http://sf -arc.org **February 2007** P.O. Box 1005, Newcastle, CA 95658

Have a Ball, NASA Style

(Reported by Greg, KO6TH)

Last December, NASA's Space Shuttle launched a set of new satellites. That's not so unusual. What is unusual is what the satellites are designed to do and how they were constructed.

Four satellites in all were launched from the shuttle Discovery on December 21, 2006. This was after the shuttle's crew had completed one of the most complex space construction missions to date, where they attached a new truss segment to the International Space Station and reconfigured the Station's power and cooling systems. The satellites were stacked together in a tube, which then separated letting the individual birds drift slowly apart. Two of the satellites, RAFT and NMARS are tiny "cubesats", little 4" cubes that one can hold in your hand. The other two, ANDE and FCAL are 19" spheres. Each of these satellites is a unique creation.

Two of the satellites, ANDE and FCal are spheres; really really really smooth, round objects. ANDE's name derives from their

(*continued on page 2)*

OFFICERS

PRESIDENT
Don Hay, WB6LPJ
wb6lpj@arrl.net

VICE PRESIDENT
Kevin Reid, K7TST
k7tst@yahoo.com

SECRETARY
Leslie Nye, K7NYE
k7nye@arrl.net

TREASURER
George Simmons, KG6LSB
grsim@mindspring.com

DIRECTORS
Birton Gilbert, N6UG
n6ug@arrl.net
Jim Griffith, KI6AZH
jim griffith@usamedia.tv
Wayne Stilwell, W6DT
dxwayne@juno.com

REPORTERS
Satellites: Greg, KO6TH
History: Gary, KQ6RT
ARRL: Casey, W7IB
Contesting: Fred, K6DGW

WEBMASTER
Marc North, W6SQL
marc@marcnorth.com

RESOURCES

REPEATERS
145.430 (-0.6 MHz/PL 162.2)
440.575 (+5.0 MHz/PL 94.8)
223.860 (-1.6 MHz/PL 100.0)

CLUB NET
Thursdays, 7:30PM, K6ARR/R 145.430

CLUB MEETINGS
Second Friday of the month, 7:30PM at the Library, 350 Nevada St, Auburn CA

CLUB BREAKFAST
Last Sat of the month at Susie's Café, Cirby at Riverside, Roseville – 8:00 AM

NET CONTROL OPS
Dave Jenkins, WB6RBE
Gary Cunningham, KQ6RT
Joe Sylvia, KF6OQY
Casey McPartland, W7IB

EDITOR
Deb Cunningham, KF6LXN
916.663.4143
kf6lxn@sbcglobal.net

2007 Calendar of Events

(Operating Events in Italics)
[Dates are local unless otherwise indicated]

Feb 3	*Minnesota QSO Party*
Feb 4	*NA Sprint-SSB*
Feb 9	**Regular Meeting**
Feb 10-11	*CQ WPX-RTTY*
Feb 11	*NA Sprint-CW*
Feb 17-18	*ARRL Int'l DX-CW*
Feb 24	**Club Breakfast**
Feb 24-25	*NAQP-RTTY*
Mar 9	**Regular Meeting**
Mar 31	**Club Breakfast**

We encourage members to receive Sierra Signals via email to save the Club the cost of reproduction and mailing

Forty Years Ago At The SFARC

(Reported by Gary, KQ6RT)

February 15, 1967

Met at Memorial Hall. Sage, Joe, Jim, Bob C., Otto, and Dick present, but no formal meeting. Good eyeball QSO held.

Dick

73,

Gary, KQ6RT

Have a Ball

(Continued from front page)

mission: the Atmospheric Neutral Drag Experiment. The idea is to carefully track the satellites as their orbits decay over the next year or so. Since the two are made of different material and have different masses, their orbits will diverge over time. They will use that data to refine NASA's model of how the exceedingly thin atmosphere in space affects a satellite's orbit. But, to be useful, the drag on the satellite must be solely dependent on the atmosphere – there can't be anything sticking out to cause different drag depending on which way the satellite is facing. Hence, the really really really smooth shape.

On board the satellites are a set of corner reflectors and 6 lasers, which will be used for precise tracking from the ground. The Maui Laser Ranging station in Hawaii will aim its lasers at the sphere, looking for the weak signal returned from the corner reflectors. The telescope will also try to detect the near-Infrared light from the on-board lasers when they are turned on.

Otherwise, the satellites are a passive shell. Never one to let an empty shell go into orbit untouched, enter Bob Bruninga, WB4APR, and his Naval Academy graduate students. Bob saw the opportunity to get another APRS and educational experiment package into orbit, but there was a problem. How to get a radio tranceiver to operate from inside a metal ball? External antennas were out of the question, and transmitting from within the ultimate Faraday cage would be, well, less than effective. Then someone noticed that the sphere was 19" in diameter, which is very close to the length of a ½ wave 2 meter ham radio antenna. Simply slice the ball into two halves with an insulator between them, and use them as the two sides of a dipole antenna. With an antenna matching circuit, the ball has an SWR of 1.2:1.

Since solar cells are also out of the question, the satellite will be powered by batteries. Four racks of "D-cell" sized lithium batteries will power the on-board electronics and lasers. The racks contain 7 strings of 4 cells each, for a total of 112 cells. They are expected to last for about a year or so. To save power, the satellite electronics are asleep 90% of the time. The "A" side wakes up for 1.5 seconds out of every 15, and the "B" side for only 1.5 seconds once a minute. If they hear activity they will remain on to service it, then go back to sleep. The "B" side is a backup for "A", which is the reason for the limited availability.

These satellites do not have the traditional "on board computer" system to control the satellite and its systems. Bob's designs are based on the versatile Kantronics KPC-3+ TNC. The TNC is slightly modified to bring out a few signals for satellite control, and runs software that has been slightly modified, but otherwise it is an off-the-shelf product that is being used in very clever ways. Within the hardware are 5 analog and 8 digital lines that are otherwise unused. The hardware modifications were simply to bring these signals over to unused pins on the DB-25 connector, for attachment to the satellite's systems. The analog channels can be are to measure things like battery voltage and temperature, while the digital lines control systems and experiments. These are commanded from the ground stations with simple packet radio equipment. In addition to internal sensing, the analog channels are tied to several solar cells positioned flush around the outside of the sphere. These are used to determine the position and spin rate of the sphere by seeing which is getting the most sunlight. The world-wide network of 145.825 mhz satellite APRS gateways provide for telemetry gathering, and the Internet its storage, access, and display facility.

Next month: How to sail a RAFT through The Fence.

73s,

Greg KO6TH

Contesting

(Reported by Fred, K6DGW)

Ahh, so many operating events, so little time. With the sun low, the weather crisp, and sunrise and sunset (aka "grayline") lasting longer right now, the winter conditions are upon us, especially on the lower frequency bands. Here's a sampling of the games for February, a full list can be had at www.hornucopia.com/contestcal/

Minnesota QSO Party: [3 Feb 1400Z – 2400Z] www.w0aa.org/mnqp.htm

NA Sprint SSB: [4 Feb 0000Z - 0400Z] www.ncjweb.com/sprintrules.php

NA Sprint CW: [11 Feb 0000Z – 0400Z] www.ncjweb.com/sprintrules.php

CQ WPX RTTY: [10 Feb 0000Z – 11 Feb 2400Z] www cq-amateur-radio.com/wpxrules.html

ARRL International DX CW: [17 Feb 0000Z – 18 Feb 2400Z] www.arrl.org/contests/rules/2007/intldx.html

NAQP RTTY: [24 Feb 1800Z – 25 Feb 0600Z] www.ncjweb.com/naqprules.php

MNQP: This is a fairly fun little effort, and for some reason, the MN stations just seem to be pipelined into N. Cal most of

the time. There will be stations on from all the MN counties, many of them mobile, and you can play "Follow the Mobiles," along with operating your rig.

NA Sprints: We've covered the "most fun you can have in 4 hours with your clothes on" before in this column, but they're worth repeating. There is an operating pattern in the Sprints, derived from the infamous "QSY Rule," where you call a station who just completed a contact, you complete with him, and then you inherit the frequency and solicit another QSO. If you make one, you have to move. Lots of fun, doesn't take a lot of time.

CQ WPX: The WPX's (there are three, this one [RTTY], and a CW and SSB) are a really great time to find new ones for DXCC totals while having a lot of fun doing it. If running up scores makes you feel good, this is the event for you … the multipliers in this one are all of the different prefixes you work, so there is nearly an infinity of them.

CQ 160: Note, this one is 1600PST on Sat, 27 Jan to 1600PST on Sun, 28 Jan. Topband noise levels are down because of winter, and this one is worth a try. Look for JA's, other Pacific Rim, and VK's in the early morning just before the sun comes up here.

NEW FOLKS ON HF: With the elimination of the Morse code exam from all license classes, it is likely (and hopeful) that we'll see a lot of new folks upgrading and showing up on the high frequencies. There are a great number of activities and opportunities on HF that do not exist on VHF/UHF FM, and I encourage all of you who might have been held back by the code test to consider upgrading and squirting a little HF RF from your station. The opportunities for fun are pretty much endless. I picked up a USB-Serial adapter for my laptop, and have been parked on 14230 most of the day today watching the SSTV crowd send pictures back and forth with MMSSTV. Not sure it's going to be my new mode, but it is a lot of fun. I'm going to be in the CQ WPX RTTY early in February as well, and I'll hit the ARRL DX, CW Sprint, and NAQP RTTY as well.

To all the HF OT's, I encourage you to step up and help those new folks who are likely to arrive. HF is a little different … OK, it's a LOT different … and some mentoring can go a long way.

73,

Fred K6DGW

January Meeting Minutes

(Reported by Leslie,K7NYE)

Minutes of the SFARC Board and General Meeting, January 12, 2007 at the Auburn, CA main library:

Board of Directors meeting began at 7:00 PM with quorum of officers in attendance. New Officers were installed, including Don Hay, WB6LPJ as President and Kevin Reid, K7TST as Vice President. New Directors include Jim Griffith, KI6AZH and Birton Gilbert, N6UG (not present). Treasurer George Simmons, KG6LSB and Treasurer, Leslie Nye, K7NYE, as well as Director Wayne Stilwell, W6DT were returning officers.

New business discussed included the 2007 Field Day, lining up antennas and generators, as well as topics for upcoming meetings. An authorization letter for a new signature card for the clubs bank account was also generated for Placer Sierra Bank. Kevin, K7TST has lined up a speaker, Harry Miller, W6HFM for February's meeting. Expenses for the 2006 Club year were presented by George, KG6LSB. Meeting was adjourned at 7:20 PM.

SFARC General Meeting Minutes:

7:35 PM Meeting started by pasr-presidemt, W7IB, Casey McPartland. introducing new SFARC Club President, Don Hay, WB6LPJ. Meeting started with Pledge of Allegiance, Introduction of SFARC Board Members and introductions made of all club members and guests, total of 36 in attendance, including three new members; Officer reports were given by Vice President, Secretary and Treasurer; Committee reports made for ARES, ARRL and VE, as well as Satellite. It was reported that 53 SFARC members and guests were present at the Club Christmas dinner. Richard Kuepper, WA6RWS reported that our postage costs for mailing out newsletters in 2006 was approximately $400.00. Anyone wishing to receive the newsletter via email can contact Deb Cunningham, KF6LXN to help save the club money.

New Business: Several members decided to purchase dual band J pole antennas from Arrow. This is being coordinated by Kevin, K7TST, so all interested should contact Kevin to place an order.

Presentation:

As this was a kick-off meeting for the new year, several members offered their opinions on antennas and other equipment. Chuck, KG6FFK, shared with the club his homebrewed 3-element dual band J Pole antenna. There was no formal presentation, as such.

Gene, KG6NYH held the monthly Drawing. Meeting was adjourned approximately 9:30 PM.

Respectfully submitted:

Leslie, K7NYE

Secretary

Presidential Material or Jail Bait

(By Don Hay, WB6LPJ)

It's a cool, rainy, Tuesday morning in West Los Angeles, 1964. The clock says 8:30AM…..I need to be at the FCC building in downtown Los Angeles at 9:00. I have about 20 miles to travel and I am still at home waiting for my ride. Where the heck is Alex?

In 1964 you had to appear at an FCC office to take exams for any Amateur Radio license with the Novice being the only

exception. The Novice was administered by any licensed General Class or higher licensee.

I had prepared for the General Exam. I was copying about 16 Words Per Minute (WPM) comfortably. The test was 13 WPM with 1 minute of "solid" copy. The CW test would last 3 minutes. My copy of the General Study Guide for the written test was reduced to individual pages. This little book couldn't survive the constant page turning that I put it through. I guess I'm ready to face the examiner.

At 15, in High School, no drivers license or car, a study of the local bus schedule suggests that I can get to the FCC by taking multiple buses. I further learn that I should plan about 2 hours for the trip.

A young couple, newlyweds, live below me in our small apartment complex. Alex and Pat have been married less than a year and Alex is a new officer with the Los Angeles Police Department (LAPD). I discussed my plans for the FCC exam with this couple. At a later date, Alex approached me with an offer. He was to be in down town Los Angeles the same morning I planned to take my test at the FCC. He and his partner were to be "plain-clothed" and attend a meeting that morning. Alex and his partner would pick me up at 8AM to get me to the FCC building in plenty of time.

It's a cool, rainy, Tuesday morning in West Los Angeles, 1964. The clock says 8:35. What the……..? A black and white LAPD police car drives up. Alex, he and partner in full uniform, gets out, opens the back door of the car and says "get-in, put your head down and look guilty!". With heavy acceleration, within moments we entered traffic on the newly completed Santa Monica Freeway (Hwy 10) heading for downtown. We were stopped in heavy traffic. Alex yelled "hold-on". He drove over to the center divide and proceeded to drive down the center of the freeway passing cars on the left that are stopped. My eyes "bugged-out" watching the rain streaming in the headlight beams. Bringing my vision back, I see the headlights reflecting off a shiny black car hood with the outline of a 12 gauge shotgun between the heads of two police officers. All this seen through a small plastic window embedded in the metal cage that I currently occupy……..no door handles or window cranks. My ears detect a "click-clack, click-clack"……it's the light bar on the top of the police car. WOW, all that's left is the siren. I must have been grinning from ear-to-ear, Alex yelled "wipe that grin off your face". He began to explain that their meeting had been canceled. Alex and his partner were to return to normal patrol for the day. He further explained the delicate position that they were now in but they wanted to make good on their commitment to me. I proceeded to look as "criminal" as I could muster. They deposited me in front of the FCC buildingwith time to spare. I'll never forget being a bad guy for 15 minutes. I went upstairs and sat down in a "class-room" style desk. The room was full of hopefuls waiting for the receiving code test to begin. The examiner was in the front corner of the room hurling expletives at the formidable looking code machine. He made the comment "let's see if this works" and turned on the machine. I thought I would use this opportunity to practice receiving until he announces the start of the test. I copied easily for awhile and then looked around to see what was going to happen next. To my surprise, everyone's head was down. This was the real thing!

I passed both code segments and was given the written test which I failed by one question. You normally wouldn't have insight into this fact but the woman that was correcting the test took pity on me. She said she was sorry but looked over the test several times to make sure I truly did fail. She told me by 1 question. I don't remember much about the ride home on the bus as I was truly disappointed. However, it's difficult to forget that police car ride with two uniformed officers as your chauffer.

A return trip, via the bus, to the FCC a couple months later rewarded me with a General Class ticket. In 1971 I upgraded to Advanced at the FCC office in San Francisco. I have retained the Advance Class license. It's kind of special to have a license class that no longer is available.

Don, WB6LPJ

It's Official! Morse Code Requirement Ends Friday, Feb. 23

(Observations by Casey, W7IB)

The headline of this article and the following text was excerpted from the ARRL web site on Jan 24, 2007 and the observation following the text is purely my opinion:

NEWINGTON, CT, Jan 24, 2007 -- Circle Friday, February 23, on your calendar. That's when the current 5 WPM Morse code requirement will officially disappear from the Amateur Radio Service Part 97 rules in accordance with the FCC's *Report and Order* (*R&O*) in the "Morse code proceeding," WT Docket 05-235. Beginning at 12:00 AM local time on February 23 (ie, after midnight Thursday), applicants for a General or Amateur Extra class Amateur Radio license no longer will have to demonstrate proficiency in Morse code. They'll just have to pass the applicable written examination. Publication of the new rules in the January 24 *Federal Register* started a 30-day countdown for the new rules to become effective. Deletion of the Morse requirement -- still a matter of controversy within the amateur community -- is a landmark in Amateur Radio history.

"The overall effect of this action is to further the public interest by encouraging individuals who are interested in communications technology or who are able to contribute to the advancement of the radio art, to become Amateur Radio operators; and eliminating a requirement that is now unnecessary and may discourage Amateur Service licensees from advancing their skills in the communications and technical phases of Amateur Radio," the FCC remarked in the "Morse code" *R&O* that settled the matter, at least from a regulatory standpoint. The League had asked the FCC to retain the 5 WPM for Amateur Extra class applicants, but the Commission held to its decision to eliminate the requirement across the board. The *R&O* appearing in the *Federal Register* constitutes the official version of the new rules.

In the text above, I believe that the FCC is continuing to attempt to tell us what ham radio is, and how it's gonna be. While I understand that the R&O has been published, and that it will become law on February 23, I got an "icky" feeling while reading this text. I was especially struck by the quote in which the "FCC remarked" (notice please that no one was given credit for this quote, nor did any one person take any credit), *"The overall effect of this action is to further the public interest by encouraging individuals who are interested in communications technology…"*.

It is interesting to me that the FCC can feel safe in predicting the effect of an action that is yet to take place! I think and hope that it would be good if the outcome they have predicted takes place, but to assume an outcome in advance of the fact is downright arrogant. I'm beginning to wonder if anyone at the FCC edits or proofreads *anything*.

I know, I know, I'm being picky, but it seems that this has become their "way of being" in the past few years. I'm beginning to feel like an enslaved servant whom must basically believe, as true, anything the "overlords" tell me. As I've mentioned before, our government, all of it, bears watching, so keep your eyes and ears open!

Another Comment

I recommend that those of you who are planning to upgrade to General under the new provisions, and have yet to do so, take a careful look at the new General Question Pool (can be found at this url: http://www.ncvec.org/page.php?id=333) . You may want to consider getting your exam and upgrade done before July 1, 2007.

Enough said!

Stay alert, our world is in a state of chaotic change!

Easing My Way into the Amateur Radio World

(by Susan Webb, KG6UIE)

Early into my role as the Emergency Coordinator for a local hospital, I was offered a ham radio. It was the product of a federal grant intended to serve the hospital to communicate with first responder agencies and personnel. This radio arrived sometime in the year 2000. It came with documentation and an agreement which committed the hospital to installing and maintaining the equipment. This agreement circulated the corporate legal wheel, back to the grantor, back to legal, then … well; let's just say the momentum was lost.

In the meantime, I enrolled in a class to obtain my Technician license. I will be indebted to Bob and Maryann Balthorpe who opened up the world of amateur radio for me. Ham radio was not just for emergency use. People were having fun, supporting recreational activities, connecting with other people all over the world, and the list kept growing!

Unfortunately, I was not able to complete this class. My job responsibilities suddenly mushroomed after 9-11 and it was necessary for hospitals throughout the country to prepare for terrorism. There was a new reality and the United States was not ready for it. I found myself writing reams of new policies and training healthcare workers on anthrax, smallpox, and dirty bombs.

I learned that the emergency response communications infrastructure was fragile and that when all else fails, there's ham radio. I recommitted to installing the grant offered radio and obtaining my license. This time my inspiration came from Joe Park, Casey McPartland, and several others. I completed this class, boasted of my new license, and bought a used hand held. I had very limited success both with my radio and with progress on the granted radio for the hospital. I did, however, include Sierra Foothills ARC in several disaster exercises. The club toured my site, became familiar with the Emergency Department and Command Center, and we prepared ourselves for integration during an exercise or for a real disaster.

During the preparations for the most recent disaster exercise, I had high hopes for meeting my two major goals relating to ham radio. I wanted the hospital radio to work and I wanted to make my personal radio functional. Chuck Minton coordinated the efforts of ARES members and we succeeded with the hospital radio. True, the functionality was temporary. I still must work on a permanent solution, but I'm not giving up!

Richard Kuepper served in the hospital Emergency Department during this last exercise. We had a chance to discuss the challenges of my hand held radio. He suggested an evaluation of my radio and home station. Inadequate power and range, mostly, as I could hear club members but not hit the repeater. My technical expert recommended the appropriate antenna and cable. I was awaiting price estimates and prepared to purchase the remedy. This would be my New Year's resolution – become an active member of SFARC and ARES!

My passion was discovered. My best friend, Pete, consulted with his friends, Kevin Dickson, Brian Diemer, and then Richard Kuepper. He surprised me with a Kenwood TM-V708A, a significant upgrade from the hand held, and he personally installed my antenna. He learned a lot in a short time to make this Christmas surprise happen. My first successful contact was Christmas Eve, my initial ARES check in New Year's Eve.

My journey has taken more than six years. Some of the SFARC/ARES members may have doubted my persistence. I have long believed that slow and steady wins the race and those things worth having are worth the wait. I want to thank Bob and Maryann. All of the ham operators I have met have been an inspiration. I look forward to meeting more of you on air and in person.

For Sale

Heathkit SB-220 1KW linear amplifier. 80 through 10 (except WARC bands). Has low voltage keying and parasitic mods installed. Currently wired for 230VAC. I'll deliver in the Sac-Auburn area. $450

Contact: Fred K6DGW (530)885-8251 or k6dgw@arrl.net

SIERRA FOOTHILLS AMATEUR RADIO CLUB
P.O. Box 1005
Newcastle, CA 95658

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2007 MEMBERSHIP APPLICATION

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Member Dues: Circle Amounts That Apply. Applications (for new members only) received in the middle of the year will be pro rated. Contact the President or Treasurer for exact rate.

Membership:	$22.00	Name Badge:	$7.00
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