



Solid Copy

The International CWops Newsletter

January

2013

Issue No. 36



CWops "CWT"

9, 23 January 2013

Start time:

- 1300Z
- 1900Z
- 0300Z (10/24 January)

1-hour each session

Exchange: name/number (members)
name/SPC (non-members)

CWA Days

2, 16 January 2013: 1300Z, 1900Z, 0300Z(+1)

CWops "neighborhood"

Look for CWops on 1.818, 3.528, 7.028, 10.118, 14.028, 18.078, 21.028, 24.908, 28.028, 50.098

CWops Officers and Directors

Officers

President: Rob Brownstein, [K6RB](#)

Vice President: Art Suberbielle, [KZ5D](#)

Secretary: Jim Talens, [N3JT](#)

Treasurer: Craig Thompson, [K9CT](#)

Directors:

Bert Donn, [G3XSN](#)

Vidi La Grange, [ZS1EL](#)

Nodir Tursoon-Zade, [EY8MM](#)

Webmaster: John Miller, [K6MM](#)

Editor/Publisher: Rick Tavan, [N6XI](#)

From the president...



First, to all our members, I want to wish you all the very best for 2013. I also want to express my gratitude to Pete, W1RM, for his service and dedication to

CWops during our first few years. Pete has left a legacy for which we can all be proud.

During the next two years, I hope to take what we've begun and add to its value to our ham community. For me, the CW Academy is our premier contribution to ham radio. I am pleased with the increasing popularity of CWT and CW Open; with the growing number of members who file QTX points each month; and with our taking on the management of ARRL's Morse Code page. But CW Academy is where CWops truly distinguishes itself. So, it will be a primary focus for me, at least, during my first year.

My philosophy about leadership has always been one of leading by example. I will never ask someone else to do something that I was not willing to do myself. In that spirit, I will continue to participate in CWT, CW Open, QTX and CW Academy. I may also ask you for your help. You'll find that I don't ask the group for volunteers; I turn to the individual.

As a New Year's Resolution I'd like to ask all members to resolve to do:

- at least one CWT,
- at least one CW Open session, and
- file at least one QTX point per month.

I'm going to ask for another resolution. Subscribe to the CWops listserv (aka email reflector). I know in the beginning there was a lot of chatter on it and some people felt overwhelmed. It's not like that anymore. It's a primary means for us to stay in contact with each other. So, please subscribe.

We have a new editor/publisher for *Solid Copy*. Rick Tavan, N6XI, has stepped up to the plate. I know Rick is going to do a great job. Please give him your support and provide him with interesting content for the newsletter.

So, that's it for now. Thank you all for your votes of confidence and I will work very hard to make sure that I do you all proud.

73,

Rob, K6RB

From the Editor



of Solid Copy as I see it.

Greetings from your new *Solid Copy* custodian! After watching in awe as my fellow founders built CWops from a startup to a highly successful organization, I have agreed to step forward and do my part. My predecessor, now your new President, Rob Brownstein K6RB, set a high bar as Editor of *Solid Copy* through the first three years of CWops. We owe him a hearty Thank You. I'll work hard to follow his lead but I'll need your help, as will Rob as President. Your club leadership is enthusiastic going into the New Year and anxious to build an even stronger CWops. That said, let's turn to the future

Solid Copy is our club journal. As such, it keeps us abreast of club activities and those of our members. But it should also provide entertaining and educational fare related to our mission – ham radio in general and CW in particular – well beyond the administrative details of the club. We need general interest articles to keep *Solid Copy* as vibrant as it has been in the past. So please tell me what you want to read and submit your own articles for publication. Welcome topics include antennas, shack accessories, expedition stories, even CW-related poetry (!) and fiction. “My Story” articles

have been well received – how about yours? Try to keep these modest in length. Tell us how you discovered ham radio, CW and your other radio activities. If yours is not a silver quill, feel free to ask for editorial assistance. If your story is good, we can make it read well. *Solid Copy* will be what we, the members, make it. Don't just read, participate!

When we first started talking about a new CW organization, matters of mission were foremost in our minds. Would CWops be primarily a social club, a training cadre, a technical forum, a facilitator of CW operating opportunities, something else? In fact, in its brief history to date it has been all of these and more. It seems to me that our best descriptor would be a *CW advocacy organization* – we are cheerleaders for our favorite mode. To ensure its survival, now that Morse Code is no longer required to earn a ham license, we have to convince our peers to love CW as much as we do. Love comes from knowledge and participation, so we are actively teaching the code to anyone who wants to learn it or to improve skills. We are advocating for CW in the pages of radio publications. We are funding CW-related programs through major radio organizations. We have an outstanding Web site that provides CW and general radio resources for members and non-members alike. We are proud of our core membership of accomplished operators but we embrace future prospects with enthusiasm. It is to that end that we conduct CW Academy. Our operating activities are not only fun for participants but also provide good PR, keep the bands active, and help to cultivate new members. And *Solid Copy* has become a journal worthy of our mission. I couldn't be more proud of the jobs done by our founding officers and directors. Let us continue!

Part of my job as editor will be to write a monthly column. I hope to inform, educate, amuse, bemuse and maybe even cajole readers as seems appropriate at the time. I'll try to focus on CW in my columns, but if I stray on occasion and just talk about ham radio, please forgive me. I really do love CW as much as you do but sometimes I'll have something else on my mind. OK? On that note, please give me your ideas to share with the membership in future columns and articles.

For this month, my main concern was to introduce myself. Meanwhile, here's a little food for thought: Are you looking for some mid-week CW contacts? Sometimes the bands are uncomfortably quiet. But every Thursday evening US time (0230Z Friday, actually) is the "NCCC Sprint (NS)" sponsored by the Northern California Contest Club. Originally conceived as a pre-contest shakedown for stations and operators, it has evolved into an informal competition in its own right. There is a ladder of participants, a slow-speed variant that would be great for aspiring CWops members, and often post-event ragchewing. It's usually on CW, although sometimes it switches to other modes immediately prior to a major, non-CW contest, and it's only a 30-minute slice out of your busy schedule. Check it out at <http://www.ncccsprint.com/>. Would you like to see a full *Solid Copy* article on NS? Would you like to write one?! How about YOUR clubs? Do they sponsor other activities that CWops members should know about?

How many contacts have you made on the "WARC bands" lately? I haven't made very many but each time I do I learn something new about propagation. If I can resolve some family matters that have kept me away from my mountain QTH too much lately, I hope to get on 30, 17 and 12 more

frequently. They are often in better shape than the adjacent traditional bands and they provide a peaceful refuge for those who seek a ragchew during a CW contest. We have CWops rendezvous spots on these bands – 10.118, 18.078 and 24.908. Check them out and poke some new holes in the ether! See you there.

73,

Rick, N6XI

CW Academy

The next sessions of CW Academy will begin after January 1 and continue for eight weeks. The Level 1 program, pioneered by Jack, W0UCE, has the largest number of current signups. We'd like to recognize and thank the following members who have volunteered to instruct these groups:

- Bill, KC4D
- Dallas, K1DW
- Ron, WT5RZ
- Chuck, W1HIS
- Dick, K2ZR and
- Rob, K6RB

We would also like to recognize and thank Dick, K2UFT who will be warming up in the bullpen. All the Level 1 instructors have now gone through a train-the-trainer session with Rob, K6RB, and have contacted their assigned students and begun scheduling the sessions.

The Level 2 programs this session will also be using the online method pioneered by Jack.

CW Academy also wants to recognize and thank:

- Will, WJ9B, and
- Howard, AB1CW.

Will and Howard are joining Jack W0UCE in teaching Group II and Group III classes starting in January.

Due to the overwhelming number of student requests for CW Academy Group I, II and III classes versus the number of volunteer instructors, it may be necessary to reschedule as many as 5 – 8 Group II students for classes starting in April unless at least one more member volunteers to help handle the teaching workload.

Group II class student assignment notifications are in process. Will and Howard will notify their students regarding upcoming class schedules in the next few days. Jack will notify his Group II and

Group III students of class schedules by e-mail as well. CW Academy regrets and apologizes for delay in starting the January Group II and III classes. Hopefully one or two more Advisor / Instructors will volunteer to lend a hand so we can honor student requests.

73,

Jay, W5JQ and *Jack*, W0UCE

What Happens When a Crank-Up Tower Gets Stuck Near Full Height?

By: Rob Brownstein, K6RB

The first thing that happens is you say “what the...?” Then you start thinking about the implications. But, before I get into the implications, it helps to consider the system we’re talking about.

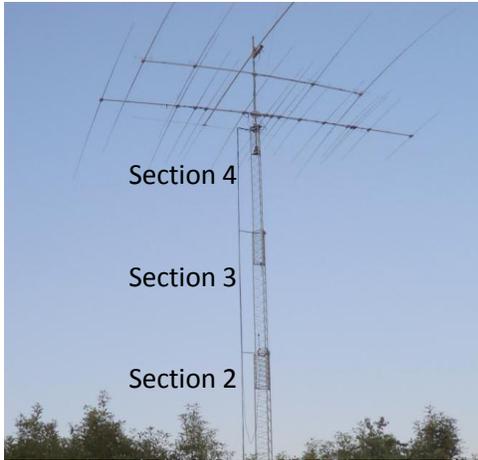
Crank up towers

There are a lot of reasons why some of us decide to deploy crank-up towers to support our yagis, quads or what have you. One benefit is being able to lower the tower, easily and at will, to make getting at an antenna more convenient. Another is being able to lower the tower in advance of an impending high-wind storm forecast to reduce the risk of losing a tower or suffering antenna damage. A third is being able to have a tower that requires no guy wires.

For all of these reasons, and more, I decided to opt for a crank-up tower going back to 1984. My first was a W-51 by Tri-Ex which was hand cranked and had a maximum height of about 50 feet. I lost that tower in a storm in 2005 and replaced it with a heavier duty US Tower TX-472, a four-section tower with a maximum height of 72 feet and an electric motor drive for raising and lowering the tower. That tower was installed in July 2005 and has worked more or less flawlessly until September 2012.

How they work

Before I get into what happened, let me briefly explain how a crank-up tower works. Typically, you have 3 or 4 telescoping tower sections of about 20 feet each. So, a 3-section tower, with 10 feet of inter-section overlapping (for added reliability) would extend about 50 or so feet when fully erect. A 4-section tower with 8 feet of inter-section overlap would stand about 72 feet. The sections are pulled into position by cranking a winch or other drive mechanism that pulls on an aircraft-control cable or cables. Essentially, all that stands between a section staying in place, or falling like a guillotine, is that cable or cables!



There are a few points of failure in a crank-up system. One, as already described, is the cable. If that snaps, the sections come down – fast. Another is the guidance path between two telescoping sections. In a 3-section tower, for example, the section with the largest horizontal area is the base section and is fixed in position. The second section fits inside that one and is designed to move smoothly up while maintaining its orientation relative to the first section so that it does not twist and get jammed up. The same is true for the relationship between sections 2 and 3. A kink in that guidance path can cause two sections to lock up. The third failure mode is the winch or motor drive and gear

subsystem.

So, with that context now in mind, let's see what happened in September 2012, why it happened, and what had to be done about it.

A Sunny September Sunday

At least once a year, I have to lower my tower and climb the nested sections so that I can put the yagis back on true heading. In the course of a typical year, my QTH, Santa Cruz California, will experience storms with winds in excess of 50 mph. With the tower nested, the winds are still strong enough to twist the mast and yagis inside the rotator clamp. I purposely avoided pinning the mast and clamp because I'd rather climb once or twice a year than have to replace a \$1,000+ stripped rotator. That day, the yagis were about 40 degrees off heading counter clockwise. To put it back on heading, I climb up to the rotator (first blocking the tower sections 2, 3 and 4 with some heavy-duty galvanized pipe to prevent their falling should the cable break) carrying a 1/2-inch ratchet wrench and a big monkey wrench.

Once I get to the rotator and secure my climbing belt, I use the 1/2-inch wrench to loosen the 3 bolts on one side of the mast clamp a bit, then I use the monkey wrench to turn the mast to the proper heading position (e.g. if the rotator control is at 0 degrees, the yagis should be pointing due North). Once the yagis are properly headed, I tighten the bolts on both sides of the mast clamp. To make sure everything is tight, I try to turn the mast with all my might using the money wrench. If I can't turn it, it's tight. (Winds of 50 mph have no trouble twisting that mast in that mast clamp, though).

So, I get it pointed, tightened, unclamp my climbing belt and climb back down to terra firma. Then, while guiding the coax and control lines that extend down from the antenna switch and 'tornado coil,' I hit the up switch and watch as the tower begins to extend itself upward. When it gets close to 72 feet up, I put the switch back in the neutral position, and I'm done. However, this time as the tower was going up, it got to about 50 feet of height and stopped. The motor stopped turning and started humming, and I switched it off. Pressing the switch to the down or up direction made no

difference. The tower was stuck at about 50 feet up, putting the top-most antenna (an 80 m rotary dipole) at about 68 feet up.

With the first storms of late Fall and Winter only a few weeks off, I knew that whatever I had to do had to be done soon or I would have the Force 12 5 BA, EF230/240 and Sigma 180S exposed to unrestrained winds.

A friendly call to US Towers

When you're not sure what you're dealing with, it sometimes helps to call the company that made the thing. So, I did. I explained what was going on and they said "there's probably a kink in one section that is jamming and stopping everything." He suggested that I start by trying to use a manual crank inserted in the large gear pulley and see if I can manually get it to nest. After that, he said, you need to remove the antennas, the mast, and raise the tower off the footing, put it on a flatbed truck and ship it down to the factory for repair.

I didn't like the sound of that at all. To remove the antennas, mast and tower meant bringing in a crane. Then there was the cost of shipping, repair, shipping back, and another crane visit. I said "if I get it nested, and it's not a structural problem, couldn't it be fixed in place?"

"No way," he said. "It needs to be shipped back here."



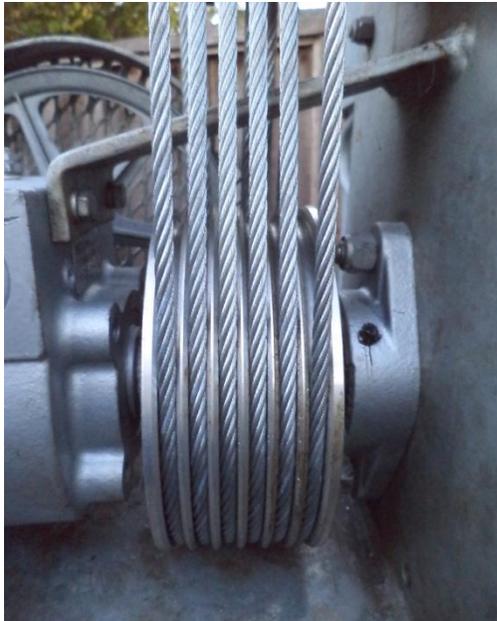
For manual operation, the fan shroud comes off and the crank locks onto the large pulley

So, I decided to start with first things, first. I ordered that manual crank and it got to me within a few days time. When I hooked it in place and tried turning that pulley, it was really hard to turn. I had to put all my weight into it, but after a couple of turn, it suddenly seemed to free itself up, and was slowly headed down. But, after many crank turns (approximately 40), it suddenly jammed up again. Once more I had to really bear down on it for a few turns and then, as before, it got easy. However, at that point, the tower sections lurched down a fraction of an inch and the cable made a very loud twang.

The physicist in me said "let's observe," as I cranked it further. I noticed that the crank and pulley were turning what was probably a worm gear, and a toothed gear at right angles to it was in turn turning a shaft which turned a 6-groove drum (they call it a bearing). While the crank was turning easily, the drum was slowly turning and the tower was slowly lowering. Once I got to around 40 turns, though, things got real tight again, and I noticed

that though the pulley and worm gear were turning, the toothed gear, shaft and 6-groove drum were not. That is, they weren't turning until I pushed against the resistance, and then they turned about 30 degrees causing the tower sections to lurch downward and the cable to twang, again.

“Ah ha,” says I. “It appears to be a gearbox problem.” So, I go back inside, call US Towers, describe my experience, and the guy says “I’ve been here for nine years and I’ve never seen a gearbox fail, but from what you’re describing, it sure sounds like that’s the problem.”



The whole subsystem that needed to be replaced included the gearbox (left), the 6-groove drum (middle) and side-mount bearing (right).

Parts need replacing

As you can see by the photos, the gearbox contains the worm gear and toothed gear. A hardened steel shaft goes through the center of the toothed gear, then through the 6-groove drum, and terminates in a side-mount bearing. The whole system is mounted within a steel frame that is welded to the tower. So, in order to remove the gearbox, one has to remove that hardened steel shaft, first, which allows the gearbox, 6-groove drum and side-mount bearing to be separated from one another.

Rather than reusing any of these parts, I ordered a new gearbox, 6-groove drum, side-mount bearing, steel shaft, and related hardware (e.g. bolts, nuts, washers). I also ordered a new set of cables (there are three of them). It took a couple of weeks, but one day a heavy box arrived with the whole kit and caboodle.

Now, I just needed the help of someone who knew what he was doing.

Skip, the Crankup Man

If you get the list of recommended repair people from US Towers, you'll find there are not a lot of them, and they are spread out from coast to coast. A ham friend of mine recommended one of them – Skip Bolnick – so I emailed him with a description of the problem and asked if he thought he could help me. He said “yes.”

So, on Monday, December 3, by pre-arrangement, Skip started driving up to Santa Cruz from Woodland Hills (about 400 miles south) with his van loaded with tools, parts, and whatever he thought he would need. Around 2:30 PM, I arrived home from work and Skip was already there. He was back by the tower, taking its measure.

“You’ve got a problem, here,” he said, first thing. I said I knew that. And, so with the remaining daylight, he began removing the pulley/fan belt shroud, blocking the tower sections with wood and galvanized pipe, and began working on removing that hardened steel shaft.

Under ordinary circumstances, once Skip has loosened the lock collars on the shaft, it should have been possible to hit one end of it with a hammer and drift pin and have it push out of the other end of the gear box. And, there he was pounding that drift pin with a hefty hammer...and that shaft would not budge even a fraction of a millimeter.

So, we decided to call it a day and instead get something to eat. Before leaving, Skip had saturated all the places where that shaft went through with penetrating oil, and we hoped by first light, it would be ready to break loose.

Hams know how to improvise

The next morning, after a quick breakfast, we went out there, again. Skip picked up that drift pin and small sledge, and we both hoped that pin would now be ready to come out of there. But, no joy. Again, it would not budge an iota.

We were mulling over cutting the welded steel frame in a way that would allow us to remove the gearbox, shaft, 6-groove drum, and side-mount bearing as a single unit. It was doable but meant that afterward, it would have to be put back by either welding or bracketing.

Then, as Skip moved one of the lock collars, exposing the shaft I said “do you think we could saw through it using a SawzAll?” He said that the steel was really hard, but we decided to give it a shot.

He rummaged around inside his van and found the SawzAll and an appropriate blade, which looked like it was made of white plastic. I didn’t ask.

We held our breath as he plugged in the SawzAll and put the blade against the edge of the shaft. Well, it didn’t cut like a hot knife through butter, but it did cut. It took about 20 minutes, but when Skip was done, the shaft was cut cleanly, and we were able to remove the gearbox, 6-groove drum, and side-mount bearing. The piece of cut shaft fell easily out of the side-mount bearing and 6-groove drum, but it was absolutely frozen inside that gearbox.

Before installing the new stuff, we wanted to satisfy ourselves that it was the gearbox. So, Skip opened it up, we looked inside, and sure enough, there was a place on that toothed gear where some teeth had broken off. Whenever that part of the toothed gear rotated into position with the worm gear, it would stop turning and cause the worm gear to become misaligned with the toothed gear. Then, if you persisted, it would snap into alignment, turning the shaft, the drum and the cable. It all made perfect sense.

The strategy going forward

Remember that while all this was going on, the tower was still stuck at 50 feet and blocked by a big piece of wood and some galvanized piping. The plan was to replace the gearbox, drum and side-mount bearing, then slip in the new shaft, tighten it all down, and increase the tension in the old cable to where it was before. At that point, we would pull out the blocking, hit the down switch and get the tower to nest. And, by Jove, it worked.

The next plan was to block things, again, and replace the set of 3 cables, all while the tower was in place. This was something the fellow at US Towers had told me could not be done.

One after another Skip replaced those three cables and then came the interesting part. Using a pair of cable winch pullers, he pulled section 2 down relative to section 1; and pulled the tensioning spring on the pull down cable down so that the spring was compressed. Then, he took out the slack in the cable by tightening it up, and, finally, released the cable winch pullers providing the cable tension the gentleman at US Towers said could not be applied without laying it on its side, on a flatbed truck, and shipping it to the factory.

The final test

With the blocking wood and pipes removed, Skip pressed the up switch. The motor started turning. The belt started turning. The big pulley on the worm gear started turning. The toothed gear started rotating. With it, the hardened steel shaft began to turn, and so did the 6-groove drum and the cable began pulling the sections up, and up, and up.

When Skip turned the switch to neutral, the tower was at nearly full height. The 80 m rotary dipole was back up at 90 feet; the 40 and 30 meter 2-element yagis were at 82 feet; and the yagi array for 20, 17, 15, 12 and 10 was once again at 75 feet. As the tower went up, it pulled taut the 160 m Double L that extended from it via two bungee cords to a tree about 150 feet away.

Unfortunately, a fast-moving and high-wind storm had swept through the area one day before Skip had gotten there. After it had passed, I checked the tower and saw that the antenna switch was no longer mast-mounted. It was now coax-suspended! The good news was the switch was still working. The bad news was I had no continuity from the shack to the 40 m antenna.

So, on December 28 I brought in a boom lift – a 60 footer – and found the 40 m problem (a broken balun wire); then put on the new spacers that keep the 10/12 meter driven ‘cell’ elements from touching in the wind (the previous pair had blown off in that storm); mounted the switch on the mast (hopefully to stay); and brought that tower back up to full height in anticipation of a new year of CWTs, CW Open, ragchews, and other assorted ham mayhem. That same afternoon, I gave it a tryout in RAC Winter. I made 470 QSOs, all on CW, on 160 through 10, and made over 94,000 points. I guess it works.

From the VP



<u>Call</u>	<u>ACA</u>	<u>CMA</u>
AA3B*	601	3325
KZ5D*	601	2522
W1RM*	539	2386
N5RR*	534	2427
VE3KI*	456	1754
EA8AY	405	1391
F6HKA*	405	948
W5ASP	404	789
K6RB*	395	1743
N2UU	371	1435
SM6CNN*	367	2066
N1ZX	320	434
W5ZR	307	1620
EA8OM*	307	1487
NN6T*	278	572
W6KY*	251	1299
W1UU	241	1054
DL8PG*	240	913
K6DGW*	223	905
EA1WX	201	1144
KR3E*	176	995
AD1C*	165	787
VU2PTT*	152	395
OK1RR	103	637
V31JP	90	547
W4VQ		794

* = updated data

73,

Art, KZ5D

The Annual Competition Award (ACA) is based on the number of members worked each calendar year. You get 1 point per member, worked once per year. It resets to zero at the beginning of each year. The Cumulative Member Award (CMA) is based on how many members you've worked since January 3, 2010 on each band and continues to grow in perpetuity. The CWops Award Manager (CAM) software, available at no cost, will help you keep track of your ACA and CMA totals.

From the Secretary



With great pleasure we welcome the following new members:

1110 WT5RZ Ron
1111 K4DJ Rich
1112 NP3A Eric
1113 K0EU Randy
1114 W4TTM Mark
1115 W5JBO* John
1116 OX3XR Peter
1117 AB1CW Howard

* = Life Member

73,

Jim, N3JT

Current Nominees

Need Sponsors	K9HXO	Bill Miller
Need Sponsors	W3GW	Joe Gerry
7-Day Waiting Period	NM2L	Greg Potter
7-Day Waiting Period	VE3GFN	Mike Goldstein
7-Day Waiting Period	W6JMP	Gene Trasti

For more details about nominees and status, check the “members only” on the Website:

www.cwops.org

For information about joining CWops, check the Website under “membership.”

QTX Scores

Call	November	Year
K1ESE	50	483
N5IR	34	378
K4AHO	20	135
WA3NZR	18	270
NN6T	26	132
JE1TRV	9	80
KC0VKN		20
K6RB	9	140
K0DTJ	1	51
W4VQ		9
K9FN		7
W1RM		74
W9ILY		1
JK1JHB		4
N1DG		1
KR3E		26
HB9CVQ		4
EA6OM		1

W5PG	1
W1HIS	1
W5JQ	8

The QTX is a program for members who enjoy casual CW QSOs. Anytime you have a QSO that goes over 20 minutes, jot down the call sign of the other station, and before the 5th of the next month (e.g. before 5 April for your March total), go to the website QTX page in the 'members only' section and put in your total.
