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July/August 1998 Newsletter of the Joplin Amateur Radio Club Vol. 8 Issue No. 7&8

ARRL PROPOSES CHANGES TO AMATEUR LICENCING STRUCTURE

The ARRL Board has agreed to propose a simplified Amateur Radio licensing structure with four classes. Lengthy discussion and debate during the Board's meeting July 16-18 led to majority support for a plan for four written examination elements to establish amateurs' operational and technical qualifications instead of the present five, and two Morse code examination elements instead of the present three.

Under the plan adopted by the Board, the entry level to Amateur Radio would be known as Class D and would convey the privileges of the present Technician license. The written examination would be at the same level of difficulty as that of the present Technician examination, but consistent with the privileges of the license. All amateurs now licensed as Technicians would become Class D.

The next step would be known as Class C and would convey the privileges of the present General license, but with phone subbands expanded by 50 kHz on 75 and 15 meters and by 25 kHz on 40 meters. Class C would be the entry level to high frequency (HF) operating privileges. To upgrade from Class D to Class C, an amateur would pass a written exam on the operational and technical qualifications required for HF operation and a 5 word per minute Morse code examination. All amateurs now licensed as General, Technician Plus, and Novice would become Class C. The expansion of the telephony sub-bands would result from "refarming" of the Novice CW bands that are no longer required for their original purpose.

The third step would be known as Class B and would convey the privileges of the present Advanced license, but with phone subands expanded by 50 kHz on 75 and 15 meters and by 25 kHz on 40 meters. To upgrade from Class C to Class B, an amateur would pass a more advanced written examination similar in difficulty to the present Element 4A and a 12 word per minute Morse code examination. All amateurs now licensed as Advanced would become Class B.

Board members were adamant that simplifying the structure should not come at the expense of privileges already earned by amateurs.

The final step would be known as Class A and would convey the full privileges of the present Amateur Extra Class, with telephony sub-bands expanded by 50 kHz on 75 and 15 meters and by 25 kHz on 40 meters. To upgrade from Class B to Class A, an amateur would be required to pass the most difficult written exam in the sequence. Consistent with the practice in

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15 METERS

THE BAND TO TRY

BY JOHN TUDENHAM WØJRP

As the new solar cycle continues to improve, 15 meters will become one of our better amateur bands. You will notice many times 10 meters will be open, but few if any skip signals will be heard on 15 meters. Actually, 15 meters is usually always open more than ten, but when everyone listens and no one transmits you will hear nothing. On field day this year, 15 was one of our best bands and a lot less QRM than either 20 or 40m.

A novice or tech plus class can work 15 meters in the range of 21.1-21.2 MHz using CW and a maximum power of 200 watts. General class licenses may operate a good portion of the voice band.

This fall, starting around October, you may expect morning openings to Europe and Africa, most of the day to South America, and evening openings to the Pacific and Asia. Also, daytime openings should occur to both coasts with very strong signals, all by regular F2 skip using an ionized layer up at about 200 miles.

The band will probably close about two hours after local sunset for long skip, but may occasionly open in the evenings for short (Sporadic E) skip. This is the same type of propagation that produces short skip openings on both 10 and 6 meters.

A Yagi beam antenna is the best antenna for DX work, but even a simple dipole or vertical will do well. Having a lower angle of radiation, the vertical antenna

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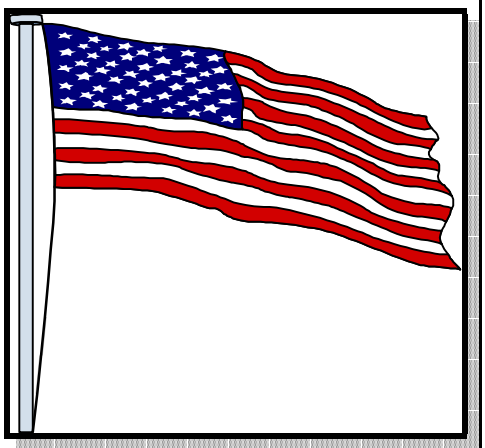
inside...

THE WORLD OF VHF

2 METER OPENINGS

May and June are always exciting times on the so called weak signal portion of the VHF bands and this year was no exception. The evening of May 20 was a great night for two meter sideband operators. In the state of Florida around the Tampa area, grid square EL86 was worked during a good Tropo Duct opening. This was very rare for the distance involved. Joplin area hams WØVD, NØMST, KØETC, NØLIE, WØRT, and WØJRP got in on the action. If that wasn't enough, our club president NØMST did one better by working CO2OJ in **Havana Cuba** (grid square EL83). Larry was probably the first Missouri Amateur to work Cuba on Two Meters. Wouldn't you know that if it was going to be done, it would be Larry! It was reported that CO2OJ was worked as far west as the Wichita KS area (grid EM17). He was heard by a western KS station in grid DM98, only 40 miles from the Colorado line! Several Sporadic-E skip openings were also reported to the east coast by several area hams on two meters. While E-skip on six meters is very common this time of year, two meter openings are usually short duration and very spotty. However, the distances covered are usually over 800 miles.

On six meters, during the June VHF contest held June 13-14, the band was as hot as a 4th of July firecracker, just a few weeks early. Several Joplin hams worked Cuba some for the first time on six meters. COØFRC in grid EL83 was worked by several hams including KCØBUL, KØETC, and WØJRP. Better yet, during field day weekend, home stations in our area worked into Costa Rica. Among the lucky ones was Larry Hiatt KCØAUY, running just **10 watts** with a vertical antenna. This represents a double hop E-skip of around 2000 miles, and it proves that when conditions are right on the



magic band, it doesn't take much power or a large antenna. Larry also had a big thrill contacting his long time friend from the Denver area, Wayne NØPOH. Larry knew Wayne long before either were hams, and an unusual thing, I (WØJRP), also knew Wayne for many years before he got his ham license. He, like myself, belongs to the National Radio Club, a listeners club which has nothing to do with ham radio. I first met Wayne at a convention held at Topeka KS in 1989.

Since the last part of June, openings have been a little scarce on six and two meters. We hope things pick up in July and August. For now thats all the big VHF DX news.

73
John WØJRP

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should do better on long haul DX. You can take advantage of the lobes produced by a 40 meter dipole. It can do a good job in some directions, with slightly more gain than a simple dipole.

The 15 meter band has a frequency range of 21.0-21.45 MHz with the lower portion (21.0-21.2 MHz) reserved for CW. Check the frequency allocation chart for the operating privileges for your class of license. See you on 15!

HAMFEST CALENDAR

August 15 Chanute KS
Hamfest 98, At Central Park
Chanute Area ARC, Chanute, KS
Charlie Ward, WDØAKU
2808 South Santa Fe, Chanute, KS 66720
316-431-6402
Pavilion, Indoor & Air Conditioned.
9am-1pm Admission $2.
Talk-in on 146.745.
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August 16 Salina, KS
Central Kansas ARC, Salina, KS
Ron Tremblay, WAØPSF
112 North Douglas Dr., Salina, KS 67401
785-827-8149
E-mail: tremblay@midusa.net
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September 12 Columbia, MO
ARRL Hamfest
Central Missouri Radio Assn., Columbia
Perry Ogletree, NØNMC
PO Box 283, Columbia, MO 65205-0283
E-mail: cmra@qsl.net
http://www.qsl.net/cmra
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September 13 Monett, Mo.
Ozark Amateur Radio Society HAMFEST
Monett, Mo. At the City Park. The park is located east side of Mo Hwy 37, just south of U.S. 60 (across from the golf course). From the entrance, drive to the SE portion of the park. This tail-gater, will begin at 8:am, followed by a pot luck dinner at noon. To participate, bring a covered dish.
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September 19 Shattuck, OK
THE GREAT PLAINS RADIO CLUB
—— **HAMFEST CANCELLED** ——
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September 23-27 Hope, AR
A celebration of the old Army proving ground. Some of us who collect military radios are going to get together and have Show-and-Tell for the public. There should be some trading too. Most events will be at the airport. Planes displayed will include a B-17, B-24, and a B-29. If you only come for one day come on the 27th when the main event is an air show.
Jim Haynes, W6JVE
jhaynes@alumni.uark.edu, 501-443-9339

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many other countries, no additional Morse code examination would be required beyond 12 words per minute. All amateurs presently licensed as Amateur Extra Class would become Class A.

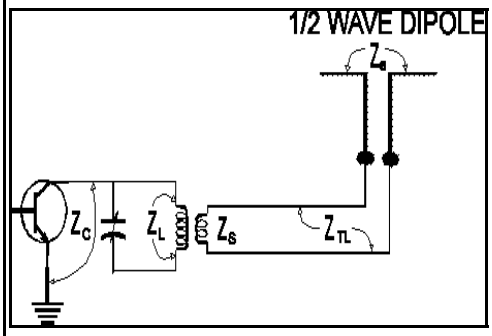
In their discussions, Board members emphasized that the objective is to rationalize and simplify the amateur licensing structure without reducing the requirements for any class of license. Where reductions in Morse code requirements are proposed, there would be a corresponding increase in written examination standards. On the other hand, Board members were adamant that simplifying the structure should not come at the expense of privileges already earned by amateurs. Therefore, present Novice and Technician Plus licensees, having earned entry-level HF operating privileges, would be granted the new entry-level HF license.

Adoption of the simplification plan marks the culmination of 30 months of work by the Board, during which time the input of literally thousands of ARRL members and other amateurs and prospective amateurs was considered. The Board debated a wide variety of options including both smaller and larger numbers of license classes, higher and lower qualification levels, and different privileges. Nine of the 15 Directors voted in favor of the plan, with six opposed. Following the meeting ARRL President Rod Stafford, W6ROD, observed, "The debate was at times contentious and the result was not unanimous. Some Board members preferred greater simplification; others were uncomfortable with some of the changes being proposed. However, every Board member, without exception, left the meeting knowing that each of his or her colleagues did what they believe is best for the future of Amateur Radio."

Members are urged to contact their ARRL directors to comment on this proposal. E-mail addresses are on page 10 of any issue of QST. Members also may comment on the proposal via the ARRLWeb site, http://www.arrl.org or via e-mail at restrux@arrl.org.

A PRIMER ON TRANSMISSION LINES AND SWR

In electricity, wether power or RF, to maximize transfer of energy from one circuit to another, the impedence of both circuits **must** match. An example of impedance matching an RF circuit to produce maximum antenna current and radiation is illustrated below.



The impedance of the antenna Z_a (70 Ohms) must match the *surge impedance* of the two wire transmission line, Z_{TL}. The impedance of Z_{TL} must match the secondary of the output transformer, Z_s, which must couple tight enough to reflect an impedance across the primary, Z_L, that must match the collector impedance of the transistor Z_c. A variation of any part of this chain may prevent maximum output.

Our transmission line consists of two parallel wires which are indciated as having an impedance Z_{TL}. In fact, any two **parallel** wires held apart a **constant** distance will have a charactersitic (or surge) impedance value. This impedance is a function of the series inductance and shunt capacitance of the parallel wires, created mainly by their diameter, and the separation distance.

Z = 276 log d/r

Where:
Z = impedance in Ohms
d = center to center distance separation of the conductors
r = radius of the conductors (same units as d)

For example, if two #14 AWG wires are placed 2" apart (center to center) to form a transmission line, it will have an impedance of 496 Ohms (do the calculations). The formula above predicts correctly that as the separation increases, the impedance will rise.

If an infinitely long 500 Ohm transmission line is connected to a matched AC source, maximum power will be taken from the source and dissipated along the line **in the form of heat**. No energy will return. If the line is only several feet long and terminated with a load resistor having a value of 500 Ohms, essentially all of the power from the ac source will be transferred to the load resistor and dissipated as heat. Transmission lines are considered a very efficient method for transmitting energy from a source to a remote load, provided that the transmission line has the **proper impedance**. A 300 Ohm transmission line connected between a 500 Ohm source and a 500 Ohm load will present a mismatch, and the load will not draw maximum power. When the transmission line does not match the load impedance, some of the energy fed from the source to the load is reflected back, forming **standing waves** on the line. Every half wave along the line, a high voltage and low current point will appear, while halfway between these points just the opposite occurs. The ratio of a high voltage point to the low voltage point is known as the **voltage standing wave ratio**, or **VSWR**, while the term **SWR** is reserved for the ratio of the high current points to the low current points.

It is enough to say that when the load impedance matches the line impedance, there will be no standing waves, and the current at **all points** along the line will be the same. Since the current is the same everywhere, the SWR ratio (as defined above) will be 1:1, and the line is said to be **flat**. It should be noted that changing the length of a matched transmission line will have **no effect on SWR**.

Enough to digest for now. In part two, we will conclude with coaxial transmission lines, and I'll cite my sources..

73 for now. Jim WBØIYC

CALENDAR ON THIS PAGE

Meeting Times, Testing, Events, other Club Information

The **Joplin Amateur Radio Club, Inc.,** a Missouri *not-for-profit* organization, meets on the second and fourth Tuesdays of each month at the Joplin Municipal Building, on the lower level, in the Civil Defense dining room at 7:30 PM. The facility is accessible to the handicapped.

The club supports and promotes annual operating events, assists area agencies with communications when requested, and offers training classes for advancement in amateur radio. It also sponsors the JARC HamFest each year in April, and maintains a wide area coverage OPEN 2m repeater on 147.21 MHz.

Club members often meet weekday mornings in Joplin for coffee at the Target Store (3151 East 7th St.) around 8:30 a.m. Members also meet for breakfast on Saturday morning around 8:30 AM in the restaurant at Smitty's (18th and Maiden Lane) in Joplin.

1998 CLUB OFFICERS:

President: Larry	NØMST
Vice-Pres. Jackson	KBØWFE
Treasurer, Jim	NØZSQ
Secretary, Mark	NØZPD

Amateur Radio VE Testing

License testing by volunteer examiners takes place on the 3rd Thursday of each month (except August) at St. Paul's Methodist Church located at 2423 West 26th St. in Joplin. Sign up at 6:30 PM, testing begins promptly at 7 PM.

ABOUT THE NEWSLETTER

This club newsletter provides an open forum for the Four-State area amateur radio community, and ***your*** comments and contributions are always invited. Items for publication, including classified ads and amateur radio related articles, may be sent to the **JARC Printed Circuit**, P.O. Box 2983, Joplin, MO 64803-2983, or send email to: jimscott@janics.com

Deadline for submissions is the 20th of the month preceding the month of publication. Non-Commercial Classified ads are free and will be run on a space available basis whenever requested. Submissions may be typed, handwritten, ASCII text files attached with email, or on disks formatted for IBM. *All items* are subject to editing for spelling, content, and space limitations as required.
'73 and Thanks. ***Jim*** **WBØIYC** ¶

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