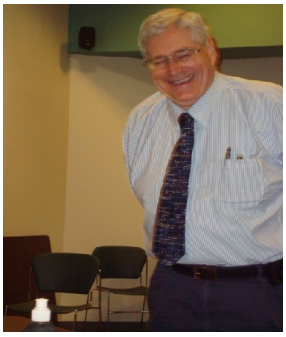
THE AERO AERIAL



Meet Aero's Newest Extra

The newsletter of the Aero Amateur Radio Club
Middle River, Md
Volume 8 Issue 1
January 2011

Editor Frank Stone AC3P

Officers			Committees	
Bob Landis	WA3SWA	President	Repeater	Phil Hock W3VRD
Bob Venanzi	ND3D	Vice-President	VE Testing	Pat Stone AC3F
Lou Kordek	KB3LJF	Recording Secretary	Public Service	Bob Landis WA3SWA
Pat Stone	AC3F	Corresponding Secretary	Webmaster	Al Alexander K3ROJ
Warren Hartman	W3JDF	Treasurer	Trustee	Frank Stone AC3P
Ron Distler	W3JEH	Property Mgr	Club Nets	Joe Miko WB3FMT

ABOUT THE AERO AMATUER RADIO CLUB

Meetings: First and Third Wednesdays at 7:30 pm at Coffman's Diner
(Middle River and Orem's Rd.)

Nets: See Local Area Net Schedule

Repeaters: W3PGA (147.24 MHz - / 449.575 MHz -)

WEBSITE: www.aeroarc.us

Net Reports

November

10 Meters: WB3FMT(NCS) AC3P W3JEH W3VRD

2 Meters: WB3FMT(NCS) AC3P/m AC3F /m KB3VAE W3JEH WB3LOT QTC1

Blue Moon Net: WB3FMT(NCS) W3JEH AC3P W3VRD K3ROJ
6 Meters

Station Activities

K3CXC and **W3JEH** were sighted at recent meetings. We can cancel the milk carton ads. Scratch that. We are still looking for **KB3JDE**. **AC3P** got the antennas back up in time to play in the ARRL 160 meter contest. **W3VRD** is back from sunny Florida.

VE Corner *by Pat Stone AC3F*

The VE Team held the last test session for 2010 at White Marsh on November 19th. There were two applicants. Congratulations to new Tech J**ack Reed KB3VJT**. A special congratulations to **Joe Miko WB3FMT** on passing Element 4 to obtain the Extra Class.

Aero VE Test Schedule for 2011

All test sessions are scheduled for 1 p.m. At the White Marsh Library for the following dates:

January 22
March 26
May 28
September 17
November 19

Walk-ins are welcome. Bring to forms of ID (picture) Fee:$15
For more information contact Pat Stone AC3F Phone: 410-687-7209
Email: ac3f@juno.com Website: http://www.aeroarc.us/vetesting.html

2010 In Review

Janus, the two-faced Roman god for whom this month was named, looks backward at the past as well as forward into the future. In like matter we look back at 2010 and recount the Aero Amateur Club's activities.

In 2010 the VE team served 31 applicants in January, March May, September and November resulting in 20 new amateurs and 10 upgrades.

In our efforts to serve the public, our members assisted in several Multiple Sclerosis bike tours and walks. Some even helped out with other events in Arizona. The club also supported the annual Baltimore Marathon. New for 2010 was assisting the Boy Scouts in their Jamboree on the Air event which introduced many boys to Amateur Radio.

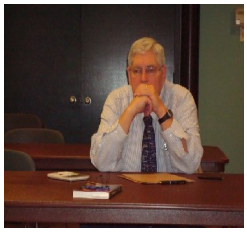
The club also had some fun time. Doug AI3G won the 20 Days 20 Nights contest. Other members took to the air with the Martin Airport Anniversary Special Event W2W. Then was The Weekend at Camp Genyara otherwise known as Field Day with as record number of participants.

We look forward to a successful 2011.

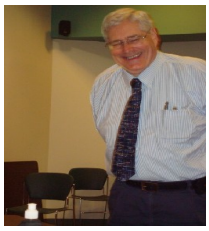
Joe WB3FMT Finally Does It!

The Saga begins
Pat WA3SSV aka AC3F (right) administers Novice Test to Joe (future WB3FMT) ca 1976

We need positive ID please



Praying for Divine Guidance



The Thrill of Victory

After years a nudging, good-hearted kidding pleading and pleading from his fellow Volunteer Examiners, Joe WB3FMT sat for he Extra Exam. And guess what? In the words of the fondley remembered , FCCs Ms Woodlon he “paaaasssssed”!.

After retirement last July Joe decided to take up the Extra Class Licence manual and study. After taking several on-line practice exams through October, Joe was felt he was ready. The result was a passing score on the first try.

In fairness this was not Joe's first stab at Element 4. Back when the code requirement was lowered to 5 wpm, Joe took a try at the test sessions in Towson, but without success. This time with proper preparation, Joe was successful.

Aero ARC's 20 meter beam
A History *by Joe Miko WB3FMT*
Part I

The Aero Club has a 20 meter two element beam, that's a fact. How it is assembled and pointed is a mystery? Until now, but first a little antenna information and history.
A beam antenna is a directional antenna because of its ability to produce a radiation pattern that favors a certain direction and provides greater gain than a dipole. This type of antenna know as a Yagi beam was first designed in the 1920's. The Yagi is very simple. The basic Yagi consists of multiple elements, as shown in Figure 1. The elements consist of a driven element which is a half wave dipole antenna; a single reflector element and any practical number of director elements. The driven element is so named because this is the only element that is connected directly to the radio; it actually drives the whole antenna. The additional outer elements (reflector and director(s)) are generically called parasitic elements. The reflector reflects radio frequency (RF) energy, the director directs RF energy. The reflector element is typically 5 % longer than the driven element and the director(s) are typically 5 % shorted than the driven element.

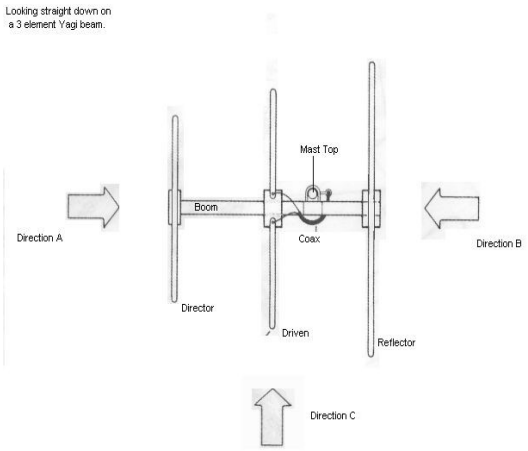


Figure 1

Photo 1 Aero ARC 20 Meter Beam FD 2002 Photo

You can even add additional directors elements to increase antenna gain. The number of additional directors is limited by your available working space and material weight limits. Also the additional directors added makes a narrower beam. Adding more reflector elements produces no additional benefits for the antenna. The signals are re-radiated by the reflector and director(s) and arrive at the driven element *in-phase* with one another. These causes the signals to reinforce each other causing incoming signal to be stronger coming from direction of the directors.

Number of Elements	Gain (Over Dipole)	Front-to-Back Ratio (F/B Ratio)	Comment
2	5 dB	14 dB	Reflector element only
2	7 dB	Zero	Director element only
3	10 dB	15 dB	
4	12 dB	25 dB	
5	12.1 dB	26 dB	
6	12.2 dB	30 dB	
7	12.3 dB	22 dB	
8	12.4 dB	32 dB	

Table 1

Table 1, list the typical performance gains for a Yagi's with the stated number of elements. Typically, the gain will be within 2 dB of the indicated gain. However, Front-to-back ratio can vary greatly (as much as 25 dB) from the indicated F/B. F/B is much more sensitive to adjustments to the element length and spacing. See the example of forward gain as shown in Figure 2.

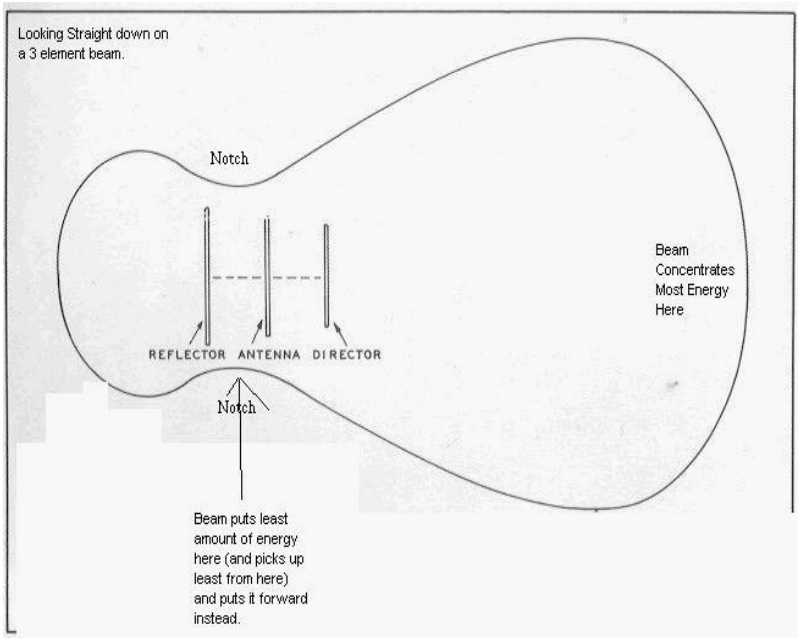


Figure 2

"*Gain measure the directivity of an antenna compared to a reference antenna, For example, the peak gain of a dipole is 2.15 dB greater than that of an isotropic antenna."* (ARRL Extra Q&A - E9A02)

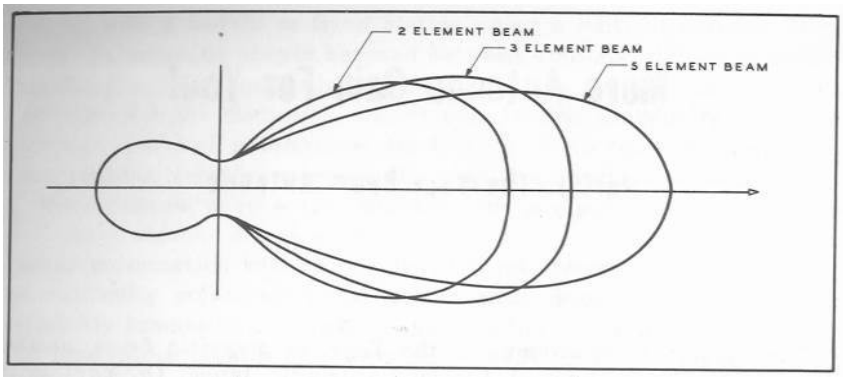


Figure 3

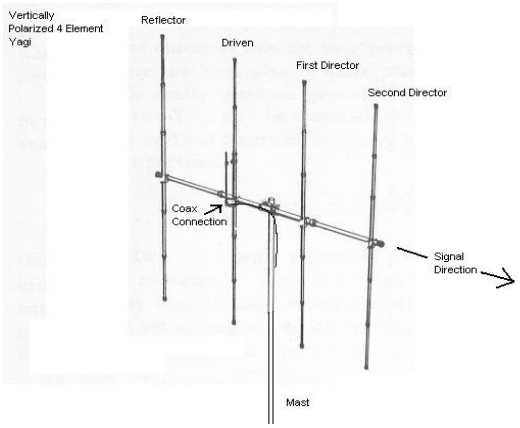
Figure 3 is an example of antenna gain based on the total number elements, counting the reflector, driven and directors.

You can make variations to the Yagi beam by changing the number of parasitic elements. You can actually still have a beam even if you take off the reflector or director element and just have a 2 element beam using one or the other. This is the configuration used on the Aero Club's 20 meter beam. This beam would have less gain than a standard the three element beam, but would still be quite directional. It has more gain than a corresponding dipole antenna for 20 meters.

Photo 2 (Aero ARC FD 2006) - The clubs 2 element 20 meter beam mounted on an excess military crank up light tower.

As you can see from the Table 1, it gets increasingly difficult to get more gain after 4 elements. Not only that the antenna gets huge, the antenna bandwidth goes down, and becomes harder to tune. Where addition gain is required the rule of thumb is to "stack" beams rather than go with a large number of elements. *"A number of experimental investigations have shown that the spacing between the driven element and reflector for maximum gain is in the region of 0.15 to .25 λ. However, total antenna length, director to reflector, of more than 0.3λ at frequencies of the order or 14 MHz introduces difficulty form a construction standpoint. Lengths of 0.25 to 0.3 λ are used." (The ARRL Handbook Chapter 20 20.32).*

Yagi antennas can radiate signals in one of two directions, horizontally or vertically. *"The electric and magnetic components are oriented at right angles to each other and 90° to the direction of travel. The polarization of a radio wave is usually designated the same as its electric field." (The ARRL Handbook Chapter 21.1).*



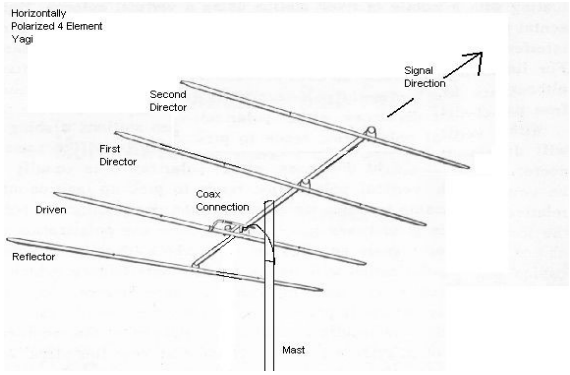


Figure 4 Figure 5

Figure 4 shows a 4 element Yagi in a vertical position, it radiates a vertical polarized signal. Figure 5 shows the same Yagi in the horizontal position. It radiates a horizontally polarized signal. You can see a matching device where the coax connects that looks a small "jumper rod" that is connected to the driven element. This matching device is called a "Gamma Match". The gamma match is a type of matching transformer used to match the feed point impedance of the antenna to the coaxial cable. Gamma Match or T-Match are used extensively on Yagi and quad beam antennas to increase the antenna feed impedance to the desired 50 Ω.

The gamma match capacitor can only cancel reactance, it cannot modify the "real part" (resistance) presented to the feed line. It is the simplest form of matching, and has the lowest operating Q and loss of any system. Adjustment of resistance requires adjusting the diameter, spacing, or length of the gamma section.

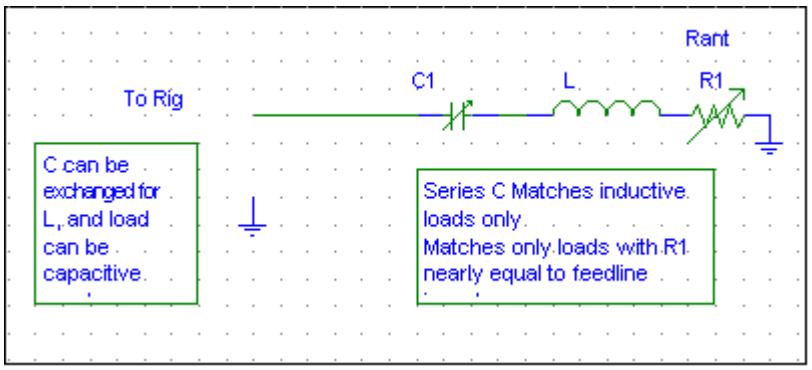


Figure 6 Gamma Match

Figure 6 - Electrical makeup of Yagi beam with a Gamma Match. Parasitic elements can be bolted directly to the boom OR can be insulated from the boom. The driven element is mounted directly to the boom in this case, it does not have to be insulated with this configuration. The shorting strap is slid up and down the rod to match the feedpoint impedance of the beam to the desired 50 Ω.

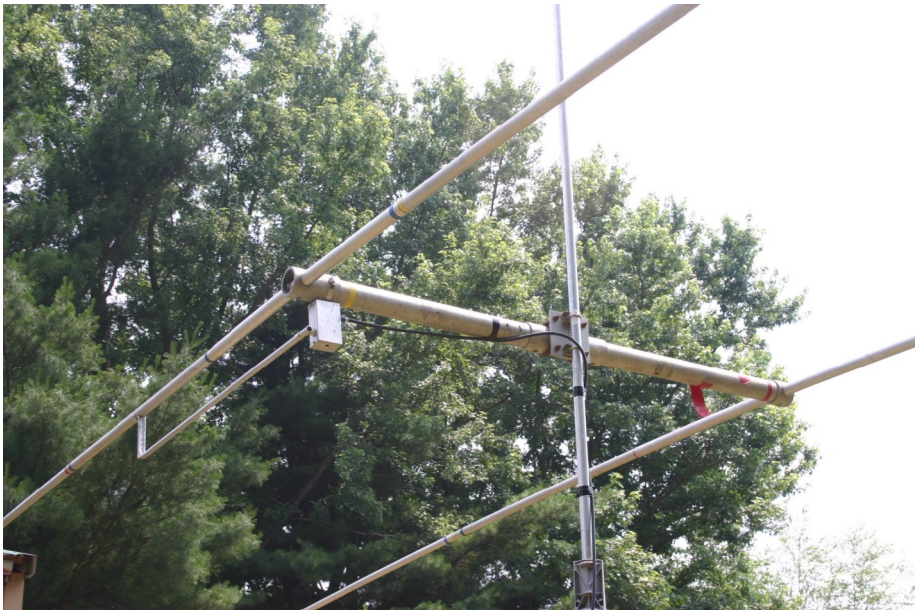


Photo 3 (Aero ARC FD 2005) - The Gamma match is the rod and capacitor box connected to the driven element on the left side of the picture.

AERO AMATEUR RADIO CLUB

20 DAYS AND 20 NIGHTS OF FUN

When: 0000 UTC Saturday, 01 January 2011 (1900 EST Friday 12/31)
Until
2359 UTC Thursday, 20 January 2011 (1859 EST Thursday 1/20)

Who's Eligible: All current AERO members

Location: All contacts must be made within a radius of 25 miles of your home QTH.

Frequency/Mode: Any mode legal within your license class on any amateur band. This excludes repeater, EchoLink & IRLP contacts. (satellite OK).

Exchange: Call, Name, and State

Scoring: The sum of all numerals in the main portion of the call sign. Do not use portable designators.

Examples:	9Q1D	1 pt !!!
	WA3SWA	3 pts
	TI7/K4XXX	**4 pts**
	K6XXX/3	6 pts
	4N7ZZ	7 pts
	V26R	8 pts
	L73X	10 pts
	S58D	13 pts
	J7ØJ	17 pts (each digit Ø counts 10 pts)
	4N5ØØZZ	25 pts !!!

Bonus:

Worked all numbers 0 thru 9	50 pts
Worked all US time Zones	25 pts (4 continental time zones)
Word in suffix of call (ie ka3OUT)	5 pts

Worked all letters of the alphabet as the first letter of the suffix of the call. 100 pts

Examples: K3AAC, VE6BQW, LU7CHY, G3DDE count for the letters A, B, C, and D.

Misc.: The same station may be worked only once regardless of mode or band.
Winner of contest will run the contest next year
Exercise good operating practices at all times

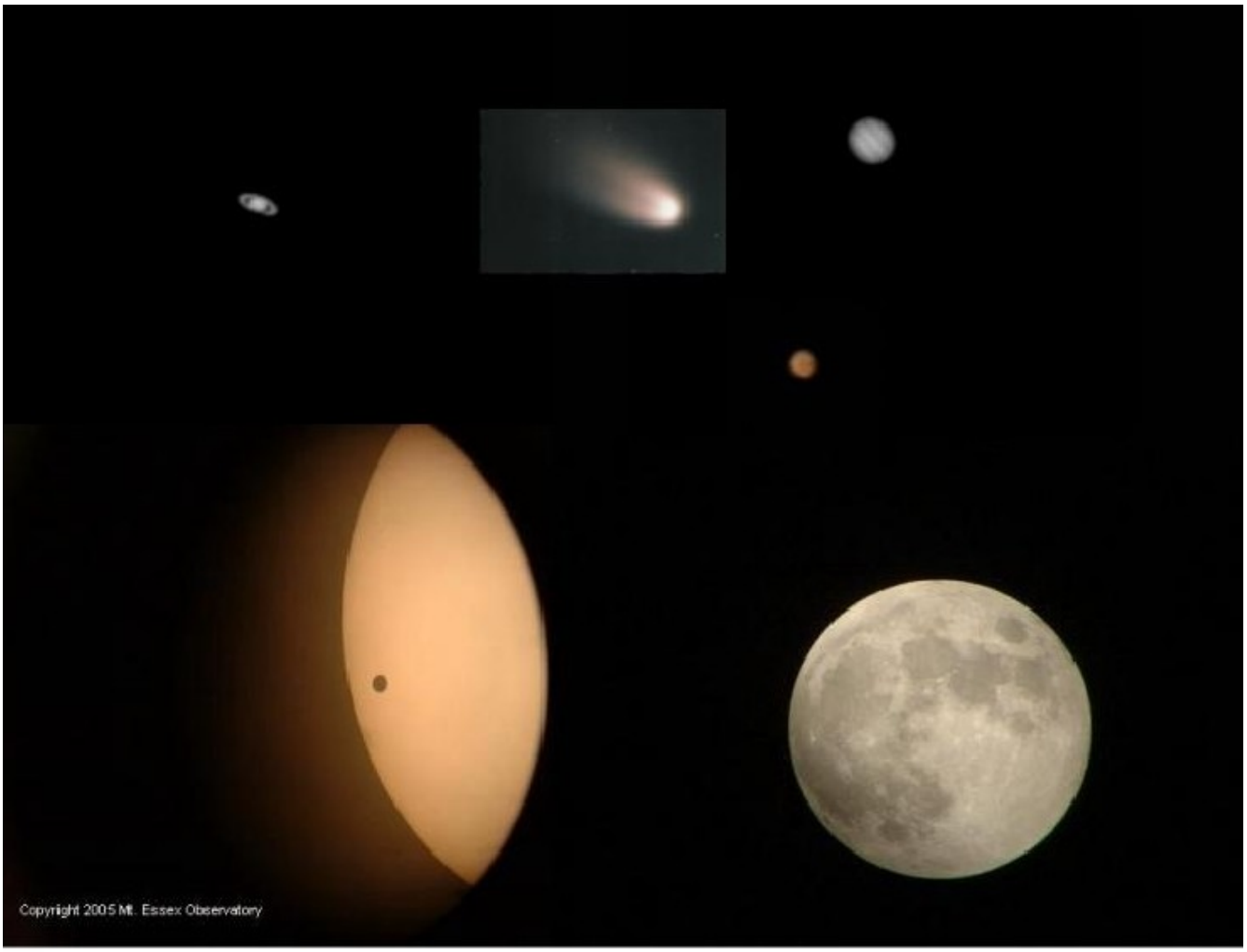
Submissions: Log sheets in the following MS Excel format: (A shell for your log sheet will be included with the December mailing of the Aero Club newsletter.)

Date	Time UTC	Band	Mode	Call	Name	QTH	Points	Bonus	Notes
4-Jan	1646	15	PSK	EC8AUZ	Pedro	Santa Brigida, Grand Canary Is.	8		“A”
4-Jan	1656	15	PSK	KC0MDK	Ben	Mankato, MN.	10		CST+”M’
4-Jan	1720	15	PSK	KA3OUT	Tony	Rosedale, MD.	3	5	EST +Word+”O”
4-Jan	1745	15	PSK	W5AJX	Don	Houston, TX	5		
4-Jan	1800	15	PSK	W7MHC	Allan	Tucson, AZ	7		MTN
4-Jan	1823	15	PSK	KI4MI/6	Bob	Lompoc, CA.	4	25	PAC
4-Jan	2107	20	PSK	KF4ONH	Paul	Gainesville, FL.	4		
4-Jan	2216	20	PSK	KX5S	Jim	Dallas, TX	5		“S”
5-Jan	2111	20	PSK	VE7KWK	Keith	Surrey, BC.	7		“K”
5-Jan	2307	20	PSK	N0KFC	Mike	St. Cloud, MN.	10		"0"
5-Jan	2321	20	PSK	PY2NJ	Rafael	Lencois Paulista, Brazil	2		“N”
5-Jan	2347	20	PSK	HK1KYR	Jorge	Barranquilla, Colombia	1		"1"
6-Jan	0023	20	SSB	WB7WNF	Raleigh	Sumner, WA	7		"7"+”W”
10-Jan	2354	20	SSB	K3ROJ	Al	Essex, MD	3		"3"+”R”
11-Jan	1810	20	PSK	VE2UC	Jean	Quebec City, QU.	2		"2"+”U”
11-Jan	1815	20	PSK	KC5BYE	Paul	New Orleans, LA.	5	5	"5" +word+”B”
11-Jan	1828	20	PSK	WB9APO	Terry	Chicago, IL.	9		"9"
11-Jan	1849	20	PSK	AB4ND	Tony	AL.	4		"4"
11-Jan	2055	20	PSK	N8IZY	Mike	Longwood, FL.	8		"8"+”I”
11-Jan	2119	20	PSK	W6PNW	Ray	Pipestone, MN.	6	50	"6"+”P”
11-Jan	2136	20	PSK	CO8FD	Freddy	Baracoa, Cuba	8		“F”
15-Jan	0115	10	SSB	AC3P	Frank	Mobile - Dundalk	3		
15-Jan	2332	20	PSK	KA0KAF	Jeff	Post St. Lucie, FL.	10		
15-Jan	2347	20	PSK	KB0IWN	Terry	Minneapolis, MN.	10		
15-Jan	2359	20	PSK	WA4PAM	Frank	Clewiston, FL.	4	5	Word

Total the points at the bottom of each log page.
Enter the grand total at the end of the last log page.

Due Date: Turn in log at the Aero Club meeting on 2 February 2011 or e-mail your log to ai3g@comcast.net by 2 February 2011.

GOOD LUCK & HAVE FUN!



January 2011

						New Year's Day 20 days/20 nights Straight Key Night **1**
20 days/20 nights **2**	20 days/20 nights **3**	20 days/20 nights **4**	Meeting Coffman's 7:30 pm 20 days/20 nights **5**	20 days/20 nights **6**	20 days/20 nights **7**	ARRL RTTY Roundup 20 days/20 nights **8**
ARRL RTTY Roundup 20 days/20 nights **9**	20 days/20 nights **10**	20 days/20 nights **11**	10 Meter Net 28.445 Mhz 7:30 pm **12**	20days/20 nights **13**	20 days/20 nights **14**	Harrisburg Winterfest www.w3uu.org 20 days/20 nights **15**
20 days/20 nights **16**	Martin Luther King Day **17**	20 days/20 nights **18**	Meeting Coffman's 7:30 pm 20 days/20 nights **19**	20 days/20 nights **20**	**21**	License Exams White Marsh 1pm ARRL VHF SS **22**
ARRL VHF SS MD Mobileers Fest Odenton MD www.mobileers.or **23**	**24**	**25**	2 meter Net 147.24 Mhz 8 pm **26**	**27**	**28**	**29**
30	**31**					

Equipment For Sale

Ameritron AL-811H Linear amp. Used lightly. 2 yrs. Old $600
Includes outboard relay.

MFJ Voice Keyer - $135

Contact: Reid Selby WI3K
reid2015@yahoo.com

LOCAL AREA NETS

Day	Time	Frequency (MHz)	NET NAME
Daily	9 – 10 am	147.03	ORIOLE Net
Daily	5:30– 6 pm	3.820	Maryland Emergency Phone Net
Daily	6:30 – 7 pm	146.670	Baltimore Traffic Net
Daily	7 pm and 10 pm	3.643	Maryland/DC/Delaware Traffic Net
1st Tues	7:30 pm	145.330	Baltimore ARES Net
2nd Tues	7:30 pm	146.670	Baltimore County RACES Net
2nd Wed.	8 pm	28.445	AERO ARC Net
4th Wed	8 pm	147.240	AERO ARC Net
5th Wed.	8 pm	449.575	AERO ARC Net

The Aero Quantum Mechanics Net: Anytime any Frequency contact WB3FMT. The last one was on 449.575 MHz on Tuesday 8 pm on March 30th. Who knows where or when the next on may be?

Dues are due on the first meeting in January. Still $24 Regular Member and $2 Family Member. A bargain at any price. See Warren W3JDF for special offers.....

From the Skies over Mt. Essex

HAPPY NEW YEAR 2011

SKY Events for January 2011

January 2nd – 6th Magnitude Uranus is ½° above Jupiter.

January 3rd - Quadrantid Meteor shower, look North between the handle of the Big Dipper and Bootees, around 2 a.m. Look up about 30° above the horizon. Up to 100 meteors per hour can be seen. This event only last a day or two.

January 4th - New Moon

January 7th - The Moon passes 5° North of Neptune.

January 8th – Venus greatest Western elongation 47°. Jupiter is near the waxing (growing in size) Moon.

January 9th – Mercury greatest Western elongation 23° (Both Venus & Mercury are visible in the Dawn sky.)

January 10 – The Moon passes 7° N of Jupiter and Uranus.

January 11th – First Quarter Moon

January 19th - Full Moon "Wolf Moon" Native American tribes or "Winter Moon" the Colonial Americans.

January 25th – The Moon passes 8° S of Saturn.

January 26th - Last Quarter Moon

January 29th – Venus is near the waning (shrinking in size) Moon.

Planet Lookout

Mercury and **Venus** – In the Southeast before Dawn.

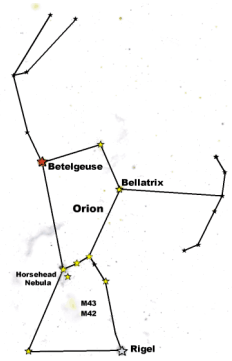
Mars – In the Sun's glare at Sunset.

Jupiter and **Uranus** - High in the Southwest at sunset. The planets will be about ½° apart; Uranus will be to the upper right of Jupiter and 1,600 times fainter.

Saturn- Rises around mid-night.

A Night's Tale!

Every one of the 88 constellations has a story to tell. One of greatest, in size 26 of the 88 and brightness 7 stars brighter than +2.4 magnitudes is Orion the Hunter. Well placed in the night sky in January.



Two bright stars in the evening sky lie at opposite corners of the rectangle: the red Betelgeuse(red giant) at northeastern corner and even brighter Rigel (white giant) at the southwest. One of the objects in Orion's sword isn't a star at all. It's a nebula — a cloud of gas and dust that's like a giant fluorescent bulb. Inside the nebula is a nursery where new stars are created.

Orion is one of the oldest and best known constellations. It is also one of the easiest to pick out. Orion was the most important sky figure to the ancient Egyptians he as was viewed as the as the soul of the god of the Egyptian underworld Osiris. It's even said that the Pyramids as Giza are aligned to match Orion's Belt. The photo below show a an overlay of the pyramids and the 3 belt stars. The three belt stars are (left to right) Zeta ζ, Delta δ and Epsilon ε.

Orion has been referenced in 3000 year old Egyptian writings and also mention in the Old Testament in the Book of Job and the Greeks.He is also seen as the legendary great hunter of the Greek mythology. It was said he was the most beautiful of men and the most skillful of hunters. Orion's pride got the better of him; he began boasting of his skills. This annoyed the gods and they decided to punish him for his ego. The gods sent a scorpion to sting Orion's foot, and kill him. Diana, implored the gods to place the great hunter in the sky to remember him by. They agreed to and also placed the scorpion there to warn him. In Orion's last request that he not to be placed near the scorpion. And so, Orion dominates the winter skies while Scorpius the scorpion dominates the summer sky.