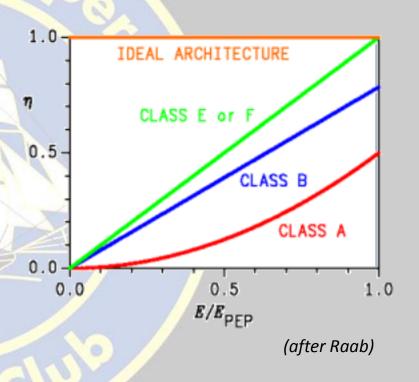
Spectral Purity Improvements

- Compensating only modulator envelope vs. output power delivers negligible IMD3 improvement
- Compensating only PA phase vs. output power delivers substantial IMD3 improvement
- Phase compensation enhances improvement delivered by envelope compensation

TX IMD3		Envelope Compensation				
	VID3	OFF	ON			
Phase pensation	OFF	-24.5db	-24.8db			
Pha Compe	ON	-36.3db	-39.9db			

Efficiency and Output Power

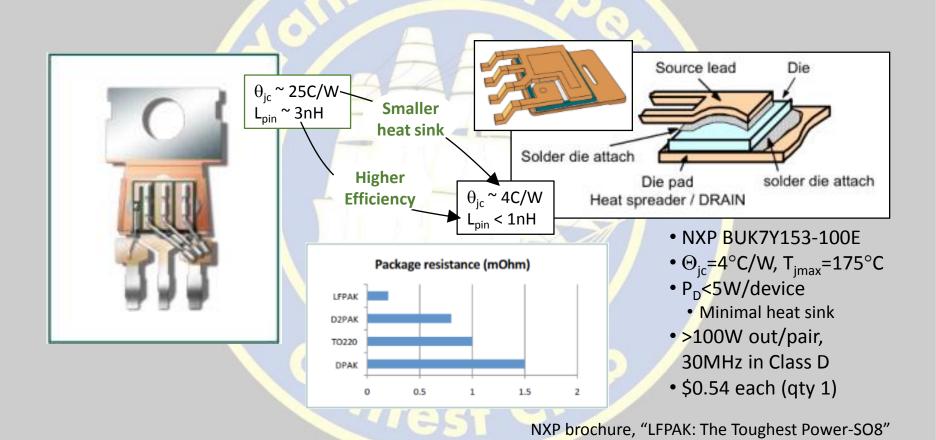
- Current Class E design
 - 55W output
 - 97% efficiency
 - PA MOSFET dissipates <5W
- Controlled-Envelope SSB will increase average output power
 - "Linear" amps' ~50% efficiency means they will have to reduce output power to increase average power
 - See February 2016 QST



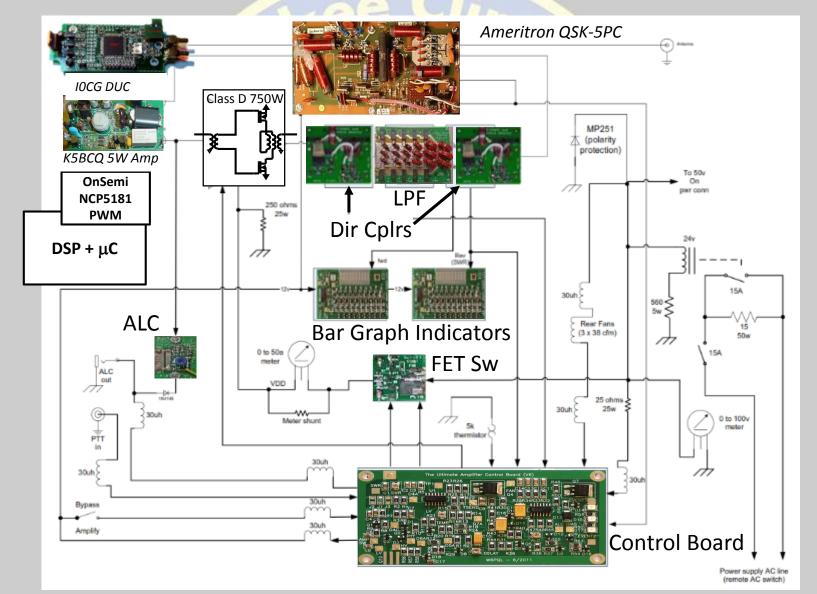
Phase I Revisions

- Increase modulator output voltage to reach 100W
 - Poor choice of driver IC
 - Needed for Phase II and beyond
- Replace IXDD614 with 5W linear amplifier
 - IXDD614 doesn't work past 40m
 - Digital "thresholding" causes phase drive dropouts
- Push-pull Class D PA
 - Class E PA parasitic sensitivity: difficult to bandswitch
 - LPF provides Class D output termination
 - Transformer eliminates need for high-side drive

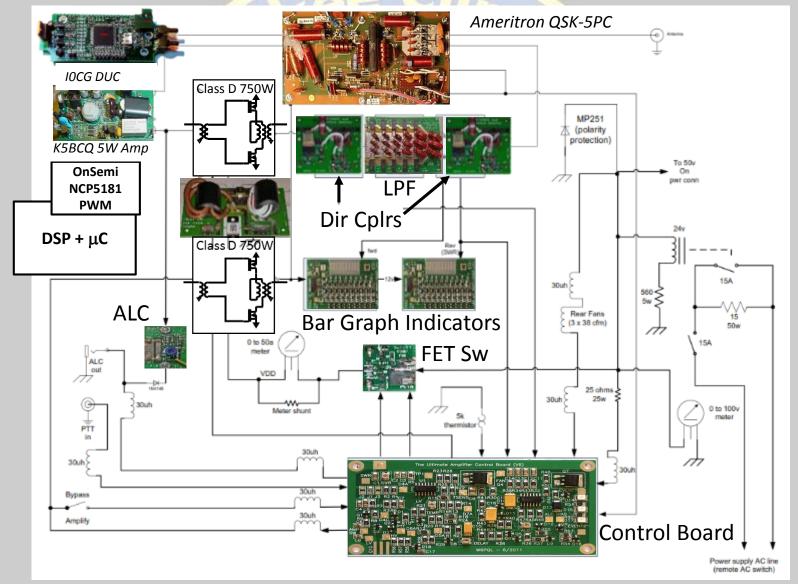
LFPAK: Packaging Revolution



Phase II: More Power!



Phase III: Legal Limit



Conclusions

- It is possible to generate a clean SSB signal with high efficiency using polar modulation and a switching amplifier
- This approach offers the following:
 - 1500W transmitter the size of a K3 should be feasible!
 - Only 10% (150W) waste heat to deal with
 - Much cleaner signals on the bands
 - Lower cost
 - Lower weight for DXpeditions

Important Messages

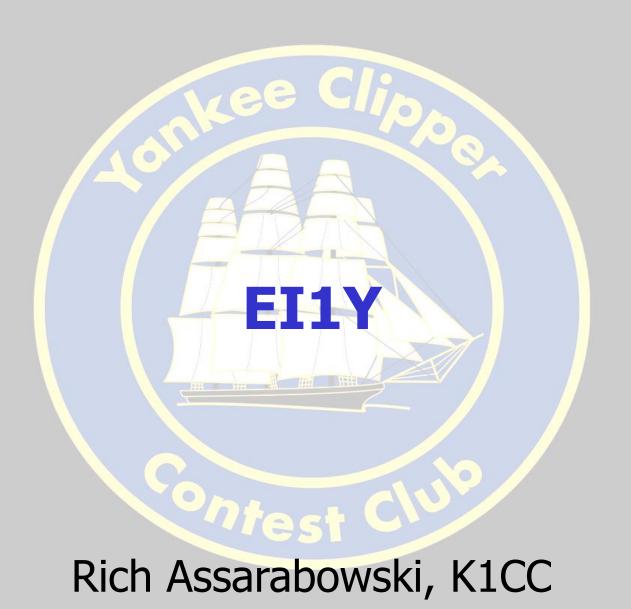
- It's the Golden Age of Homebrewing... 2.0?!
 - Much can be accomplished with software
 - Hardware and software building blocks abound
- Shout-out to component engineers
 - Unsung heroes of every successful project
- Have an itch? Scratch it!
 - You might have the next big idea
 - Don't be boxed in by tradition
 - Challenge yourself

Design Tools and Guides

- Linear Technology: LTSpice IV circuit simulator
- Microchip Technology: MPLAB X IDE
- Analog Devices: AD9957 Evaluation Software
- Iowa Hills: FIR/Hilbert Filter Design
- Tonne Software: SVC Filter Design
- Magnetics, Inc., "Inductor and Transformer Design with Ferrite Cores"
- Steve Cripps, "RF Power Amplifiers for Wireless Communications"

Thanks

- Giuliano Carmignani, IOCG (i0cg.com)
- Alberto di Bene, I2PHD (weaksignals.com)
- George Krausse, Microsemi, retired
- Rick Snow, Aavid
- David Cripe, NMØS
- Fritz Raab, W1FR, "High Efficiency RF Power Amplifiers and Transmitters" (tinyurl.com/gpgxj9g)
- Dave Hershberger, W9GR, "Understanding Controlled Envelope Single Sideband", QST, Feb 2016







--- Rich K1CC

Naas

County Kildare, Ireland

Feb 6, 2016 YCCC meeting

Who is EI1Y?

- Small 2-tribander contest station about 45 minutes SW of Dublin
- EI3KG (SP9UUC) and EI5JQ (SP9UMI) owners
- Enthusiastic group of IOTA expeditioners
- Several WWYC members (SQ6MS, SQ9C and SQ9UM)
- Captured EI M/S record in CQWW CW last year from EI7M
- EI1Y vs. EI7M <----> "David vs. Goliath"



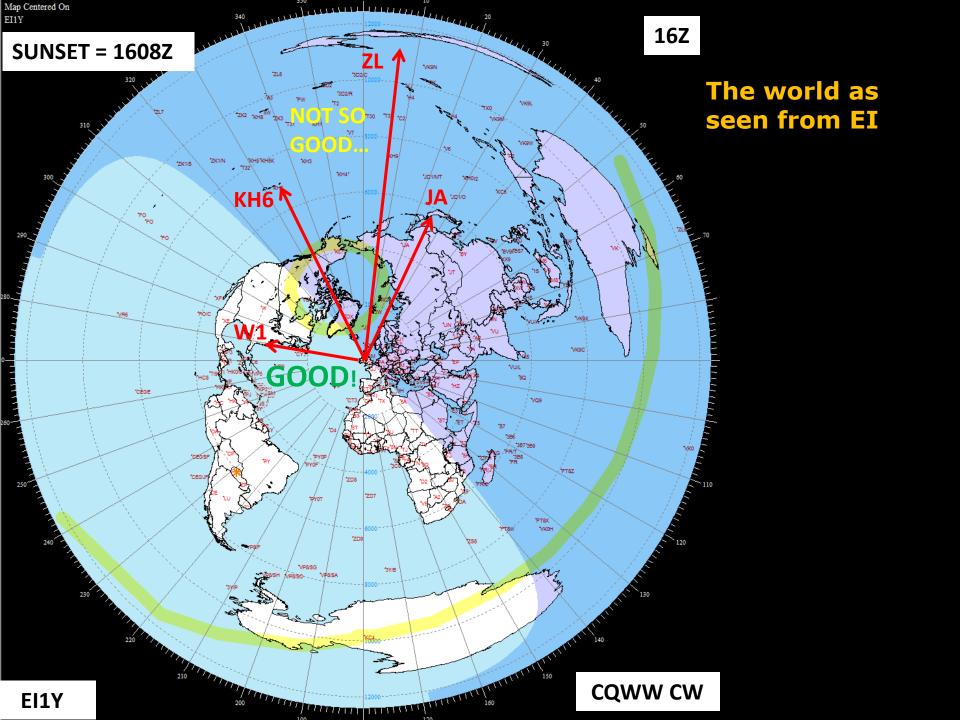


Multiop stations in Western Europe



Europe M/S records in CQWW CW

Rank	Call	Year	Category	Score	QSOs	Zn	Cty	Hours	Operator(s)
1	403A	2014	MULTI-ONE	18,303,516	9,210	212	811	48.0	403A 404A 406Z 409IT
2	OM7M	2014	MULTI-ONE	16,941,392	7,259	214	813	48.0	OK2BFN OM3PA OM3PC O
3	TM6M	2013	MULTI-ONE	16,420,000	7,141	207	793	48.0	F1AKK F5MUX F6ARC F8
4	TM6M	2011	MULTI-ONE	16,378,200	7,210	202	809	48.0	5B4WN F1AKK F5MUX F5
5	OM8A	2012	MULTI-ONE	16,044,698	7,190	206	812	48.0	OM2KW OM2VL OM3BH OM
6	IR4M	2014	MULTI-ONE	15,945,594	7,115	209	784	48.0	I4EWH I4FYF I4IFL IK
7	9A1P	2014	MULTI-ONE	15,655,000	7,466	204	796	48.0	9A1AA 9A1UN 9A2NA 9A
8	OM8A	2011	MULTI-ONE	15,559,464	6,952	214	818	48.0	OM0WR OM2VL OM3GI OM
9	9A1P	2013	MULTI-ONE	15,472,217	7,125	215	816	48.0	9A1UN 9A2NA 9A3K 9A3
10	ES9C	2011	MULTI-ONE	15,391,805	7,751	216	829	47.8	YL3DW YL2GQT ES2DW E
11	OM7M	2013	MULTI-ONE	14,776,537	6,549	208	789	48.0	OK2BFN OM3PA OM3PC O
12	IR4M	2013	MULTI-ONE	14,730,210	6,621	205	785	48.0	I4EWH I4FYF I4IFL IK
13	UZ2M	2013	MULTI-ONE	14,548,992	7,569	215	809	48.0	UR0MC UR3QCW UR4LRG
14	EA2EA	2011	MULTI-ONE	14,242,416	6,503	200	784	48.0	EB1RL EA2EA EA4KR EA
15	SJ2W	2014	MULTI-ONE	14,184,296	6,625	208	756	48.0	OH2UA SE2T SM2LIY SM
16	UZ2M	2011	MULTI-ONE	14,184,116	7,168	215	837	48.0	RA4LW RW4LE R7LV UX3
17	IR4M	2012	MULTI-ONE	14,153,292	6,666	198	774	48.0	HB9CAT I4EWH I4FYF I
18	E7DX	2013	MULTI-ONE	14,147,450	6,934	205	765	48.0	9A1TT 9A5K E70R E70T
19	UA4M	2014	MULTI-ONE	14,023,848	7,397	214	802	48.0	RU4HP RW4PL RU4PU UA
20	E7DX	2011	MULTI-ONE	13,792,680	6,889	204	768	47.8	9A5K 9A8A E70R E70T
21	IR4M	2011	MULTI-ONE	13,750,174	6,466	196	762	48.0	HB9DUR I4EWH I4FYF I
22	EI1Y	2014	MULTI-ONE	13,418,424	7,055	194	714	48.0	EI2JD EI3KG EI5JQ EI
23	E/DX	2012	MULTI-ONE	13,403,520	6,698	196	764	47.8	9A6XX E70R E70T E71D
24	EA5RS	2014	MULTI-ONE	13,016,794	6,069	197	776	48.0	EA5BY EA5FID EA5FV E
25	TM6M	2010	MULTI-ONE	12,965,378	6,613	192	707	47.6	F1AKK F5TTU F6FVY F6
26	9A1P	2011	MULTI-ONE	12,962,024	6,066	205	793	48.0	9A1UN 9A2NA 9A5CW 9A
27	9 A7A	2013	MULTI-ONE	12,902,344	6,376	204	754	48.0	9A3OS 9A3TR 9A5X 9A6
28	RU1A	2000	MULTI-ONE	12,753,600	5,670	203	757	-	RW1AC RU1AA RV1AW RN
29	UZ2M	2012	MULTI-ONE	12,736,540	7,177	205	777	48.0	R7LV RA4LW UT7QF UR3
30	EA7PP	2013	MULTI-ONE	12,730,491	6,246	199	728	48.0	EA4CWW EA7KW EA7PP E
31	EI7M	2013	MULTI-ONE	12,705,945	6,565	194	691	48.0	EI3DP EI3KD EI3JZ EI



Station design

K3 on run station with #1 tribander

- -- microHAM Station Master's
- -- micro Keyer II's
- -- Russian military surplus R140 auto-tune amplifier

K3 in-band vertical for 40-10

No in-band on 80 or 160

Two interlocked radios with amplifier sharing for multiplier station on #2 tribander

-- Homebrew amplifier

All amplifiers located in container outside the shack

EI1Y in action



EI1Y antennas

Main tribanders --- SP3GEM GB312 (3el 20, 4el 15, 5el 10 on 26 ft boom) (see http://www.sp3gem.smoczyk.pl/), both at ~60 ft

EU chaser – SP3GEM GB37 (2el 20, 2el 15, 3el 10 on 13 ft boom) at 16 feet

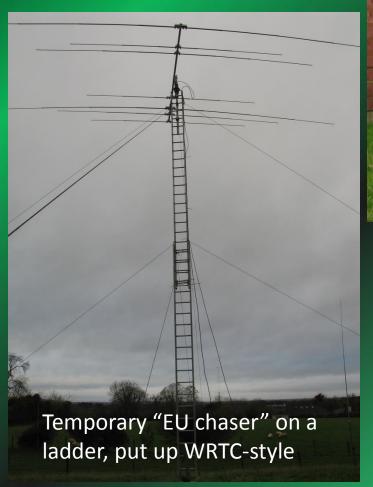
2el 40 at 65 ft – Homebrew Moxon design

Full-size ¼-wave vertical on 80

Inv-L for 160

4-band vertical for in-band





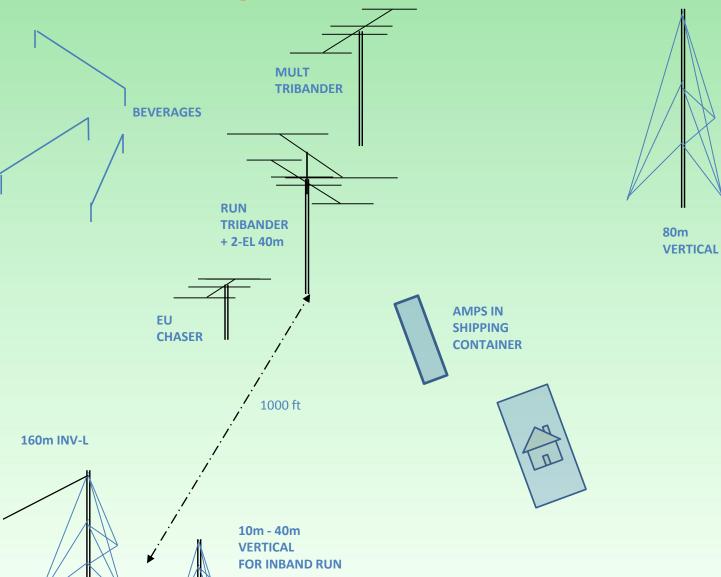








EI1Y antenna layout















Antennas in the wind





.... Very very nice!































Beverage choices – UA∅ vodka or El Guiness?







Highlights

- 300/hr on 40m the first 2 hours (~80/hr on in-band radio)
- 40+ multipliers/hr on the mult station the first 2 hours
- At the 8 hour mark we were tied with EI7M on the Live Contest Score server – YESSS!
- Small station but very effective, nice quiet location with drop-off to the west – great spot to the US!!
- Good camaraderie, good ops, made new friends and had lots of fun!
- Oh, and the "Beverages" were also good after the contest!

Lowlights

- High 10m SWR on the tribander on Saturday morning, had to use
 3el tribander at 16 ft NOT GOOD...
- Working Asia (including JA) is difficult from that part of Europe.
 The low antennas and unfavorable topography in that direction made it even more challenging for us
- Inter-station inteference not totally sorted out
- Amplifiers in outside shipping containers cuts down on noise in the shack, but does not make for fast band changes
- Reliability

Europe M/S claimed scores in 2015 CQWW CW

```
TM6M......16,237,056 (F1AKK F4DXW F8DBF F8FKJ)
3 E7DX......16.045,026 (9A5CW 9A5K E70A E70R E70T E76C E77C E77DX E77E E77W S55M)
 4 OM7M......16,025,646 (OK2BFN OM3PA OM3PC OM5RM OM5RW OM5MF OM5NU OM5ZW)
7 RT6A......15,006,000 (R7AA UA7A R7CT RW3ONZ RN3OO UA3OOO UA7C)
8 II9P...........14,645,202 (W5MX LY5W LY4S PB8DX I2WIJ IK1HJS IZ8JAI IT9EQO IT9CJC IT9WNU IT9CHU IV3...)
10 UA2F......14,352,080 (R3DCX RA2FA RA3ATX UA2FB UA2FF UA2FM)
11 E17M.........13,997,750 (E181R E13JE E13JZ E13KD E17IG E17KD E16BT E14BZ JK3GAD G10RTN G3ZVW)
12 RT4F......13,021,622 (RK4FD RO4F RK4FU RK4FM RG4F UA4FBG UD4F)
13 EA2EA......12,563,085 (EA2EA EA2ET EA3AKY EA3ALZ EA3AVV EA5KA EA5GX EC2DX)
14 UA4M......12,310,270 (RN4WA UA4WI RU4HP RW4LE UA4LL UA4LCH RW4PL UA4PCM RA4LW)
15 EA5RS......11,096,184 (EA5BY EA5FID EA5FR EA5RS)
16 EA7PP......11,064,648 (EA7KW EA7JHO EA7OT EA7PP EA7RM EC7AMY)
  EI1Y...........10,739,850 (EI3KG KD2GYF K1CC SQ6MS SQ9C SQ9UM EI6DX EI2JD EI9KC)
18 IB9T...........10,637,960 (I2GPT IT9BLB IT9EJW IT9GAC IT9RZU IT9VDO IT9ZMX)
19 HG6N......10,547,040 (HA1AG HA6ND HA6NY HA6ON HA8RT)
20 SP2YWL......10,158,141 (SP2FWC SP2MHD SP4R SP4ZO SQ2GXO SQ4NR)
```

=> Multi-single is a VERY competitive category in Europe!

Claimed score breakdown

M/S HP			Totals			160			0		40		20			15			10		
Call	Score	QSOs	Zones	Countries	Q	Z Cnt	t	Q Z	Z Cnt	Q	Z Cn	t Q	Z	Cnt	Q	Z	Cnt	Q	Z	Cnt	
TM6M(@F6KHM)	16,237,056	7485	202	759	257	18 72	2 1	1410 3	80 109	1767	7 40 14	5 172	7 40	152	1567	39	150	757	35	130	
OM7M	16,025,646	6854	216	813	223	22 90)	715 3	7 129	2277	7 40 15	1 178	1 40	151	1504	40	155	354	37	137	
EI7M	14,004,900	6988	200								40 14										
EI1Y(@EIØPL)	10,792,751	6155	184	645	292	19 69	9	566 2	26 93	2048	3 40 14	1 129	36	122	1846	36	135	113	27	85	

- ⇒ 40m Moxon really works, but perhaps not enough time spent on 80?
- ⇒ 20m is always very difficult with just a small tribander
- ⇒ Short on multipliers (mostly Asia), especially difficult with small antennas and marginal conditions
- ⇒ Need bigger antennas on 10!















Croagh Patrick Visitor Centre Craft & Coffee Shop Croagh Patrick Teach, na Miasa - Ionad na gCuairteoiri - Siopa Caife & Ceardair









Adjourn – Go Forth & Kick Butt!!

See you at the April Meeting!!

April 10, 2016

After the Framingham Spring Flea Market

12:30-4:00pm

Keefe Technical School

Framingham, MA

Ontest Club