

Cathay Newsletter August 2009

www.cathayradio.org

President: George Chong, *W6BUR* **email:** *W6BUR@comcast.net*

Vice President North: Leonard Tom, *NX6E*

Vice President South: Murray Kay, *WA6USL*

Membership Chairman: Bill Chin, *KC6POF*

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Treasurer: Vince Chinn, *W6EE*

Mission: The Cathay Amateur Radio Club is basically an active social club of Ham Radio Operators and their spouses

Monday Night Net Time: 9PM PST Frequency: 146.67MHz -600KHz PL85.4 and 442.70 +5MHz PL 173.8 The repeaters are linked. The Monday night net is the best way to find out the latest club news. All check-ins are welcome.

Message from the President George Chong *W6BUR*

We just had a CARC "first". Members celebrated Edison's (*WB6IQN*) birthday here in the Oakland Hills. His wife Sharadon and their kids brought a huge birthday cake, and as usual, the food at the Pot Luck was delicious. Our group always brings the right varieties. I can never figure out how our guys and dolls always know what to bring, but then I stopped trying years ago. This has always been a party that we never ask how many are coming and who is going to bring what dish etc. and it always work out so well. You did it, yes you all did it. Thanks to all that made it here, and those of you who missed this one, we missed you; but there will be another. Bring your home cooked specialties for next year's Pot Luck.

Remember when the Club, a few years back, went to the Hiller Air Museum for an outing - everyone (30) had such a great time. We were there again last week. It was all about folding and flying paper airplanes. My grandson, Ryan, (8 years old) was having the time of his life. But haven't most of us folded paper airplanes before? Of course you have. The guy who did the

demonstrations and showed us paper planes was spectacular. This fellow was from Channel 4 (my Alma Mater way back when....how about 1951?). But that's another item for some other time. Back to the paper airplanes, we were in awe when he hand launched this paper airplane that flew, and flew - forever it seems and that for a motorless vehicle it was a very long time. I believe that it could have flown throughout the whole demonstration. But then there were more paper planes to fly.

Wow O' wow. How this summer is going, already the days are getting shorter. Wasn't there some talk during the first part of this year about Field Day on the Jeremiah O' Brien? Please don't forget that an early reservation must be made (this year) for 2010 Field Day. We need to have another club partner this event due to the cost. So which one of our members wants to Chair this Partnership?

The next Club event coming up is WB6IQN Edison's Tech Session, and then ending the year with a Christmas get together also at Edison's QTH. Member participation will make a healthy club.

Chat sub saum,
George Chong W6BUR Aug.2009

Note from XYL Hetty Chong – WB6SHU

Thanking you all for a great Pot Luck party at our home, especially for all the delicious food and help from the ladies in the kitchen. We also celebrated Edison's 54th birthday with a delicious cake and, of course, serenaded him with the birthday song. Many thanks to all for taking plants home - I can't bear throwing plants with roots intact away. George and I are looking forward to seeing you all again at the summer picnic - the next event.

Tech Session in Sunnyvale Saturday August 8th. (includes free lunch)

Date: August 8 **Time:** 12 noon – 3PM

Subject: *A DC-3 GHz Spectrum Analyzer Using Time Domain Sampling*

Place: *1163 Quince Ave. Sunnyvale, 408-245-8210. Monitor 146.52 MHz*

Cost: *FREE to Cathay Members and Guests*

Directions: *If you are coming from the DeAnza Flea Market, just head North on Stelling Rd. DeAnza College is on the the corner of Stevens Creek and Stelling Rd. Go 2 miles, past Homestead Road, past Fremont Ave. (Stelling Rd. will change names to Hollenbeck Ave. after you cross Homestead Rd.) After Fremont Ave., watch for the first signal light which is Torrington, make a left. Go one block and you will run into Quince Ave. We are at 1163 Quince Ave. I will monitor 146.52 MHz if anyone gets lost.*

If you need precise directions from where you are coming from, go to www.mapquest.com. They seem to give the best directions or give me (Ed Fong) a call on the phone.

This event is right after the DeAnza Swapmeet. Before going home, come on by and have a great lunch and meet new friends. Lunch will consist of lasagna, pizza, salad, drinks, chips and

desserts. Why go out to the traditional St. John's after the swap and then to HRO's? Drop by, save your money and still have time. Bring a dessert to share.

This year's talk will be on a 3 GHz spectrum analyzer I worked on at National Semiconductor. This was my last major project I worked on after a 16 year career at National. The spectrum analyzer is built on a PC board that plugs right into a USB 2.0 port. It needs a 6 volts external supply and loading of driver software. From there, the PC is used as the display and also performs a Fourier Transform - in particular, a Fast Fourier Transform (FFT). This transforms time sampled data to the frequency domain.

Unlike a traditional spectrum analyzer that sweeps the frequency of interest, this new technique, that was also developed at National, uses no sweeping generators, and no narrowband filtering. Rather it uses the power of Digital Signal Processing (DSP) via a high speed 10 bit 3 Giga sample ADC to sample the entire RF spectrum. Yes, you heard it correct. The A to D converter on this spectrum analyzer can process data at 10 bits at 3 GHz per second. We presented a paper on this chip in the February 2009 International Solid State Circuits Conference. There was always an issue of who or what would one use a 10 bit 3 GHz ADC? So that was the basic premise that was given to me. Who needs a DC to 3 GHz 10 bit ADC? When that question was proposed to me, the Time Domain Spectrum Analyzer came to mind. The basic chip could sample the entire RF spectrum, as we know it, from AM radio, FM broadcast, TV, Cell phones, 802.11 wifi, GPS, police, fire communications, you name it, all in one sample.

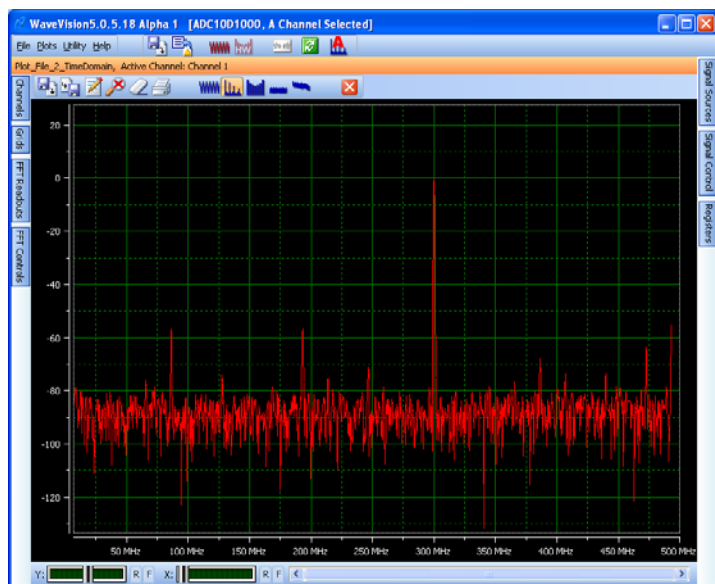
National Semiconductor's philosophy was that "if you could make it, they will come." So how about a DC-3 GHz spectrum analyzer on a 8 inch by 8 inch PC board that plugs into your USB 2.0 to operate for under \$300? Well, NSC spent over \$10 million on developing Giga Hertz sampled A to D converters. In the end, who could use this and who would buy it? National made it and they didn't come. My job was a last straw at National was to see what one could do with a 3 GHz A to D. We managed to do this with a small team at National. The project manager was a UC Berkeley grad name Robbie Shergill. He needed several people on his team to make it successful. These included a Windows XP GUI interface guy - Ken Teteno. Also a Berkeley Alumnus. A USB 2.0 expert and a FPGA (Field Programmable Gate Array) expert name Ravi Masand - a former Bell Labs engineer.

I was responsible for all the RF circuitry, the precision clocking and the power management of the board. An article is coming out in EDN in the near future covering how we overcame the broadband matching problem. The Spectrum Analyzer is fabricated on a 10 layer Nelco 6000 PC board. We even had to develop a new low cost balun. So the effort put into making this Spectrum Analyzer probably was about \$1 million, not including the cost of the development of the chips themselves.

So come on by and see this board work and who knows, you may be buying one in a few years.



The above is serial number 009 of the Spectrum Analyzer board. This board interfaces to your USB2.0 and like magic converts your PC in at DC-3GHz spectrum analyzer. Just amazing what modern IC technology can do. This was my last major project at National Semiconductor.



The above is a typical output of the spectrum analyzer software as it appears on a PC running Windows XP. Just like a real spectrum analyzer but all for about \$300.

Report on the Picnic at George's House, July 27th - Ed Fong *WB6IQN*

That was a great potluck get together at George's W6BUR. I counted 17 people. The club wishes to thank George and Hetty for their hospitality. Everyone had a great time. Aside from the great food (and there was of plenty of it) and birthday cake, this was the first time my youngest daughter, Violet, ran the raffle. Almost, all by herself. She made change for people

and as far as I know she was correct with all of them. A few people even tried to fool her and tried to entice her to give extra tickets but she always stood her ground. The only person Violet listened to was Hetty *WB6HSU*. Hetty kept on saying, "I'm only going to buy tickets if you sell me the winning ticket." Sure enough, Hetty was the grand prize winner of the laptop. So at the next raffle consider buying a ticket from Violet.

Some of my favorite foods were also there. Jackie's layered jello was Violet and Mei-lin's favorite. The Chow Fun just hit the right spot topped off with the pork buns. Hetty also gave away dozens of plants from her garden. My wife saved big bucks by taking Hetty up on her offer.

Prize Winners:

Acer Computer - *Hetty Chong WB6HSU*, Tachical Watch - *Gary Gin KN6L,V* Hallogen light - *Violet Fong*, Mag LED light - *Dirk Thiele KE6ZUY*, GP4 SW radio - *Tony Halog KR6EG*, CD storage case - *Joe Lee W6DOB*, Tool box - *David KF6FPO*, 2- pocket knives - *George W6BUR and Ron KI6AZB*, Laser pointer pen - *George W6BUR*, CREE LED flashlight - *Howard N6MNV and Gary Gin KN6LV*

Attendees:

Ed Fong WB6IQN, Gary Gin KN6LV, George Chong W6BUR, Hetty Chong WB6SHU, Tony Halog KR6EG, Connie Halog KF6WEA, Chris Gin KG6FOX, Dave and Judy Chan KI6FPO, Joe Lee W6DOB,, John and Lois Tim W6QNT, Dirk Thiele KE6ZUY, Sharadon Smith, Violet and Mel-lin Fong.and Susan Fong.



Dirk *KE6ZUY*, Tony *KR6EG* and Connie *KF6WEA* enjoying themselves.



The winner, Hetty *WB6SHU*, with the Acer Aspire One Note book Computer. Does this mean you will start helping out with the newsletter?



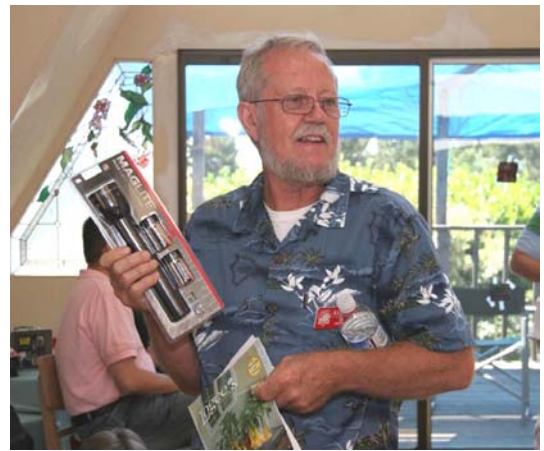
Violet selling raffle tickets to John Tim.



Long time member John *W6QNT* and wife Lois.



Ed's *WB6IQN* and his family, Violet, Mei-lin, and Sharadon, celebrating his 54th birthday.



Here's Dirk *KE6ZUY* winning the LED 3 Watt Mag flashlight.



Dave and Judy *KF6FPO* looking over the prizes.



Tony *KR6EG* and Connie *KF6WEA* winning the GP4 Shortwave Radio

EARN YOUR RADIO LICENSE IN ONE DAY!

NOTE NEW SITE FOR THIS EXAM!!!

Sunday, September 13, 2009

8:45AM SHARP! - 3:00PM

Saint Mary's Hospital

450 Stanyan at Fulton (where Golden Gate Park meets the Panhandle)

There will be a General cram for Techs, same place & time.

See *hamcrams.com* for parking info & late-breaking news.

Lunch available onsite or you can brown-bag.

Bring 2 IDs (one with picture), a couple of pens and
\$20 cash for Technician study materials, tips, and test OR
\$40 cash for General study materials, lecture, and test OR
\$14 cash for testing only (Extra exams available too)

8:45AM Check-in for study. Don't be early or late. Dropins OK.

If you want test only (no preparation onsite) come at 2PM.

8:50 Beginners' tips

9:00 Self-study starts, General cram lecture

1:30 Exams begin

3:00 Last tests start

No advance preparation needed for beginners, we do it all in 6 hours.

General exam class begins 9:00AM (if you are already licensed or have already thoroughly mastered the Technician exam material).

Questions? hamcrams.com

Next test date: November 22, 2009

Passing this test will get you a ham radio license from the FCC good for 10 years.

Questions? **hamcrams.com**