



Fresno Amateur Radio Club Newsletter

Nov 2010 Volume 72, Issue 11

Our next meeting will be the FARC annual SWAPMEET. The meeting will be on November 12th at 7:00 PM. Meeting place: Cedar Lanes Bowl—Cedar and Shields Aves. Come to the meeting and enjoy the camaraderie with your fellow hams.



The Prez



FARC General Meetings

Are held the 2nd Friday of each month, 7 p.m. at Cedar Lanes unless otherwise noted.

2010 FARC BOARD MEETING DATES

1st Tuesday of each month
Woodward Park Library at
Champlain and Perrin.

FARC Nets

Morning Drive Time Net:
Weekday mornings-7:30—
8:00 a.m.

W6TO/R 146.940

Tech Net:

Wednesdays @ 7:00 pm
W6TO/R 146.940

FARC Net:

Sundays @ 7:00 pm
W6TO/R 146.940

CQ ,CQ

October 30th and 31st was a busy weekend for our Hams. We started off with the 75th Anniversary of ARES. It was held at the Salvation Army Citadel on 1854 Fulton St. This event provided a lot of information on what ARES is all about. From the comments there was a lot of work done putting this event together. I would like to thank Dan AE6SX, Joe WA6FFJ and Carol W6TTF and many others who worked so hard to put this event together. I hope you had a chance to stop by.



Tom Jarvis KG6KYU

We also had the CQ World Wide contest this weekend. This contest provided the opportunity for making a lot of contacts. This is a big event as they all want to have contacts with USA. Good DX'ing.

Nov. 12th - SWAP MEET, Cedar Lanes, 6:00 doors open for the sellers, 7:00 doors open for the buyers. This is the time to get rid of all those dust collectors. Looking forward to seeing you.

Details for our Christmas Party are in the Skip. Please sign up early as we need head count. December 10th our regular meeting night, dinner is a bargain at \$12.00. With great food, music, awards, and Ham Friendship, what more you could ask for on a Friday night?

73, Tom

Fresno Amateur Radio Club

FARC BOARD OF DIRECTORS

FARC Officers:

Tom Jarvis, Pres. - KG6KYU	kg6kyu@w6to.com	(559) 916-2445	12/2011
Craig Carter V.P. —K6QI	k6qi@w6to.com	(559) 284-1722	12/2011
Jim Erbe, Sectry - WA6NIF	wa6nif@w6to.com	(559) 222-7524	12/2011
Ron Hunt, Treas - N6MTS	n6mts@w6to.com	(559) 289-8514	12/2010

Board Members:

Aaron Lusk, K6USY	k6usy@w6to.com	(559) 301-1022	12/2010
John McGraw, AE6QR	No E-Mail	(559) 255-2349	12/2010
Ken Holden, —WA6OIB	wa6oib@w6to.com	(559) 323-6753	12/2010
Charles McConnell, W6DPD	w6dpd@w6to.com	(559) 431-2038	12/2010
Dave Smith, W6TE	w6te@w6to.com	(559) 323-6095	12/2011
Joseph Capell, W0PJD	W0PJD@me.com	(559) 225-3582	12/2011
Jack Baker, AC6LT	ac6lt@CVIP.net	(559) 297-4311	12/2010

Mark your calendars for every Thursday, for the lunch gathering at the *Silver Dollar Hofbrau* at the corner of Hwy 41 and Shaw. It starts at 12 noon and there is a table reserved in the back room.

Also every Monday and Saturday at the *Country Waffles* at Blackstone and Dakota starting at 7am.

Lastly, Breakfast every Tuesday at *Yosemite Falls Cafe* at Blackstone and Shaw starting at 8am.

Support our advertisers in SKIP. They support us not only in revenue for the club but they also allow us space on the counters and shelves for copies of SKIP and other club announcements.



Please send items for
SKIP to Editor Dave
Smith W6TE.
w6te@w6to.com

<u>Date</u>	<u>Event</u>	<u>Date</u>	<u>Event</u>
Nov 2	FARC BOD Meeting	Dec 3-5	ARRL 160 Meter Contest
Nov 5	CARP General Meeting	Dec 3	CARP Christmas Party
Nov 6-8	ARRL Sweepstakes, CW	Dec 7	FARC BOD
Nov 12	FARC Swap Meet	Dec 10	FARC Christmas Dinner
Nov 19	SJVARs General Meeting	Dec 10-12	ARRL 10 Meter Contest
Nov 20-22	ARRL Sweepstakes, Phone	Dec 17	SJVARs Christmas Party
Nov 23	QCWA Luncheon	Dec 19	Rookie Roundup
		Dec 21	QCWA Lunch

75th FRESNO ARES BIRTHDAY ANNIVERSARY CELEBRATION

When: Saturday, Oct. 30th, 9 AM—1 PM

Where: Salvation Army Citadel, 1854 Fulton St (just south of Divisadero and Fulton)

Speakers, door prizes, food, fun

- 0900— Greetings and Introductions / EOC Tour
- 0930— Event Communications Coordination for a Century Bicycle Ride
- 1000— Winlink System—Functions & Capabilities for ARES
- 1030— APOC P25 and the ongoing Quest for Interoperability
- 1130— Tour-OASIS Communications Trailer
- 1200— Hot Dogs/Chips/Sodas/Cake
- 1230— Door Prize Drawings



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Thanks to Richard Pack, KE6SHL, for providing the photographs included in SKIP.

No Membership Attendance award for October.



Local Amateur Radio Repeaters

<u>Organization</u>	<u>Call Sign</u>	<u>Frequency</u>	<u>Offset</u>	<u>PL</u>
AARC	WB6QDN	146.610	-	NONE
CARP	K6ARP	147.675	-	141.3
CARP	N6JXL	224.380	-	141.3
CARP	K6ARP	444.725	-	141.3
CARP	NI6M	440.350	+	141.3
CONDOR	WB6BRU	224.900	-	156.7
FARC	W6TO	146.940	-	141.3
FARC	W6TO	223.940	-	141.3
FARC	W6TO	444.200	-	141.3
FRESNO	N6MTS	145.230	-	141.3
KINGS ARC	KA6Q	145.110	-	100.0
KJ6KO	KJ6JO	927.6625/902.0125	-	146.2
MADERA ARC	W6WGZ	147.180	+	146.2
MADERA ARC	W6WGZ	441.175	-	146.2
QCWA	WQ6CWA	146.850	-	141.3
QCWA	WQ6CWA	443.250	+	107.2
RACES	N6HEW	147.150	+	141.3
SJVARs	KE6JZ	146.820	-	141.3
TURLOCK ARC	W6BXN	147.030	+	100.0
WA6NIF	WA6NIF	444.100	+	100.0
WIN/SYSTEM	K6JSI	146.790	-	100.0

Birthdays:

Dennis Thompson KB6GFD	Nov 12
Ron Reeg K6IOH	Nov 19
John Morrice K6MI	Nov 5
Tom Reinhart N6MQG	Nov 19
Vic Rosenthal K2VCO	Nov 30
Gwynne Holden WA6VZM	Nov 4
Berge Bulbulian W6XC	Nov 10
Jay Flaherty KF6ZDW	Nov 23

Anniversaries:

Jerry and Faye Chandler K6PKO	Nov 5
Duane & Karen Lutz KI6QEL	Nov 5
John & Carrolyn McGraw AE6QR	Nov 27



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Fresno Amateur Radio Club

Amateur of the Month: John McGraw AE6QR , by Joe Capell W0PJD

If you have been to a radio club meeting lately you would not have escaped being approached by John McGraw, AE6QR to buy a ticket or two for our fund raising raffle held at the end of each evening to win a chance at tools/ flashlights/electrical tape/fasteners or what-have-you items on display.

John was born in Glendale, California but spent much of his youth in or near Roseburg, Oregon where he graduated from high school an accomplished welder and mechanic. After high school we worked for the school district in maintenance and the Caterpillar company as a diesel engine mechanic.

He joined the Air Force and ended up at Castle AFB and became a jet engine mechanic working on those B-52's that used to be doing touch and go landings over Merced at all hours, part of the Strategic Air Command.

While still in the service he worked on his off hours repairing truck and remain there for a few years afterward.

He came to Fresno in the early 1960's and worked for United Grocers as the fleet maintenance supervisor for about then years and then tried his hand an owning his own business, East Fresno Automotive near the corner of East Tulare and Maple streets for another ten years.

In the course of all that "mechanicking," he got to drive buses and so learned another career in driving tour busses all over the western states and as a bonus to his employers, when the bus broke down, he could fix it.

He retired about five years ago. He is married to his wife, Carrolyn and has two grown children.

He became interested in amateur radio because it complimented his knowledge of electricity and automotive electronics, but primarily because of a friendship with Bob Wendell, W6KOC, MD, a benefactor of the FARC.

He got his Tech license in 1998, his General Class in 2007 and his Extra Class in 2008.

He has been on the board of directors of the club for the last four years and will be completing his term in December. His favorite aspect of ham radio is emergency services. He is a member or RACES, ARES and SATERN and frequently participates the Salvation Army field day exercise at the downtown headquarters.

Next time you are at the club meeting, say hello to John, thank him for his service, but most of all, BUY TICKETS !



VISIT W6TO.COM



FARC CHRISTMAS DINNER

Friday, December 10

**Yosemite Falls Café
Blackstone and Shaw Aves**

**Time: 6:00 PM Social (Music) Dinner at 7:00 PM
\$12 Member and \$12 for one guest only**

**Menu: Tri-Tip, Chicken or Salmon,
Rice, veggies, salad, desert, and beverage**

**Mail check to PO Box 5912, Fresno, CA 93755
or pay at Nov meeting.**

(Money will be refunded if you cannot attend)

THE DX CORNER by Charles McConnell W6DPD

If you want help with DX, you can contact the local members of the Central California DX Club for some assistance. Charles W6DPD 431-2038, Perry K6XJ 299-2802, or Jim WS6X 292-8353 can give you advice. The big thing about finding DX is to tune the bands. Check out the Central California DX Club Web page at <http://www.ccdxc.org> for information and useful links.



The local DX'ers meet on the first Saturday of the month for breakfast at Carrow's, 4280 N. Blackstone in Fresno. The group gathers between 0700 and 0800. All are welcome.

Check out www.spaceweather.com and www.solarcycle24.com for information on the solar cycle. The higher the solar flux and the lower the A and K Indices, the better the band conditions. The sun is not cooperating by providing sunspots at this time; there are lots of blank days.

The address of the Sixth District QSL Bureau is P. O. Box 970, Fairfax CA 94978-0970. You can send up to 10 address labels and \$0.70 for each envelope to the address above. They will put 1 unit of First Class postage on the envelope.

Postage rates around the world are constantly changing. To see current rates go to <http://www.qsl.net/w9ol/IRCChart.htm> where you can find the current postal rates for most of the countries of the world. IRCs can be ordered online from the US Post Office. U.S. postage rates are scheduled to go up in January 2011.

The ARRL will delete the Netherlands Antilles (2) from the DXCC list on January 1, 2011. On that date 4 new entities will be added, Curacao, Bonaire, Sint Maarten, and Saba and St. Eustatius. The last 2 are too close together to qualify as separate entities. Con-

tacts with the new ones must be dated October 10, 2010, 0400 UTC and later. QSL cards for the new ones may be submitted after January 1, 2011. There is a lot of activity from these new ones now.

If you don't get a DX Bulletin and you belong to ARRL, you should register on the members only web page and check the box for the ARRL DX Bulletin. This one is emailed each Thursday. Or you can go to the ARRL web page in the News/ Bulletin section and view the bulletins there. You can also read the OPDX Bulletin or the 425 DX Bulletin on the web. Search OP DX Bulletin or 425 DX Bulletin to get the URL. You can subscribe to the Daily DX, Weekly DX or QRZ DX too. These bulletins will keep you informed of DX operations and QSL information.

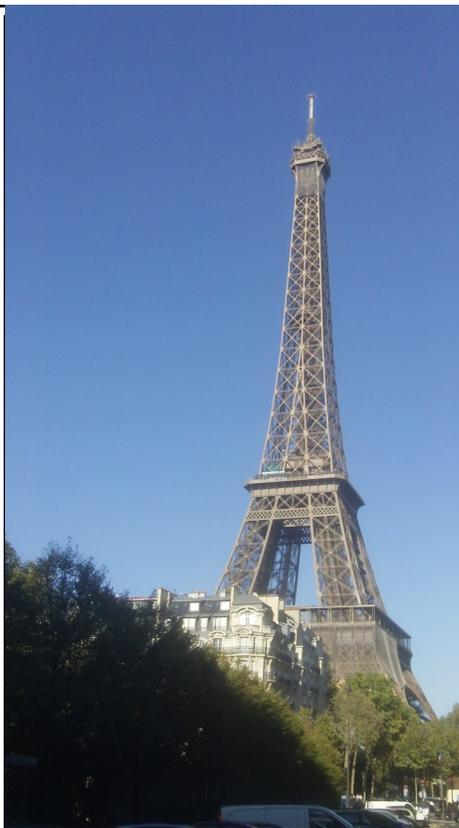
- The following operations are scheduled:
- Afghanistan T6TL and T6JC Oct 2010 to May 2011
 - Bahrain A92IO now through August 2011
 - Wake Island KH9/WA2YUN now through 2010
 - Djibouti J28AA now for at least a year
 - Djibouti J28JV soon for at least a year, maybe 2
 - Lebanon OD5/DL6SN now to December 2010
 - South Shetlands DT8A now to February 2011
 - Angola D2CQ February 2010 for a few years.
 - Marion Island ZS8M May, 15 2010 to April 2011
 - Egypt SU/HA3JB September to November 2010
 - Tristan De Cunha ZD9AH Oct 10 to sometime in Dec
 - Gough Island ZD9GI October 2010 for 1 year
 - St. Maarten PJ7 beginning October 10, 2010
 - Macquarie Is VK0KEV end of Oct 2010 for 18 mos.
 - South Cook Is E51NOU Oct 18 to Nov 13, 2010
 - Sable Island CY0 Postponed indefinitely
 - Madagascar 5R8FU Oct 26 to Nov 10, 2010
 - Botswana A2 October 21 to November 4, 2010
 - Fiji 3D2A October 27 to November 14, 2010
 - St. Eustatius PJ5/SP6IXF and PJ5/SP6EQZ Nov 18 to Dec 3, 2010
 - Kermadec ZL8X November 19 to December 5, 2010
 - Norwegian Antarctica 3Y8XSZ Nov 2010 to Dec 2011
 - Niue ZK2A November 19 to December 3, 2010
 - Norfolk Island VK9N Dec 5 to Dec 12, 2010
 - Juan Fernandez XR0ZN postponed to the end of

THE DX CORNER (cont)

Spratly Islands DX0DX Jan 6 to Jan 24, 2011
South Orkney Islands VP8O Jan 27 to Feb 8, 2011
Sao Tome and Principe S9DX Feb 3 to Feb 17, 2011
Kanton Island T31A April 2011 for 9 days
Sierra Leone 9L5MS? March 2011
Jan Mayen JX July 4 to July 14, 2011
Christmas Island T32C? September-October 2011
Conway Reef 3D2/C October 1 to October 10, 2011
Jarvis Island KH5 November 2011
Heard Island VK0/H February 2013

Watch the DX Bulletins for up to date information. As the time for the operation is at hand, watch the DX Summit (www.dxsummit.fi) for listings. There are a number of state QSO parties each year. Check the contest corral in QST or the ARRL web page. State QSO parties are a good place to collect states for your Worked All States award. ARRL Log Book of the World now supports the Worked All States Award.

Good luck, tune the dial, and listen.



We received this nice picture from Stuart Holm, WB6VRJ.

“Well, here I am in real DX country-but no ham gear-just a camera, and not missing any body at all.”

SURPLUS OPEN HOUSE

An open house has been planned at All Phone Company, a surplus place in Concord, CA. All Phone Company is a huge warehouse with lots of RF stuff from 900 MHz up to K-band. An open house a few months back and it was a great success. Here is another chance to get some good microwave stuff, like TWTA's, SSPA's, oscillators, cable, etc.

When: Saturday, November 13th.
1000 till 1300

Where: All Phone Company
2371 Stanwell Drive
Concord, CA 9452-0800
425-5746 x 6604 (ask for Ellie)



Fresno Amateur Radio Club

FRESNO ENCOMM ARES/RACES by Dan Pruitt AE6SX

ARES/RACES/SATERN Participated in more events this month than any other month in recent history. We had Bicycle races, walk-a-thons, Simulated Emergency Tests, a SAR exercise, The Great Shakeout, a SATERN drill and a Birthday Party for ARES. Some where in there, Pacifi-con happened!



The 6 October bike race was the kick-off event. The Clovis Amateur Radio Pioneers was approached by the Off the Front Century Bike Ride committee, late in September. They requested communications in areas they knew was bad cell phone coverage for their first annual event. Rob Mavis took the lead and renewed our March of Dimes partnership and expertly orchestrated a collaborative effort spanning 2 counties and 7 clubs/organizations in a very short period. Resources turned out to be a premium as the regularly scheduled Fresno Cycle Club's Double Century ride was the same day and used some of the same route! Details are on the www.k6arp.org website.

Next ARES/SATERN participated in a exercise scenario that included packet operation at the Hospital sites in the Stanislaus County. Pairing on our role as support for the Regional EMS in the Fresno Region, we passed traffic via Grady's K6IXA-11 RMS link on Bear Mtn. This is significant as it is directly connected to Mt. Oso and in range of VHF to Sacramento.

Great Shake-out! Scheduled for 10:21 AM on 21 October, ARES/RACES/SATERN registered to participate and Lew KI6YWX choreographed a response that simulated availability and status of our people. The response was quite good There were 2 NCS, thank you Richard KE6SHL. A little about the GSO; it is totally voluntary and is promoting the good practice

of considering the best response to an Earthquake. "Drop, Cover and Hold-on" is an empty epitaph if it isn't practiced.

Another event without much warning was the annual "Crop Walk" on 24 October. A collective of 25 churches in the area sponsor a walk every year to fight world hunger. This year the host was "Temple Beth Israel" on Maroa South of Herndon. One of their members is a member of ARES and invited us to provide communications for the 2 hour event. Quick and the weather cooperated, made for an enjoyable afternoon. Thank you for the opportunity Gary KI6OYW.

Fresno was the site of NAS Lemoore's traveling Search And Rescue Exercise. All of the County and City(s) emergency response teams were invited to a simulation exhibiting FEMA plans of interoperability. Amateur Radio was there as MARS/ARES/CAP in the form of Ed Vonderbeck KA6PNL. I also had the privilege of being part of this and at the Armona site, early this year. Last years exercise Fresno provided relay communications from Mammoth, in Madera. These drills allow us opportunities to test all our modes.

Still on the agenda at the time of this writing is the 75th Anniversary of ARES. This will be an exhibition of EmComm from all over the San Joaquin Valley. A morning of demonstrations and forums informing and educating the hams and public alike. Presented at the Salvation Army Citadel and during CQDX the SATERN Kenwood TS-690 will be put to use for a SATERN Drill the same day. Thank you Pat W6YEP for the donation of the transceiver. It is a welcome improvement to the borrowed Alinco DX-70 xcvs used on Field day. We hope everyone comes and look us over.

73,

de Dan AE6SX

(Continued on page 11)

The case of the failed battery connections (from Design News)

September 7, 2010

By William C. Tope

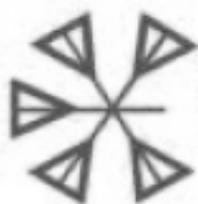
Problems and their solutions were a way of life for me in my 20 years with the Custom Body Division of The Gerstenglaser Co. of Wooster, Ohio. In addition to doing all of the electrical designs for about 1500 bookmobiles, speech and hearing vans, air pollution testing vans and TV production vans, I went out on at least 34 service trips for the company. One of the most unusual trips was to repair a speech and hearing van for the Anna State Hospital in Anna, Ill.

I had a call from the project manager at Anna State just two days before and even though he was a very good electrician, he could not determine why the Ramsey 12 volt DC hoist would not operate with 12 volts present at the solenoids. The hoist in question was used to lower the on-board generator to the ground while hearing tests were in progress, to isolate the noise and vibration from the van. When the hearing tests were completed, the hoist was used to lift the generator back up to its transport position in the van.

By the time I arrived at Anna State my customer had taken the hoist apart and had it spread out on his workbench. Step number one was to put the hoist back together and install it in the van. The Simpson 260 Meter still read 12 volts DC at the solenoids. We were back to square one. Why did the battery power not get to the hoist?

It was 30 degrees F. on the ground that December day and with a gentle breeze blowing between my legs as I traced every inch of the battery cable down through the rubber grommets, under the chassis to a terminal block and then back up into the generator compartment. Everything looked OK. I found a flashlight and went back to get a good look at that terminal block. The terminal block was made up of two brass 3/8" insulated studs. One cable ran from one stud to the battery and a second cable ran to the solenoids in the generator compartment. What everyone thought was a copper bar connected the two studs. The bar was aluminum.

Everything was fine at the factory inspection, but the December trip from Wooster, Ohio to Anna, Ill. through ice and snow and salty roads did an electrolytic transformation on the copper to aluminum interfaces. I threw out the aluminum bar, cleaned up the cable terminals, put both cables on one stud and we were back in business.



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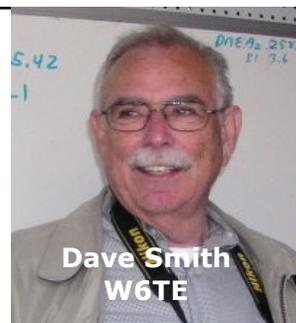
CMAS Contract # 3-06-58-0122B

GSA Contract # GS-35F-0248J

Fresno Amateur Radio Club

CONTEST RESULTS By Dave Smith W6TE

Here are the results of the 2010 ARRL June VHF QSO Party for the San Joaquin Valley section and a partial list of the Orange County Sections (where two FARC members participated as rovers). The rows highlighted in yellow are FARC club members



2010 ARRL JUNE VHF QSO PARTY RESULTS

	Call	Score	QSOs	Mult	Class	Section	Club	Ops
1	N6TEB	301,466	808	193	M	SJV	SCCC	+ K6WCI & KE6HPZ)
2	K6MI/R	230,400	849	100	R	ORG	SCCC	
3	W6TE/R	224,220	847	101	R	ORG	SCCC	+W6KYO
4	KR7O	57,072	296	174	L	SJV	NCCC	KR7O + packet)
5	W6TV	48,500	300	125	M	SJV		KW6N & W6YEP, ops)
6	W5DQ	13,050	145	90	B	SJV		
7	N6SJV	7,216	109	44	M	SJV		N6GKJ, W6MRM, KE5JTS, KI6BEW, KI6MPQ, WA6OSX,
8	KF6KDA	4,080	99	34	A	SJV		
9	K6YK	2,736	60	36	A	SJV		
10	W7AIT	2,604	73	28	B	SJV		
11	KE6EEZ	817	37	19	A	SJV		
12	KE6SHL	770	45	14	A	SJV		
13	K6USY	741	43	13	A	SJV		
14	NF6P	646	34	19	A	SJV	NCCC	
15	N6FD	255	16	15	A	SJV		
16	K6CSL	33	11	3	A	SJV	NCCC	
17	KJ6HGZ	16	4	4	A	SJV		

FRESNO ENCOMM ARES/RACES (cont from page 9)

NET: Monday 1930 hrs on 147.150+, PL 141.3

Monthly: The 4th Thursday of each Month, Salvation Army Citadel, 1854 N. Fulton 1900 hrs, Training meeting.

EmComm and Coffee: 0830 hrs, 3rd Friday Yosemite Falls Cafe on Blackstone and Shaw

Web: www.fresnoares.com or www.fresno-races.net. You can contact us directly at info@fresnoares.com



Father and son film outer space, do-it-yourself style

By Stephen Messenger, TreeHugger
Posted Fri Oct 8, 2010 12:30pm PDT

Buzz up!



Like many youngsters, and those young at heart, seven-year-old Max Geissbuhler and his dad dreamed of [visiting space](#) -- and armed with just a weather balloon, a video camera, and an iPhone, in a way they did just that.

The father-and-son team from Brooklyn managed to send their homemade spacecraft up nearly 19 miles, high into the stratosphere, bringing back perhaps the most impressive amateur [space footage](#) ever. The amazing footage starts at 2:35 minutes in the video below.

[Homemade Spacecraft from Luke Geissbuhler on Vimeo.](#)

The duo housed the video camera, [iPhone](#), and GPS equipment in a specially designed insulated casing, along with some hand-warmers and a note from Max requesting its safe return from whomever may find it after making it back to solid ground. All told, father and son spent eight months preparing for their homemade journey into space, in hopes of filming "the blackness beyond our earth."

Then, one day in August, Max, his father, and his friend Miles Horner headed out to a nearby park to see their dreams realized. After attaching their equipment to a 19-inch weather balloon and switching on the camera, they watched as their simple craft disap-

peared high into the sky.

After a little over an hour, the craft reached the stratosphere, 100 thousand feet overhead, and captured some incredible footage of space before the balloon popped and fell back towards earth. They found their spacecraft 25 miles away from where they had let it go -- stuck up in a tree.

Although the camera's battery died some minutes before touching down, the footage the camera returned is impressive. And despite the fact that the craft didn't *technically* reach the boundaries of space, Max and his father are undoubtedly proud of their accomplishment.

Geissbuhler describes the experience on the video he uploaded to the Internet:

In August 2010, we set out to send a camera to space. The mission was to attach a HD video camera to a weather balloon and send it up into the upper stratosphere to film the blackness beyond our earth. Eventually, the balloon will grow from lack of atmospheric pressure, burst, and begin to fall.

It would have to survive 100 mph winds, temperatures of 60 degrees below zero, speeds of over 150 mph, and the high risk of a water landing. To retrieve the craft, it would need to deploy a parachute, descend through the clouds and transmit a GPS coordinate to a cell phone tower. Then we have to find it.

Needless to say, there are a lot of variables to overcome.

Just as the space-race of the 1960s was driven by a spirit of exploration and ingenuity, so too was the bold idea of Max and Luke Geissbuhler to film the darkness beyond our planet with their homemade spacecraft. And just as mankind was at once emboldened by the success of science and the realm of possibility was widened for an entire generation -- perhaps this father-and-son team can inspire others to follow their dreams, too, do-it-yourself style.



Meteorological insight into Sporadic E (maybe)

(A Discussion from the North Texas Microwave E-mail reflector; Monday, October 4, 2010)

Hi NTMS,

For many years, it has been theorized that Sporadic E events on the VHF bands are related to thunderstorms in some fashion. Yet, I have yet to run across an article that definitively points what causes sporadic E. One of the nice things about being in my field now is the opportunity to periodically attend academic seminars. So many of them are real snoozers, but occasionally, a gem is found. This past Friday, I attended a talk by Dr. Walt Lyons out of the Fort Collins area on the topic of Sprites and Blue Jets. These are grouped into a phenomena called transient luminous events or TLEs. These events were first publicly reported back in the late 80s although pilots have since reported seeing them before that time period. Sprites usually have the look of a red jellyfish and blue jets look kind of like a very thin inverted cone (pointy end down...and they tend to be blue in appearance.)

If you'd like a bit more background on some of these phenomena, have a look at <http://www.fma-research.com/spriteres.htm>

Now, this in and of itself wouldn't be worth posting to the NTMS list, but a point brought out in the presentation cause a light to go off in my head. It is well known that May, June, July, and the Nov-Jan time frame are the best for sporadic E events. It is also well known that these are the peak seasons for certain types of thunderstorm activity in the northern and southern hemispheres respectively. That said, why these two line up so well isn't specifically known. Also, we have thunderstorms all over the country during the summertime, even into August and even along frontal boundaries in the fall. Still Sporadic E isn't reported very often in those months....at least not on a large scale.

It turns out that Sprites are visibly detectable (if you have dark-adapted eyes and are away from city lights and haze), up to about 75km which is well up into the Mesosphere. This is nice, but it still doesn't explain the correlation with Es. However, Blue Jets are observed to travel as high as 90km. Well, guess what? The E layer nominally

starts around 85km-90km (reference <http://en.wikipedia.org/wiki/Ionosphere>). Might this be a trigger?

Does this prove anything? No, but it is a place to start looking for relationships and patterns. It's just a hunch.

Wanna know a little more?

More info:

It turns out that just any thunderstorm won't produce sprites and blue jets. Some of the most violent storms on the plains each year, Super cells, are not known to produce many of the TLEs. Garden variety storms don't do it either. However, there are two types of storms, which are the most prolific TLE producers. Musicale convective systems with trailing stratiform rain (squall lines to most of us) and Musicale Convective Complexes (huge circular thunderstorm complexes which typically move across KS/NE in the late spring and early summer). These two quite often occur most often in the May to July time frame in the northern hemisphere. So, perhaps Es. is linked to the specific type of thunderstorm which happens most frequently in the aforementioned months.

Now, just any ole lightning strike in and of itself isn't enough to trigger a TLE. It turns out it has to be a VERY strong event. It has been determined that TLEs are triggered most readily with a "Charge Moment Change" value exceeding 100 Coulomb Kilometers (perhaps about a 10% chance of making a TLE) and more likely 300 C km (75% likelihood,) For reference, most lightning is under 50 C km. We're not just talking peak current, as is detected by the National Lightning Detection network, but rather a strike with long "continuing current" whereby charge is pumped for a "long" period of time. To get enough of a charge in the cloud, these flashes need to be spatially large to source all the energy required. Many of you have probably seen those huge forks of lightning out the back end of a large squall line. Sometimes, they are called Anvil crawlers. Well, this is the type of large scale discharge we're talking about. Some of the largest events measured have been around 300km in length (horizontally), and taking nearly 6 seconds to travel through the cloud. That's about the distance from Houston to Austin plus a little more. Of course, not all are this large.

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(Meteorological insight into Sporadic E (maybe) cont)

So, like i mentioned, Sprites are typically occur after the flash travels through the cloud and then finally jumps to ground in the stratiform region (light to moderate rain behind the main heavy rain region). These were generally associated with positive charge being lowered to ground. For some time, there was a theory that TLEs were caused only by positive flashes. But, its not the polarity, but rather the Charge Moment Change that determines whether a TLE will form. The area where enough negative charge is lowered to ground to make a TLE typically occurs in the heaviest rain (convective) region. And these are sometimes known to produce the Blue Jet events which make it to the ionosphere (90km or so). Blue Jets are more rare than sprites being that there are very few negative flashes with the kind of power necessary.

It may very well be that Sprites and Blue Jets contribute to the occurrence of Es. There are other features, known as Elves, which are even more mysterious and rare...and scientist are still working on what is going on with all three of these.

Now, most of these types of storms are nocturnally driven. As you know, Es occurs mostly in the daytime. Perhaps the occurrence of TLEs may prime the E layer somewhat, being part of the story. The other main part of the story could be the ionization of the layer by the Sun. I wonder if there are correlations between TLE events during the night and Es the next afternoon?

Well, in that light, here's something to keep an eye on. There is a near-real time map of likely TLE events, based on ULF/ELF signatures of Charge Moment Change and NLDN data that is available on the web:

http://people.ee.duke.edu/~cummer/cmc/cmc_realtime.html

So, it might be worth seeing where the most TLE prone storms are and seeing if that region gets a E layer patch capable of opening up the band the next afternoon. As I write this, it looks like the best TLE areas are perhaps from Flagstaff to Cedar City, UT and over toward Tonapah, NV. Yet, none of these look to exceed 300 Ckm in intensity. It will be interesting to see if an Es cloud were to form over this region tomorrow. Guess we'll have to wait and see. Certainly though, as squall lines pick

up with fall, it will be worth watching the map to see if it ends up being a predictor of Es.

So, hopefully, I've piqued some interest for all those who enjoy Es openings and given us something to look at and explore. It would certainly make some sense if this linked Storms and Es, but there are no promises. It's just speculation, but we have to start somewhere.

If you're interested in high speed video of lightning (7200 - 10000 fps), watching the stepped leader and everything that goes on before you see the flash, have a look at these sites: <http://www.ztresearch.com/> (high speed lightning) <http://www.forensic-weather.com/wvhd.php> (high speed and normal sprite video among others)

Best 73,
Joe - N5PYK

Joe,

It had been know for years that there was a strong relationship between Thunderstorms with tops above 40,000 feet and E openings. Also that 6 meters would open suddenly.

20 years ago they flew a fiberglass sailplane back and forth over a thunderstorm taking voltage readings. Even without a Sprite, there was about .3 megawatt of DC current flowing between the top of the thunderstorm and the ionosphere. Nice story in Scientific American.

17 years ago I used that first photograph of a Sprite in a Central States VHF Society talk after W9IP wrote that is was impossible for weather to have any effect on the ionosphere.

Much like a Phaser blast from the Enterprise! hihi. Yes, certainly enough energy to get those ions excited and form and electrically conductive area.

Kent Britton, WA5VJB

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