

# *The eKilo - What*

Monthly Newsletter of the San Angelo Amateur Radio Club

May 2014

## ***San Angelo Radio Club Officers***

*President:* Tom Austin/K4OTM

*Vice President:* Hughbert Robinson/KC5NPC

*Secretary/Treasurer:* Bob Freeman//KD5PIX

*Activity Director:* Gary Chaffin/W5ETJ

*Emergency Coordinator:* Mike Dominy/KD5URW

*Grounds Chairman:* Open

## ***Appointed Positions***

*SAARC Trustee:* Charlie Campbell/KC5EZZ

*Registered Agent:* Charlie Campbell/KC5EZZ

*Public Information Officer:* Matt Healy/W5MAT

## ***Club House Location***

Mathis Field  
5513 Stewart Lane

## ***Mailing Address***

P.O. Box 4002  
San Angelo, TX 76902-4002

## ***World Wide Web***

[www.w5qx.org](http://www.w5qx.org)

## ***eKilo-What***

[norripeter26@gmail.com](mailto:norripeter26@gmail.com)

## **SAARC COMING EVENTS**

### **ARES Meeting**

June 19, 7:00 PM at the Clubhouse

### **General Membership Meeting**

June 12, 7:30 PM at the Clubhouse

**June 28 & 29th - ARRL Field Day**  
at Sam's Southland and Sherwood

### **Other Events**

September 20th - Lily Fest

October 11th - SAARC Club's Birthday Party

December 6th - Skywarn Recognition Day

CONGRATULATIONS to new Hams - Page 5.

## Meeting Minutes

### SAARC Meeting May 8 2014

Meeting called to order by Gary W5ETJ at 7:36 pm

Our president Tom is returning from TN.

Less/K7PTZ led the pledge of Allegiance.

All member and guests introduced themselves.

ARES: no report Mike KD5URW.

KD5PIX reported the clubs insurance bill has been paid.

W7IKT reported no trailer from American RV this year, all booked Field Day weekend.

Discussion revealed we may get another trailer from the Base, EOC or a private party.

Tom K4OTM appreciated the flowers from the club in memory of his father.

KD5PIX reported the total funds in both accounts is \$3,854.12.

Both the minutes as printed in the eKilo-Watt and treasurer's report were approved.

The IRS has approved our 501 C3 status and back dated it to 5/15/2010.

The Cowboy Church chuck wagon has a prior commitment on Field Day weekend.

W5UI offered a rotator control head to the club for \$50.00. It was moved seconded and approved to buy the rotator control head from W5UI.

W5UI announced club shirts are available for \$22.50, payable in advance. Joe also has Field Day caps for \$12.00.

KD5PIX won the split the pot.

Meeting adjourned at 8:05.

Submitted by Bob/K7IKT

## Hamvention



Some lucky souls were able to go to Dayton this year. Here are some pictures.



Photos submitted by Garry/W5ETJ. Thanks Gary - Ed.

## West Texas News

---Wink High School Tackles Ham Radio In Physics and Science Classes ---

Wink High School, under the direction of Cary Hannsz KG5ZBW, Physics and Science Technology Instructor, has incorporated Ham Radio into the class curriculum. A project report, written by Jordan Graves, senior and Valedictorian of the Wink High School 2014 Graduating Class is as follows:

### HAM Radio Wink Student Report

From the start of the year our class studied HAM radios and covered all of the questions in the study guide preparing for the HAM radio test. We covered various materials over the first 2 months of school in preparation for the HAM certification test. Later our knowledge of dealing with the 2 meter band and using the APRS was very important to our high altitude balloon project. We also spent time working on building crystal radios. These projects taught us to build our own radios and also helped us develop skills such as soldering. Another important project we worked on was building our own 2 meter Yagi antennas, this gave us a way to track out payload with the backup transmitter in the payload. Overall these skills we learned throughout the year lead to the success we saw in our project.

Over a number of weeks we studied different types of payloads, different building materials that could be used, and even the importance of being able to reflect signals with our payload. Our final Payload was built out of balsa wood and ash wood; we used a triangular shape supported by dowel rods in the corners. Later in the project fins were added to the sides to keep the payload stable while taking pictures. The parachute that was used was designed by the senior class of 2013. Over a week we used a series of drop tests to figure out what the descent rate of our payload would be. The final decent rate was determined to be 6.4 meters per second based on our 4 pound payload. We used these numbers in the HabHub flight predictor program to predict the landing location of the balloon.

We saw total success in our flight; the balloon flew approximately 90 miles south east of our launch location in Wink. We reached a maximum altitude of 76,890 feet. Temperatures plummeted to -55 degrees Celsius while in the jet stream, but at maximum altitude the temperature averaged -36 degrees Celsius. The lowest pressure was 76,000 Pascals. Our temperature and pressure probe we acquired from High Altitude Science, it was their Eagle flight computer. We were very fortunate that our balloon landed only about 4 miles south of McCamey, about a quarter mile west of highway 305.

One of the first goals we set in the beginning of the year was to get a picture of not only our small town from the air, but also a clear picture of the curvature of the Earth. We were very pleased with our overall results.

Thanks to Jordan for this well written and informative report of the balloon project. Congratulations also for being named valedictorian of this year's Graduation Class! Good luck to you from all Ham Radio Operators in the West Texas Section.

This piece was considered so impressive it has been included in its entirety as it appeared in the ARRL *West Texas Section News - May 2014* e-mail - Ed.

## Technical

### A Solar Battery Charger – Part I

The battery charger described was originally designed to charge a battery that supplied 120 V AC power to two small pump motors. One ran continuously during daylight hours while the second ran for less than 1 minute every 2 hours, or so, 24 hours a day. These were supplied by an 80 watt inverter which had a small cooling fan that ran continuously on the 12 V side. Combined, these resulted in a variable battery load and an average battery drain calculated from the sum of the duty cycles of the machines described.

Rather than describe this design, however, the battery charger will be evaluated as a supply for a radio. This discussion can then be used for the reader to design a system suitable for his or her needs.

First, the solar panel used will be described. Next, a charge regulator will be described and then the battery selection discussed.

A very, very simple equivalent circuit for a solar panel is shown in Figure 1. The symbol that looks like an “8” is an “ideal” current generator that provides a constant current to any load. (An ideal voltage source provides a constant voltage to any load. This says the voltage source can supply infinite current and has no internal resistance, whereas the current source has an infinite voltage capability. These “perfect” elements do not exist in practice but can be approximated by power supplies.) In Figure 1, the current generator is shunted by a resistor. This represents the internal resistance of the panel. A more realistic equivalent circuit will be discussed later but this circuit will do for now.

To determine the characteristics of the panel, expose the panel to the sun with a voltmeter on the panel terminals and adjust the panel position for maximum voltage. Then measure the maximum current output with an ammeter. For the panel used, the measured “open circuit” voltage ( $V_{OC}$ ) was 20 V. The “short circuit” current ( $I_{SC}$ ) was found to be 1.25 A. The shunt resistance is then  $16 \Omega$  ( $20/1.25$ ).

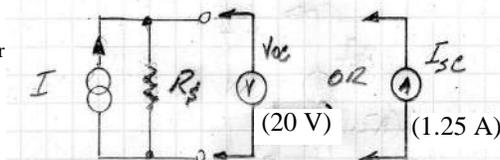


Figure 1. Solar panel equivalent circuit showing measured voltage and current.

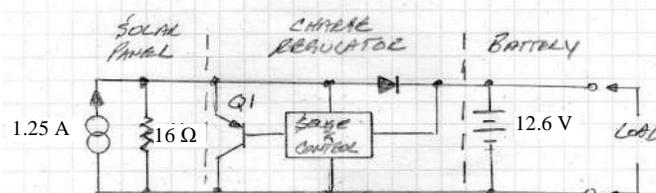


Figure 2. Solar panel battery charger with battery and load.

Figure 2 shows a charge regulator and battery. The regulator is also simplified but is sufficient for this discussion. The “Sense and Control” box senses the battery voltage and reduces the current to the battery as the battery approaches full charge by causing Q1 to shunt the panel current. The diode isolates the panel from the battery.

The controller “make or buy” decision was easy: A 100 W controller was available from Harbor Freight for under \$20.00 (with discounts), which is less than cost of components to build a controller.

The battery was purchased from Advanced Auto for about \$30.00 with an exchange core. This battery is small engine battery rated 200 Cranking Amps. Cranking amps is not useful for this application. Contacting the factory representative, the battery was said to be capable of supplying 34 Amp-Hours from full charge (13.2 V) down to 12 V. (The battery spec sheet shows 12.6 V as full charge, 11.8 V as the full discharge voltage and 13.2 V as the continuous-preservation charge voltage, with gassing voltage at 14.4 V.)

The last consideration is the solar panel output per day and over a year. Maximum output is achieved when the panel is oriented at  $90^\circ$  to the sun’s rays. This is illustrated in Figure 3. For a fixed panel location, the panel is tilted at about  $31.5^\circ$  to the horizontal for the latitude of San Angelo. This achieves maximum output at solar noon (sun is overhead at the equator). The clock is ahead of the sun by about 7 minutes at this time. As the year progresses the sun moves north until Summer Solstice when the sun is overhead at the Tropic of Cancer at about  $23^\circ$  N. The panel output is then reduced about 8% due to the angle of incidence about of the sun rays to the panel. The sun then reverses its direction, passes through the Equinox, and is overhead at the Tropic of Capricorn (Winter Solstice) when the sun is overhead at about  $23^\circ$  S. As the year moves along, the number of daylight hours is reduced to a minimum at Winter Solstice. For mobile radio operators, the panel is usually portable and can be oriented throughout the day providing near maximum output at all times. If the panel orientation is fixed, the average daily output may be reduced to 40%, or more, of the peak output depending on obstructions, clouds, etc., at Equinox.

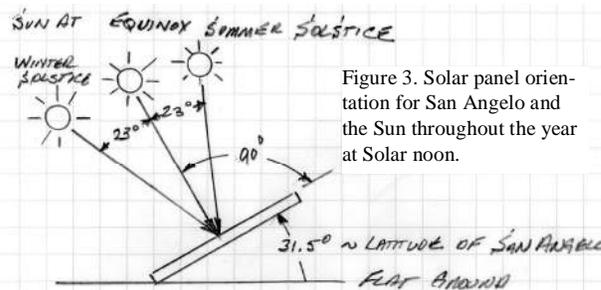


Figure 3. Solar panel orientation for San Angelo and the Sun throughout the year at Solar noon.

Next time: Figuring the power needed for a radio and how long can the radio be operated using the system.

Questions or comment? Contact Pete/KJ5SS at 325-617-4387 or norrispeter26@gmail.com.

## Congratulations

On April 13, 2014, SAARC sponsored and administered ARRL's Amateur Radio Examination at the clubhouse located at 5513 Stewart Lane at Mathis Field.

Members of the VE Team:

Glenn Miller/AA5PK, VEC    Don Hejl/N5SVK    Joe Kent/W5UI    Dave Lewis/W5DLL    Jack Roberts/KB5TMY

Congratulations to the following who obtained a license or passed an exam:

Noah Whitaker/KG5BQI -Technician	Brian Hurtt/KG5BQC -Technician
Jimmy Whitaker/KG5BQI -Technician	Jeffrey Rottman/KG5BQB -Technician
Susan Whitaker/KG5BQI -Technician	Lloyd Duck/KG5BQA -Technician
Marsha Hughes/KG5BQJ -Technician	Jeff Schonberg/KG5BPZ -Technician
Keith Hughes/KG5BQK - General	Ken Grimm/KG5BPY -Technician
William Fuller/KG5BWP -Technician	Zachary Van Tine/KG5BPX -Technician
William Hinds/KG5BQF -Technician	Mathew Fuller/KG5BSS -Technician
Jimmy Welch/KG5BQE -Technician	Kent Shelburne/KG5BSZ -Technician
Gerald Chrisman/KG5BQD -Technician	

All are encouraged to become members of SAARC and request addition to the eKilo-What e-mail list. Tom Green County residents are encouraged to join other Amateurs in public service by joining ARES, taking SKYWARN training and becoming Spotters and Radio Operators at NWS.

The above list was provided by Glenn/AA5PK. Thanks Glenn - *Ed*

### Scanner Jack's Corner



THESE ARE THE VHF INTEROPERABILITY TACTICAL SIMPLEX FREQUENCIES.

155.7525 V TAC 10 CALLING  
 151.1375 V TAC 11  
 154.4525 V TAC 12  
 158.7375 V TAC 13  
 159.4725 V TAC 14  
 155.475 NATIONWIDE POLICE CH

FROM SCANNER JACK ROBERTS KB5TMY

**FOR SALE**



For sale: lightly used since purchase,  
 Icom IC-2350H 2m/440 Fm MOBILE RADIO.  
 Used in ham shack, and never mobile. And then not used.  
 Asking \$215 before posting on eBay. Bill WB5ZAM [325-340-6102](mailto:325-340-6102)

YOUR AD COULD BE HERE

**OF INTEREST**

From Tom/K4TOM:

One of the San Angelo Radio Club members shared this article from Fox News on Monday.

Check out the article at:

[http://www.foxnews.com/tech/2014/05/19/ham-radio-old-technology-gets-new-respect/?cmpid=cmy\\_twitter\\_fn](http://www.foxnews.com/tech/2014/05/19/ham-radio-old-technology-gets-new-respect/?cmpid=cmy_twitter_fn)

Thanks, Tom - Ed.

**Upcoming Hamfests/Conventions**

Date	Event	Location	Information
6/13/2014	Ham-Com 2014 - Regional ARRL Centennial Event	Plano, TX	<a href="http://hamcom.org">http://hamcom.org</a>
7/24/2014	Central States VHF Society Conference	Austin, TX	<a href="http://csvhfs.org">http://csvhfs.org</a>
7/25/2014	Oklahoma State Convention (Ham Holiday 2014)	Oklahoma, OK	<a href="http://www.hamholiday.org">http://www.hamholiday.org</a>
8/1/2014	Texas State Convention (Austin Summerfest)	Austin, TX	<a href="http://www.austinsummerfest.org">http://www.austinsummerfest.org</a>
8/8/2014	Rocky Mountain Division Convention	Albuquerque, NM	<a href="http://dukecityhamfest.org/">http://dukecityhamfest.org/</a>
8/30/2014	Alamogordo ARC Hamfest	Alamogordo, NM	<a href="http://www.qsl.net/k5lrw/index.htm">http://www.qsl.net/k5lrw/index.htm</a>
9/13/2014	Ada Hamfest 2014	Ada, OK	<a href="mailto:kd5nqa@yahoo.com">kd5nqa@yahoo.com</a>

Hamfests are listed for all Texas, Oklahoma, and New Mexico. -Ed.

**OF INTEREST**

**Let's Eat!**

The current Eating Schedule for TGC Hams is:

Wednesday, 8:00 AM, T-Bears Café, 2105 Knickerbocker Rd

Thursday, 9:00 AM, McDonald's (Wal-Mart), 5501 Sherwood Way

Saturday, 7:30 AM, T-Bears Café, 2105 Knickerbocker Rd

**HF Nets of Note** de Gary Chaffin/WSETJ

NET	DAYS	LOCAL TIMES	DIAL
Concho Valley Ragchew Net	S-M-T-W-T-F-S	0600	1900
Concho Valley Ragchew Net	S-M-T-W-T-F-S	1700	3825
7290 Traffic Net	M-T-W-T-F-S	1000 - 1200	7290
7290 Traffic Net	M-T-W-T-F	1300 - 1400	7290
Texas Traffic Net	S-M-T-W-T-F-S	1830 - 1930	3873
Central Gulf Coast Hurricane Net	S-M-T-W-T-F-S	1900 - 2000	3935
Texas ARES Net	Monday	1930 - 2000	3873
Big Bend Emergency Net	Sunday	0830 - 0930	3922
Texas Trader's Net	Sunday	0900 - 1000	7245
Concho Valley 6 M Roundtable	Sunday	2100	50.135

**Emergency Communications**

de Mike Dominy/KD5URW - Emergency Coordinator

**Tom Green County ARES Net**

Meets every Monday night at 8:30 CST (2030 hr) on the 444.350 MHz (PI 162.2) (N5SVK). The net can also be reached by EchoLink at WB5VRM-R or Node 412402. Other frequencies are announced on the Concho Valley Net at 8:00 pm.

**ARES meets the 3rd Thursday at 1900 of each month at the Clubhouse unless announced otherwise on the Monday net.**

**ARES Net Report**

Date	Net Ctrl	Check-ins	Time	Freq
5/5	KD5URW	10	14	444.350
5/12	KD5URW	12	18	444.350
5/19	KD5URW	14	18	444.350
5/26		No net		444.350

**Concho Valley**

**Two Meter Net**

<u>Date</u>	<u>NCS</u>	<u>Check-ins</u>	<u>Duration</u>
5/5	KD5URW	14	10 min
5/12	W5MAT	11	20 min
5/19			min
5/26	No net		min

This net meets every Monday night at 8 p.m. on the club's 146.94 repeater. All amateurs licensed to operate on that frequency are invited to participate.

**Concho Valley Open FM Repeaters**

**2 Meter**

145.27- San Angelo PL 88.5  
 146.88- San Angelo PL 88.5  
 146.94- San Angelo PL 103.5  
 147.06+ San Angelo No Tone  
 147.30+ San Angelo PL 88.5  
 146.72- Eldorado PL 100.00  
 147.34+ Robert Lee PL 88.5  
 146.90- Brady PL 162.2  
 147.36+ Brady PL 114.8 (Echo Link Node)  
 Echo Link: N5TBR-L Node#920069  
 145.7850 Simplex PL-88.5  
 147.39+ Eden PL 114.8

**70 centimeters**

441.750+ San Angelo PL 162.2  
 442.250+ San Angelo PL 162.2  
 444.225+ Robert Lee PL 162.2  
 444.350+ San Angelo PL 162.2  
 444.875+ Brady PL 162.2

**6 M**

53.63- San Angelo PL 88.5 Linked to 442.25 Repeater

**New Member Application/Membership Renewal**

Membership renewals are due in January 2013. Regular memberships: \$20, Each additional family member: \$5; Seniors (age 65+) and Juniors (under age 19): \$10, Renewal package deal: 5 years for \$80, Associate members: \$20

**Dues may be paid to the secretary at any club meeting or mailed to the club's post office box.**



**Application  
for  
Membership**

\_\_\_\_\_  
 Last Name:                      First Name:                      Call Sign:

\_\_\_\_\_  
 License Class:                      Year First Licensed:                      Previously Held Calls:

\_\_\_\_\_  
 Mailing Address:

\_\_\_\_\_  
 Physical Address (if different from above):

\_\_\_\_\_  
 City:    State:      ZIP:

\_\_\_\_\_  
 Home Phone:                      Work Phone:                      Cell Phone:

\_\_\_\_\_  
 E-mail address:

I hereby give permission to publish the above information in the club's membership roster which is distributed to all club members. Check here  if you do not want your e-mail address linked on the club's Web site.

Signature	Date
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