



# ROUNDTABLE

### VICE-PRESIDENT'S MESSAGE

By Bryan Steinberg - KB0A

Hello DRC Members,

As I fill in for our president, Gerry, W0GV, with this month's newsletter the summer is quickly drawing to a close. Well Fall may be quickly approaching on the calendar but our weather continues to be summer like - hot and dry. I would hope that a lot of us have been able to take advantage of the warm and dry weather to finish up our outside antenna projects. Hopefully, we won't have another wet and cold winter like last year and we will still be able to get some outdoor work done later in the year. As far as the club goes all our systems are doing well although there are still a few projects to complete prior to old man winter reappearing.

August was a busy month for the club. Once again our annual hamfest was met, once again with a sellout of all the tables and great attendance by the Colorado ham community, including some hams from Wyoming. Our attendance was a little down from last year, however, that still put us at about 450 give or take a few. The hamfest is a major event for the club, it brings in some extra money which has allowed us to upgrade our repeater radios over the past few years. As always, it's nice to see fellow hams get a chance to meet, either the first time or again. So often we forget what our on-line friends really look like.

We have quite a few new members this month and I would like to welcome and thank each for joining the DRC. They are Milton Bonham, KY0E, Daryle Brooks, WB7TNE, Kris Brooks, KD0MPW, Ric Clark, KD0MNM, Rick Roland, KD0MEZ, Leslie Roland, KD0MEY, Ken Thomas, W0JKT and Sue Thomas, W0LST. Please check in on the nets and come to the meetings and activities and remain an active member.

I presented our August meeting which was an overview of the High Definition Media Interface, HDMI, cable that many of us are now using to connect our Hi-Def TVs to the cable or satellite receiver, A/V receiver, Blu-Ray player and other devices in our home entertainment center. I hope that the presentation

was informative and interesting. Who knew there was so much going on in those small wires with the funny connector. We introduced a new portable PA system at this meeting which I expect made it a bit easier for the folks in the back of the room to hear my presentation.

September is our annual business meeting and we have a couple of items to address up front at the meeting before we get into the presentation. The main item is the election of four board members. Each board member is elected for a 2-year term, these are alternated so we elect four members, or half the board each year. From the board members we elect the officers - President, Vice-President, Secretary and Treasurer. The board is also in the process of completing some minor, but necessary changes in the club Bylaws to bring them up to date. It's been about 18 years since they have last been updated and presented to the membership. So, some house-keeping was overdue. We will also work an abbreviated presentation into the meeting so it won't be all business. In addition to all this we will still have our Elmer and Technical committee sessions at starting at 6:30. I also wanted to give you a heads up on our October meeting which will take an in depth look at lightning and the proper methods of grounding your station to avoid damage for the lightning. Stay tuned for more details on this one.

See you all at the meeting September 15th at the El Jebel Shrine Center which is one block West of the intersection of W. 50th Ave. and Tennyson St. (second level in the East Room). And remember to check our web site, [www.w0tx.org](http://www.w0tx.org), for lots of important information about the DRC. The Elmer Session and Tech Meeting start at 6:30 PM followed by the Regular Meeting and program at 7:30 PM.

Bryan, KB0A  
Vice-President

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## AUGUST MEETING - WHAT'D I MISS

By Bill – W6OAV

Forty five folks attended this month's meeting! Bryan, KB0A, began the meeting with attendee introductions. After the introductions, Bryan gave a status report on the upcoming DRC Hamfest. Almost all the tables are sold and all is looking good. However, due to many of the regular helpers being out of town, Bryan needs additional help. Bryan then announced that the club officer elections will be held at the September meeting. Bryan closed the business part of the meeting mentioning that the board is considering moving the club meeting night to Thursday as Wednesdays are very busy at the meeting location.



Bryan then gave a great presentation on HDMI. The presentation was extremely interesting and informative. Some of the topics Bryan covered were:

- What is HDMI and how it works.
- The makeup of an HDMI cable and functions of the various internal conductors.
- What to look for when buying HDMI cables and how much to pay.
- The future of HDMI.

Attendees left the meeting with a great respect for the HDMI cable and all that it provides in today's systems.

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## Technical Committee Report

By Bill – W6OAV

The meeting was short this month as many of the members were on vacation. Therefore, only the following item was discussed.

### New Salvation Army Location:

Goal: Install VHF/UHF systems and HF long range and NVIS capability.

Various configurations were discussed. The final configuration chosen was to mount two dual-band VHF/ UHF antennas to the back of the building valence and the R7 on the back wall of the building. An NVIS antenna would be constructed that could be setup on the backside of the building when needed. This configuration would avoid having to walk on a rather flimsy roof.

W6OAV used Photoshop to show the proposed antennas on a picture of the building. The picture will be sent to the building managers for their approval.

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## HAMfest Report

By Bill – W6OAV

After months of planning, and the frantic days just before, KB0A has once again produced a very successful and popular DRC hamfest. Bryan sold all the tables and the attendance was around 450. Vendors came from as far away as Cheyenne and Colorado Springs.



There were two conference rooms available, one for VE testing and the other for the technical forums. Bill, W6OAV, presented a forum on using EZNEC, a free antenna analysis program. Lance, N1ETV, followed with a forum on how the MFJ 259B antenna analyzer functions and how to use the analyzer to characterize antenna parameters. Rob, K0RAR, wrapped up the forums with a Q and A forum for new and experienced hams.

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The VE session produced one new tech and three new generals. Congratulations to you all!

As usual, our kitchen staff did a great job of feeding the attendees. In the morning they provided fresh doughnuts and coffee. In the afternoon they provided various combinations of KD0CXX's fabulous pulled pork and BBQ beef lunches.

The club says THANK YOU to all who assisted KBOA in setting up, running and cleaning up afterwards, to the ham community who supported the hamfest and a **BIG THANK YOU** to KBOA, who I think aged a bit with all the issues he had to resolve.

### Remember When?

By Bill - W6OAV

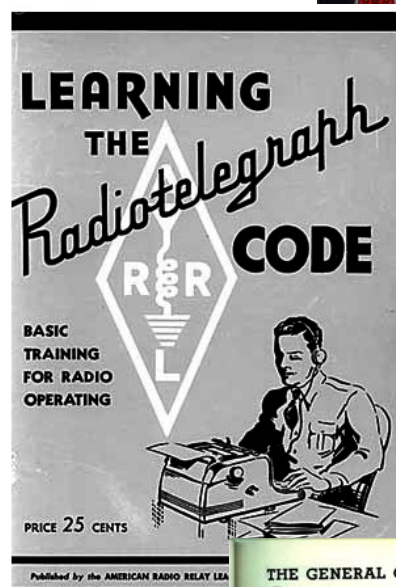
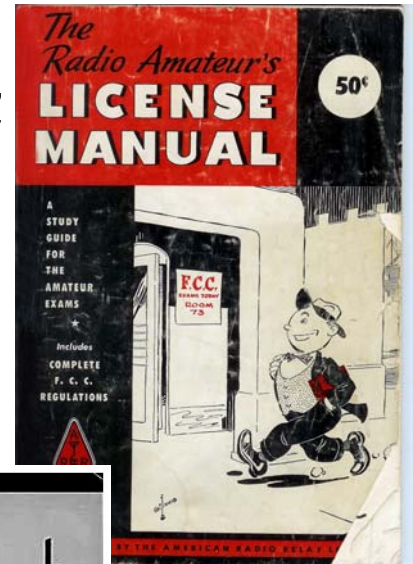
Old timers, like me, have seen many changes in the process of obtaining a ham license. Back in the 50s and 60s a prospective amateur operator had to make sure that he was definitely prepared to pass the test. The reason? If he failed the test, he had to wait a minimum of thirty days before being allowed to retake the test. This could be a real issue depending upon where the applicant lived as described below.

The prospective amateur operator had to go to an FCC office to take the General test from an FCC examiner. (Novice and Technician tests were given via mail, by a licensed General with the requirement for a witness and both were required to monitor the total test sequence). Larger cities had FCC offices where amateur exams were given on a regular basis. In addition, FCC examiners gave tests on a quarterly basis in some other cities. Taking the General test often involved time away from work or school and sometimes required a long drive to an FCC examination location. Hence, one didn't want to fail the test!

If the applicant lived more than 125 miles from the nearest FCC office, he could apply for a Conditional class (same as the General class). The test would be administered by an FCC qualified examiner with a witness. Once the Conditional class license holder moved to a location less than 125 miles from an FCC office, he had to retake the test.

The Technician and General written test requirements were the same. The Technician license required 5 WPM code speed and General required 13 WPM code speed. The prospective amateur operator first had to successfully pass the code test. Only then could he open the written portion of the exam.

To prepare for the test, most prospective amateur operators obtained copies of the ARRL publication *The Radio Amateur's License Manual* and the *Learning The Telegraph Code* manual.



The license manual contained 12 schematic drawings that the applicant had to be prepared to draw as part of the exam. Also, there were 98 sample questions given for study.

The questions on the actual exam were different from the samples, but if the prospective amateur operator could answer the sample questions correctly he was supposed to be able to answer those on the exam.

**THE GENERAL CLASS LICENSE** 21

39. Draw a simple schematic diagram of a plate-neutralized final r.f. stage using a triode tube coupled to a Hertzian antenna, showing the antenna system and a Faraday screen to reduce harmonic radiation.

40. Draw a simple schematic diagram of a half-wave rectifier with a filter which will furnish pure d.c. at highest voltage output, showing filter condensers of unequal capacitance connected in series, with provision for equalizing the d.c. drop across the different condensers.

41. What is a safe procedure for removing an unconscious person from contact with a high-voltage circuit?  
The safe procedure is first to open the main switch of the high-voltage power supply and then remove the victim from contact with the high-voltage circuit. No direct contact should be made with any part of the victim's body until the high-voltage switch has been opened.

42. Draw a simple schematic diagram of a piezoelectric crystal-controlled oscillator using a pentode vacuum tube, indicating polarity of electrode supply voltages where externally connected.

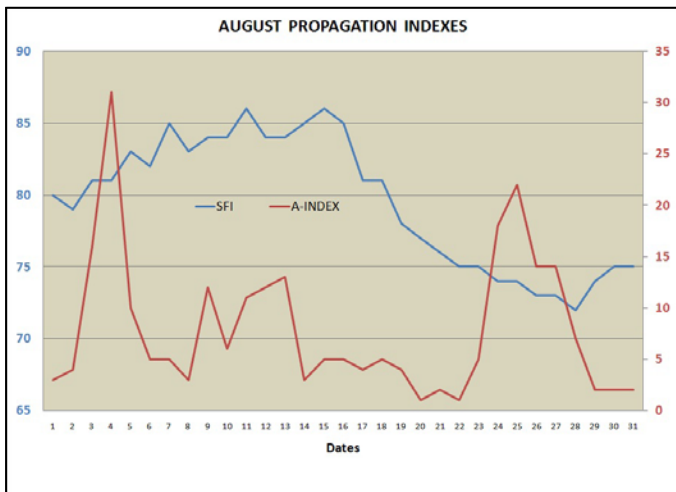
Note: The circuit for a tetrode (four-element) tube would be the same except that the suppressor grid would be omitted. For a triode oscillator, both the suppressor and screen grid would be omitted, as would also be the screen-grid supply voltage terminal indicated on this pentode diagram.

43. Draw a simple schematic diagram of two r.f. amplifier stages using triode tubes, showing the neutralizing circuits, link coupling between stages and between output and antenna system, and a keying connection in the negative high-voltage lead including a key-click filter.

# THE NEW ROUNDTABLE SOLAR PROPAGATION CHART

By Bill – W6OAV

The purpose of this article is to introduce the new monthly Roundtable solar propagation chart, to provide an overview the various propagation indexes and to show how to use this information for determining current, and roughly future, HF and VHF propagation conditions.



The solar propagation chart above provides readers with two key pieces of propagation information. The chart will show the main propagation indexes for the prior month; namely, the daily Solar Flux Index or SFI and the A-Index. These indexes will allow the reader to see where the solar cycle is going. These indexes will also allow the reader to “forecast” the propagation conditions for the upcoming month based on the index information contained in the current chart. More on this later.

So, what are the (SFI) and the A-Index?

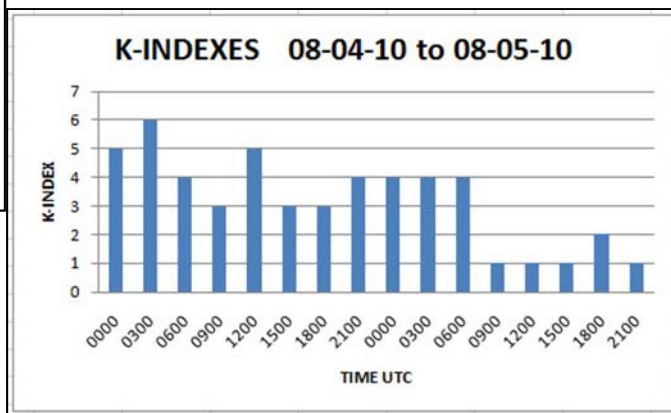
### SFI

The SFI is a measurement of the strength of solar emissions at 2800 MHz. The strength of these emissions is proportional to the sunspot activity. The greater the sunspot activity, the higher the SFI and consequently the better the HF propagation. As a general rule, as the SFI increases, good propagation moves up to the higher HF bands. Most scientists agree that there is no real correlation between the SFI value and the highest frequency providing good communications. The SFI values can range from a low of 64 to a high of 300. One must remember that the A and K Indexes discussed below can adversely affect the good propagation conditions provided by a good high SFI value.

### A AND K INDEXES

The A and K indexes are magnetometer measurements of the condition of the earth’s magnetic field at specific times. We must first discuss the K index since it is “real time” and is the basis from which the A index is calculated.

The K index is a magnetometer measurement made every 3 hours. 8 measurements are made in a 24 hour period beginning at 0000 UTC (6 PM MDT). The K index units range semi-logarithmically from 0 to 9. The higher the index, the worse the propagation conditions. The Chart below shows the effect of the massive solar event on the sun during the week of August 1<sup>st</sup>. As shown in the chart, the K index can change quite a bit over several 24 hour periods. So, if you obtain the current K index value, you have a pretty good picture of present propagation conditions.



The A index is indicator of the condition of the earth’s magnetic field averaged over a 24 hour period. The A index is derived from a day’s worth of K index values (eight K indexes). The A index units range linearly from 0 to 400. As with the K index, the higher the A index, the more active the sun had been and the worse the propagation.

Again, if you obtain the current published K and A indexes, you have both a current measurement and a 24 hour average measurement of the solar activity.

There are two types of K indexes and A indexes published, the mid-latitude and planetary indexes. The mid-latitude indexes are measured near Boulder. The planetary indexes are a “summing” of measurements made by stations in different parts of the world.

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The reason the two measurements differ is because the solar activity on the sun affects the northern and southern latitude magnetic fields more than the magnetic field at our mid-latitude location. For example, when the major sun eruption occurred on August 4th, the mid-latitude A index was 31 and the planetary A index was 42. Since we're more interested in our mid-latitude area, the Roundtable solar propagation chart will include only the mid-latitude A index. As shown later in this article, WWV also broadcasts only the mid-latitude indexes.

**HOW TO USE THE CHART**

Note two things on the Roundtable chart: the trend of the SFI and A indexes for the month and the largest peak, or peaks, value(s). The index trends show the progress of the solar cycle during the past month, in other words, is it getting better with time? The SFI peak(s) allow the rough forecasting of the reoccurrence of SFI peak(s) for the next month. To "forecast" note when the SFI peak(s) occurred and project the peak(s) out to about 28 days. Due to the sun's 28 day rotation, the SFI peak(s) will often reoccur in about 28 days. The reason is because the sun spots causing the SFI peak(s) move with the sun's rotation and face the earth every 28 days. This 28 day repetition will become more pronounced as the solar cycle improves.

**HOW TO USE THE K-INDEX**

Use the K Index to determine the present magnetic field conditions and possible HF and VHF propagation conditions. The chart below shows the general HF and VHF Sporadic E conditions for different K index values. The chart also shows the correlation between the K and A indexes.

K-INDEX	A-INDEX	SOLAR CONDITIONS	HF PROPAGATION	SPORADIC E
0	0		GOOD	
1	3	Calm		
2	7			
3	15		DEGRADED	
4	27			
5	48	Minor Storm	MARGINAL	POSSIBLE
6	80	Major Storm	BAD	MORE POSSIBLE
7	140	Severe Storm		VERY POSSIBLE
8	240		BLACKOUT	
9	400			

The K-indexes can be obtained at many internet sites. Some of my favorites, which provide mid-latitude indexes, are:

- <http://www.swpc.noaa.gov/Data/info/WWVdoc.html>
- <http://www.solarcycle24.com/>
- <http://dx.qsl.net/propagation/>
- <http://www.wm7d.net/hamradio/solar/k7ra.shtml>

The latter two sites above also provide a 3 day forecast of the various indexes.

**WWV and WWVH BROADCASTS**

WWV and WWVH also provide mid-latitude index information, propagation conditions during the past 24 hours and propagation forecasts for the next 24 hours. WWV broadcasts at 18 minutes after the hour and WWVH broadcasts at 45 minutes after the hour. The following is a sample of the WWV August 06 broadcast (This same information is available at (303) 497-3235):

Solar-terrestrial indices for 06 August follow:

- 1) **Solar flux** 82 and estimated **mid-latitude A-Index** 5.
- 2) The **mid-latitude K-index** at 2100 UTC on 06 August was 1 (07 nT).

No space weather storms were observed for the past 24 hours. Space weather for the next 24 hours is expected to be minor. Geomagnetic storms reaching the G1 level are expected.

In summary, use the Roundtable chart to look for trends and to forecast. Use the K index to determine present HF and VHF propagation conditions. Hopefully the information contained in this article will help you make some interesting contacts on HF and VHF. Good luck!

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**W0TX MAKES QST MAGAZINE**

By Bill – W6OAV

Check out page 91 in the September issue of QST. W0TX, the DRC 2 meter /20 meter packet gateway, is the center piece for an article on NET105. NET105 is a packet network on 14.105MHz consisting of many nodes and gateways around the country. The network's purpose is to provide a system for handling keyboard chats, message handling and emergency communications when required. The network provides access to VHF systems around the country and internet telnet access to worldwide nodes.

## THE ARRL / W1AW EXPERIENCE

By Bill – KB0MPY

On my recent trip to the east coast I was able to squeeze in a few hours to visit the headquarters of the ARRL in Newington Connecticut. This turned out to be much more than I had expected. The directions to the facility invite you to watch for the antenna farm. This was an impressive beacon to the location. Out front stands the small original building which houses the W1AW facilities. The headquarters is located in the rear of the property.

Entering the front door I was greeted by Skip who would be my tour guide. Along with me were my wife, our oldest son and his family. Skip asked a few questions of me to understand my interests. He then led us on a journey down the hallways of history, the present day and the future of HAM radio.

We were shown the displays of homebrew equipment made in the early years of radio as well as some made in more recent times. Such items as home made keys or a true tuna can radio. Antennas made from light reflectors. There is more but space is limited.

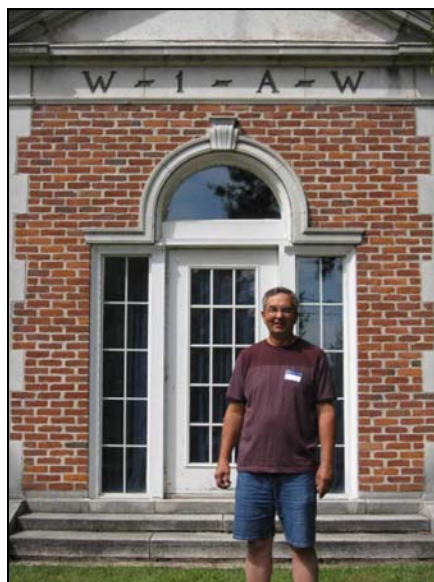
We saw the Product testing lab. We were shown the shops where products or ideas are built.

There is the rack of D Star equipment which is in full operation there at the ARRL facilities.

I met several of the people behind the scenes who right the articles and draw the schematics and pictures we read and enjoy. I walked past the library of documentation gathered over the years which is kept for reference and future use.

Then the real thrill for any HAM was about to happen. We walked across the parking lot to the small brick building which is home for the W1AW station. The doorbell was pressed and Joe, the keeper of the station, opened the door and welcomed me in.

This is an article in itself. We were first shown Marconi's



original static radio. Then we entered into a modern up to date facility. This was like any commercial radio station. Racks of radios used for the daily bulletins. Patch panels for each studio and each antenna to be connected as needed.



I was ushered into the first glass enclosed studio. Joe explained the layout as well as the requirements for use of the station. I displayed a copy of my license, DON'T FORGET YOUR LICENSE! I signed the log book and I was ready to call CQ as W1AW. What could be cooler than that!



Everything is automatic. I type the call sign of the station contacted and the signal report. The computer knows the frequency, time and date.

Should you ever make a trip east I strongly suggest a visit to the ARRL facilities. Say HI to Skip for me.

## UP COMING EVENTS

**4 SEPTEMBER – 26<sup>TH</sup> ANNUAL HAMFEST**  
**ALAMOGORDO AMATEUR RADIO CLUB**  
 Alamogordo, New Mexico  
 Otero County Fairgrounds  
 7am to 2pm  
 License Exams 12noon  
 Contact: K5LRW@qsl.net  
 Admission: FREE

**26 SEPTEMBER – BARCFEST**  
**BOUNDER AMATEUR RADIO CLUB**  
 Longmont, Colorado  
 Boulder County Fairgrounds  
 8am to ?  
 License Exams 10am sharp  
 Contact: BARC70@arrl.net / Mike W3DIF  
 303.404.2161

**7 FEBRUARY 2011 – ARA SWAPFEST**  
**Aurora Repeater Association**  
 Adams County Fairgrounds  
 9am to 1pm  
 Admission: \$5.00  
 Contact: Wayne N0POH, 303.699.6355

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September 2010							<i>DRC Net Sunday 8:30pm Local</i>
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	
			1 <b>Learning Net</b> 7pm 	2	3	4 <b>ARRL EME</b> 2.3GHz & Up Begins 0000U	
5 <b>ARRL EME</b> 2.3GHz & Up Ends 2359U	6 	7	8 <b>Learning Net</b> 7pm 	9	10	11 <b>ARRL VHF</b> QSO Party Begins 1800U	
12 <b>Grandparent's Day</b> 	13 <b>ARRL VHF</b> QSO Party Ends 0300U	14	15 <b>DRC Meeting</b> Elmer 6:30pm General 7:30pm 	16	17	18 <b>ARRL</b> 10GHz & Up Contest Begins 0600L	
19 <b>ARRL</b> 10GHz & Up Contest Ends Midnight	20	21	22 <b>Learning Net</b> 7pm	23 <b>First Day of Autumn</b> 	24 <b>Native American Day</b> 	25	
26	27	28	29 <b>Learning Net</b> 7pm	30			

*Check [www.ARRL.org](http://www.ARRL.org) for Contests and Rules!*

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## DRC REPEATERS

BAND	Freq / Shift / PL Tone	Additional Information
10m	29.620mHz (-100kHz) FM	Not In Service
6m	53.090mHz (-1mHz)	
Packet	145.05mHz<>14.105mHz	
2m	145.490mHz (-) 100Hz PL	Linked to the 70cm - 448.625mHz machine.
2m	147.330mHz (-) 100Hz PL	Local Area, Members Auto-Patch Does Not TX a PL!
2m	147.330mHz (-) 131.8Hz PL	NE Area Remote Does Not TX a PL!
1.25m	224.380mHz (-) 100Hz PL	
70cm	448.625mHz (-) 100Hz PL	Linked to the 2m - 145.490mHz machine.
70cm	449.350mHz (-) 100Hz PL	Wide area coverage with Echolink Node # 4140.

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DRC members - this is your newsletter. If there is something which is club or amateur radio related that you'd like to see as a regular feature, email suggestions to the editor. Members are the heart and sole of The Denver Radio Club, if you have an expertise or an interest in a particular segment of ham radio that you'd like to write about, you may email your submissions to AG0S@comcast.net. Submission deadline is the 25th of the September. **Editor**