

CQ Chatter

DECEMBER 2020

VOLUME B20 •ISSUE 10

WOOD COUNTY AMATEUR RADIO CLUB

President	WB8NQW	Bob Willman
Vice President	KD8VWU	Doug Perez
Secretary	N1RB	Bob Boughton
Treasurer	KD8NJW	Jim Barnhouse
Board Member	KE8CVA	Terry Halliwill

President's Letter

The year 2020 is almost over and a different year it has been. If my memory is correct, we had only 2 in-person meetings this year and I hope December, 14, will be the third at Woodland Mall. The on-air meetings went well. Our plans for Wood County's anniversary celebration evaporated, but we did use the special call, W8C, for Field Day, and we did have 2 fox hunts. Our 3 nets and CW practice have been well attended.

The amateur radio fraternity is a group of dedicated folks from all walks of life and backgrounds with a common desire to serve. We are willing to share ideas about all aspects of ham radio with each other and demonstrate to others the joys of amateur radio. I feel it is necessary to continue this in Wood County and we

can only do this with members who are willing to lead this club.

Now it is time to plan for 2021. I have not appointed a nominating committee hoping that members would volunteer to run for Club offices. At the last meeting Jeff, KG8FH, volunteered to run for Board Member. Thank you, Jeff. We will need candidates for President and Vice President at a minimum, and it would be nice to have a full slate of candidates. Please consider offering your talent to guide us into the new year and beyond at the December meeting.

Thank you to all those who helped WCARC in any of our projects during my term as president. It has been an honor to work beside all of you.

Bob, WB8NQW

Net Check Ins

Nov 10 **Traffic: 0**

WB8NQW (NCS)

KD8RNO

WE8TOM

KA8VNG

N8VNT

WD8LEI

KD8NJW

W8PSK

N1RB

K8BBK

KE8CVA

KC8EKT

WD8PIC

KC8NKC (14)

Nov 17 **Traffic: 0**

N1RB (NCS)

WD8JWJ

KD8RNO

K8BBK

KE8CVA

KG8FH

WD8LEI

W8PSK

WB8NQW

KD8NJW

KA8VNG

WE8TOM

KC8NKC (13)

BRAIN TEASERS

1. In which of the following bands is phone operation prohibited ?
 - a.) 160 m
 - b.) 30 m
 - c.) 20 m
 - d.) 12 m
2. Which of the following is an advantage of ceramic capacitors as compared to other types of capacitors?
 - a.) tight tolerance
 - b.) high stability
 - c.) high capacitance for given volume
 - d.) comparatively low cost
3. Which of the following is an advantage of a switch mode power supply as compared to a linear power supply?
 - a.) faster switching time makes higher output voltage possible
 - b.) fewer circuit components are required
 - c.) high frequency operation allows use of smaller components
 - d.) all of the above

December Contests

The contest lineup for the month of December is given below. Please note that the WARC bands (60, 30, 17 and 12 m) are never open to contesting.

Dec 4-6	<i>2200 to 1600 Z</i>	160 m
ARRL 160 m 'test		CW
Dec 12-13	<i>0000 to 2359 Z</i>	10 m
ARRL 10 m 'test		CW/SSB
Dec 19	<i>0000 to 2359 Z</i>	160 m to 10 m
OK (Czech) DX RTTY 'test		RTTY
Dec 19	<i>0000 to 2359 Z</i>	160 m to 10 m
RAC (Canada) Winter 'test		CW/SSB
Dec 19-20	<i>1400 to 1400 Z</i>	160 m to 10 m
Croatian CW 'test		CW
Dec 20	<i>1800 to 2359 Z</i>	80 m to 10 m
ARRL Rookie Roundup		CW

Time to Renew

WCARC 2021 membership dues

are payable to:

WCARC Treasurer, P. O. Box 534

Bowling Green, OH

Net Check Ins

Nov 24

KG8FH
WD8JWJ
KE8CVA
K8DLF
WD8LEI
WB8NQW
KB8QEW
KD8NJW
KA8VNG
KD8RNO
N1RB

Traffic: 0
(NCS)

(11)

Dec 1

N1RB
WD8JWJ
WB8NQW
KD8NJW
KE8CVA
KG8FH
K8DLF
KC8EKT
KA8VNG
KD8RHO
N8VNT
K8DAL
KC8NKC

Traffic: 0
(NCS)

(13)

Brain Teaser answers: (G) 1-b, 2-d, 3-c

Diodes: The Switch You Never Knew You Had

from Hackaday

When looking across the discrete components in your electronic armory, it is easy to overlook the humble diode. After all, one can be forgiven for the conclusion that the everyday version of this component doesn't *do* much. They have none of the special skills you'd find in tunnel, Gunn, varicap, Zener, and avalanche diodes, or even LEDs; instead they are simply a one-way valve for electrical current. Connect them one way round and current flows, the other and it doesn't. They rectify AC to DC, power supplies are full of them. Perhaps you've also used them to generate a stable voltage drop because they have a pretty constant voltage across them when current is flowing, but that's it.

Not so fast with dismissing the diode though. There is another trick they have hiding up their sleeves, they can also act as a switch. It shouldn't come as too much of a shock, after all a quick look at many data sheets for general purpose diodes should reveal their description as switching diodes.

So how does a diode switch work? The key lies in that one-way valve we mentioned earlier. When the diode is forward biased and conducting electricity it will pass through any variations in the voltage being put into them, but when it is reverse biased and not conducting any electricity it will not. Thus a signal can be switched on by passing it through a diode in forward bias, and then turned off by putting the diode into reverse bias.

Diode Switch Basics

To illustrate a basic diode switch, we've prepared a couple of simplified circuit diagrams. The first shows

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WCARC Weekly Net

Tuesdays at 2100 all year

147.18 MHz 67 Hz PL

Net Control Roster

Dec 8	KD8NJW
Dec 15	WB8NQW
Dec 22	N1RB
Dec 29	KG8FH
Jan 5	KD8VWU
Jan 12	KD8NJW

NEXT MEETING

Business Meeting

Monday

December 14

TIME: 7:30pm/7:00 EB

PLACE:

Woodland Mall-Food Ct.

1234 N. Main St.

Bowling Green, OH

10 meter Net

***informal group
meets***

Sunday

@ 20:30

on 28.335 MHz

Fusion Net

Thursday

@ 19:30

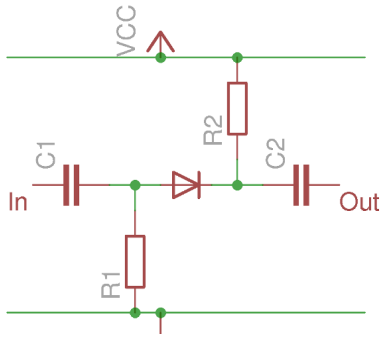
on 442.125 MHz

67 Hz PL on analog

Informal net

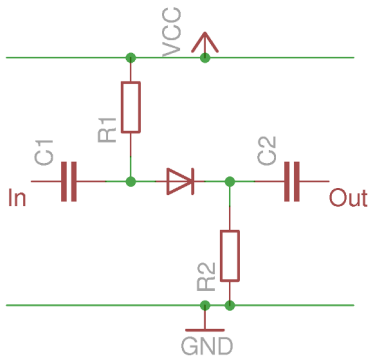
diode—from p. 4

the anode tied to ground through R1 and the cathode tied to the Vcc power rail. The diode is in reverse bias, and no current is flowing through it. An AC voltage applied to C1 will appear at the anode, but will not appear at the cathode and the output via C2.



A simplified diode switch in the reverse biased Off position.

but with the resistors connected to the opposite supply lines. The anode is now tied to the Vcc rail and the cathode to ground. A current is flowing through the diode, and it is forward-biased.



A simplified diode switch in the forward biased On position.

This is a simplified circuit, but not by much. A practical diode switch usually works by maintaining one side of the diode at a bias point so that when at a logic level is

applied to the other point it will switch the diode from forward to reverse bias to allow the switch to be electronically controlled. In other words, hold one end of the diode in the middle, waggle the other end high or low.

Particularly for RF circuits you will also find RF chokes in the bias lines to stop RF finding its way into the power and logic circuits. But the essence is there in the diagrams, diode switches really are that simple.

So now you know how diodes can be used as simple on-off switches. You can even make multi-way switches by connecting single diode switches in parallel to a single bias point. But that's not the limit of the capabilities of the humble diode when it comes to switching, so we'll now consider a couple more applications.

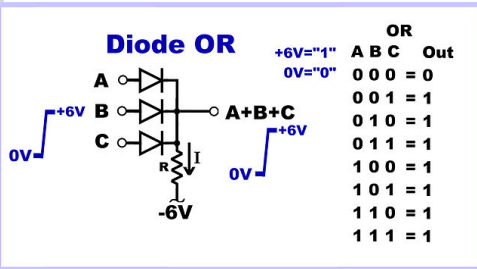
Diodes: They're Only Logical

The first electronic digital computers such as those you would have found in military installations or universities in the 1940s used vacuum tubes, sometimes in conjunction with relays or other electromechanical components. As computers evolved through the early 1950s and found their way into civilian applications they started to be produced using the much smaller and less power-hungry semiconductors which were then the new kid on the block. The trouble with transistors of the 1950s though was

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diode—from p. 6

that they were both expensive and unreliable, instead of the super-reliable



Diode OR

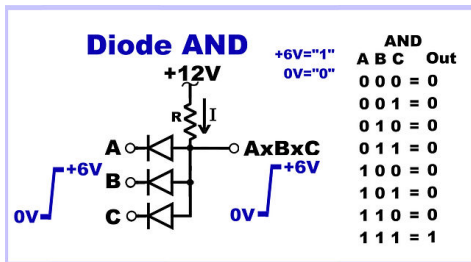
+6V="1"
0V="0"

A	B	C	Out
0	0	0	0
0	0	1	1
0	1	0	1
0	1	1	1
1	0	0	1
1	0	1	1
1	1	0	1
1	1	1	1

The diode OR gate

had to work with germanium point-contact transistors. These devices, aside from their fragility, had the unfortunate characteristic of latching in the logic high state and

requiring a power supply refresh after a state change.



Diode AND

+6V="1"
0V="0"

A	B	C	Out
0	0	0	0
0	0	1	0
0	1	0	0
0	1	1	0
1	0	0	0
1	0	1	0
1	1	0	0
1	1	1	1

The diode AND gate

Clearly any circuitry that could reduce reliance on them was of great interest.

To the rescue of those 1950s designers came the humble diode. They were cheaper and far more reliable than a point-contact transistor, and capable of forming AND and OR gates with only resistors for company. This so-called diode-resistor logic, or DRL, was used in solid-state computers everywhere possible during this period, with transistors used only where an inverter was required.

Both diode gates use the diodes on their input lines, bringing the other ends

of the diodes together at an output point with a pull-up or pull-down resistor.

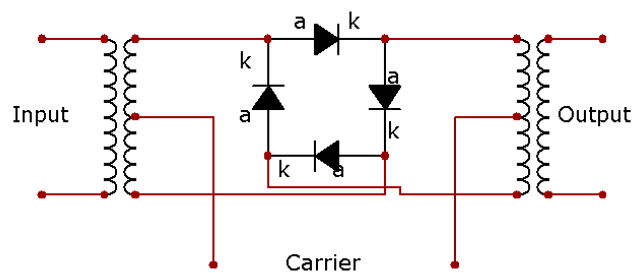
The diode OR gate has the anodes facing the inputs and a pull-down resistor on the output, while the AND gate has the cathodes facing the inputs and a pull-up resistor on the output.

Aside from requiring a transistor whenever a logic inversion is required, these gates suffer the problem that there is a voltage drop across each gate. Thus if you daisy-chain a series of diode gates you will find that with each layer the logic levels drop, eventually to a point at which their transition is not sufficient to operate successive gates.

It is however still worth having diode logic in your stock of available circuits, for sometimes you may have a requirement for a single AND or OR in a project and it may make sense to quickly put one together using a few diodes rather than another 74 series chip.

Mixing it up with diodes

There is a further place that you will encounter a diode switch, especially if



A diode mixer or ring modulator

continued on p. 8

Amateur Input Sought for Propagation Experiment

from *ARNewsline*

If you love experimenting - and who doesn't? - this might just be something to get involved in. HamSCI, the Ham Radio Science Citizen Investigation, needs amateurs around the world who can help collect propagation data during the eclipse happening across South America on December 14th. To do this, you'll need to have a computer connected to your HF radio. Hams are being asked to record data between the 9th and the 16th of December so that there is plenty of control data gathered for this experiment. There will be two 24-hour practice runs beforehand: one on the 21st of November and the other on the 5th of December.

Visit the [Newsline](http://arnewsline.org) website at arnewsline.org to find the link to the webpage containing further details about the experiment. Instructions are in English, Spanish and Portuguese. If you're interested in signing up, contact Kristina Collins at kd8oxt@case.edu ■

diode—from p. 7

you are interested in radio or electronic music. The diode bridge mixer, or ring modulator, is a circuit using four diodes in a superficially similar configuration to that you'd find in a bridge rectifier, and it functions as a frequency mixer in which an AC signal and the output of an oscillator are mixed to create their sum

and their difference. The four diodes act as switches between the balanced signal input and the output, and have the effect of reversing the polarity of the path between them on each cycle of the local oscillator. It is used in synthesizers and guitar pedals, and in radio circuits wherever a transition between frequencies is required.

We hope you'll now look at those diodes in your junk box with new respect now you know they can also do a good job of switching. You may never use a diode as a switch in practice, but it's good to be familiar with the concept, and if diodes have caught your interest, why not continue with a look at our recently-published [history of the diode](#)? ■



Back in the Old Days.... When there was a Ham-a-rama (1980)

Photos courtesy of WD8ICP

***Flea market in front of Junior Fair Building
at Wood County Fairgrounds —>>***



<<—WD8ICP and helper moving tables

Patrons at the Snack Bar —>>



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