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THE NEWSLETTER OF STARS (SOUTHTOWNS AMATEUR RADIO SOCIETY)

ISSUE 304

APRIL 2007

# AMATEUR RADIO ACTIVITY SHUT DOWN IN IRAQ

Iraq Amateur Radio Society (IARS) President Diya Sayah, YI1DZ, has informed ARRL that all Amateur Radio activity in Iraq has been suspended until the security situation there improves. The ham radio blackout began this week.

Sayah says the suspension affects both Iraqi citizens as well as any foreigners, including military personnel and contractors -- who have been on the air from Iraq identifying with YI9-prefix call signs. It does not affect the operation of Military Affiliate Radio System (MARS) stations, however, since they operate on military frequencies, not amateur frequencies. The IARS is informing its member to stay off the air, although some Voice over Internet Protocol (VoIP) modes like IRLP and EchoLink still are okay to use, as long as they don't involve transmitting a signal over the air.

The request to halt all ham radio activity and the issuance of licenses in Iraq originated with a letter from the Iraqi Ministry of Defense to Iraqi Prime Minister Nouri al-Maliki as part of the new Baghdad security plan, Sayah said. He received subsequent confirmation via the Ministry of Higher Education and Scientific Research to shut down ham radio activity, although he allows for a possible misunderstanding on the part of government officials as to the nature and purpose of Amateur Radio.

"I'm waiting an answer from the Office of Prime Minister, because I requested a meeting with him through e-mail," Sayah told the League. He said the government expressed concerns over the difficulty of



identifying "enemy" as opposed to "friendly" radio traffic, the potential for revealing military movements via radio and eavesdropping.

Sayah said the government also wanted radio amateurs in Iraq to send all ham radio equipment to the IARS until the security situation improved, but he's advising hams in Iraq to hang onto their gear. "Because we had the security plan going, no one can carry his equipment, and all checkpoints belongs to the Ministry of Defense," he said. "Besides, the location of our Society is not safe to keep members' equipment in one place."

Sayah also has reached out to the worldwide Amateur Radio community to use its influence to reverse the Iraqi government policy.

- The ARRL News

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#### FROM THE PRESIDENT

Hello To All! Hard to believe it's April already, No fooling.

As some of you know, we have started doing some public relations for STARS—redoing the old club flyers with a quick update. We intend to continue with these efforts to boost the membership of the club.

At the April meeting we will be discussing the Dayton Club Special. So if you in intend to go to Dayton this year, please try to attend.

We are working on designing a updated edition of the club T-shirts and want to make them available once again. They will be similar to the golf type T-shirts you commonly see with the STARS logo. More to come on this.

Now is also the time to start thinking about Field Day 2007, I know it's 2 months away in June and you're wondering why I would be talking about Field Day already. We are all very busy these days and I just wanted to refresh your memory a little so that you can set the time aside. We had a really great time last year and it looks like a even better time this year. Remember STARS is a learning Club and that is the premise that we want to build on. Don't forget the idea behind Field Day is "Emergency Communications" NOT how many points the club can score. Let's get out to the site and work up the bands and let the World hear CQ FD CQ FD WB2ELW QRZ?.

> 73's Bob Koster KA2WYE



STARS has been designated a Special Service Club by the ARRL.

# A Look at High Frequency Single Wire Antennas

by Don Niles - K2PMC

Let me start out by saying that I am not an expert in the field of antennas, nor do I even consider myself extremely knowledgeable in the field of antennas. I am just a ham radio operator from way back who likes to experiment with various ways of putting RF into the ionosphere. Now, having cleared the air in that regard, let's get to the topic of this initial article.

One phenomenon that I have observed recently is that more and more amateur radio operators are buying, rather than making their own HF antennas. Now, I can understand purchasing a multi band beam or vertical antenna because there are design and construction techniques employed in these types of antennas that exceed the skills or parts availability of many of us. But, the question I keep asking myself is why would someone pay big bucks for a hundred feet or so of wire with maybe a balun thrown in when the same, or in many cases better, antenna can be home brewed for a fraction of the cost?

Simply stated, the wire antenna has 2 components, the radiator (sometimes called the flat top) and the transmission line (sometimes called the feed line). In this installment I am going to discuss only the wire or flat top portion of the antenna. I will discuss transmission lines in a future article. And, if there is sufficient interest, we can get into further comparisons of some commonly used wire antennas.

Also, I am not going to get into the design and construction of multi-element phased arrays because most people don't have the space or support structures for antenna systems of this nature. Furthermore, anyone who would build a system of this type knows at least as much, if not more about antennas than I do.

Most hams would like to have a single antenna that they could use on several bands with good performance. For that reason, I will be concentrating on the

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multiband center fed HF antenna. This antenna may be called a dipole, a doublet, or a zepp (not to be confused with the Extended Double Zepp). No matter what the name, they are the same. The center fed antenna is a balanced antenna. That is, the currents on either side of the feed point are equal.

Before I get into a comparison of wire antennas, I think it is important to understand the term "vertical angles of arrived signals" (VAAS). An understanding of the VAAS is important because it will have a direct impact upon the design and performance of your antenna. Table 1 lists the VAAS factors for the 80 through 10 meter bands. The 40 through 10 meter (excluding 30 meters) data are actual data as reported in the ARRL Antenna Book. Information was not available for 80 or 30 meters, so I estimated the VAAS for those bands based upon the VAAS for the other bands. I included the 30 meter WARC band because first, I like it, and more importantly, it is a great band for rag chewing and DX. Additionally, it stays open well into the evening hours even during periods of low sunspot activity and is not as prone to warm weather QRN as the lower frequency bands.

A multiband antenna should perform well across a broad spectrum of frequencies. However, its effectiveness will depend upon the VAAS of the band in use and the height of the antenna. If you are interested in an effective DX antenna, then you must consider the height of the antenna. If your interest lies mainly in shorter range communication, then height is not as big a factor. The only way you can reduce the angle of radiation on a single wire antenna is to increase its height above ground. In this case, the magic number is one quarter wave length. At a height of one guarter wave length the antenna begins to respond well to the VAAS. So a rule of thumb is the higher the antenna, the lower the angle of radiation. This does not mean that you can't work DX on 20 meters with a 30' high wire. But, don't be surprised when stations that are 1500 miles out are rolling in S9 and stations in Europe are much weaker. It's not the band conditions, it is that your antenna is responding to a higher VAAS. When your antenna is relatively low, you can still work stations at long distances. However, you will be working them via a multi-hop route rather than a single hop (or less hops) route if your antenna were higher. Multi-hop means just what the name implies. Your signal will reflect off the ionosphere, back to the ground and then back to the ionosphere. This can happen multiple times, each time resulting in a weakening of the signal. And, your antenna will receive signals in the same manner.

For example, a 20 meter dipole that is 30' high has a maximum forward gain of 6.59 dbi at an angle of elevation of 32 degrees. This means that most of its power is being radiated at an angle that is substantially higher than the VAAS for 20 meters. Take that same antenna and raise it to 50' and the forward gain increases to 7.44 dbi, not really much different, but the elevation angle has dropped to 20 degrees. Now most of the power will be radiated at an angle much closer to the VAAS for 20 meters resulting in much better DX performance. Now that we understand antenna height versus VAAS, let's do some comparison of antennas.

Many people think that in order for a center fed antenna to perform well, it must be a half wave at its fundamental frequency. That is not necessarily true. Short center fed antennas can be effective, providing they are not too short. A good example of this is the

G5RV antenna

First, from Louis Varney, G5RV, of West Sussex, UK, here is some background and insight into the G5RV. "The G5RV antenna, with its special feeder arrangement, is a multiband center-fed antenna capable of efficient operation on all HF bands from 3.5 to 28 MHz. Its dimensions are

(Continued on page 4)

		Table 1	
Freq. Mhz	Angle below which signals arrived 99% of the time	Angle above which signals arrived 50% of the time	Angle above which signals arrived 99% of the time
3.5	45°	30°	20°
7	35°	22°	10°
10.1	25°	18°	8°
14	17°	11°	6°
28	9°	5°	4°

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specifically designed so it can be installed in areas of limited space, but which can accommodate a reasonably straight run of 102' for the flat-top." A102' antenna may be a good fit for a small lot when compared to the 80 meter dipole which is usually in the area of 132' or so.

I have run a series of comparisons using EZNEC to see how the G5RV antenna stacks up against the 80 meter dipole. The antennas are modeled at a height of 50' over average ground.

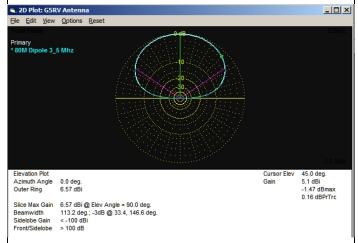
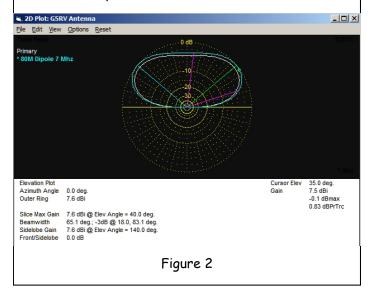


Figure 1

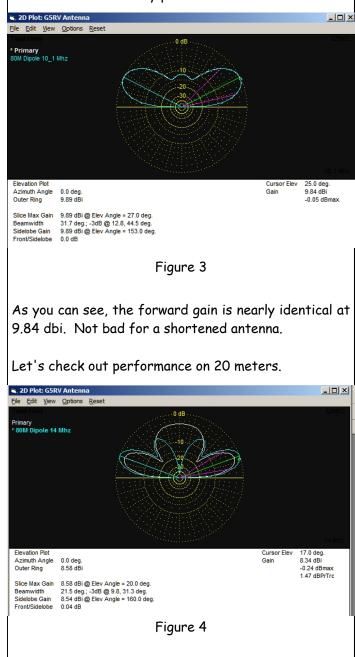
The forward gain of the 80 meter dipole calculates out at 5.1 dbi while the G5RV comes in at 4.94 dbi. So, at 80 meters, the 2 antennas are equal in performance, as the .16 dbi difference in gain is of no consequence.

Now let's compare these 2 antennas on 40 meters.



You will notice that at 35 degrees the 80 meter dipole comes in at 7.5 dbi while the G5RV is at 6.67 dbi. Again, not a noteworthy difference.

Now let's see how they perform on 30 meters.

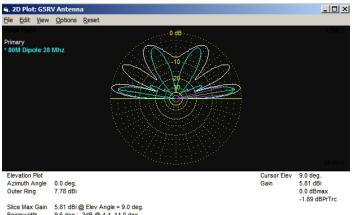


On 20 meters, the 80 meter dipole at 8.34 dbi begins to show some gain over the G5RV at 6.87 dbi. The 1.47 dbi difference might be noticeable at the receiving end.

And lastly, let's look at 10 meters.

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 Slice Max Gain
 5.81 dBi @ Elev Angle = 9.0 deg.

 Beamwidth
 9.6 deg; -3dB @ 4.4, 14.0 deg.

 Sidelobe Gain
 5.81 dBi @ Elev Angle = 171.0 deg.

 Front/Sidelobe
 0.0 dB

Figure 5

On this band, the G5RV comes in at 7.78 dbi while the 80 meter dipole sits at 5.81 dbi for a difference of 1.89 dbi. The extra gain provided by the G5RV could make a difference on the receiving end.

So, after looking at all this you might come to the conclusion, that the G5RV antenna is just what the doctor ordered. Well maybe, and..... maybe not. In my next installment I will discuss transmission lines and how the transmission line can affect antenna performance. Oh, by the way, maybe you can't do 102'. But, how about an antenna that is 84' long and still does a good job over a wide range of frequencies? Can you do that? Stay tuned......

73, Don - K2PMC

## Club Nets

STARS club nets are open to all to exchange information on local amateur radio activities.



STARS WB2EZU Memorial HF net meets at 10AM local time on Saturdays on 3.925 MHz +/- QRM. Bob Lehning WA2YSJ is usually the net controller.

STARS co-sponsors, along with WB2JPQ, the Sunday morning RagChew Net at 9:30AM on 28.380 Mhz.

# PROS HAMFEST APRIL 21

The Pioneer, Radio, Operator, Society (PROS) will be holding it's annual indoor hamfest in Sardinia on April 21, 2007 at 8 AM until noon. The location is at the Sardinia Historical Society Building on Savage Rd. in Sardinia NY. It is accessible from Rt 16 or Rt. 39 and the Rt. 219 expressway in Southern Erie County. Talk in will be the 145.390 repeater in Delevan. The PROS club will also conduct a Foxhunt this year at 11 AM.

Tables are \$5. The club is raffling off a Trip to 2007 Dayton Hamvention. This includes 2 nights overnight accommodations, 2 admissions tickets, bus passes and some spending cash or take the cash of \$300. You pick one or the other. Come out and enjoy the Tricounties "Cabin Fever reliever".

For more info for table reservations, call Roy at 716/676-3903 or Email at schwedt@netscape.com

# Atlantic Division 2007 Awards Nominations

Do you know someone who has really stood out in their service to amateur radio? That service could be in: technical abilities; public service; training; education, you name it. Wouldn't it be an honor for that individual or group to be recognized by their peers for their time and talents spent in good service to others? Why not nominate them for one of the Atlantic Division Awards that they qualify for?

Nominations are being sought for two awards, Amateur of the Year and Technical Achievement Award. Atlantic Division awards are presented annually to the hams who make us proud to be part of the Amateur Radio Service. Nominations are taken from the ham community. Selection is made by an Awards Committee chaired by the Atlantic Division Vice Director.

The awards are conferred at the annual Division Convention. The nomination period closes April 14, 2007 for this nomination. For more information, go to http://www.atldiv.org/AtlAwards.htm

## April Special Events

Apr 7, 0000Z-2359Z, Tulsa, OK. Tulsa Health Department Amateur Radio Club, K5THD. Celebrating World Health Organizations World Health Day 2007. 28.373 21.373 14.273 7.273. Certificate. Tulsa Health Department Amateur Radio Club, 5051 S 129 E Ave, Tulsa, OK 74134. PSK and SSTV on request. www.tulsa-health.org/k5thd

Apr 14-Apr 16, 1000Z-0547Z, Godalming, SU, ENG-LAND. Wey Valley Amateur Radio Group, GB95MGY. 95th Anniversary of Loss of RMS Titanic. 21.015 14.015 7.015 3.015. QSL. RSGB Bureau (or via QRZ.COM), Lambda House, Cranborne Rd, Potters Bar, HE EN6 3JE, ENGLAND. WWW.WEYVALLEYARG.ORG.UK

Apr 21, 1400Z-2100Z, Carthage, TX. Panola County Amateur Radio Club, WA5PC. Only international boundary marker within US. 21.425 14.325 7.275 3.950. Certificate. WA5PC, 380 CR 1271, Gary, TX 75643. 166th year; the only remaining marker that separated the US and the Republic of Texas. www.wa5pc.org

Apr 21-Apr 22, 2000Z-2359Z, Piscataway, NJ. Piscataway Amateur Radio Club, K2VOA. Former Voice of America relay station WBOU. 28.370 21.370 14.270. Certificate. Bill Toth, 6 Rivercrest Dr, Piscataway, NJ 08854. www.homestead.com/k2voa

Apr 26-Apr 29, 1700Z-2200Z, Virginia Beach, VA. Virginia Beach Amateur Radio Club, W4UG. 400th Anniversary of the First Landing of English Settlers. 28.365 21.365 14.265 7.265. Certificate. W4UG VB 2007, PO Box 62003, Virginia Beach, VA 23466. Joint effort with Jamestown Landing; reenactment of the First Landing on American Soil. www.w4ug.com

Apr 28, 1400Z-2300Z, Kushla, AL. Mobile Amateur Radio Club/Mobile County ARES, W4IAX. 142nd anniversary of the signing of The Southern Appomattox. 146.520 50.125 14.260 7.260. Certificate. Gerald Jones Sr, KD4DLJ, 7015 Victor Rd, Mobile, AL 36608-4244. www.w4iax.com

# April Contests

**QRP ARCI Spring QSO Party** -- CW, sponsored by the QRP ARCI, from 1200Z Apr 7-2400Z Apr 8, work 24 hours max (same rules as Fall QSO Party, see Oct 2006 QST, p 102 or www.qrparci.org).

#### EU Spring Sprints --

CW, managed by G4BUO from 1600Z-1959Z Apr 14 Frequencies (MHz): SSB -- 3.730, 7.050, 14.250; CW -- 3.550, 7.025, 14.040.

SSB, managed by 9A6XX, 1600Z-1959Z, Apr 21 EU stations work everyone, non-EU stations work EU only. Exchange: your call, the other station's call, serial number starting at 001, your name -- both stations must repeat both call signs. For more information or contest software: www.eusprint.com.

Ontario QSO Party -- CW/Phone, sponsored by Contest Club Ontario and the Ontario DX Association from 1800Z Apr 21-1800Z Apr 22. Frequencies (MHz): SSB -- 1.870, 3.735, 3.860, 7.070, 7.260, 14.130, 14.265, 21.260, 28.360; CW -- 30 kHz above band edges; VHF-SSB: 50.130, 144.205, 432.105; VHF-FM 52.540, 146.550, 446.1; no repeater QSOs. For more information: cco.ve3xd.com/oqp.

**EA QRP Contest** -- CW, sponsored by the EA QRP Club. From 1700Z Apr 21-1300Z Apr 22 in four parts (see Web site). Frequencies: 80-10 meters. Categories: QRP and QRPp (<1 W). Exchange: RST+A (QRP) or B (QRPp) + M (Member EA QRP). QSO points: same country -- 1 point; same continent -- 2 points; different continent -- 4 points; all QRPp -- 5 pts. For more information: www.eaqrp.com.

**Old-Old-Timers Club QSO Party** -- CW/SSB, from 0000Z Apr 28-2359Z Apr 29. Frequencies: 80-10 meters. Exchange: RS(T) and member number or state. Score: total number of QSOs, work stations once per band and mode. For more information: www.ootc.us/ party. Page 7

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# KNOW YOUR PRIVILEGES! MISCONCEPTIONS ABOUND REGARDING TECH HF PRIVILEGES

Some Technician licensees who gained new privileges February 23 remain unaware or uninformed as to what they may and may not do on the HF bands, says ARRL Regulatory Information Specialist Dan Henderson, N1ND. In addition to all Amateur Radio operating privileges above 50 MHz, Technicians who never passed a Morse code test now have CW privileges on certain segments of 80, 40 and 15 meters plus CW, RTTY, data and SSB privileges on certain segments of 10 meters. And that's it. "Know your privileges (www.arrl.org/FandES/field/regulations/bands.html)" Henderson advises all Amateur Radio licensees. He says some Technicians apparently believe their new HF phone privileges go far beyond what they really have.

"Technicians have no phone privileges on any HF band other than 10 meters, period!" Henderson emphasizes. "That's the bottom line. If you want to operate phone on the other HF bands, you'll have to upgrade to General or Amateur Extra class."

A lot of Technician licensees appear to have done just that, according to statistics compiled by Joe Speroni, AHOA. So far in March, the number of General class licensees is up by more than 2700 over the February figure to 134,173, after hitting a 5-year low of just under 131,000 in January. The number of Technicians dropped by 4655 in the same period to 318,838. Speroni notes, however, that his mid-month figures tend to underestimate actual totals.

Most Technician license holders face a learning curve to take advantage of their new CW privileges on HF, but they no longer have to pass a Morse code examination. Technicians also may use their new HF privileges without having to apply for them first. No other license class automatically acquired additional privileges February 23. The "omnibus" rule changes effective last December 15 did not give Technician licensees without Morse code credit any additional privileges either.

Henderson further warns new Techs not to extrapolate additional phone privileges by misconstruing the FCC Part 97 rules to mean something they don't. "Calls I've been getting lately indicate that some misinformed individuals believe Technicians may operate 'digital voice' on 80, 40 and 15, where they have only CW privileges," he says. "Not true. Digital voice is really digitized voice, and it's not permitted in nonphone band segments."

Henderson reiterates that Technicians do not have FM voice privileges on 10 meters -- or on any other HF band, for that matter.

The HF privileges all Technicians now have are equivalent to those that Novice licensees enjoy, Henderson notes. "This also means the 200 W maximum power limit still applies, regardless of where you operate in the HF bands," he says. Technicians may operate at up to the legal limit on VHF and UHF, however.

On 10 meters, Technician and Novice licensees have CW, RTTY and data privileges from 28.000 to 28.300 MHz, and CW and SSB privileges from 28.300 to 28.500 MHz. "We're sorry that the sunspots aren't favoring 10 meters at this point in the sunspot cycle, but they will in a few years," Henderson allowed.

In addition, Technicians and Novices have CW -- and only CW -- privileges on from 3.525 to 3.600 MHz on 80 meters, from 7.025 to 7.125 MHz on 40 meters and 21.025 to 21.200 MHz on 15 meters.

Henderson believes at least some of the confusion may have originated with a few brand-new or inexperienced Technician licensees who heard that the FCC deleted the Morse code requirement to obtain an Amateur Radio license, but paid little attention to the fine print.

"And we all know the devil's in the details," Henderson says. "Remember, the FCC requires you to know where you may and may not operate and with what modes. Stick to the privileges your license allows or risk hearing from the FCC."

- ARRL News

## FCC NOW POSTING AMATEUR RADIO ENFORCEMENT ACTIONS

Amateur Radio enforcement correspondence -- with some exceptions -- now is available to the public on the FCC's "Amateur Radio Service Enforcement Actions" Web site www.fcc.gov/eb/AmateurActions/ Welcome.html. The listing will be cumulative, and Special Counsel in the FCC Spectrum Enforcement Division Riley Hollingsworth anticipates updating it every 7 to 10 days.

The site will not be a comprehensive listing of enforcement correspondence. For example, it will not include letters requiring retesting pursuant to \$97.519(d) of the FCC's rules, letters regarding radio frequency interference to amateur licensees and letters requesting an initial response to a complaint.

Direct all questions concerning the Amateur Radio Service Enforcement Actions Web postings via e-mail only to Riley Hollingsworth in the FCC Spectrum Enforcement Division fccham@fcc.gov.

#### Ham Radio Trivia

Test your knowledge with these questions taken trom the QRZ. COM trivia website.

1. If you are sending CW at a speed faster than the other ham in a QSO, the considerate thing to do is:

- a. Send at a speed about the same as the other ham
- **b**. Ignore him and move on
- ${\bf c}.$  Send 5 WPM less than your normal speedRG-8X
- d. Keep sending at your regular speed

**2.** At short ranges, the best reception occurs when the transmitting antenna and receiving antenna are of the same orientation.

- a. True
- **b**. False

**3**. Over long distances, a signal transmitted from a vertical antenna will be received best when both antennas are of the same orientation (e.g. vertical to vertical)

- a. True
- **b**. False

**4**. In what year did Marconi first span the Atlantic with wireless communication?

- **a**. 1896
- **b**. 1900
- **c**. 1908
- **d**. 1901

**5**. Marconi was awarded the Nobel Prize for Physics. In what year did this occur?

- **a**. 1899 **b**. 1909
- **c**. 1909
- **C**. 1912
- **d**. 1916

6. Who developed the superheterodyne receiver?

- a. Harry Collpits
- **b**. Maj. Edwin Armstrong
- ${\bf c}.$  Hedy Lamar
- d. Thomas Edison
- 7. A "side-swiper" is:
  - **a**. A large mobile antenna
  - **b**. A telegraph key
  - c. A bandspread dial
  - d. A Collins 160 meter converter

**8**. How long does it take for a solar flare to affect radio propagation on Earth?

- **a**. Instantly
- **b**. 16 minutes
- **c**. 20 to 40 hours
- d. 8 minutes
- 9. Solar cycles have an average length of:
  - **a**. 1 year
  - b. 3 years
  - c. 6 years
  - **d**. 11 years

**10**. Which of the following is another name for a poor operator?

- **a**. SAP
- **b**. LAD
- c. SAD
- d. LID

(Answers on next page)

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# STARS & ARRL MEMBERSHIPS

Membership in STARS is open to anyone with an interest in amateur radio. A license is not required. Membership applications may be downloaded from the club website or obtained by sending a SASE to Judy Levan N2TEZ, 120 University Blvd., Depew, NY 14043.

Annual dues are payable on January 1 and are \$21 for a single membership, \$27 for family memberships and \$8 for a student membership (through grade 12). The dues are pro-rated on a monthly basis for new members plus there is a one-time initiation fee of \$5 when first applying to the club. For example, a new member joining in July would pay \$15.50 (6 months X \$1.75 per month plus the \$5 initiation fee).

Applications should be returned to Judy N2TEZ along with the appropriate dues. The applications will be reviewed and approved by the Board of Directors and then voted on by the general membership at the next regular club meeting.

Members who are joining ARRL for the first time or who are renewing their membership should send their ARRL membership forms to Jack Cullum KB2ESM, 6871 Webster Road, Orchard Park, NY 14127 along with a check made out to STARS. No extra cost to you and STARS benefits!

# AMATEUR RADIO EXAMINATIONS

STARS will be holding test sessions during 2007. Test dates are set for April 14, May 12, July 14, Sept 8,

and Nov 10. For information or to preregister for STARS tests, contact John Crawford KB2VWC at 649-5933.

Lancaster ARC will be holding test sessions on a quarterly basis. For information on or



to pre-register for Lancaster exams, call Hal Cameron NH7R at 832-0031. Pre-registration is required.

ARATS will be hold test sessions on the first Saturday of the month (except when falling on a holiday weekend, when they will be on the second Saturday) starting promptly at 10AM at the North Tonawanda Fire Headquarters at 495 Zimmerman Street. Walkins accepted, pre-registration is highly recommended. For information on or to pre-register for ARATS exams, call Vic Godzik K2YW at 694-9738 or email k2yw@hotmail.com.

PROS holds test sessions as needed at 585 North Star Road, East Aurora. For information, contact Pat Murray NW2I at 652-8178.

# Visit STARS on the web at www.wb2elw.com

Answers to Trivia Quiz:

1-a; 2-a; 3-b; 4-d; 5-b; 6-b; 7-b; 8-c; 9-d; 10-d.

## MARK YOUR CALENDAR

NOW!

# FIELD DAY IS JUNE 23-24



## CLUB REPEATERS

The club repeater (WB2ELW/R) is located near Colden, NY (147.09/.69 output/input) with a PL of 107.2 Hz). Use a PL of 141.3 for the Nike Base remote receiver. STARS honorary southern repeater (KE2VW/R) is in Arkwright, NY (146.67/.07 output/ input with a PL of 107.2 Hz). The club UHF repeater is location near Colden, NY (442.325 MHz with a PL of 107.2 Hz).

# CLUB HF STATION

The club Nike Base HF station is located on Lakeview Road 1.75 miles east of Route 20 next to the Hamburg Town Arena.

# CLUB MEETINGS

Club meetings are held on the first Thursday of the month at the Hamburg Youth Center (Prospect and Hawkins Avenues) at 7:00PM. Everyone is welcome. Board meetings are held on the fourth Thursday of the month at the Nike Base Club Station at 7:30PM and are open to all club members.

