

# FDIM 2016 Wrap-up

by W1REX

Every year, I'm asked to pitch some Buildathon ideas for the FDIM Buildathon. A few years ago I pitched the idea of 'The World's BIGGEST Buildathon' but another idea was selected from the list. The idea laid dormant for a while, until this year, when it was pitched BACK at me by the new ARCI President, Steve Fletcher, G4GXL. I accepted the 'challenge' and dutifully set off to plan the event. I only had a 40+ minute window or a little more since I asked for the last seminar time slot. Then I worked on how we could build it without setting up 300 soldering irons in the ballroom...boy that would have been FUN!

## The Circuit:

I didn't want the WBB kit to be something trivial so I searched a lot of resources for the perfect design. I had already been studying the legacy of Dave Ingram, K4TWJ, and came upon the Hamfest Buddy, a simple little 20m transmitter kit with a minimum number of parts. A Buildathon with 300 builders is ambitious enough without trying for a complicated design. The Hamfest Buddy seemed perfect. Since the design was a little dated (2005), I first set about changing the circuit to meet current regulations.

I enlisted my #1 Elmer, Chuck Carpenter, W5USJ, onto the project. Chuck & I use the SIP pin sockets for band specific parts when developing a new design so I reasoned that a circuit board made entirely using the SIP socket pins would solve the soldering iron issue. We went through MANY revisions of the layout until it finally evolved into the layout now used for the Hamfest Buddy][ we built.



I submitted the design on April 5<sup>th</sup> and waited for almost 3 weeks for the boards to arrive. To my horror, when they did arrive, they had been etched using the wrong layout. The pcb fab shop had goofed and used a previous design used for the price estimate and not the current revised design. I called them up, we talked the situation through, and the pcb guy said he would fix it in time. It took an additional week to have WBB circuit boards in hand. Hurdle #1 jumped over!

## The Parts:

Now that the pcb design was finished, I turned my attention to the parts. I wanted to pre-bend and pre-cut the parts to decrease the assembly time and remove the necessity of hand tools. It just so happens that I remember another friend who had just the machine for the job. Jim Scott, WBOIYC, gave me a tour of his shop back when I attended Ozarkcon when it was held in Joplin Mo, I remember that he had a hand cranked lead bender for forming and cutting parts on tape & reel. I 'enlisted' Jim onto the project, ordered all the parts on tape and had them shipped to Jim. As you can see in the picture on the right, Jim cranked all the parts in his shop and sent them back to me.



I made sure that ALL the parts were specified as tape & reel and confirmed it with the salesperson when I placed the order with Mouser. As usual, there always has to be a wrinkle in every project that I work on and the 2.2uh axial choke was the designated fly in the ointment. They came as bulk loose parts. After a LONG discussion with a salesperson and a techie at Mouser, we 'discovered' a flaw in their computerized order system. A search was made for the only part meeting my criteria and they shipped it to Jim via overnight UPS. Hurdle #2 cleared!

## Board Assembly:

Since the board was now a week late, I lost the time buffer to send them out for soldering. I had to do it in-house either by hand, all 12,600 solder points, or by machine. I did own a Displacement Solder System; but, the machine was 'resting' on a shelf in the pallet racking in my Quonset hut. I hadn't used it in at least 12 years so it was going to be a challenge not only to get it out, but to remember how it worked. Since it weighed 300+ pounds with over half of that in solder, I just couldn't move it from its shelf. I had to use it as it sat, about 5' up on the shelves. I gathered up some soldering supplies from another friend, found the pcb frames and tried to do a test run. No dice! The vacuum pump didn't turn over. I figured it was stuck from disuse. I found a rebuild kit on Ebay, bought it and paid extra for overnight shipment. Rebuilt the pump and it still didn't work. This was Friday, only one week away from the WBB event at FDIM. I called everywhere & everyone who I thought might be able to help me figure out why the machine was not functioning. I got nowhere fast until I got a call back from a lady at the Wave Room over in NH. Nobody at her company knew anything about the machine, too old, but she remembered a field service company in the same business park. She walked over at lunch time, talked to someone there who promptly produced a wiring diagram of my very machine. A mere 4 hours later and my machine was soldering boards. It was still pretty awkward working with the machine up in the air. I pushed a workbench in front of the shelf and stood on that to run the machine. Another friend, Geoffrey, came over around 11PM to show me something and got sucked into the operation. He passed the 'ammo' and I ran the machine. By 1AM, I had 140 boards soldered so I was half way over hurdle #3.

## **The Kits:**

Later that same Saturday morning, I took a break and showed the kitting 'ropes' to Mitchell, Geoffrey's son fresh home on Friday from his first year of college. I gathered up all the parts and kitting supplies, ran through the process on a couple of dozen kits and let him run with it. He kitted for the rest of the weekend while I went back to soldering circuit boards. I volunteered my daughter Katie to pass the ammo and we stuffed and soldered the remaining circuit boards Saturday night.

By midnight, we had 312 boards soldered and then we ran out of SIP sockets. We lost 9 boards to jiggled parts but I reworked a couple and ended up with 305 boards.

By Monday morning, I had 384 kits kitted by Mitchell so now I had cleared hurdles #3 and #4!

Now I had to move on to the documentation. I knew from my test run with the NEQEP club members that I had to provide better build documentation, again, to insure a smooth build in a minimum amount of time...



## The very FIRST Buildathon on a plane??

Here's QRPme, W1REX, starting my WBB kit on the Southwest flight into Dayton. We had to make it fast as it was only a 32 minute flight and we had to wait for the plane to get up to altitude before we could put down our lap trays to build.

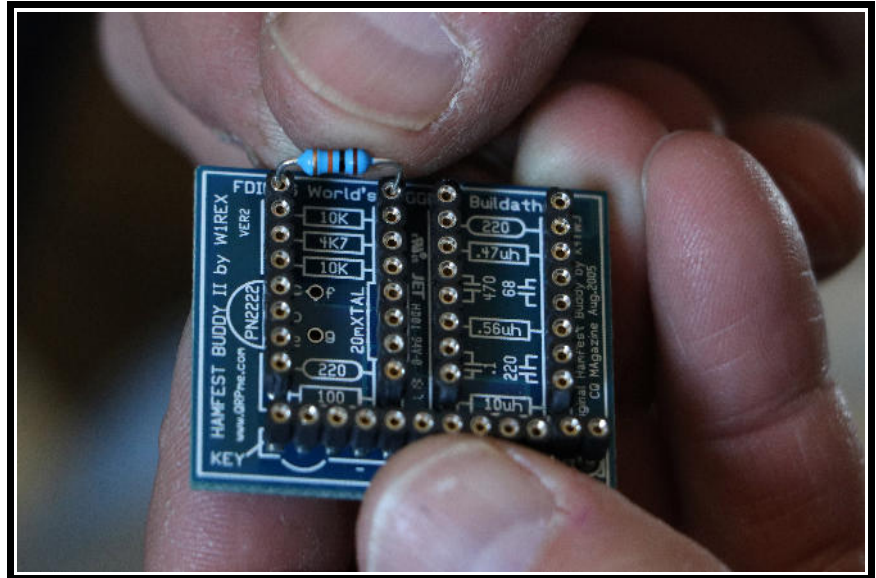


That passenger just over my shoulder kept a close watch on the two 'radio nuts' on the other side of the plane blissfully assembling electronic do-hickeys on an airplane...but apparently looked away when this picture was shot...

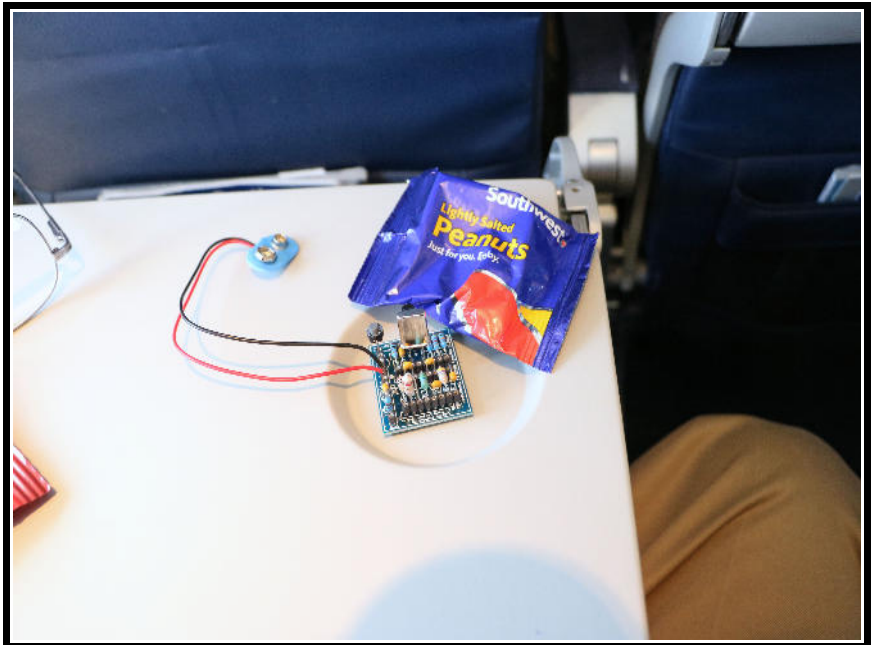
Here Joe, KONEB, is building his WBB transmitter. He didn't have the circuit 'etched' into his brain after working on it for over a month like me. He was a little bit slower. Note the absence of any documentation... it wasn't completed yet! Of course, we didn't put any batteries to our kits and try to verify any transmission, but I did verify that they were built correctly and would have worked if tested.



The main reason for the ability to build a WBB kit, anywhere, was the SIP sockets for ALL the components and the careful attention to component topology and lead spacing.



Later in Wednesday evening, a few volunteers recruited for runners during the WBB Buildathon event were assembling them in the hallway outside the FDIM registration room. Glen Hazen, N8WE, who is 88,



built his in about 30 minutes. Bill Kelsey, N8ET, built his in under 20 minutes with only his left hand! This was going to work!

I spent the remainder of Wednesday night and Thursday mourning finishing the documentation and getting 300+ copies made over at Kinko's.

## The WBB in action!



The picture above says it all! Almost 250 builders working away at their little transmitters. Many had seen my series of posts to bring lighted pocket magnifier and needle nose pliers..the only tools need to built the WBB kits. That is for builders who have 'fat fingers, or 'all thumbs' and of course, those with less than 20-20 eyesight. There was a lot of tool borrowing and neighbors helping neighbors going on. The biggest glitch was a few dozen 68pf caps that had snuck into the 220pf caps before the kitting process. Some kits had two 68pf .1" spaced caps and no 220pf .1" spaced cap. All told, I think there was 3 or 4 dozen kits without the 220pf cap. Fortunately, I had about 350 kits on hand and I put one of my volunteers, Dennis Anderson G6YBC of Kanga UK, on the task of borrowing the right 220pf caps from the unused kits. Unfortunately his eyesight was NOT 20-20 and the 220pf caps were a little slow to materialize. Once we got someone on the task with EXCELLENT eyesight, the caps started coming out of the corner. We have 3 SW receivers set up to check the transmitters after they were completed and once some kits were built and tested, we were able to borrow 220 caps from those radios and



then the cap problem disappeared!

I set the timer when I let the builders go to town and stopped it at 70 minutes when the last radio was tested as working. Out of 248 kits handed out, 246 were built tested and declared working in the 70 minute build!

Of course, a couple of interesting notes about the WBB kit.

1. Pull the 51 ohm resistor and attach an antenna to the 2 socket pins or solder an antenna jack to the 2 pins on the underside of the pcb. The harmonic filter is street legal so you can put it on the AIR!
2. Pull the little membrane switch and add a keyer jack so you can really make the WBB transmitter into a real controllable transmitter.
3. The 100 ohm resistor can be substituted with lower values to increase output power. Of course, it is only a single transistor oscillator circuit but you could go for a little more power if you want.

I wish I had some more pictures to show the event but I was pretty busy running around being the head runner. If anybody has some interesting pictures of the event, I would love to have some more. Joe Eisenberg, KONEB, provided the pictures included here. I had my camera with me but took my first picture on Sunday afternoon after the Flea-market had ended..... I was a busy boy!

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<another non picture!>

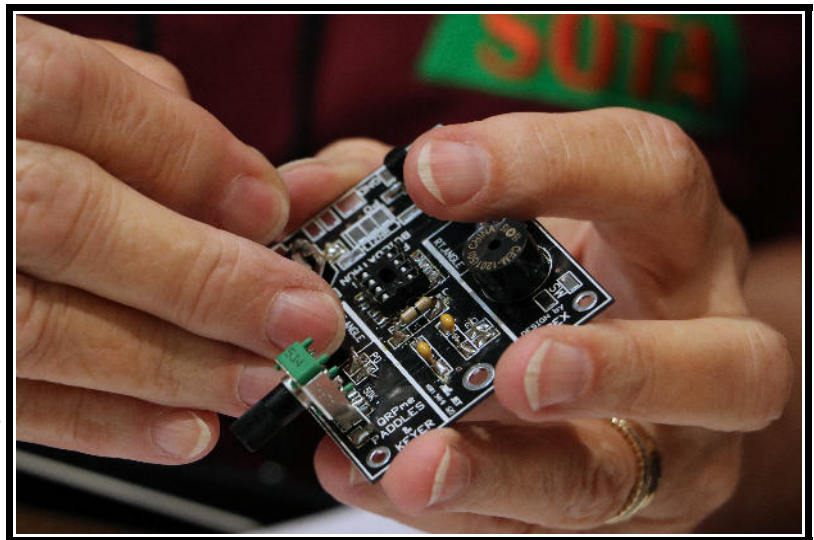
## The 'OTHER" Buildathon

I had also committed to run the second Buildathon on Friday afternoon. We had 34 builders show up to build the FDIM 2016 Keyer/Paddles kit. It started a little after 4:00 Friday afternoon



and the last of the builders were out the door before 8PM when the CLUB night had started over in the ballroom. Of course, ARCI provided us with pizza and drinks during the build so everybody was good to bug out and hit Club night!

After the last builder left the buildathon room to head over to Club Night, a QRPer from Columbus staggered in to build a kit. I did a one-on-one Buildathon with him until about 10:00 before I headed out for Club night. It was pretty much over by then.



## The Flea-market

I usually hang out in the GQRP booth so that the Brits can go on forays into the flea-market looking for those elusive 'bits' they are always searching for. GQRP had no representatives that flew across the pond, so I had no booth to hang out in. So I signed up for a flea market space. Flying into Dayton meant that I had nothing to sell out of....BUT, one of my Lobstercon buddies, Uncle Cy the LED Guy, K1TES, was driving out with practically nothing in the back of his pick-up. I solved that 'problem' by prefabbing a portable ham shack back in Limerick and had him transport it to Dayton. My kits and parts don't usually sell well in a typical hamfest flea-market so I resigned myself to having a little FUN with the hams wandering by. I did have a work bench and butane soldering iron in my shack so I hung out and built some stuff in between my forays into the flea-market looking for 'Bits'...



LOTS of pictures taken of my shack!