

PRINTED CIRCUIT

FALL 2000

Newsletter of the Joplin Amateur Radio Club

Vol. 10

Issue No. 3

JARC OPERATES K6C ON ROUTE 66

This year the Joplin Amateur Radio Club took to the airwaves in concert with eleven other clubs operating special event stations, each of which was located in one of the 12 cities named in the famous song about America's prestigious highway - "Get your Kicks on Route 66".

This Bobby Troup hit, recorded by dozens of artists over the past half century, urged a generation of post-war Americans to hop in the car and see the country by traveling Route 66's more than 2000 miles from Chicago to Los Angeles. It captured the spirit of freedom stimulated by the open road, and inspired many to hit the highway.

To offer hams a fun way to relive their own memories of Route 66, and to share
(Continued on page 4)

DON'T MISS IT! JOPLIN ARC CHRISTMAS BANQUET

DEC 12TH, 2000

6:30 PM

**RYAN'S STEAKHOUSE
7TH AND RANGELINE
JOPLIN**

Club Recognition Awards,
and
Prize Drawings will be held.

WE HAVE RESERVED THE BIG ROOM IN THE BACK, WHICH SHOULD SEAT UP TO 100. TO AVOID CONFUSION, EACH PERSON IS RESPONSIBLE FOR THEIR OWN CHECK AND GRATUITY.

JARC ELECTS NEW OFFICERS

By the time you read this, the balloting for our National President will still not be decided. However, the JARC has selected the new slate of officers to lead you into the 21st Century. I might note, that from this reporter's observation, the JARC will probably never suffer from the problems plaguing the National election, but instead, quite the opposite!

As a past president I can say that this club, the JARC, has a wealth of talent in its membership for I have seen it. Throughout the years, this has been demonstrated many times in the things that the club has accomplished. Not often do we get to "toot our own horn" so to speak, but perhaps some of the membership is not aware of the extent of this club, its organization and most of all, its accomplishments.

SETI AT HOME HELP FIND ET!

SETI@home is a scientific experiment that uses Internet-connected computers in the Search for Extraterrestrial Intelligence (SETI).

You can participate by running a free program that downloads and analyzes radio telescope data.

Over a million computer users have made history with this, the largest distributed computing project ever, with more
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FIELD DAY 2000 RESULTS

The December issue of QST arrived this last week, and it had the long expected results from this year's Field Day event. Gleaning through the long lists I discovered the results for the JARC. The club had operated using the call WØIN (+NØKMP) and scored 1550 points in the "2A" class. Highest score for this class was 11,010 recorded by the Eastern AZ ARS K7EAR (+K7JEM). The Arizona club made 1351 contacts, with 14 operators, running 5 watts. By

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Eleven years ago, the JARC decided to host a small hamfest. Today, the JARC Hamfest is recognized as a major event in the Midwest, and is still gaining popularity with each and every year. Members regularly help with, or participate in, events for various other organizations in the area, including ARES and the Boy Scouts. This year they included a Bike Tour for the Children's Miracle Network, the MS-150 Bike-a-Thon, and the Route 66 - on the Air special event station K6C.

To raise awareness of amateur radio in the community, the club has provided QST, the ARRL monthly journal, to the

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inside...

**ARISS Internation Partners Meet
World of VHF & UHF
Upcoming Club Events / Hamfest Calendar**

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REFLECTION

DEC 7, 1941

An article published in the December 1941 issue of QST discussed changes that were to be made to the HF ham bands, but that never happened. This is one ham's recollection of his life in that time.

I was reflecting on an article printed in Dec. 1941 QST that never happened. A lot of changes were to take effect on Dec. 20, that year, but you know what happened on Dec. 7th, and as a result, all ham frequencies except 112Mc were turned over to the military. The 40 meter band which had always been CW was supposed to allow for phone operation on 7250-7300kc, and 160m to be expanded to 1700-2050kc.

At this time I was a 12 year old studying for my ham license. I was trying to learn CW. My receiver was an Echo Phone EC1, which with the help of my parents and grandmother, was purchased for \$19.95. At this time, my Dad and Mom had a small business and were lucky to make \$40 a week, which was a fair living then, at least almost enough to raise a family.

After Pearl Harbor, with the hams off the air, my interest shifted to commercial AM radio along with a couple of my school friends. We wanted to be disk jockeys. I remember saving up my allowance money and buying my first 78 RPM record, it was on the Bluebird label: "Elmers Tune" by Glenn Miller. It sold for 37 cents, plus 1¢ MO sales tax. In December 1941 this was the number one song on a Saturday night radio show on NBC, "Your Hit Parade", then, AM 550 in St. Louis, KSD.

The only thing in which ham ops were allowed to participate was WERS (War emergency Radio Service). I was not involved in it as I was not a ham, but I knew some kids older than me that were active.

Most of the equipment for 112Mc (our old 2-1/2 meter band) was modulated oscillators and super-regen receivers. There were some commercial units made but a lot were homemade.

In 1941, most new hams that worked AM voice got started on 160 meters because you needed a class A license (now advanced class) to work the

ARISS INTERNATIONAL PARTNERS MEET AT GODDARD

The Amateur Radio on the International Space Station, or ARISS--international partners are meeting this weekend at Goddard Space Flight Center in Maryland. The three-day session will update current status of the ARISS program and attempt to map its future direction.

Expected to be on hand will be ARISS delegates from the US, Russia, Germany, Belgium, Canada, Japan and Italy, in addition to representatives of NASA, AMSAT-NA, TAPR and the Mir Amateur Radio EXperiment group, MAREX-NA.

Space Amateur Radio EXperiment (SAREX) Working Group Chairman Roy Neal, K6DUE, will serve as meeting moderator. ARISS rules and bylaws development and ratification tops the list of discussion items this weekend.

The Expedition 1 crew of Commander William "Shep" Shepherd, KD5GSL, and Russian

higher HF bands on voice. Both 80m and 40m were popular bands for new hams working CW with simple equipment.

At this year's Springfield Hamfest, I had the pleasure of seeing George Franklin WØAV, who now lives in Kansas City. I first met George in St. Louis in 1941, at that time he was W9UXQ. I had sent him an SWL card after hearing him on 160m and he invited me to visit his ham shack. My mother drove me and another kid down to south St. Louis, about 5 miles away. George was about 10 years older than me. Today, I still talk to him on 2 meter sideband. I remember his nice homebrew rig mounted in a 6 foot rack all open in the back. A nice setup in those days, located in the basement of his parents home.

Anyway, this was ham radio in 1941 which I am thankful to be old enough to remember. I didn't get my license till 1948 however. These were the days when most new hams were teenagers. Why can't it be that way again?

- John Tudenham WØJRP

cosmonauts Sergei Krikalev, U5MIR, and Yuri Gidzenko has been aboard the ISS since November 2. With about three months left in its tour of duty, the crew has been extremely busy with its normal work schedule. Crew members did take time in mid-November to check out the initial amateur station gear aboard the ISS. On November 17, Shepherd enjoyed a few casual QSOs with earthbound hams.

ARISS spokesman Will Marchant, KC6ROL, says the crew has used Amateur Radio for personal contacts with family members but that crew members have been too pressed for time to engage in casual contacts. In addition, the shuttle Endeavour launched November 30 carrying huge solar arrays to the ISS.

Marchant said he hopes ARISS can ramp up the level of school and casual contacts after the first of the year. A tentative schedule of school contacts is pending. The topic of future contacts between ISS crew members and students is on the agenda for this weekend's meeting. The delegates will look at how school contacts can be smoothly integrated into the ISS crew schedules and how often they will occur. They'll also attempt to come up with an equitable system for the international partners to select schools for ARISS QSOs.

ARISS delegates also will be looking ahead to the next phase of Amateur Radio hardware on the ISS. Right now, the initial station gear consists of low-power VHF and UHF hand-held transceivers. As currently configured aboard the Zarya Functional Cargo Block, the gear provides 2-meter FM and packet capability, although the packet system has not yet been activated. Marchant said ARISS needs to make sure the packet system operation will not interfere with the regular 143-MHz communication channel between the ISS and Earth.

Marchant says the most immediate and pressing hardware projects are to install the German "digtalker" system and to move ahead with a plan to deploy Slow-Scan TV aboard the ISS.

A German proposal to upgrade the initial

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ARES MOVES TO FALL SCHEDULE

The director of the Jasper County Amateur Radio Emergency Services, Andy Gabbert, has announced that the meeting times for ARES have been changed to 7 p.m. No other changes have been made. They will still be at the same location, the Red Cross Chapter located at 4th and Jackson, in Joplin. ARES meets on the first & third Tuesdays.

It should be noted that the weekly ARES net is held at 9:00 p.m. Monday nights on the JARC repeater 147.21 MHz (+).

If you desire any information or schedules about ARES, feel free to contact Andy for any additional information, or email him at ka0tud@arrl.net ¶

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Joplin Public Library, and has for over three years. Recently, the club demonstrated a commitment to communications for emergency preparedness by purchasing and installing antennas and feedline at several select sites around the area. Presently, the club sponsors four annual events, the Hamfest in April, Field Day in the summer, a Tailgater in the fall, and a Chili Feed in the winter. Finally, the club maintains a 2 Meter repeater, and uses it for a weekly swap net held Monday nights.

I want to thank the members who bravely stepped up to the plate to do their part in the maintenance of this fine and deserving organization.

The new officers elected for the 2001 term are named as follows:

Ray Brown	KB0STN	President
Martin Matarazzo	WD6FIC	Vice President
Mark Mitchelson	N0ZPD	Secretary
Jim Johannes	N0ZSQ	Treasurer

THE WORLD OF VHF & UHF

BY JOHN TUDENHAM WØJRP

The September ARRL VHF contest was held September 9 and 10. Conditions were only fair for Tropo and no sporadic E skip reported. WØJRP worked the following:

144 MHZ - 38 contacts in 20 grids
50 MHZ - 6 contacts in 4 grids
222 MHZ - 6 contacts in 5 grids

With no sporadic E, six meter contacts were scarce. I did manage to work the states of MO, KS and OK on 6.

On two meters I worked MO KS AR OK TX IA and IL, all on tropo. Also I worked Larry NØMST, who was mobile near Mena AR in grid EM24. Larry has a great two meter mobile station if you haven't seen it. On 222 MHZ, I managed to work MO KS OK and IA. My best contact was KA0Y in grid EN41 in SE IA. I also worked the same station on 2 meters.

F2 SEASON HAS ARRIVED

The high sunspot count this fall, we hope, will bring some F layer skip DX on six meters. Sunday afternoon, KØETC and I heard the HC8GR beacon for several hours on the low end of six. The station is located on the Galapagos island just west of Ecuador in South America. No contacts were made as no operator was present there, however I understand after they got on the air, some other places in the USA had QSOs after signals faded out here.

MODES OF PROPAGATION

I have found that many new VHF ops are confused when it comes to the various types of propagation. They wonder how hams can tell the difference between F2, Sporadic E, Tropo, etc., not to mention "double hop", "backscatter", or the relationships between these various types of propagation.

F2 SKIP

For amateurs, F layer skip is only observed on six meters during the peak of the 11

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comparison, the JARC made 476 contacts, with 8 operators running less than 150 watts. In defense of our score, I can only say that they were probably on top of a mountain.

Our friends from the Four State ARC were also listed in QST under the "3A" category. Using their call NIØW, they reported to QST making 431 contacts with 32 operators for a score of 1824 points.

For those who helped or participated in making this event such a success for the club, many thanks for the support and effort. I for one, really enjoyed the 10m opening that ran throughout the day.

73

Jim WBØIYC

year solar cycle, and it has never been observed any higher than around 70 MHz (TV CH 4). For F2, the maximum single hop distance recorded is around 3000 miles, while no F2 direct single hop on six meters has ever been closer than 1800 miles. This means from our location in the Midwest you will never hear a stateside station in the 48 states on direct F2. However, Hawaii and Alaska can be heard (There is such a thing as back scatter but we won't discuss that now).

SPORADIC E-SKIP

E-skip is what makes six meters and most stateside contacts are made by E-skip. It has little if anything to do with the solar cycle and can occur any time of the year day and night, but June is always the peak month. (That's why we do so well on field day on 6, 10 and 15 meters). E-skip while common on six meters has been observed as high as 222 MHz on at least three occasions. While not rare, it does occur on two meters at times, and usually of short duration. That is how NØMST, KØETC and myself made contacts with WA and CA this year on two meters. The usual range for E-skip on six meters is from 600-1350 miles, but can be as close as 300 miles on rare occasions. It can provide strong signals from just one area, but usually slowly drifts west. Under good

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the impressions of others, the Northern AZ DX Association put together the "Route 66 On the Air event". Amateur Radio clubs were operating from each of the 12 cities during the special event period, 9 September (0000Z) through 17 September 2000 (2400Z), with the task to contact as many stations as possible wanting to take part.

As for the participation by the JARC membership. On hand for the event were Mac W9NLA, Ray KBØSTN, Jay KØETC, Wayne WBØAAN, and John

WØJRP. Contacts were made on preassigned frequencies on 80 thru 6 meter bands using the call K6C.

The last tally showed a total of 862 QSO's were made. It should be noted that Jay made 583 contacts, several which were foreign stations. The club received requests for over 245 K6C QSL cards (see sample) which are presently being printed.

Several notes were received from hams that worked K6C, and I have included one that describes hospitality at it's best. ¶

Hi ham radio friends, I contacted your rt 66 special event station and I shared this on the air with them. I can't remember the gentlemen's name but in the early 60's I was traveling thru Joplin on 66 from California with my hot rod 58 Chevy and blew a head gasket coming off of the turnpike. I made it to a gas station in downtown Joplin that was owned by a insurance man. This man extended me hospitality that I will never forget the town for.

He closed his station and let me work inside using his tools to fix my 409 Chevy engine, and at "no charge". This man showed me hospitality and respect that is hard to find in today's world. What has happened to today's world?

Thanks for the event and "being" there.

Dan Adkinson W8DFA
Radio officer W8VPV
Cuyahoga Falls Amateur Radio Club.
Cuyahoga Falls, Ohio

Our website newspaper tells about your rt66 special event.
<http://www.cfarc.org>

**Amateur Radio Celebrates
the Mother Road**

Joplin Amateur Radio Club
P.O. Box 2983
Joplin, MO 64803-2983

CONFIRMING QSO WITH	DATE			UTC	MHZ	RST	MODE
	DAY	MONTH	YEAR				

JARC K6C COMMEMORATIVE QSL CARD

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processing power than any supercomputer ever built.

The SETI@home program is a special kind of screensaver. Like other screensavers it starts up when you leave your computer unattended, and it shuts down as soon as you return to work. What it does in the interim is unique. While you are getting coffee, or having lunch or sleeping, your computer will be helping the Search for Extraterrestrial Intelligence by analyzing data specially captured by the world's largest radio telescope.

Several operating systems are supported, and the Windows version requires at least 32MB RAM and the ability to display 8-bit color in 640x480 resolution (though

800x600 or higher is recommended in order to fit all the graphics on the screen). The software will not work if your PC does not meet these requirements.

If you want to join thousands of people around the globe in the search for intelligent life outside *this* planet, or read more about this experiment, get on-line, and go to the web site shown below, then follow the links. To participate, follow the step by step instructions below.

<http://setiathome.ssl.berkeley.edu/>
Click on Groups.
All Groups (Top 100)
Find a Group to join. Or, search for "Amateur Radio Operators"

73, and Happy Hunting!

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station gear with a so-called "transportable station" mobile transceiver offering more power and flexibility also will come under scrutiny. Deployment of the next phase of ARISS gear probably will not happen until 2002, Marchant said.

More information about ARISS and SAREX, is at <http://ariss.gsfc.nasa.gov/>.

ARISS EXPEDITION FREQUENCIES

Worldwide downlink (all)	145.80 MHz
Worldwide packet uplink	145.99 MHz
Region 1 voice uplink	145.20 MHz
Region 2 & 3 voice uplink	144.49 MHz

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conditions, skip is also observed on TV CH 2-6 and the FM broadcast band. At times, multi-hop can be observed on six making long haul DX contacts possible usually with much weaker signals than F2. Jay Rugar K0ETC has worked Spain and the Canary Islands this year - on probably 3 or 4 hop E's.

TROPO DUCTING

Two meters is probably the best band for Tropo, although it can work even up into the UHF bands. While tropo occurs on 6 meters, it is usually with weaker signals. Tropo unlike E-skip may stay in for hours, sometime days, and is caused by certain weather conditions usually a stationary front with a high pressure dome. Usually the best conditions occur during the late nighttime and early morning hours. Some tropo ducts can be as long as 700 miles and only 100 miles wide. One tropo opening on two meters during August produced good signals all the way to Duluth MN, and very good signals to the Twin Cities in MN. Omaha seemed to be on the west end, and Des Moines on the east, indicating a very narrow duct. Other closer tropo or temperature inversion occurs over a wider area but not as great

distance. This is why some of the FM ops note strong signals from Kansas City or Tulsa mostly in the summer during early mornings and evenings. Some refer to this as skip, but it is NOT skip. Skip signals are reflected off an ionized layer, while Tropo does not. Tropo like ground waves require the same polarization of both stations for good signals. That is why a vertical is used on FM, but horizontal on SSB and CW. When working skip it doesn't matter which polarization you use as it tumbles when it relected off the layer.

If you work six meters, a simple vertical works well for E-skip even if the station on the other end uses horizontal polarization.

Next time I will discuss other propagation such as Aurora, Meteors, back scatter, and forward scatter. These are things that make VHF operation real interesting.

If you would like to know more about the world of UHF/VHF and operating these bands, or have any questions, feel free to email me at w0jrp@earthlink.net, or call me at (417) 624-8058.

SCHEDULED ARES NETS AND ACTIVITIES

Listed here are the Nets & Activities planned for the winter. Future activities, such as Emergency Exercises, will be announced at meetings or on the net.

The **ARES Group** meets at the **Red Cross Chapter**, located at 4th and Jackson (7 blks W. of Main) in Joplin, on the **first and third Tuesday** of the month at **7:00 pm** and welcomes all Hams to attend.

Next ARES Meeting: 12/5 7:00 PM Red Cross Chapter

For announcements, scheduled events, and notices, the **ARES Weekly NET** meets every **Monday at 9 pm** on the JARC Repeater **147.210+**.

The ARES Group is involved in emergency preparedness planning and training for Hams in the four state area. This knowledge can be beneficial in times of need, as Hams offer an effective method of both local and regional communications.

Although the membership roll is important, ARES members are volunteers - you serve as you see fit, but we do need everyone's help to implement a plan and to make this a success.

If you need more information on how you can help, please call Andy, KAØTUD (417) 673-8371 After 6 PM weekdays. Or email: kaØtud@arrl.net

HAMFEST CALENDAR

Note: Listings are updated as information becomes available.
Courtesy of Lonnie Allen NØTBO

Thursday, December 7th - Pittsburg KS
The Pittsburg Repeater Organization
Annual Holiday Party, starting at 7 pm.
This year at "The Rocking K", which is located North of Pittsburg/Frontenac at 999 East 620th Ave. It is two miles East of the US69-K57 Junction (Ginardi's Corner). The Joplin Amateur Radio Club members are invited to come, as well as any other amateurs in the area. There will be a HAM white elephant drawing as usual. Please bring a **WHITE ELEPHANT** gift. - something that you find useless around the shack. **LADIES** gift (a real one) worth less than \$5.

Tuesday, December 12th - Joplin MO
Joplin Amateur Radio Club Annual Banquet - Ryan's Steakhouse 7th and Rangeline. 6:30 pm in the big room. All area hams are invited.

— 2001 —

January 7th, 2001 - Crane MO

Sunday 12:00 pm - 4:00 pm.

Kick those winter Blahs. "NORTH STONE COUNTY SENIOR CITIZENS BUILDING" On Main Street. Admission \$1.00

Large Tables \$5.00, Small Tables \$2.00.

Coney Hot Dogs, Chile Soup, Soda, Coffee, Chips and Deserts. Come hungary for Food - Fun - Fellowship. Talk-in: 147.015 + (pl 162.2)

January 13th, 2001 - Springfield, MO.

Hamfest and Computer Electronics Show

Presented by the 49ers 8:00 am - 2:00 pm.

Teamsters Hall Building - 1850 E. Division, Springfield, MO. Talk-in on 145.490

First Come - First Served on Tables for Rent

Free Parking. Grand Prize at 12:00 p.m.

Admission: \$3.00 Tables: \$11.00 for first Table \$6.00 for additional Tables

For tickets, tables, or more information:

Michael Blake, NØNQW 417-742-3955,

Email: nØnqw@arrl.net

February 3rd, 2001 - LaCygne, KS

Mine Creek ARC Winterfest/LaCygne Hamfest
Community Building on Broadway



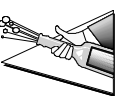
9:00 a.m. - 1:00 p.m. Free Admission.

Tables \$10 · Coffee & Donuts · Hourly Prizes

For info: Ron (913) 757-4455 kbØdti@arrl.net

December

2000

<i>Sun</i>	<i>Mon</i>	<i>Tue</i>	<i>Wed</i>	<i>Thu</i>	<i>Fri</i>	<i>Sat</i>
					1	2
3	4 19:30 JARC NET NOKMP - NET CTRL 21:00 ARES NET KA0TUD - NET CTRL	5 18:30 JOPLIN CHRISTMAS PARADE 19:00 ARES MEETING	6	7 PRO HOLIDAY PARTY 19:00 - ROCKING "K"	8	9
10	11 19:30 JARC NET KB0STN - NET CTRL 21:00 ARES NET KA0TUD - NET CTRL	12 JARC BANQUET 18:30 - RYAN'S	13	14	15	16
17	18 19:30 JARC NET W0JRP - NET CTRL 21:00 ARES NET KA0TUD - NET CTRL	19	20	21	22	23
24 	25  19:30 JARC NET N0ZPD - NET CTRL 21:00 ARES NET KA0TUD - NET CTRL	26 NO MEETING	27	28	29	30
31 	Happy New Year					

January

2001

<i>Sun</i>	<i>Mon</i>	<i>Tue</i>	<i>Wed</i>	<i>Thu</i>	<i>Fri</i>	<i>Sat</i>
	1 19:30 JARC NET NOKMP - NET CTRL 21:00 ARES NET KAOTUD - NET CTRL	2 19:00 ARES MEETING	3	4	5	6
7 CRANE MO HAMFEST	8 19:30 JARC NET KBOSTN - NET CTRL 21:00 ARES NET KAOTUD - NET CTRL	9 19:30 JARC BUSINESS MEETING	10	11	12	13 SPRINGFIELD, MO HAMFEST/COMPUTER SHOW
14	15 19:30 JARC NET W0JRP - NET CTRL 21:00 ARES NET KAOTUD - NET CTRL	16 19:00 ARES MEETING	17	18	19	20
21	22 19:30 JARC NET NOZPD - NET CTRL 21:00 ARES NET KAOTUD - NET CTRL	23 19:30 JARC PROGRAM MEETING	24	25	26	27
28	29 19:30 JARC NET KBOSTN - NET CTRL 21:00 ARES NET KAOTUD - NET CTRL	30	31			

Meeting Times, Testing, and 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 a.m. at the restaurant in Albertson's Super Market, on 18th and Maiden Lane in Joplin. For details, contact Ray Brown KBØSTN at (417) 781-4967

2000 CLUB OFFICERS:

President: Ray Brown KBØSTN
Vice-Pres. Jim Scott WBØIYC
Treasurer: Jim Johannes NØZSQ
Secretary: Dave Ferguson NØKMP

Amateur Radio VE Testing

License testing by volunteer examiners takes place on the 3rd Thursday of each month (except June & July) 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 offers 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.

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PRINTED CIRCUIT

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Joplin, Missouri 64803-2983