



NoGa News

Special Feature:
Tech Stuff

North Georgia QRP Club August 2007 Meeting

The August 2007 meeting was held on August 10 at the Wieuca Road Baptist Church, 2636 Peachtree Road, Atlanta. NoGa meetings are held on the 2nd Saturday of each month.

Pickett, AD4S chaired the meeting. The following were present:

Harold, KE6TI	Dick, K2UFT
Jim, W4PDZ	Steve, KI4IXR
Arnold, KC4ZUA	Rick, K4RAB
Mike, KD4SGN	Russ, AE4NY
Phil, K4PQC	Pickett, AD4S
Barry, K4WX	Joe, W4JHR
Terry, WA9WNE	Brian, N4TRB
Dave, KB4UUV	Brooks Lide
Ted, KX4OM	Dave, KE4UMT
Jim, WA4RDR	Bobby, W4BLB

Opening remarks - Pickett, AD4S

I'm sure there were some, and knowing Pickett, they were captivating. This is your humble NoGa News Editor writing an apology, as I was late...very. I rolled in just as Arnold, KC4ZUA was wrapping up the last of the "what's happening with the members" thing. My only excuse is that I didn't have a clue what day it was when I got up at 10:15 a.m. Y'all that were there heard the story, as it was my turn to speak, anyway. Since taking on some new responsibilities on July 30th, I've been burning the feedline at both ends, without a balun, to mix a couple of metaphors. I asked my XYL, K4EKF,



Pickett, AD4S relaxing as the meeting moves right along

upon my waking "Is today Friday or Saturday?" "Saturday", she replied. I said, "Is it the 6th?", "No, it's the 10th." A few curses later, hopping downstairs while tying my shoes, and I was on my way. I think I'm going to get really, really bad reviews on this edition of the NoGa News. I'm trying to make up for it with a **Special Feature**.

Member Reports

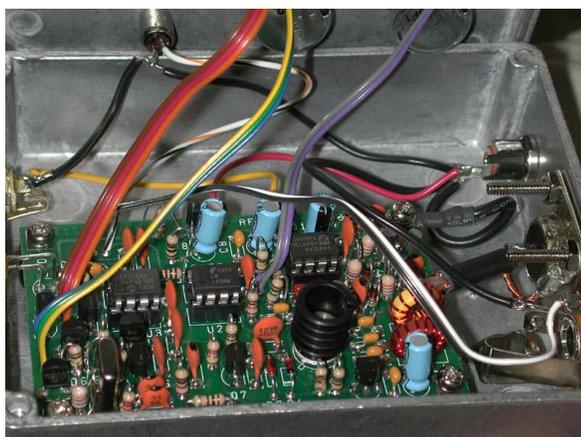
Arnold, KC4ZUA was discussing crystal sets, and specifically the fact that he either had several, or had a line on a bunch of high impedance crystal earphones. Those things used to be common RadioShack items, but not any more.

Ted, KX4OM mentioned that some Mitsubishi RF MOSFET power transistors

had been recommended to him by Wes, W7ZOI as potential replacements for IRF511/510 power switching types in most of the EMRFD designs, and that they were low cost when compared to 2SC1969 BJT devices with similar power ratings. Ted also brought in the PIN diodes for those who had wanted them.



Brian, N4TRB and his Tuna Tin 2; and below, his HiMite



August Meeting Group Photos: 20 shown in the photos, including Terry's 'lil Heterodyne, as they used to say. Ted, KX4OM is not in the photo as punishment for being late.

NoGa Special Event: Flight of the Bumblebees Contest

NoGa had two entries in the **Adventure Radio Society's "Flight of the Bumblebees"** CW QRP contest. We set up camp at a park/recreation area in Roswell. Unfortunately, the pavilion was taken, so we adapted and set up the stations under the roof overhang of the concession stand at the baseball field. Jim, W4QO primarily ran one station, a K-2 to a

40m dipole hung between two light poles for the baseball diamond. Sam, AE4GX ran an IC-703 to a 20m PAR Electronics end-fed half wave.



Chief ops Jim, W4QO and Sam, AE4GX confer on antenna plans



Sam, shooting at a light pole with a homebrew slingshot/Zebco 33

Fortunately, we had a few minutes before the contest to figure out the menus on the 703 and get that set up. Once the clock struck 1 p.m. local time, both stations were off and running. Sam and Jim operated for the first hour, and Norm, WA4ZXY and

Ted, KX4OM logged. Both stations heard, but did not work, NoGa members Wey, K8EAB, and Ken, W4DU on both bands.

Dave, KE4UMT joined us for the duration and observed. We also had other visitors stop by, as well as the occasional teenager careening around the corner, nearly knocking the tables over.



Hot and heavy contest run. Norm took a break from logging to shoot these.



The team took a break after an hour of intense activity. After another half hour of snagging contacts, another break, which pretty much lasted until 5 p.m. We had a lot of fun talking about ham stuff, though.

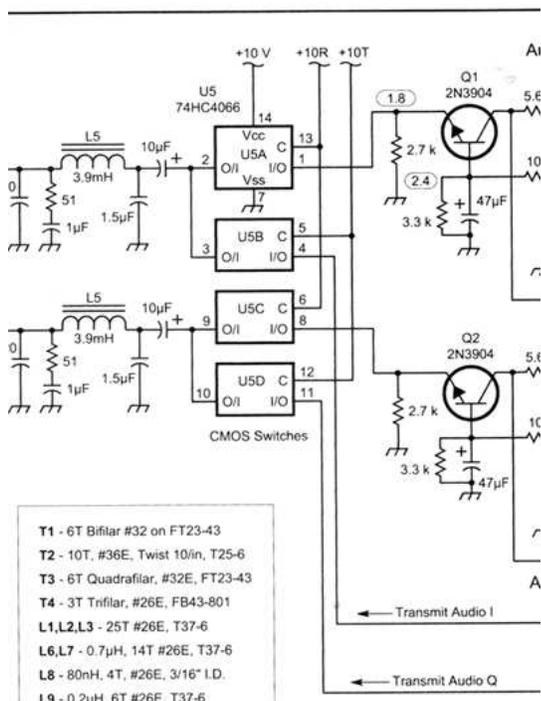


Norm takes a turn on the K-2

Special Feature

Technical Stuff: IC Switches

After the meeting, a few of us were discussing switching in RF circuits using IC's (as opposed to PIN diodes, or regular diodes used in switching applications). One topology that has been around for awhile is the 74HC4066 Or just "4066" in several incarnations. An example of the use of this device is shown in the below partial diagram, taken from 11.14 in EMRFD:

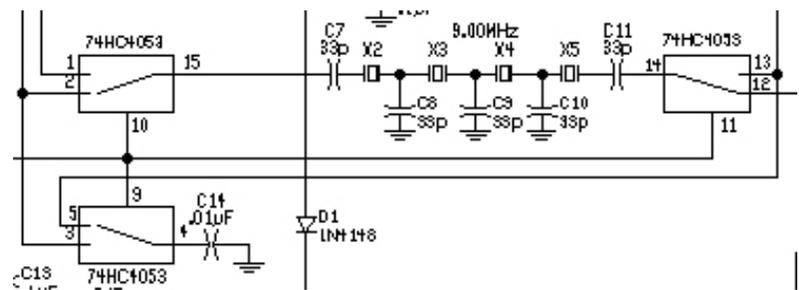


Here, two channels of audio, I and Q are being switched between transmit and receive. The common enabling signals are on Pins 13 and 6 for +10V Receive condition., and Pins 5 and 12 for +10V Transmit condition. Transmit Audio I and Q phases go to Pins 4 and 11, respectively, and exiting on Pins 3 and 10 in the Transmit condition. In the Receive condition Pins 1 and 2 are connected, as are 9 and 8 for the other phase.

Here are some specifications for this device, which is called a Quad Bilateral Switch:

- On resistance: 50 ohms
- Turn on time: 11 nSec
- Turn off time: 13 nSec
- PD: 100mW per switch, 500 mW total
- C input: 3.5 pF
- C through: 7 pF
- Switch current: 25 mA

The next device is the 74HC4053. One place it is used is in Steve Weber, KD1JV's "Simple SSB Transceivers", where it performs in a couple of places, the one shown below switching signals between transmit and receive in a two-way IF system:



This device acts as a 3PDT relay. It is shown in the Receive condition. When enabling voltage is applied to pins 9, 10 and 11, all three switches change states, routing the IF signal through the filter in the opposite direction (Pins 1, 2 and 13, 12, with

Pins 15 and 14 being the common "pole"), and RF bypassing the input to the 1st Receive mixer (Pin 3 through Pin 4) to ground.

This device is called a Triple 2-Channel Analog Multiplexer/Demultiplexer, and its specifications are shown in part below:

On resistance: 70 ohms C input: 5 pF
 Switching time: 15 nSec C I/O: 11pF
 PD: 500mW Switch current: 25 mA
 Icc: 4 uA (quiescent)

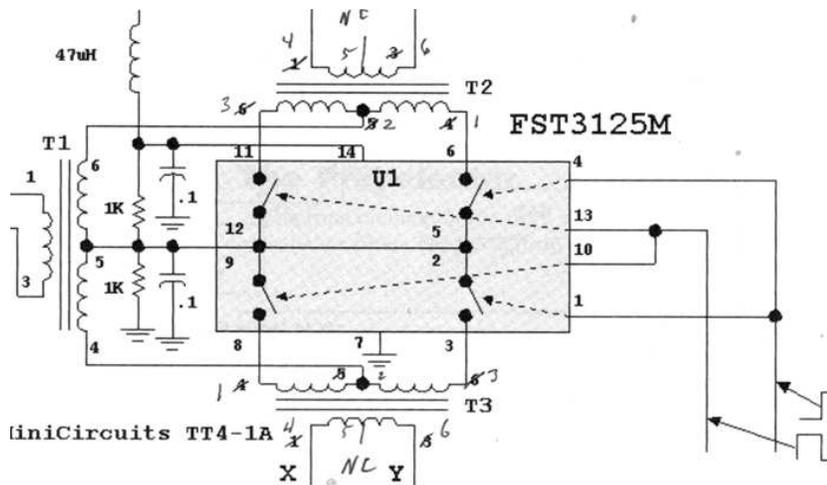
The final device is relatively new, and its specifications are such that it should see more applications in homebrew designs. It uses what is called "Fast Switch Technology", or FST. This particular device, the FST3125, is used in Figure 6.90 of EMRFD as an H-mode mixer in the front end of a receiver.

Pins 1, 4, 10 and 13. FST devices come in other configurations, including Multiplexer/Demultiplexer Bus Switches (74FST3253). Wes Hayward, W7ZOI has recommended the use of these devices. The FST3125 in the H-Mode mixer example is called a 4-Bit Bus Switch, and consists of four 1-bit switches with separate enabling signals. Compare the below specifications with the other two devices, particularly the On resistance and Switching Time:

On resistance: 4 ohms Cin(control pin): 3 pF
 Switching time: 4 nSec Ci/o :5 pF
 Iout sink current: 128 mA Icc: 3 uA
 Off-state leakage current:
 +/- 1.0 uA

Well, that's about all I know about that subject. And with that, we'll put a wrap on this edition of the NoGa News. See you next month, I hope.

73,
 Ted, KX4OM



RF in is through T1, and it produces a balanced output through T2 and T3 to two IFs. The logic-generated LO comes in on