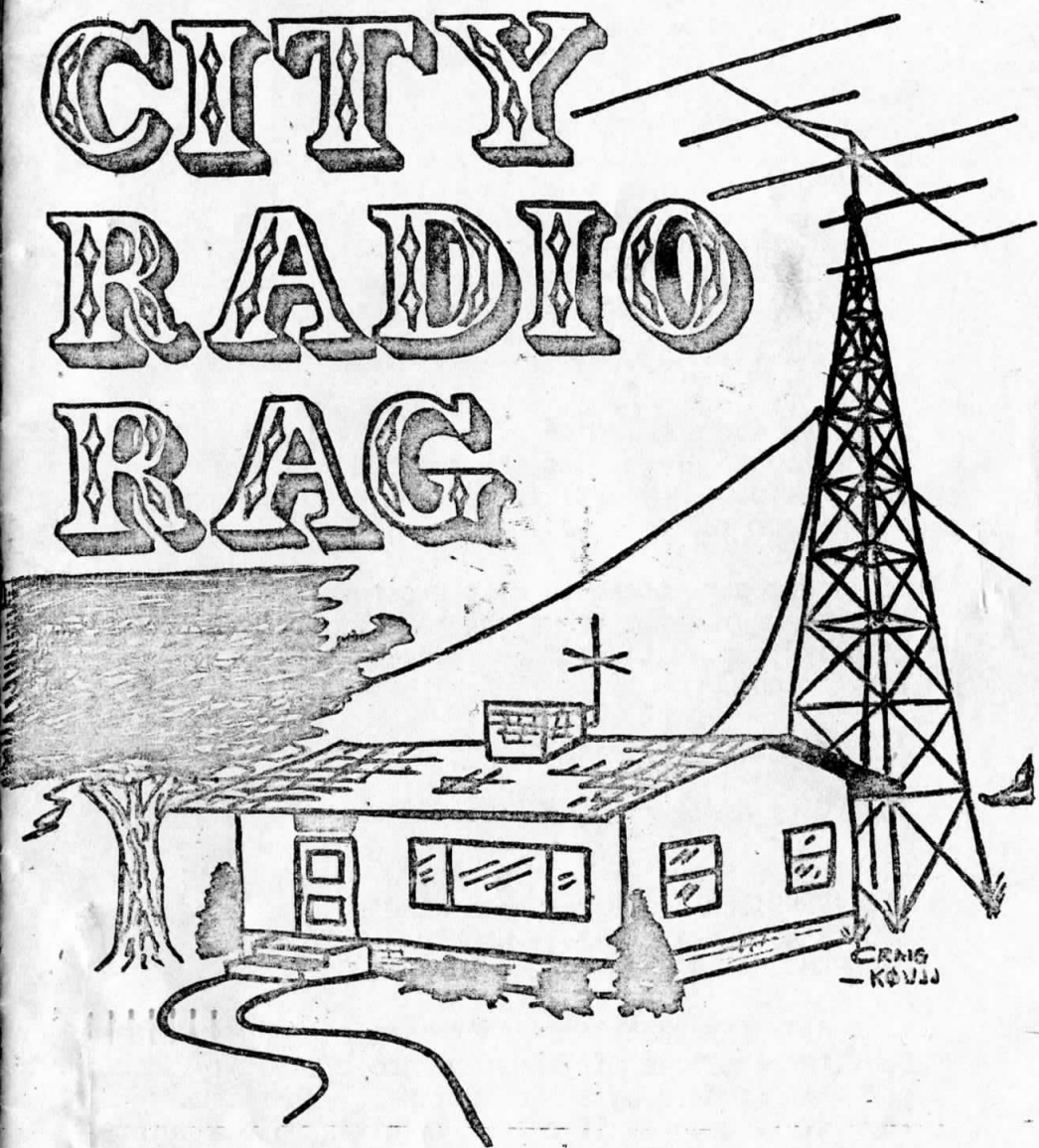


# RIVER CITY RADIO RAG



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Iowa City Amateur Radio Club

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The Iowa City Amateur Radio Club  
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Iowa City, Iowa 52240

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Deadline for submission of materials is the 20th of the month preceding the desired month of publication. Any article dealing with any aspect of amateur radio is welcome.

It is not our intent to edit prospective articles, however we reserve the right, out of necessity, to delay publication of an article due to space limitations.

\*\*\*\*\*

Iowa City Amateur Radio Club Officers for 1974:

PRESIDENT: Steve Towle M.D. KØSVW  
VICE-PRESIDENT: Robert Lucas WAØDXZ  
SEC-TREAS: Doris Delaney WNØKBD  
PROGRAM CHAIRMAN: Mike Nowack WBØHOG

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Dues for the Iowa City Amateur Radio Club are \$6.00 per year (including subscription). Permission to reprint is granted if credit is given to the author and this publication.

A NOTE FROM THE PRESIDENT.....

From the officers of the ICARC we would like to wish you all a happy Thanksgiving. We as amateurs have much to be thankful for. There are few countries in the world which allow the wide range of frequencies that we utilize daily. Most of Europe and Great Britain for example, can only operate from 7.0 to 7.1 MHz in the 40 meter band and the Japanese have long been limited to a single frequency on 80 meters.

Few countries have such an extensive selection of duty-free locally-made products to choose from and few countries allow the free imports of foreign made products as does the USA. As an example, a ham in New Zealand who wishes to buy a ready made radio must shop on the foreign market and can expect to pay at least 50% duty, ie an FT101B from Tokyo will run well over US \$1000.00 in Auckland.

Few countries besides the US allow the power output we run, the complete selection of modes we enjoy and the freedom from automatic shut-down when an RFI complaint is received.

Few countries have as effective a national voice (the ARRL) to watch over their privileges both nationally and internationally as we do.

Well enough of that---hope you all eat the bird on Thanksgiving.

Steve KØSVW



IN CASE YOU MISSED IT.....

The October meeting of the Iowa City Amateur Radio Club was held at the usual time and location. In the absence of Steve KØSVW, Bob WAØDXZ called the meeting to order welcoming all those in attendance, especially the visitors from the Cedar Valley Club. A short business meeting followed after which refreshments were enjoyed by all followed by the evenings program.

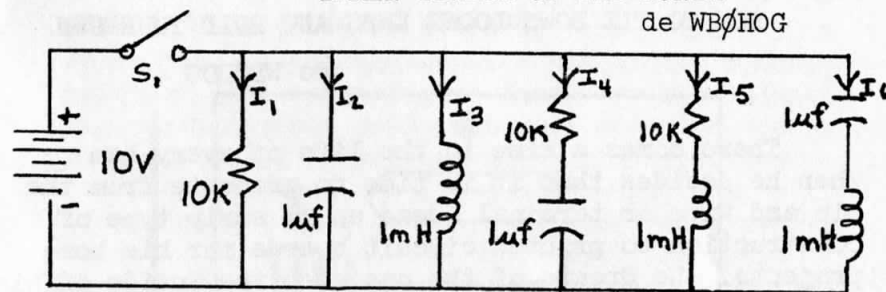
Lloyd KØDDA and Gail KØFLY presented a very interesting program on the use of the amateur radio satellite, OSCAR 6. The presentation was complete with slides and a taped narration. Actual OSCAR 6 QSO's were heard by way of the tapes. Operational data on the upcoming OSCAR 7 was given so that interested hams could think about using it. Local hams were encouraged to support the AMSAT effort either by getting involved or by keeping up on the latest developments. It was a very well done program and everyone enjoyed it as shown by the number of questions put to Lloyd and Gail.

Following the program were more goodies and lots of conversation .....a fine evening.

de Dee WNØKBD

The next meeting of the Iowa City Amateur Radio Club will be held on Wednesday, November 13th at 7:30 PM in the community room at the First National Bank at Towncrest. The program will be a presentation on the RACES system by Arnie Verdow WØLIJ of Collins Radio Amateur Products Division. Mr. Verdow is active in this area and has some good information on this emergency system to share with us. So set aside the second Wednesday of November and come on out and enjoy the fun.

BRAIN-TEASER OF THE MONTH  
de WBØHOG



This month we're going to find out how much you know about transients. If you were to build the circuit above and had a current meter that was capable of reading current transients, could you predict what the meter would read for each of the six currents (I1 thru I6) at the very instant S1 closed and the 10 volts was applied? Is the value of each (choose a value for each one separately) a) 1 ma b) 2 ma c) 0.5 ma d) 10 ma e) 0 ma f) infinite or g) you tell me?

THE ANSWERS WILL BE IN NEXT MONTH'S RAG.

The answer to last months puzzle which was submitted by Steve KØSVW was 30 squares. Here they are;

A	B	C	D
E	F	G	H
I	J	K	L
M	N	O	P

- 1 thru 16) each individual
- 17) all together
- 18) ABEF
- 19) ABCEFGHIJK
- 20) CDGH
- 21) BCDFGHJKLM
- 22) KLOP
- 23) JKLNOPFGH
- 24) IJMN
- 25) EFGIJKMNO
- 26) BCFG
- 27) JKNO
- 28) EFIJ
- 29) GHKL
- 30) FGJK

P. C. BOARDS THE EASY WAY or.....

HOW TO TIE DOWN LOOSE ENDS AND ROLL YOUR OWN

de WBØHOG

There comes a time in the life of every ham when he decides that it is time to graduate from the pin and wire or terminal (dead end?) strip type of construction to printed circuit boards for his home projects. He dreams of the day when the inside of his homebrew gear will look more like a piece of quality equipment and less like the half-eaten plate of cold spaghetti the third harmonic left at the table last evening. He curses the day he missed that rare DX station because of the loose wire in his keyer that took 20 minutes to find, only to get back on the air in time to hear 20 meters die. If this is you, and if you are ready to make the transition to pc boards, then perhaps this will help explain how easy it can be to get started making your own boards.

For your first project, I would recommend a project where the artwork has already been done for you. Many construction articles appearing in ham magazines, such as Ham Radio, QST, CQ, etc include a reproduction of the layout of the circuit card. These reproductions are usually positives, or in other words, the areas that are to be copper are represented in black and the areas to be etched away are in white. The first step is to get a negative of this layout made. Take note if the layout is full-sized, 2 times or 4 times. Most appearing in magazines are either full-sized or 2 times real size. Next take it to a local photo shop or to University Photo Service and ask them to make a full-sized (for full-sized layouts) or a half-sized (for 2 times size layouts) negative. I would recommend the University Service as they do this type of work routinely and are equipped to do the negatives to size very accurately. One thing that makes it easier for them is to have somewhere on the artwork a size indication, such as one dimension of the card. (See figure 1.) This dimension should indicate the finished size, not the artwork size (in the case of the full-size layout they are the same). This usually

takes about three days and costs around \$2.50 for negatives up to 4 x 5 inches.

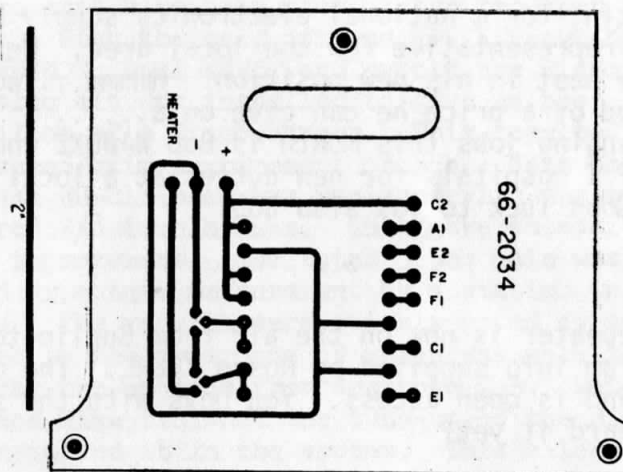


Figure 1

While you are waiting for your negative, you can be preparing the copper clad board. If you buy the board already sensitized (coated with a light sensitive resist) then you are all set. You can, however, save a few bucks (and who doesn't need to?) by buying scrap board and coating it yourself. If you wish to coat your own, then there is one word that you must keep in mind at all times..... CLEANLINESS!! I would say that 95% of all problems encountered by hobbyists who coat their own boards are a direct result of not keeping things clean. If you do not follow a few simple rules, you will only be waisting time and money. First; when working with copper-clad materiel always wear rubber gloves. Oils and grease from your skin can leave a film on the surface of the copper and will prevent the resist from adhearing to it firmly. Second; always try to handle the board by its edges. This will help to prevent damage to the resist coating. Third; during the coating process keep all doors and windows in the immediate area closed to stop air currents from blowing dust onto the surface of the resist where it may become stuck and may eventually cause holes to be etched in the copper

## S T R A Y S

Rumor has it that Jack WØMIE has changed jobs and is now working for a national electronics supply house as a sales representative for the local area. We wish Jack the best in his new position. Hmmmm...wonder what kind of a price he can give on a.....  
Also changing jobs this month is Bob WAØDXZ who left the U of I hospitals for new duties at a local camera shop. Good luck to you also Bob.

\* \*

A new repeater is now on the air from Burlington on 19-79 from info supplied by Rosco KØURL. The call is WRØAFJ and is open access. You boys with the synthesized boxes heard it yet?

\* \*

John KØHLB of the blue hat fame is now living in the Minneapolis area and is planning on keeping in touch with old friends in Iowa on 75 meters. If anyone comes across him on the bands please share the news with us.

\* \*

Two local stations won high honors in the recent ARRL DX contest. Lloyd KØDDA took tops in the Midwest division in the single op cw class. Steve KØSVW and group (John KØHLB and John KØOAM) took honors in the multi-op cw class for the Midwest division. Congrats to all of you.

\* \*

There are reports that a new voice has been heard through WRØACU lately. Seems Dick WAØVFP finally broke down and bought rocks for 28-88 and has made the transition from 94 at long last. Welcome back to 2 meters Dick.

7

## REPEATER NEWS

de KØØBU

I am happy to report that in recent weeks many improvements have been made on the repeater system. With the help of Gene KØCKX, Dave KØLUM, Mike WBØHOG, Paul KØRLT and myself the Ringo extension kit was installed to give us the equivalent of a Ringo Ranger. This resulted in a measured gain improvement of 3db. Next the downlead RG-213 coax was replaced with the recently acquired 7/8 inch heliax. This gave an additional 2.5db improvement. The total 5.5db gain was confirmed by actual measurement by a station in Cedar Rapids. The results were quickly noted by several mobiles in the area, one of which was able to key and hear the machine from downtown C.R. Later Paul and Mike finished the tune-up of the diplexer and installed it in the system. This allowed the transmitter and the receiver to operate from the same antenna, raising the transmitted signal about 50 feet. This has resulted in a marked increase in the useable range of the machine. Medium power mobiles can use it as far east as the Cedar River Valley and as far west as the Amana exit on I-80. Next in line is the installation of the higher power transmitter and the autpatch system.

On October 10th a business meeting was held in the U of I Physics building with the election of officers the major item on the schedule. Your new officers for the coming year are Chuck Walker KØØBU President; Paul Jagnow KØRLT Vice-President; Mike Nowack WBØHOG Sec- Treasurer; Max Otto WØLFF Member-At-Large; and Craig Fastenow KØUJJ Trustee of WRØACU.

## S T R A Y

Max WØLFF, as the new Iowa Section Communications Manager informs us that he would be happy to plug local news in the Station Activities column in QST magazine. Items must be submitted to Max by the 3rd day of the 2nd month preceding its appearance in QST.

8

MODERN CW

de Mike Valdez WNØNCX

I received yesterday my copy of Ham Radio for November 1974, and I was reading thr W6CAB article on "The Code Mill", a typewriter that remembers the characters that you type on it, converts them into Morse Code, and sends them at the speed you select.

When I read one of these articles on superkeyers, I could not help but thinking of a super CW receiver, a gadget that receives the perfect code from these superkeyers, converts them into characters, and then displays them to the operator, so he can use his superkeyer to answer. I was thinking how well this could be done with a computer. The computer could be programmed to listen to the radio through a very selective filter, a detector, and an A/D converter. The computer can analyze the characters and display them in any of the available forms. The operator enters in the teletype his answer, that is sent by the computer without any of the complexities of the superkeyers.

One step ahead and we can store in the computer memory a number of standard messages that can be selected from the console. Messages of the type "UR RST" will insert automatically the values on the teletype. For very unusual circumstances, the operator can improvise a message on the teletype.

Once this is achieved, it is very easy to add instrumentation such as the computer reads the RST of the incoming signal and insert the value into the corresponding message. Of course, the computer can be programmed without problems to recognize the phrase "WØABC de WD3XYZ K" Upon receiving this phrase, the computer will store the other stations call for further use, print the logging statement on the teletype, and transmit automatically the calling sequence, RST, QTH, name sequence, the "HW?" and return to the other station, receiving and displaying the information

MODERN CW Continued...

sent by the other station, the computer will respond with the description of the rig and the weather conditions as read by telemetry at the moment. The next time, the computer will send 73,88, and everything else and sign off, unless the operator intervenes.

On the next step of development, the computer receives the message, interprets its content, compares it with a list of standard messages, and looks on a table for the adequate answer. If the other station has also the codes of the standard messages, the QSO can be simplified by exchanging the codes only. The next natural step of efficiency will be when the other station has also a computer and both have the messages perfectly catalogued, then a QSO will go on something like this:

CQ SM DE WØABC (SM means standard message)  
WØABC DE WD3XYZ--R--599--73--SK-- WD3XYZ DE WØABC CL  
WØABC DE WD3XYZ--R--73--SK-- WØABC DE WD3XYZ CL

At this time, my alarm woke me up. I went to the shack thinking how stupid it would be to operate like that. I picked up my hand key and started slowly CQ CQ CQ DE

WNØNCX

S T R A Y

KØFLY, Gail, has been named the new EC for Linn County. We also are told that he has been appointed an assistant director by the ARRL. We wish Gail the best of luck in his new duties.

\* \*

Al, WØGET is reported to be in possession of a new Regency HRT-2. How's it working Doc?

## LOCAL REREATERS

Here is a partial listing of the repeaters in the Eastern Iowa Area:

Location	Call	Freq	Access
Ames	WRØACO/Ø	16-76	Carrier
Burlington	WRØAFJ	19-79	Carrier
Cedar Rapids	WRØAEH	16-76	Voice
Clinton	WRØADE	16-76	Carrier
Davenport	WRØABS	22-82	Carrier
Davenport		28-88	Carrier
Des Moines		22-82	Carrier
Des Moines		34-94	Carrier
Dubuque	WRØABD	34-94	Carrier
Iowa City	WRØACU	28-88	Carrier
Marshalltown	WØDYS/Ø	28-88	Carrier
Ottumwa	WRØADC	04-64	Carrier
Waterloo		34-94	2100 Tone

## S T R A Y S

Successive articles in the Des Moines Register on 7 and 8 November indicate that the F.C.C. is again monitoring and making arrests for illegal transmissions on the Citizens Band by truckers in the State of Iowa.

\* \*

A article appeared in the November 9 to 15 TV Guid Magazine which may be of interest. It concerns the operation of WR4AAG, a 430 mHz repeater in the Washington D.C. area which is a slow-scan television repeater. Plans include using the the machine for educational prposes at a local college.

\* \*

On November 7 the Cedar Rapids repeater on 16-76 went to voice access. It is now no longer possible to bring up their machine by simply keying your rig; but rather one must speak to it. We assume this is in part to reduce the number of "key-ups". We are also told that the machine has been extensively revised - details to follow

## S T R A Y S

The latest boat from the land of the rising sun brought goodies for two locals. Craig KØUJJ and Steve WAØFSQ got their TR-2200s finally and have been heard asking for signal reports through the machine. Craig is not new to 2 meters as he has been on in recent weeks with KØSVW's handie-talkie. We do welcome Steve to the scene, a new voice in Iowa City. Just great..... another Steve, hasn't anyone heard of the names Frank or Ralph or George or Kieth.....? HI

\* \*

Steve KØSVW has returned from his long stay in the land of inflation and reports he is happy to be back in River City. We are looking forward to seeing him at the next meeting. He should have some interesting tales and pictures to share with us. How about a program on your travels sometime Steve?

\* \*

The Iowa City skyline is changing with several new skyhooks visible. Mike WBØHOG has a TH3 at 50 feet with an inverted V for 40. Paul KØRLT has 50 feet of new Rhon and a pair of 12 element yagis for 2 with a TH3 to go under them. Dave KØLUM has a pair of the KLMS also but his are at 100 feet and he has plans for duo-bander for 15 and 20 to go with. Should be some good signals out of IC now.

\* \*

FOR SALE: Heathkit Phone patch. Contact Steve KØSVW.

\* \*

Mike WBØHOG recently got a chance to try out his new TH3 in the recent CQ DX contest. In less than 20 hours of operating time Mike worked 51 new countries! Best catch was a 5 x 7 report from VQ9D in the Seychelle Is. on 20 meter ssb.

## WHO'S WHOM

Many years ago a star was seen to rise over Cook County, Illinois, and upon investigation, it was discovered that Dave Christ, KØLUM was born.

At the tender age of one year, the Christ family moved, with Dave in tow, to Lake Mills, Iowa, where Dave went through grade school and was graduated from Lake Mills High School.

Dave then entered Iowa State University, where he majored in German and Engineering. He later came to Iowa City, where he received a degree in Math Science in 1970. Since then, he has received a Masters Degree in Statistics.

Dave received the Novice ticket in 1955 and later his conditional ticket which he still holds.

Dave is married and has three children and his wife's name is Rose.

He is active in Navy Mars, as well as most of the amateur bands-- on SSB and RTTY, with a signal radiating from a 100 foot tower south of Iowa City.

de WØMIE

## S T R A Y

Our TVI chairperson, Craig, KØUJJ reports that since being appointed, he has received 20 calls involving interference to home TV's, radios, stereos, etc. The alleged violators in 19 of the 20 cases were CB operators and only one involved a ham. Keep it clean fellows or you may be getting a call from Craig.



where you do not want them. Fourth; work only in an area which is clean and one where you can use chemicals safely. Granted, the kitchen is clean but it is not a safe area to do this work in. Besides, the XYL will certainly have a few choice words to say about that. This would be a good excuse to clean up the workbench or the ham shack. Make sure the work surface is of Formica or like material. Painted or bare wood surfaces will be damaged by accidental spills. Also the bare wood will absorb the spills and will become permanently stained. Fifth; do not work near an open flame or do not smoke while working with the chemicals... they are very flammable. Sixth; keep all trays and tools clean. A little dirt can go a long way.

Select a piece of board of the appropriate size, about 1/2 inch excess material all around is about right. Next, clean the copper surface with a small hand brush (stiff bristles) using water and fine pumace or household cleanser. Pumace is better as it rinses off easier, but cleanser may be used if extra care is used to make sure no residue is left after rinsing. Scrub the board with medium pressure until the copper is bright and the water does not "bead up" on the surface after rinsing. This beading action indicates the presence of oil or grease on the surface. Look carefully for this, especially near the corners and edges. If in doubt, scrub it some more. After you are sure it is clean, stand it on edge on a paper towel. Allow to dry for 15 minutes, in air, and then bake in an oven at 250°F for 15 minutes while lying on something like a bread cooling rack. Make sure the copper side is up and is not touching anything. Remember that during all this you are wearing rubber gloves. After 15 minutes, remove the rack from the oven with the board on it using a hot pad. Do not try to remove just the board using rubber gloves as they will melt and you will get burned. Allow the board to cool to room temperature. Now it is ready to coat with the light sensitive resist.

There are several good photo resists on the market. Some come in a liquid form, others in a spray can. I personally like the liquid types, but that is because I have done very little with the spray types. Both work well and give the same results. If you are using the spray type, stand the cleaned, cool board on edge, copper side facing you, with old newspapers as a background. Starting at the top, spray the board from a distance of 8 inches with a single spraying motion from left to right. Upon reaching the right side, release the nozzle and move back to the left side and start a second sweep from left to right but a little lower than the first but overlapping it. Do not spray while moving from right to left. Continue this overlapping spraying until you reach the bottom. Spray very lightly as the resist need only be a mil or so thick and it may run before drying if sprayed too heavily. Allow to dry for about 10 minutes and then turn the board 90° and repeat the whole process. Allow to dry for another 10 minutes. Meanwhile, turn the spray can upside down in an old wastebasket and depress the nozzle until only gas comes out. This will clear it and keep it from becoming clogged. After the board has air dried, place it back on the bread rack and put back in the oven at 250°F for 15 minutes and then remove again using the hot pad. One word of caution; coat the board as soon as possible after cleaning as the copper will oxidize and after a period of time will have to be re-cleaned. I would not wait more than an hour after cleaning before coating.

If you wish to use the liquid form of resist, clean the board in the same manner. After it has cooled, hold it over an old newspaper by its edges, copper side up and level. Pour a small amount of resist on the copper surface and gently tilt the board from side to side to make it run over the entire surface. Add more liquid if necessary. When finished, carefully stand on edge on old

newspapers and let dry for at least 20 minutes. Bake at 250°F for 15 minutes.

Either of these coating methods can be carried out in subdued room lighting, but I would recommend the use of a red or yellow safelight. Under no circumstances let sunlight enter the area where you work with the coated boards. The coating is only sensitive to ultraviolet light and is not affected by the other colors in the spectrum.

After the board is coated it can be stored for months without any problems. The copper is now protected from the air and will not oxidize. If the boards are to be stored for future use, they should be in a light tight container to avoid accidental exposure to ultraviolet.

Now, with a coated board and negative in hand, you are ready to make a board. The materials needed to expose the circuit card are a source of ultraviolet and a piece of glass 8 x 10 inches. A good source of UV is one of those black light bulbs so popular now. A word of caution; do not look directly at a source of ultraviolet as it can cause damage to your eyes.....permanant damage. If you use this type of source, use it in a fixture that prevents accidental exposure to your eyes. An old style goose-necked desk lamp might do. To expose the board, place it copper side up on the work bench and lay the negative on top of it, centering very carefully. At this point check the original artwork and make sure the negative is right side up. Once you are sure all is in ready, place the cleaned piece of glass over the negative. This will hold everything in place and also keep the negative flat against the resist. Center the UV source over the glass at a distance of 10 or 12 inches. Now turn the lamp on for 4 minutes. Do not move the board or glass and be careful not to bump the workbench. After the lamp is off, remove the negative and glass and store away for future use. You are now ready to develop the image of the circuit on the surface of the copper.

The developer you use for this is actually a solvent that dissolves away the resist that was not exposed by the UV. Most common resist developers on the market contain mostly xylene. It is best to buy

a developer made for use specifically with the resist you used. The best thing to do is to buy both from the same manufacturer. Many developers can be used with other brands of resist, but this will take some experimentation. Pure xylene will also work in many cases as will some brands of lacquer thinner. I would suggest that to avoid trouble you stick to the developer made to go with the resist you buy.

Choose a metal or glass (not plastic) tray large enough to lay the board in flat, and pour in developer to a depth of 3/4 inch. Carefully slide the card in, copper side up and gently rock the tray for three minutes. Remove and rinse gently with cool water. Remember, you are still wearing gloves. Now put the board on the bread rack and bake at 250°F for 10 minutes. Caution; From the time you put the card into the developer til the time it comes out of the oven the resist will be very soft and easily damaged. Handle with care by the edges. Remove from the oven and cool. Examine the resist pattern for any damage. If the resist you used is tinted, the pattern will be seen easily. If the resist is colorless, you will have to tilt the board in a bright light to see the pattern. There are resist dyes available to tint the resist patterns with. If you would like to use one, they come in both liquid and spray form. To use either dip or spray with the dye and rinse with cool water. Be careful as the dye is very hard to remove from clothing and hands. Let dry in the air and bake again in the 250°F oven for 10 minutes. Remove and you should be able to see the pattern easily.

CONTINUED NEXT MONTH IN THE RADIO RAG

\* \*

S T R A Y

The U of Iowa Radio Club WØIO expects to receive new Drake TR-22C 2 meter xcvr soon and will be using the IC repeater from their location in the Engineering building. They are also the proud owners of a new Collins 30L1 linear. Nice eh?

## S T R A Y S

The many times delayed launch of AMSAT's OSCAR 7 is now set for 13 November at 1711 Z. For those wishing more information contact Lloyd KØDDA. He can usually be found on 28-88 in the evening.

\* \*

The results published in QST for November show that the Field Day group from the ICARC (WØJV/Ø) placed 35th nationwide in a field of 211 entries in class 2A. The group at KØSVW/Ø Steve and ops Bob WAØDXZ, John KØHLB and John KØOAM came in 42nd in class 1A out of a total of 175. Also of great interest, was the 17th place showing of Lloyd KØDDA and his CR group in the 3A group list of 193. A job well done by all three entries. How about next year guys?

\* \*

New officers for the Iowa City Amateur Radio Club will be elected by the membership at the December 11th meeting. Plan on attending so that your vote will be counted. Nominations will come from the floor so give some thought as to who you would like to see leading our club in 1975. If you plan on offering a nomination be sure he is either going to be at the meeting or gives his consent prior to that time.

\* \*

A winner has been declared in the DX contest of last summer sponsored by the ICARC. The proud owner of a 1975 DX callbook is none other than our own DX hound Steve KØSVW. He worked 30 DXCC countries in the contest period. Where was everyone else at?

\* \*

The General code and theory classes are now in progress with 12 people in attendance. Nice size group doing a fine job in the long struggle to the General ticket.

## S T R A Y S

The American Radio Relay League has announced a subscription rate increase of \$1.50 per year effective on 1 January 1975. They will accept renewals, extensions and new subscriptions at the lower rate until that date. This includes life memberships applied for before that date and paid for in the scheduled 8 quarter payment period. So save yourself a few dollars and subscribe, renew, or extend before 1 January.

\* \*

Doug WØSML is putting the final touches on his new conical monopole for 40 thru 10 meters and has already gained much practical knowledge from it. Doug lives in Marion and is attached to the University of Iowa Physics Department.

\* \*

TOKYO --- Yaesu Musen has just announced the upcoming release of their FT220 FM, CW and SSB 2 meter transceiver. It is VFO controlled with provisions for up or down 600 kHz operation and sports a 10 watt output. Should be a great little box for DX or OSCAR.

\* \*

TOKYO --- Icom is soon to release a synthesizer package for their 2 meter FM gear (ie IC-21). Details will be forthcoming.

## S T R A Y S

Ken WBØIBH has recently accepted a Radiology position in New Orleans, La. and will be moving to his new home in 5 land around January 1. We will miss Ken and all he has had to share with us. Good luck to you, Ken.

\* \*

The Iowa Repeater Council has received more repeater applications including a 31-91 machine for Humingston and a 13-73 machine to be located in Knoxville.

\* \*

The ARRL bullitins report that the raft M/S Pengall, with amateur radio station ON4AXA/MM aboard, was launched from Antwerp, Belgium on October 10. By riding the ocean currents their destination of Trinidad and Tobago should be reached in ten weeks. Contact will be made with ON4AXA/MM at 1200 and 1600 GMT each day on one of the crystal controlled frequencies of 14207, 14222 or 14187 kHz. After the schedules are completed others may contact the station.

\* \*

Mark it on your calenders.....December 14-15 is the annual ARRL 10 meter contest. This is a good chance for those of us who don't have a KW and 6 elements on 10 to have some fun. Low power still has a chance on 10 to rack up some points and perhaps a few new countries. QST has the rules.

\* \*