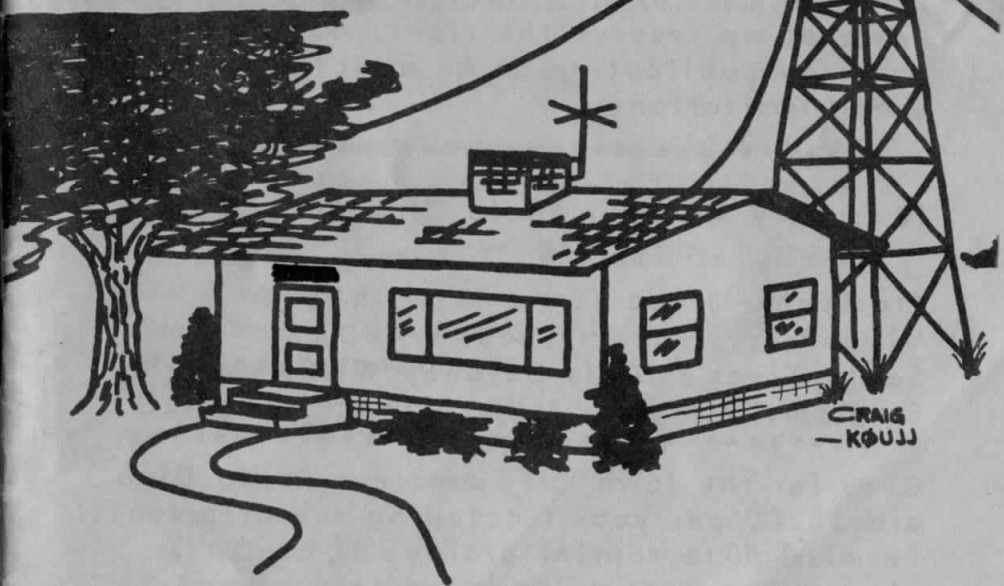


RIVER CITY RADIO RAG



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EDITOR :

Robert Lucas--WAØDXZ
RR #3 Box 124
Iowa City, Iowa 52240

Deadline for submission of materials is the 20th of the month preceeding 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
1974

President: Steve Towle M.D. KØSVW
Vice-Pres.: Robert Lucas WAØDXZ
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Program Chairman: Mike Nowack WBØHOG

Dues for the Iowa City Amateur Radio Club are \$3.00 per year (including subscription). Permission to reprint granted if credit is given to author and publication.

FROM THE EDITOR ---- WAØDXZ

This is the first time that the newsletter has come out in this format, and we hope you enjoy it.

Many thanks to all of our contributors, without you there would be no newsletter. We appreciate all of the help we received and hope that you will continue to submit both articles and simple bits of information for publication. We are not editors in the strictest sense; no articles will be rewritten or hacked apart. We do reserve the right to withhold publication of an article if we do not have space to print it the month it is received.

Thanks again, hope to see lots of stuff coming in, along with any suggestions you might have to improve this thing.

73, de WAØDXZ

ATTENTION !!

The next regularly scheduled meeting of the ICARC will be May 15, Wednesday, at 7:30 PM CDT in the 1st National Bank.

The program includes a SSTV demonstration by Steve, KØSVW and Glenn, WAØPUJ.

Remember---this month only--- its the THIRD WEDNESDAY. See you there!

STRAYS

Those of you who utilize the ARRL QSL Bureau are reminded to send extra postage to cover newly increased rates.

--- de KØSVW

IN CASE YOU MISSED IT

Steve Towle conducted a regular business meeting April 10th...minutes and treasurer's report accepted as read...Jacquie Belding has received her Novice license, Chuck Walker his Advanced...FD: KØOBV, Chairman, has been busy planning for Field Day. They are seeking possible sites (possibly downtown Iowa City) and have some equipment and volunteers. They still need more equipment, and some operators. Anyone interested contact Chuck...

NEWSLETTER: Always needs contributions...REPEATER: IC Repeater members cast ballots for the Iowa Repeater Council Officers. GENERAL THEORY CLASSES: We have several Novices and non-licensed members that need help on the General Class theory. If anyone could conduct this class, contact KØSVW... CLUB PICNIC: Jack, WØMIE, has been appointed Chairman to formulate plans for a Club Picnic. UPCOMING PROGRAMS: Mini-Programs, SSTV, ARRL Film, are a few. We've had some excellent programs this year and some very good ones are slated for summer months. Be sure and attend the meetings so you don't miss them. MAY MEETING: The May, 1974 meeting will be on the 15th, the THIRD WEDNESDAY this month. Mark your calendars right now. This is on a one time basis only. Future meetings will be held on the second Wednesday as usual. APRIL PROGRAM: Mike Nowack gave a very good program on the construction and testing of the Hawkeye satellite. In fact, he is now in California for the final testing preparatory to launching... See you May 15th at the meeting!

de
Dee WNØKBD

THE ANTENNA MART

de KØLUM

Sunday, April 21, KØOBV, WBØHUR, two junior ops and myself went to The Antenna Mart at Rippey, Iowa. After several hours of browsing, we returned with a pickup truck full of stuff. There is no describing the establishment, Even after several trips there, I haven't seen all of the buildings. Any attempt at describing what is found there must fail. He has lots of surplus stuff that changes from day to day. Lots of aluminum for building beams, towers, and antenna wire. He has quite a good selection of beams and mobile antennas on hand. e.g. Hustler, Hy-Gain, CushCraft, KLM, and possibly others I didn't see. Typical prices:

Hy-Gain TH6DXX	\$175.00
Hy-Gain TH3	\$150.00
Hy-Gain 203BA	\$150.00

One special deal he had was a Kirk helicoidal 4 element 20 meter beam. He is asking \$150-160 for it. For more info, see Chuck, Steve, or myself.

STRAYS

Need an address for a U.S. or a DX station, call Steve, KØSVW at 338-7255, as he has just received the latest editions of the domestic and foreign callbooks---KØSVW

THE LURID STORY OF COCHLEAR FUNCTION:

A Technical Construction Project in One Part, or,
IT HELPS TO BE A PLUMBER

de WBØKBA

Since I'm a newly licensed General, and the tests don't require you to know anything about amateur radio (hi) I'll have to write about something that may or may not be of interest.

Fortunately for radio amateurs, human beings are born with sensing devices for sound, the outer portion of which resembles a parabolic antenna. (How's that for technical name dropping, OT's ?) By now you should have guessed the subject about which I am rambling. If not, let me make it perfectly clear, (as someone once said) : EARS!

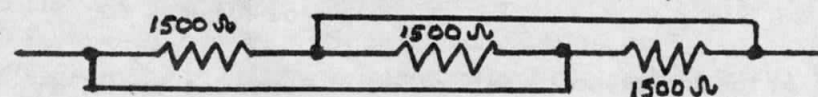
Were it not for those two flaps of skin on the sides of your head, it would not be possible for you to enjoy the sound of all that electrical noise everytime you turn on the rig, another OM calling CQ on the frequency that you just spent five minutes clearing for a phone patch, or the beautiful sound of your XYL's voice telling you "For the last time" that dinner is ready just as that KG6 answers your 51st call. As well as all that good stuff, they may even allow you to enjoy an occasional QSO if the QRM lets up enough. The way they work is really quite remarkable, and that's what I want to talk about. So if you already know, please excuse me for taking such a long time to get to the point, and skip to the next contribution.

Now for those of you who are still onfrequency, let's pretend that we are all listening to code practice from WIAW, (assuming the present state of affairs has changed, of course, and you can HEAR them) and we perceive the first 'dah' in the letter "Q". Some would describe the chain of events that transpires as miraculous; hams would just call it an interesting electro-chemical response to a supra-threshold acoustic stimuli.

(cont'd on page 19...)

TECHNICAL PROBLEM OF THE MONTH

What is the total resistance of this network?



Be careful!

Answer next month---

de Glenn WAØPUJ/Ø

STRAYS

FOR SALE : Drake 2-B receiver, Hallicrafters
HT-40 Novice rig, HG-10 VFO : Bob Lucas WAØDXZ
351-1488

* *

KØLUM is building some SSTV monitors...
Already 2 in town on SSTV; soon 3 ?

**

KØOBU is designing a new vertical for HF. . .

**

KØLUM has a SUPER-PRO receiver for sale
Covers 2-20 mhz plus some VLF: Dave Christ
338-1418

TWO METER TRANSMITTER HUNTING ---

de KØSVW

At the last several meetings, I mentioned the possibility of starting local transmitter hunts and many of you indicated an interest. Two meters is the obvious choice of frequency because more of us have mobile, portable, or hand - held receivers on this frequency than any other. I propose using 146.52 mhz. Those of you without gear can team up with someone who has, because someone is needed to take bearings, and the other to drive.

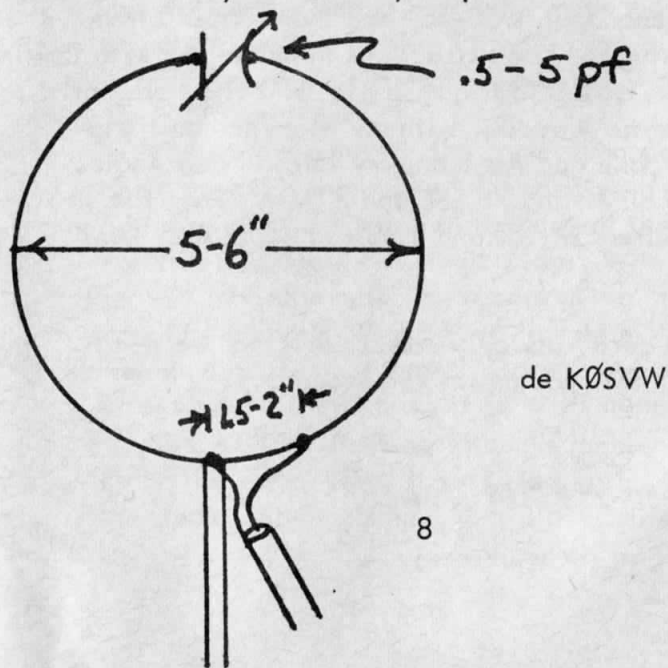
Normally, certain limits are proposed by the participants; i.e. the "Fox" (hidden transmitter) will come on at a given time, be limited to a certain geographical area, (like Johnson County) and transmit with sufficient power and/or antenna to be heard throughout the area. We have found that if the Fox transmits about 60 seconds out of every 3-4 minutes, it allows time for the hounds to kibitz on frequency and still have time to take bearings. The first team to find the hidden transmitter is the winner, however we found in Tokyo that it was more fun if it was not announced at the time, rather only after several teams have "zeroed in". There is another interesting variation to this theme, for example having least miles traveled determine the winner.

The equipment one needs is basically a receiver capable of receiving at the chosen frequency and an antenna which is somewhat portable and directional. Most popular is a small beam or a loop. One then rotates the directional antenna and listens for a null or observes a null on the S-meter. Also handy is a set of simple attenuators to reduce the RF when one gets "close" to the transmitter.

I propose the club sponsor a series of hunts this spring and summer. Prizes would increase the interest. We found

in Tokyo that a hunt in connection with a picnic or a social event was most popular.

Following is a description of a loop design from WBØDEX that can be thrown together at little cost. The basic antenna is a loop of 1/4 inch copper tubing 5 or 6 inches in diameter available at about 27¢ a foot at Plumbers Supply, which is left open at the top. A variable capacitor is placed across this opening to allow tuning. The antenna is fed with coax (RG58) with the braid tacked at the bottom of the loop directly below the opening and the center conductor placed up the loop on either side about 1-1/4 to 1-1/2 inches. This assembly is then fixed to a mast made of most anything handy. The tuning is rather simple; simply connect the coax to your receiver and tune in a strong signal, then place the loop broadside to the source of the signal and tune the capacitor for a dip in the S-meter (or a 0-3VDC meter hooked to the first or second limiter). Thus your loop should read maximum when aimed at the signal source, and a null when held broadside. Now you are ready to join us in the hunt.



WHO IS WHOM

de WØMIE

I thought to start off the first issue of the new "WHO IS WHOM" I would use myself as a trial balloon.

J.C. "Jack" Haldeman--WØMIE-- was born Sept. 17, 1925 in Shenandoah, Iowa. I got a very early start in radio as my mother listened to one of the "pioneer" radio stations, KFNF and KMA in Shenandoah, on a crystal set, using the bedsprings for an antenna. I grew up bothering the engineers at KMA and getting cast off parts and instructions from them all through school. In my junior year I worked on the control board of KMA feeding live programs to the transmitter site and recording on disc other programs for "future airings".

I was a radio operator in the Navy, taking training in Oxford, Ohio, in 1944 and it was at that time that I was on the air my first time with CW from Navy Radio NDS5. Later I was aboard a destroyer DD477 USS Pringle and ended my Navy career aboard USS Dane APA 238. 1946-50 attended U. of Missouri at Columbia. Received my WØMIE call with a class "B" license in 1946, attained my class "A" in 1950. Operated in Shenandoah 1950-56, and then 1956-70 from Cedar Rapids using the same call. Was in marketing with Collins Radio 1956-1962, moved to Iowa City in 1970 and I presently live at 2505 Wayne Avenue, with my wife Margaret and two daughters, Jane and Anne and my faithful dog Angie.

I am active on 40 and 75 SSB and 2 meters FM. The rig is a Hallicrafters SR-150 and a pair of 4CX250's. Runs about 1 KW.

Ed. Note: Jack, our only complaint is that we don't hear you on the air enough...



← WØMIE, JACK

REPEATER NEWS ---

de KØOBV

This is the first of a number of articles about the Iowa City Repeater, WRØACU, and FM and repeaters in general.

The surge of activity, and increased usage of repeaters has been as spectacular as any other milestone in ham radio. It has been compared to the transition from spark to CW or the shift from AM to SSB. FM is not new, nor are repeaters, and 2 meters has been around for a time time. What sparked FM activity is believed to be FCC rules changes for commercial services in the 150 MHz range. Reducing permissible bandwidths flooded the market with "obsolete" police, taxi, etc two way FM units, Ideal for ham conversion to 2 meter FM. A short time later, the electronics manufacturers jumped into the market, providing us with even more to choose from.

One of the first Vhf repeaters was WIAWW, later WIHMO, in Massachusetts. Its 100 watt transmitter and 90' tower was repeating at distances up to 100 miles. That was in 1932! It was even an FM repeater, in practice, if not by intent. Modulating the simple oscillator made more FM than AM, though it was the fashion in those days to have plenty of both, in order to assure high audio recovery with the simple "rushbox" receivers.

FM and repeaters is the perfect marriage. FM has certain characteristics that make its mating with the VHF repeater a highly effective solution to many of the problems of mobile, portable and local communications. With receivers designed for FM, the strongest signal on a given channel has a marked "capture effect". With only a few dB difference in level, any weaker signal is not heard. Gone is the plague of AM--heterodynes. They hardly exist with modern FM gear.

The AGC or limiting effect is inherent in FM reception. Once the signal level is sufficient to quiet the receiver noise, the audio output changes very little, eliminating mobile flutter.

(continued on p. 18)

THE WRØACU ID'er---

de KØUJJ

The WRØACU ID'er was recently placed into operation, and the thought arises that many of the local two meter group would be interested in the theory of operation of the device. This article is presented in an effort to explain it in a simple straightforward manner.

The ID'er is built entirely with 7400 series TTL (Transistor-Transistor-Logic) Integrated circuits. Discussion of the operation of this type of logic circuit has been well covered in the Amateur Literature (QST, Ham Radio, etc.) and will not be covered in great detail in this paper, although I shall mention a few important points before proceeding. First I should like to point out that the common 7400 NAND gate can also be used as a NOR gate by merely inverting the signal levels, that is, to define a logic 1 as a low voltage and a logic 0 as a high voltage, rather than the reverse, which is the standard notation. Ordinarily, both inputs must be high for the output to be true (low in this case, because the output is inverted). However, note that if either input goes low, the output goes high (true in this case) which describes a NOR condition (either input true gives a true output) This is commonly called negative logic, because all signals are inverted, or negated. The same logic applies to using a NOR gate (7402) as a negative logic NAND gate, and both conventions are used extensively in the design of this ID'er.

The information that is sent by the ID'er is "DE WRØACU". If we make a timing diagram of this sequence, (see Fig. 1) you will note that this conforms very well to a steady string of dashes. Because of this, I decided to make the ID'er send a string of dashes and inhibit the output in the appropriate places to form dots and spaces, or to fill in where necessary, which as you will note from the

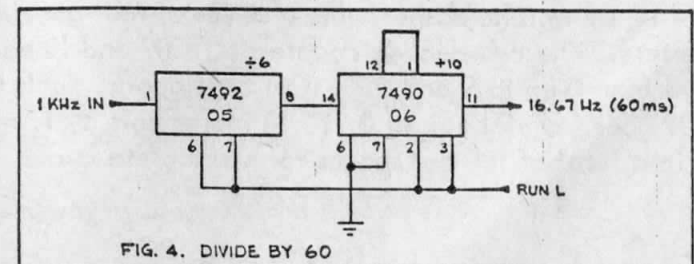
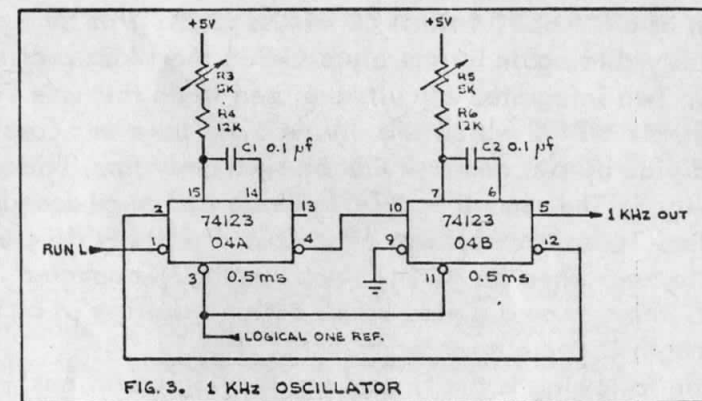
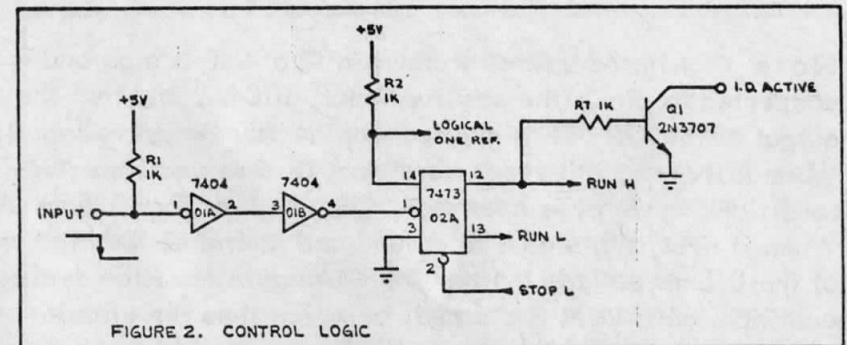
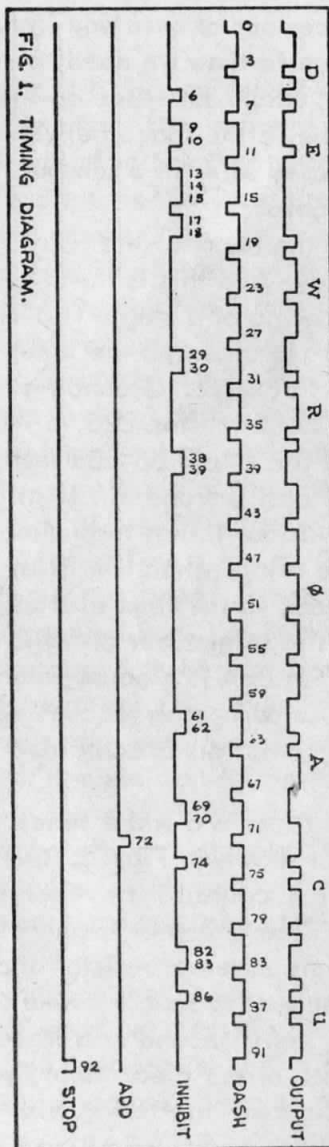
(cont'd on p. 12)

The WRØACU ID'er continued...

timing diagram was necessary only in one instance. In order to determine where in time we need to inhibit or add I have numbered each dot space on the diagram, three dots to a dash, one to the space between the dashes. These numbers will be used later in a scheme to form the proper morse code output.

Before getting into the heart of the ID'er, the control logic will be discussed-- and this is the simplest part of the ID'er, consisting of a single flip-flop and two inverters used as buffers to clean up the input trigger. This circuitry is shown in Fig. 2. Grounding the input will cause the input to pin 1 of flip-flop 02a, a 7473, to go to ground, thus triggering the flip-flop and setting it to the "one" state with pin 12 positive and pin 13 at ground. These two levels enable the various things throughout the ID'er, and conversely disable things when the ID'er is not active. An output is also provided in the form of transistor Q1, which turns on to hold the transmitter on when the ID is being sent. Flip-Flop (FF) 02A is cleared when the count mentioned in the previous paragraph reaches 92, the end of the ID. The circuitry to do this is contained in a later section.

The output from the ID'er is a 1 kHz tone, which is generated by the circuit shown in Fig. 3. This circuit consists of a 74123 which contains two identical but independent one-shots. The one-shot triggers for a period of time determined by the external resistor and capacitor, in this case 0.5 millisecond (so that the time of the two one-shots added together is 1 millisecond or a frequency of 1 kHz.) This one-shot (OS) has a direct clear input, which if grounded will prevent it from interfering with the action of the oscillator. The triggering action of the OS is as follows: If the positive input is high, and the negative input transitions from 1 to 0, the OS fires; or, if the negative input is at ground and the positive input transitions from 0 to 1, the OS fires; no other conditions will fire it.



The WRØACU ID'er continued...

Note that in the unfired state, pin 12 of 04B is high and is connected to pin 2 (the positive input) of 04A, and that the output of the RUN FF is applied to pin 1 (the negative input). When RUN sets, this input transitions to zero and since the conditions above have been met, OS 04A fires for 0.5 ms. When it fires, pin 4 goes to ground and returns at the high end of the 0.5 ms period, it fires OS 04A again, and the cycle continues until RUN is cleared, at which time the circuit ceases to oscillate. The output from pin 5 is a 1 kHz square wave.

The maximum speed for a CW ID is 20 wpm and this is the speed selected for this ID'er. By the most common standard, using the word "PARIS" as the standard 5 letter word, the length of a dot at 20 wpm is 60 milliseconds. This time period is readily obtainable by merely dividing the 1 kHz oscillator by 60. Two integrated circuits are used to do this (see Fig. 1) The first is a 7492 which is a divide by 12 counter, consisting of a divide by two and a divide by six. Only the divide by six is used. The second is a 7490 divide by ten or decade counter. These counters use the output of RUN FF to clear them to zero when the ID'er is not running. Connected in series, they cause a divide by 60 action resulting in 60 ms dot length at the output (or 16.666...Hz).

The following is the first of the two logic sections which form the heart of the code generation circuitry (see fig. 5) It consists of two 7490 decade counters, IC's 09 & 10, two 7442 BCD (Binary Coded Decimal) to Decimal converters, IC's 07 & 08, a Flip-Flop used in conjunction with the first FF of IC 09 to form dashes, and a series of four gates and inverters. The two decade counters IC's 09 and 10 each count from 0 up to 9 and then start over again. Each time IC 09 goes from 9 back to 0, IC 10 increments by 1, resulting in a total of 100 dot spaces for a complete cycle.

(cont'd on p. 23)

BRAIN TEASER OF THE MONTH--

de WBØHOG

A friend gives you a black box he bought at a ham-fest and would like you to help him figure out how it works. On the front are 2 SPST toggle switches and 5 pilot lamps each with a #47 Bulb installed. Your friend says he was told that there is nothing inside the box except one 12V battery and the necessary wire to complete the circuit. You play with the box and find that it acts in the following way:

SW 1 off, SW 2 off : L1 off, L2 off, L3 off, L4 off, L5 off.
SW1 on, SW2 off : L1 on, L2 on, L3 on, L4 off, L5 on.
SW1 off, SW2 on : L1 on, L2 on, L3 off, L4 on, L5 on
SW1 on, SW2 on : L1 on, L2 on, L3 on, L4 on, L5 off
(SW is switch L is Pilot Lamp)

Can you tell him what the circuit looks like? Remember, there are no components used except the 2 switches, 5 pilot lamps and one 12 V battery.

HINT: Not all lamps will light with equal brightness.

Send your solutions to WBØHOG c/o KØSVW and a list of those submitting correct solutions will be published next month, with the answer, and a new brain teaser.

de WBØHOG

STRAYS

Murphy's Laws : Left to them selves, things will always go from bad to worse.

Nature always sides with the hidden flaw.

UPCOMING EVENTS

MAY 15: Iowa City Amateur Radio Club Meeting
7:30 PM Program is SSTV

MAY 19: Cedar Valley ARC Flea Market at Thomas Park

JUNE 12 : ICARC Meeting with Jerry Buck giving a
program on a solid state 2 meter FM rig he built.

Also in JUNE: Date unknown ; Des Moines ARC Hamfest

STARVED ROCK: This is the big one! June 2nd, Princeton
Illinois (Bureau County) \$1.50 advance
\$2.00 at the door... local group will be going

Early Summer: ICARC local Picnic and Transmitter Hunt
WØMIE Chairman

JUNE 22-23 Field Day (KØOBV local chairman)

STRAYS

Good local maps are available from the U.S. geological
Survey in Iowa City, most cost around \$1.00. A really
nice one (Davenport Map) shows CR, Iowa City, Fairfield,
and Quad Cities on one map, complete with all elevations,
in full color.

Also available are more detailed local maps showing
specific houses on streets, etc, with elevations, for you
two meter and VHF nuts. ---KØSVW

REPEATER NEWS continued...

Another plus from FM is the noise free quality of
well designed FM receivers. Another is an effective
squelch system. A good FM system provides much more
pleasant listening than some other modes.

Transmitter design is a plus too. No linearity problem---
No amplitude changes involved in the modulation process.
Class C amplifiers are used, the audio equipment is elementary,
and hardly any power is used.

So, there's a little history of and advantages of FM and
repeaters. Iowa City has a growing population on 2 meter
FM. Think about joining us---more propaganda next month.

de KØOBV

FIELD DAY UPCOMING!

Field Day preparation is coming along. We have
lined up some AC generators, and have a few sites in
mind. We have some equipment, but could use more.
We have a tri-band beam, rotor, a 60 foot tower, coax
and antenna wire, as well as two campers.

Many have voiced interest, including KØLUM, WBØKBA
WBØHUR, WAØDXZ, WBØHOG, WBØMCX and many others.
We'd like to see your name on that list.

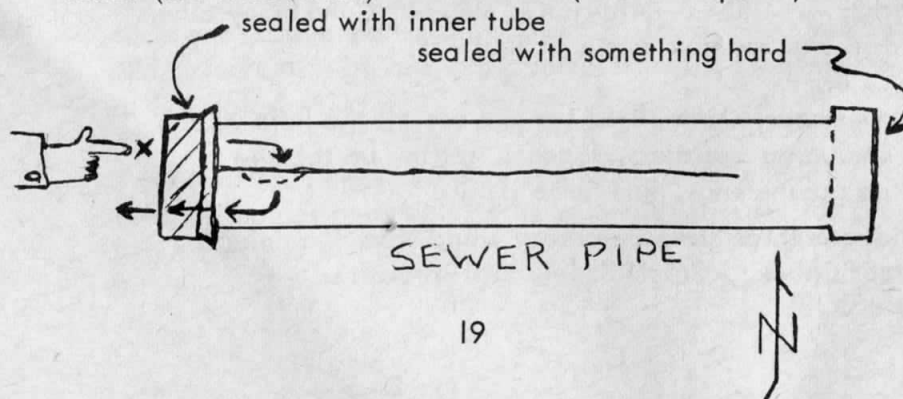
So, remember, June 22-23 we can use all the help we can
get, including operators, loggers, setting up the site,
putting up antennas, you name it!

The idea is to do some operating, and have fun doing it.
Contact Chuck, KØOBV 354-1286 if interested---
--de KØOBV

IT HELPS TO BE A PLUMBER continued...

As we all know, the sound from the speaker cone is nothing more complicated than a series of rarefactions and condensations of air molecules (waves) that impinge upon the tympanic membrane (eardrum) and cause it to vibrate (shake, but not too hard!) Someone, either an extremely dedicated soul, or an obsessive-compulsive from the psych ward at VA Hospital has determined that excruciating pain results when the ear drum moves a distance slightly less than its own thickness (sorta like the thickness of a piece of cigarette paper). This all takes place at an intensity of about 140 dB Sound Pressure Level, re; .0002 microbar. This would be about the loudness of a Lear jet taking off from your lap. So keep away from Lear jets...

The vibrations of the eardrum are constantly transmitted (Aha! The magic word!) via the ossicles, the 3 small bones of the ear, to the acoustic receptor in the bone-encapsulated inner ear -- the cochlea. It is here in the auditory system's peripheral computer that the sound of the "dah" is analyzed into its component frequencies. The mechanism by which this takes place is quite unique. Imagine for a moment a great pair of legs...that's long enough, now back to business. Think of the cochlea as a short piece of sewer pipe closed off at one end and divided lengthwise, except for a few inches at the closed off end, into two chambers, an upper and a lower, by a loosely stretched piece of inner tube. (see illustration) (con'td on p. 20)



IT HELPS TO BE A PLUMBER continued...

Imagine further that both chambers are filled with your favorite beverage. Now seal off the other end with another piece of tightly stretched inner tube, and you have your own personal working model of the cochlea! Now, here's what happens. Our "dah" if you will recall, has worked its way from the eardrum through the ossicles, to the inner-tube end of the sewer pipe. The illusion will be complete if you will all volunteer your index finger (actually, any finger will do) to act as the final bone in the middle ear chain. This final bone, the stapes, pushes like a plunger against the flexible end of the cochlea. You can duplicate this force, the "dah" if you will, by pressing the upper half of the inner-tube end of the sewer pipe (see X in illustration). This mechanical force, the "dah" is 1. transposed into a hydraulic force in the fluid pipe 2) which causes a downward deflection in the membrane which divides the pipe and 3) results in the bulging outward of the bottom half of the inner-tube which seals off the end of the pipe. This all happens many times per second.

"So what?" you may query. Well, there are nerve cells, very tiny indeed, topped by even tinier hairs (cilia) distributed all over the top of our inner-tube divider. And, wonder of wonders, these cells are sensitive to the way their hairs are bent. When the dividing membrane, the basilar membrane in the real cochlea, is bent by hydraulic pressure, some hairs are bent and their respective cells respond by firing an electric impulse off to the brain. Pretty neat, huh? Furthermore, it turns out that the cells closest to the finger (stapes) end of the pipe are responsive to high frequency sounds, those in the middle to middle frequency sounds, and those at the far end of the pipe to low frequency sounds. And so, you see, the pitch of our "dah" determines what part of our membrane is bent and which cells send what pitch information to the thinker.

(continued on p. 21)

IT HELPS TO BE A PLUMBER, continued...

Obviously, things are somewhat more complex than they look on paper, but then that's even true of pornography. Most importantly, the bend is not really a bend. It is more like a wave that travels the length of the membrane, sorta like when you whip your garden hose to get the kinks out of it. But basically, that's how we hear the "dah", that is, if the anti-code practice league is not in operation, which is another subject entirely.

By the way, loud sounds impinging on the ear over long durations (those that make your ears ring after you get away) can damage hair cells and eventually cause a hearing loss. So, if you want to continue to fight with code practice, enjoy your QSO's in spite of QRN/QRM or shrug off that "last call for dinner" and work your DX contact, give your ears a BK, they do a lot for u.

That is all. Steve, WBØKBA...

F C C E X A M S !!

Will be given in these places at these times:

Chicago: Every Friday at 9:00 AM
Des Moines: March, June, Aug., and November
Davenport: Jan., April, July and October

Chicago is administered out of the Chicago Office,
1872 US Courthouse: 219 S. Dearborn St.
(Davenport is also out of Chicago Office)

Des Moines exam is out of Kansas City Office
1703 Federal Bldg., 601 E. 12th St. Kansas City, Mo.

STRAYS

KØSVW, KØHLB, and KØOAM recently operated the ARRL CW DX Contest as KØSVW. They logged 414 DX QSOs on 5 bands in 136 countries in some 71 hours of operation.

**

Senator Goldwater as introduced Senate Joint Resolution 197 which declares June 17-23 National Amateur Radio Week.

**

The Khmer Republic (Cambodia) has announced that XUIDX now joins XUIAA as a recognized amateur station.

**

Collins Radio announces that Donald Beall has been named new president of the firm. He came to Collins in 1971 from Rockwell.

**

FCC clarifies license possession needs. Your original operator/station license must always be in your possession when operating any amateur radio station-- home, mobile, or another ham station.

**

Chinese People's Republic has never recognized amateur radio in an official way, therefore, under ITU rules, the proposed DXpedition planned for this spring by WIGY is not regarded as a legitimate service. FCC advises not to work him.

**

The recently announced increase in amateur fees may be cancelled as a result of U.S. Supreme Court decision. Therefore FCC must reconsider its entire fee structure and this will cause at least a delay.

The WRØACU ID'er continued...

The 7442 BCD to Decimal converters take the output of the decade counters and change it to one of ten true for each state of the counter, in other words outputs 0-9 go low one at a time as the counter increments from 0 through 9. When this cycle starts, the 0 output of the IC 07 is low, and the 00 output of IC 08 is low. The outputs of IC 07 increment along until 9 is reached, and then 0 goes low again, and the output of IC 08 goes low. This cycle continues for a total of 100 separate and distinct states of these 20 output lines. This will be used in the next section to generate inhibit or add pulses.

The output of pin 12 of IC 09 is applied to the input of IC 02B causing it to complement each time pin 12 of IC 09 goes from one to zero. When these two signals are OR'ed together in IC 03C perfect dashes at exactly 20 wmp are formed. This, in turn goes to one input of the inhibit gate, IC 030. If the input to pin 12 is low, the dashes go through unimpeded, but if it goes high, the dashes are shut off (inhibited). This output is then inverted by IC 01C and goes to the ADD gate. (IC 13D) which OR's this signal and the ADD pulse to fill in spaces between dashes if necessary. Finally, this output is AND'ed with the 1kHz clock in IC 14A to produce a keyed tone at the output, and buffered by IC 01E, from which it goes to the transmitter audio.

Finally, we arrive at the last section of the ID'er, Fig. 6. Here, the outputs of IC's 07 and 08 are gated together to form the inhibit or add pulses, and incidentally, to stop the ID'er when the ID is over. I shall explain one section of this gating logic and leave it for the reader to follow the rest of it out if interested. From the timing diagram, you will notice that the first place at which the output must be inhibited is at dot location 6, which is a combination of IC 07 and out put 6 and IC 08 out put 00. These signals are AND'ed together in IC 11A at the top of the drawing. When we arrive at dot space 6, pin 1 of IC 11A goes high, is inverted by IC 04A and applied to

(cont'd on p. 24)
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The WRØACU ID'er continued...

one input of an eight input NAND gate (used here as a negative NOR gate). When any input of the gate goes low, the output goes high, and this, if you remember from the previous section, inhibits the output of dashes. The other sections perform similarly, although in most instances several inhibit pulses are combined together in order to simplify the logic. It would be good exercise in gaining a better understanding of logic circuitry for the reader to attempt to find out just how all of this gating functions.

At the bottom of the drawing is IC 11D which is used to gate outputs 2 and 70 together to add a pulse at dot location 72. Immediately below this is IC 03B which detects dot location 92, the end of the ID. This is AND'ed with the 16.67 clock from IC 06 to prevent a 'glitch' which occurs in the outputs of the 7442's from stopping the ID prematurely.

This concludes my explanation of the WRØACU ID'er. For those of you who have an interest in learning more about logic circuitry there are many excellent sources of information. In particular, an excellent introductory article appears in QST for November 1971, page 24. This article is written in a very easy to understand manner, and I recommend it for anyone not familiar with logic circuitry. In addition, if you are interested in experimenting with this type of circuitry, a good Data Book is a necessity. Excellent ones are published by Texas Instruments, Signetics, Fairchild, Motorola, National Semiconductor and others. TTL integrated circuits are very cheap at this time, and are readily available from many sources, so order a few and do a bit of fooling around with them. Its fun and educational at the same time!

de KØUJJ

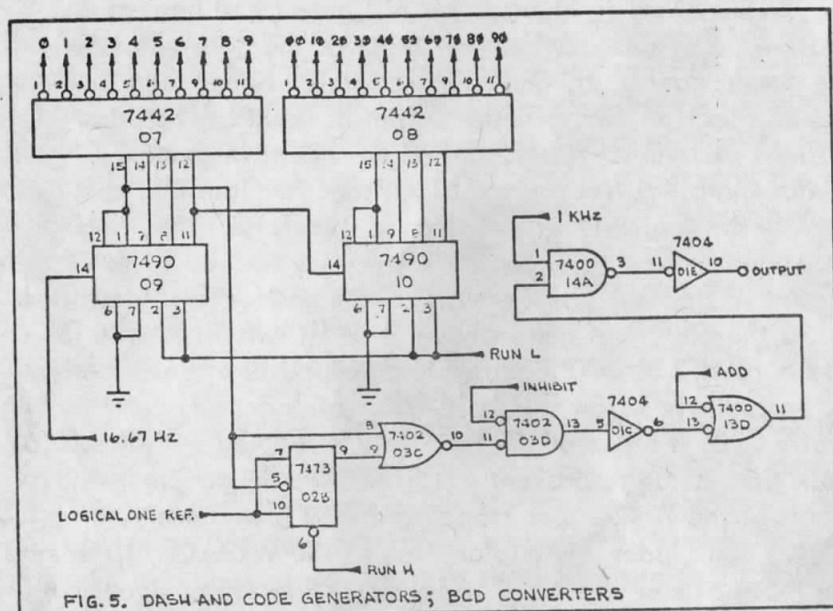


FIG. 5. DASH AND CODE GENERATORS; BCD CONVERTERS

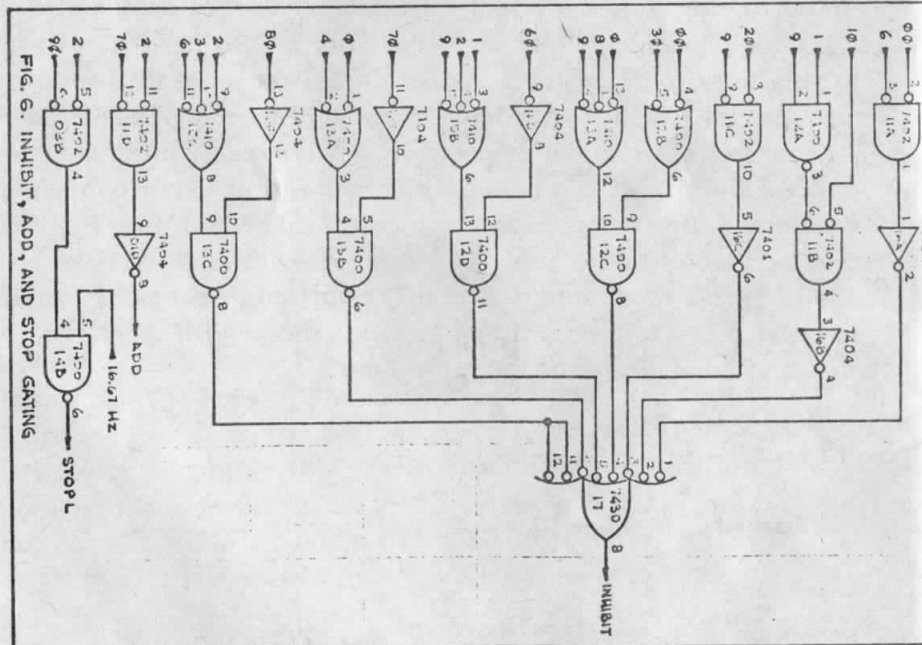


FIG. 6. INHIBIT, ADD, AND STOP GATING

STRAYS

Wayne Green, W2NSD, Editor of 73 Magazine, was convicted by a jury of 12 counts of tax evasion. Sentencing is scheduled for April 29, 1974

☆☆

Clipperton Island DXpedition possible this fall, as the French have OK'ed a scientific visit of Swiss/German scientists to this long dormant spot. Several members are reported to be hams.

★★

VE6CB J/SU, part of the U.N. peacekeeping mission in Egypt has recently been heard on 14,220 kHz. He is making it easier to get this tough zone.

Many QSL's are not mailable to DX countries under present regulation at normal rates. A card for domestic use can be as small as 3 x 4 1/2", cards sent in international mail must be between 3 1/2 and 5 1/2 minimum and 4 1/4 by 6" maximum.

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WAØPUJ, Glenn, reports that the Marshalltown repeater now has dual inputs, 146.25 and 146.28. This is primarily to help the fellows with handie-talkies. **

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Thanks to HR Report for use of some Strays