



Majors Field Amateur Radio Club

Regular Monthly Meeting

SEPTEMBER 13, 2018

Agenda

- Officer Reports
- Calendar of Events & Announcements
- New/Old Business
- Adjournment



Current Officers

- **PRESIDENT**
Larry Smith – K5XB
- **VICE-PRESIDENT**
Michael Ketchum – K5MDK
- **SECRETARY**
Scott Davis – KK7JS
- **TREASURER**
John C. Nelson Jr. – NØDFW
- **TRUSTEE**
Jonathan Brown – WB5KSD



Officer Reports

- **SECRETARY'S REPORT**
 - **MEETING MINUTES** – as published in the AirWaves newsletter.
- **TREASURER'S REPORT** – John Nelson Jr. – NØDFW
- **PRESIDENT'S REPORT** – Larry Smith – K5XB



Select Committee Reports

- **REPEATER UPDATE** -- Jonathan Brown (w/ Gabe Cook)
 - Internet connection update.
 - Work day
 - 2m repeater status



Area Club Meeting Calendar

- Rains ARA Meeting Saturday, October 13th, Rains County EOC at 9 AM. Combined Rains/Hopkins County net Mondays 7:30 PM 146.92(-) (88.5)
- SVARA September 20th at 7 PM Hunt County Regional Hospital, Greenville – 2nd floor. Net Thursdays 7 PM 146.78(-) 114.8Hz (Except meeting night)
- Van Zandt County ARES meets Saturday, September 15th 9 AM, Canton Library.
- RARC September 18th (7PM) Soulman's BBQ . Net Tuesdays 7 PM 441.525(+) 141.3Hz. BU 441.375(+) 141.3Hz (Except meeting night)
- Next Majors Field ARC Meeting October 11th at 11:45am --- Kitty Hawk CR.



Contest Calendar

- **September**
 - 1-2 Alabama QSO Party www.alabamagsoparty.org
 - 2-3 Tennessee QSO Party www.tnqp.org/rules
 - 6 NRAU 10-Meter Activity Contest www.nrau.net
 - 6 SKCC Sprint Europe CW www.skccgroup.com
 - 8-9 WAE DX Contest SSB www.darc.de
 - 8-9 SKCC Weekend Sprintathon www.skccgroup.com
 - 8 Ohio State Parks on the Air www.ospota.org
 - 8-10 ARRL September VHF Test www.arrl.org/september-vhf
 - 9 North American Sprint www.ncjweb.com
 - 10 RSGB 80-Meter Autumn SSB www.rsgbcc.org/hf



Hamfest Calendar

- Upcoming
 - Belton HamEXPO!, Oct 6, Belton, TX, www.tarc.org/hamexpo/
 - Texoma Hamarama, Oct 26, Ardmore, OK, <http://www.texomahamarama.org>



Old Business

- Repeater Linking Project and Echolin
- Social media sites started and needs material.
- Appreciation to Audie Murphy/American Cotton Museum for use of the facility for FD. (have we completed this yet?)
- Cotton Patch Challenge Bike Ride support
- LARC VEC Status
 - New MFARC VE Coordinator needed.
 - Potential merger with SVARA VE team



New Business

- General Class Course and Testing
- Need for after-meeting programs
- Preparations for N5C Event



New Business

- **OTHER IDEAS OR DISCUSSION?**



Wrap-Up

- Go Backs?
- Do Overs?
- Second Guesses?
- I Wish I Had Said...
- I Just Remembered...

- Remember to add your name to the sign in sheet!



Program

RF Exposure and Antenna Safety Amplifier Operations



When do you need to do RF Environmental Evaluation?

Table 1

You must perform an RF environmental evaluation if the peak-envelope-power (PEP) input *to the antenna* exceeds these limits.

<i>Band</i>	<i>Power (W)</i>
160 meters	500
80	500
40	500
30	425
20	225
17	125
15	100
12	75
10	50
6	50
2	50

Repeaters: Non-building-mounted antennas: If the distance between ground level and the lowest point of the antenna is less than 10 meters *and* the power is greater than 500 W ERP.
Building-mounted antennas: If the power exceeds 500 W ERP.



First – What mode is in use?

Table 2
Operating Duty Factors by Mode

<i>Mode</i>	<i>Duty Factor</i>	<i>Notes</i>
Conversational SSB	20%	Note 1
Conversational SSB	40%	Note 2
	50%	Note 3
Voice FM	100%	
FSK/RTTY	100%	
AFSK	100%	
Conversational CW	40%	
Carrier	100%	Note 4

Note 1: Includes voice characteristics and syllabic duty factor. No speech processing.

Note 2: Moderate speech processing employed.

Note 3: Heavy speech processing employed.

Note 4: A full carrier is commonly used for tune-up purposes.



Check Antenna Gain

Table 3
Typical Antenna Gains in Free Space

<i>Antenna</i>	<i>Gain</i>	
	<i>dBi</i>	<i>dBd</i>
Quarter-wave ground plane or vertical	1.0	-1.1
Half-wavelength dipole	2.15	0.0



Calculate Mean Power

Determine and record the antenna gain and transmitter output power that is applicable. Note that transmitter power can be specified as either peak envelope (PEP) or mean power. The determination of human exposure levels, and consequently, minimum separation distances, is based on the mean power. Accordingly, where only PEP is known, the power shall be multiplied by the conversion factor (form factor) appropriate to the mode of operation. Table 1 provides form factors for transmission modes commonly used in the amateur service. For example, an SSB transmitter has a power rating of 100W PEP and the form factor from table 1 is 0.2 (no speech processing in use). Therefore the mean power is 20W. An FM transmitter provides 25W output power and form factor is 1, therefore the mean power is 25W.



Determine Safe Distance

Table 4
Estimated distances from transmitting antennas necessary to meet FCC power-density limits for Maximum Permissible Exposure (MPE) for either occupational/controlled exposures ("Con") or general-population/uncontrolled exposures ("Unc"). The estimates are based on typical amateur antennas and assuming a 100% duty cycle and typical ground reflection. (The figures shown in this table generally represent worst-case values, primarily in the main beam of the antenna.) The compliance distances apply to average exposure and average power, but can be used with PEP for a conservative estimate.

Distance from antenna (feet)

Frequency (MHz)	Gain (dBi)	100 W		500 W		1000 W		1500 W	
		Con	Unc	Con	Unc	Con	Unc	Con	Unc
2	0	0.5	0.7	1.0	1.6	1.5	2.2	1.8	2.7
	3	0.7	1.0	1.5	2.2	2.1	3.1	2.6	3.8
4	0	0.6	1.4	1.4	3.1	2.0	4.4	2.4	5.4
	3	0.9	2.0	2.0	4.4	2.8	6.2	3.4	7.6
7.3	0	1.1	2.5	2.5	5.7	3.6	8.1	4.4	9.9
	3	1.6	3.6	3.6	8.0	5.1	11.4	6.2	13.9
	6	2.3	5.1	5.1	11.4	7.2	16.1	8.8	19.7
10.15	0	1.6	3.5	3.5	7.9	5.0	11.2	6.1	13.7
	3	2.2	5.0	5.0	11.2	7.1	15.8	8.7	19.4
	6	3.2	7.1	7.1	15.8	10.0	22.4	12.2	27.4
14.35	0	2.2	5.0	5.0	11.2	7.1	15.8	8.7	19.4
	3	3.2	7.1	7.1	15.8	10.0	22.4	12.3	27.4
	6	4.5	10.0	10.0	22.3	14.1	31.6	17.3	38.7
18.168	9	6.3	14.1	14.1	31.6	20.0	44.6	24.4	54.7
	0	2.8	6.3	6.3	14.2	9.0	20.1	11.0	24.6
	3	4.0	9.0	9.0	20.0	12.7	28.3	15.5	34.7
	6	5.7	12.7	12.7	28.3	17.9	40.0	21.9	49.0
21.45	9	8.0	17.9	17.9	40.0	25.3	56.5	31.0	69.2
	0	3.3	7.5	7.5	16.7	10.6	23.7	13.0	29.0
	3	4.7	10.6	10.6	23.6	15.0	33.4	18.3	41.0
	6	6.7	14.9	14.9	33.4	21.1	47.2	25.9	57.9
24.99	9	9.4	21.1	21.1	47.2	29.8	66.7	36.5	81.7
	0	3.9	8.7	8.7	19.5	12.3	27.6	15.1	33.8
	3	5.5	12.3	12.3	27.5	17.4	39.0	21.3	47.7
	6	7.8	17.4	17.4	38.9	24.6	55.0	30.1	67.4
29.7	9	11.0	24.6	24.6	55.0	34.8	77.7	42.6	95.2
	0	4.6	10.4	10.4	23.2	14.7	32.8	18.0	40.1
	3	6.5	14.6	14.6	32.7	20.7	46.3	25.4	56.7
	6	9.2	20.7	20.7	46.2	29.3	65.4	35.8	80.1
	9	13.1	29.2	29.2	65.3	41.3	92.4	50.6	113.2



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- Next ... RF Safety



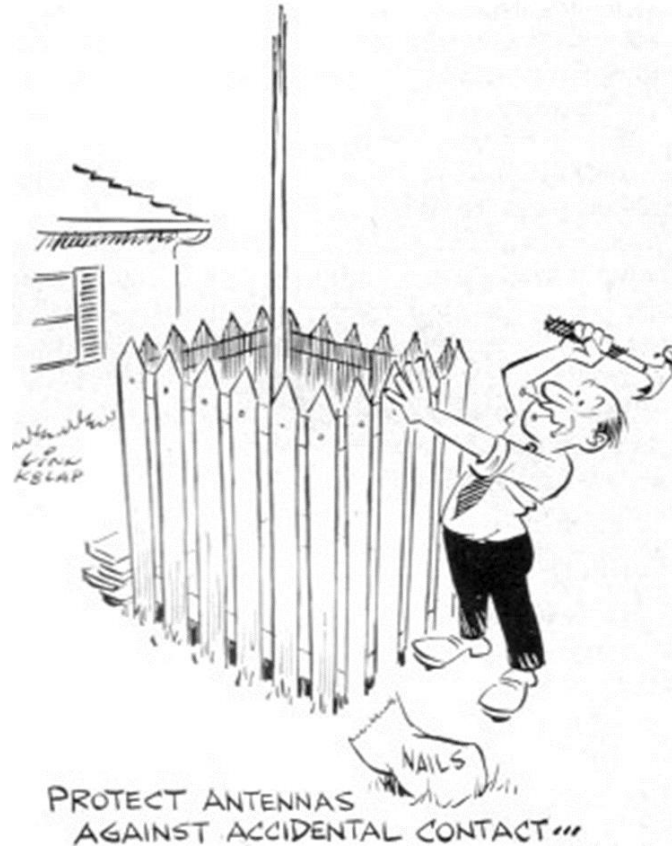
(this might be: 'nuff said!



Even Kitty can be exposed!



Antenna Perimeter



Amplifiers

Amplifier Operations

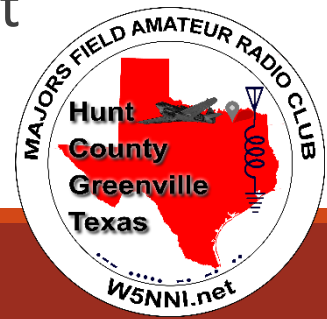
- Some Safety Considerations:
 - An amp in its case with covers on, grounded, plug and cord in good condition, properly loaded and properly tuned is perfectly safe to operate.
 - Always:
 - Be sure the amp is off when plugging or unplugging power.
 - Be absolutely sure you never turn the band switch while the amp is making power.
 - Be absolutely sure the amp is not being driven by the exciter when the amp switches from receive to transmit, or transmit to receive.
 - Be absolutely sure a properly tuned antenna or a dummy load is attached to the output before causing the amp to make power.



Amplifiers

Amplifier Operations

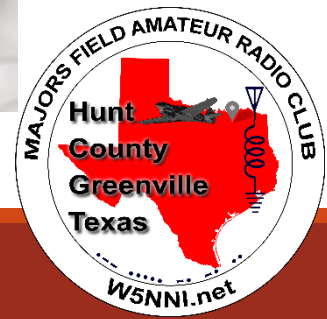
- Most amplifiers require output circuit tuning which has become a lost art among typical operators
- Become familiar with the terms Plate Current and Grid Current.
- Typically we will reduce exciter power and use the Tune Control for maximum amplifier output which should coincide with minimum Plate Current. Adjust the Load Control for Max out. Then readjust the Tune Control for max out. Lastly increase exciter power for max output within the limits of the maximum Grid Current.



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- That is called “Dip the Plate and Peak the Grid.”
 - 3-500z tubes we will be using are pretty forgiving up to a point. But Grid Current is still the enemy. Too much and the tube will short out.
 - Tubes like the 3CX800 and the 8877 are very intolerant of excess Grid Current and I don’t recommend them for beginners in high power.

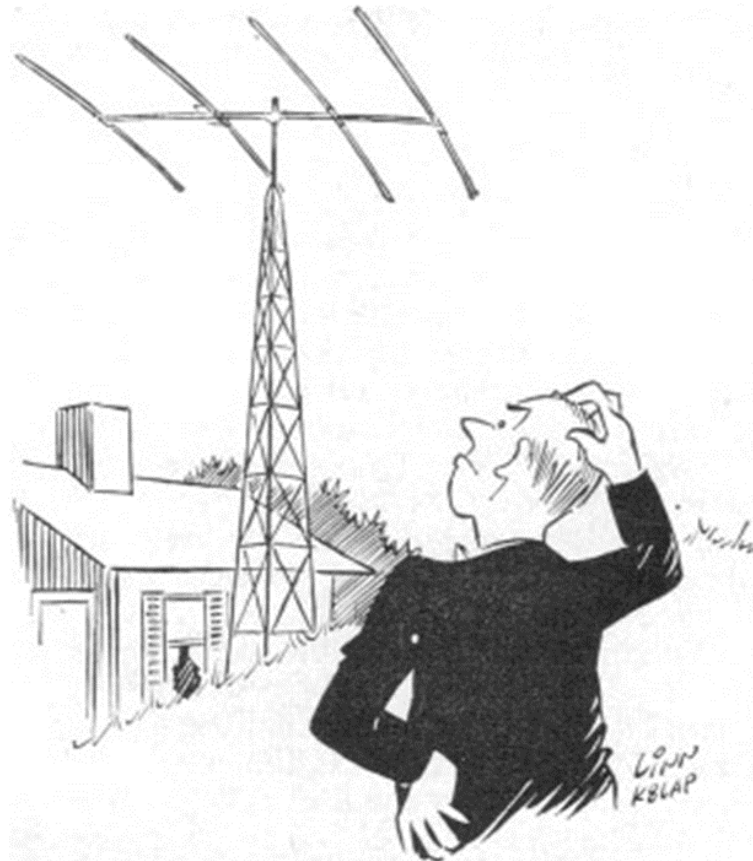


AL-80A



SB-1000





EVERYTHING SEEMS TO BE OKAY!!!



Adjournment

C U NEXT MONTH



THE END

