

FEED BACK

GEORGIAN BAY AMATEUR RADIO CLUB NEWS

Editor Bill VE3EFX

APRIL 1976

Executive	President	Dick Shave	VE3RIS
	Vice Pres.	Dave Dixon	VE3DKO
	Sec. Treas.	Cy Weaver	VE3DQA

The March meeting was attended by 25 members and visitors including Mr Ted Quinnell who is Recreation Director for the town of Southampton.

The minutes of the last meeting were read and the financial statement showed that the club has a total bank balance of \$395.79.

Jim, VE3CRV moved that the nominating committee consist of three past presidents and the immediate past president will be the chairman. The motion was approved and will be written in to the byelaws by Harvey.

A second motion by VE3CRV that dues for members that are not paid by December 31 for the folling year , be increased to \$7.50 was finally changed on a motion by Rick, VE3HIO, to read, that dues will be \$7.50 for all full members but if the dues are sent in before December 31st they shall be \$5. This in effect gives a \$2.50 reduction for early payment rather than a penalty for being late. This was approved and will also be written in to the byelaws by Harvey. A new member will pay \$7.50 on joining the club .

A letter was read from the Motor Club thanking us for helping with the rally and enclosed was a cheque for \$40.

Ian, VE3HIP was confirmed as Field Day coordinator.

It is hoped that Jim, VE3HIZ will be able to run a radio class in Southampton this Fall and the Recreation Director is behind the idea 100%. The class will be held in the ART School which is located on the main street.

XJ3EFX played a tape on Auroral propagation which was made during the Quiet Sun Years about 10 years ago by GM3GUJ. Coffee and donuts were served.

Anyone who wants to go 2m mobile without drilling holes in the car can purchase a $\frac{1}{2}$ wave antenna complete with magnetic mount, coax and connector from XJ3EFX. I can guarantee that it won't move as it has been used at speeds of over 90 mph on the 401. The swr is 1.5:1. Make an offer.

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Following hot on the heels of my comments in last month's newsletter I got my copy of the Bluewater Club Bulletin and noted that they have voted not to become affiliated to CARF as the membership felt they might not get their \$10 worth out of it. This is the sort of short sighted attitude that prevails in many clubs in this country and for this reason you have an uphill battle trying to get any kind of support for Canadian organisations. I frequently hear amateurs commenting that they don't belong to ARRL because it is American and they don't join their provincial organisation because it doesn't pay interest on their \$5 in the form of visible handouts. One very common criticism of TOA is a lack of interesting content, but if you ask those who complain if they have ever contributed an article to the magazine, the answer is invariably NO. It will be interesting to hear the comments by the uncommitted majority in 1979 if we lose a couple of favourite bands at the WARC. The ARRL has set a goal of 100,000 new amateurs by 1979 and 60,000 new League members. The emphasis on growth is because of the conference and because amateur radio has not grown as it should have in recent years. There will be strong pressure to get some of our frequencies by many of the nations who do not know or care about amateur radio. Preparations are already underway and the ARRL will be spending a lot of money getting a strong team into the ring for the defence of our interests as will CARF. No doubt the ones who do not give their support will be most vocal if they lose anything in the shuffle.

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VE3FCW was mobile the other day running his 2w rig in the car, and doing a good job out to Alvanly on the way back to Port Elgin.

K5EVE/VE3 was busily programming his Microprocessor the other evening. Quite a job. VE3KIN now has a more reasonable ID since John cut down on the signal it feeds to the TX.

VE3GOD was QRT with transmitter trouble the other day but is back on the air again. VE3OSR tends to be temperamental but manages to behave itself most of the time. VE3BIS disagrees with my comment about the 2m net last month but when the net was started it was to GET TRAFFIC INTO THIS AREA AND CONTACT THE LOCAL STATIONS, and you can't pick up traffic without listening to the nets I mentioned. There is no need to monitor the CJ net for the complete hour as people will soon learn to get on at the beginning or move to another net if they want into this area.

There will be a slight change in the rules for the WORLD OLYMPIC AWARD. I called XJ3GCO for clarification of the rule which stated that you had to contact 50 countries taking part in the Olympic Games. I'd worked the necessary countries but had no idea whether or not they would all be sending a team to Montreal. Gary told me that he had written three times to COJO for a list of participating countries and to date had not had a reply.

I mentioned that countries like GM,GI,GW,andGI would likely be taking part in the Games but within the British team. Also many of the countries that I'd worked like OX,FP8,etc would hardly be sending teams.

The new ruling will state that you must contact 50 countries and include a Canadian using the XJ or XN prefix. These awards are well designed and look pretty good on the shack wall so I'd hope that some of the club members can muster enough enthusiasm to work for them, we don't host the Olympic games very often and the two awards are relatively easy to get. Not only that but we hear so much muttering about supporting things Canadian it surprises me when so little interest is taken of events like this.

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There was some suggestion that BIS was going to break out and use the XJ prefix after January 1st but no sign of any action so far.

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Jim, VE3HIZ is talking about running a course in Amateur Radio in Southampton next fall as there seems to be a demand for it. It will certainly relieve people of a long drive from down this way. Best of luck to you in this venture Jim.

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It will pay to watch for some special activity stations in July when the U.S. celebrates its birthday and also when the space probes are due to land on Mars. Maybe the Goddard Space Centre will have a special call at that time.

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XJ3EPX worked a station in Tiverton, Rhode Island the other night, Ian XJ3EIX missed out on this one unfortunately as he needs it for WAS.

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Some good conditions are beginning to develop on 2m and we are getting into VE3SAR quite often these days. VE3OSR is putting up to 30 microamps in here at times but often there is QSE on it to 10 microamps.

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Try to get on the GBARC nets at 7pm nightly on OSR, and 9.30am Sunday on 3.783mhz.

CLARA is offering an award for contacting 10 Canadian VL's in 5 call areas but no more than 4 VE3's.

QSL's must be in your possession and all for contacts after September 12 1972. Send copy of your log and \$1 to VE3GJH, 30 Lisburn Crescent, Willowdale, M2J 2Z5.

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Good Conditions and lots of DX on the bands during the ARRL DX Test. A new one worked by EFX and HIR was FYØBHI on 80 metres. Tess also got 8P6 and VP2M on 80m.

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After waiting since November as I mentioned last month, Bill, VE3FOF finally got his FT200 from Peterson in London. This was the result of pressure applied by VE3CRV I understand. All club members should be warned to steer clear of this company as we have a number of club members who have had similiar experiences.

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The technical data in this issue was contributed by Ian, VE3HIP. Tnx Ian.

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Brian, VE3ERT, is listening to the OSCAR satellites these days with some success and it is nice to know that somebody is using the information in Feedback. It seems to me that a lot of you use it to wrap your sandwiches in judging by the dumb questions I get asked all the time.

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Jim, VE3HIZ, sees a difference in his 2m mobile operation since he moved the 5/8 antenna to the roof of the car.

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Cy, VE3DQA, finally got on the air with his new TS520 and is working DX on 20m.

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There is likely to be a DXpedition to Albania this month by DL7FT so it might be a good idea to watch the usual frequencies just in case. This is one of the most sought after countries as amateur activity has not been allowed since before the war.

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Since the first of March postage to the U.S. has been 10c on a letter so if you are sending QSL cards there be sure to put on sufficient stamps.

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Art, VE3HP, reports that he talked to VE3FPF, editor of TOA the other day as he drove up to the Warton area. Laurie was operating 2m mobile through VE3OSR. It is nice to have Art monitoring the repeater during the day from Port Elgin.

THE GOOD OLD DAYS - FACT OR FICTION

From time to time we hear comments that "Amateur Radio isn't what it used to be, nobody builds anymore, the bands are full of appliance operators, and the advent of SSB made construction of homebrewed equipment too difficult for the average amateur". Sometimes we hear about the loss of AM as if it was a national disaster.

Let's look at the facts with regard to the "old days" first. Sure they built equipment, and wound transformers, and made capacitors, and improvised in many ways to get a signal on the air. They had to, there just wasn't anything for sale and kits were unheard of. Do you think the amateurs of pre WWI1 would have sat around making components if they could have slipped out to the local Radio Shack and bought them? Hardly likely when the planned end result was to get on the air as it is today.

If a person wants to build today he has a very good choice of projects and an excellent supply of parts with plenty of information readily available. The large number of parts supply houses in business suggests that we have more people building than at any previous time, and they are building more sophisticated and better equipment than was possible in days gone by.

Just what was so good about the days of AM rigs anyway? Some people tend to forget the 10Kc wide signals, multiple heterodynes and the amount of QRM caused by a few hefty carriers. Also a 25watt SSB rig will do a superior job of getting out compared to a 100watt AM rig.

Would present day amateurs really like to be building AM rigs with these big Modulation transformers and even bigger power supplies? There is still some AM on the 10m band and occasionally you can hear the odd rig on other bands but the carrier does cause interference and the signals are broad compared to SSB from a properly operated rig.

Surely it is better to move ahead and try to keep up to the state of the art with more efficient equipment using less power to accomplish the end result of efficient communication.

If you wish to compare AM to SSB just listen to the CB channels and I'm sure you will quickly see or rather hear the difference.

Another thing to consider, can you picture a 200watt mobile rig in one of today's cars? Along with the separate receiver and the necessary power supply you would need a trailer to tow it. I'm sure there would be a lot more satisfaction to be gained from building a kit and having a rig capable of good results.

If any of the club members would like to express differing opinions I'd like to hear from them in time for the next issue of Feedback.

Bill XJ3EFX

MY HAM RADIO STORY -- VE3BIS

Saturday night at home in New Brunswick all us kids crowding around the kitchen stove to keep warm, mother always wanted to listen to the "institution" shows. "Chase & Sanborne Hour", "Major Bows Amateur Hour", Kate Smith, Allens Alley, Nelson Eddie and Janette MacDonald, whew!

Whats this other knob for? "VE1CL calling CQ, Grandmanan", voices of men talking to each other by radio, this thrilled the sixteen year old tinkerer. Our gang had a home made telephone from Harkie McInnis's house to Shave's Barn; a motor driven "escape" window, all due to a would be hams' inquisitive nature. Money was a non-existent commodity, working Saturday, Sunday and holidays netted a few dollars a month, a lot of this money went to mothers grocery purse. After buying a 22 rifle, parts for a bicycle and 25¢ for a cinema show some Saturday evenings I finally got enough money to buy a type "49" tube for a space ~~erge~~ detector receiver built from plans in Popular Mechanics. Bumping the shaky receiver was unnerving, the loose turns moved and the station I was listening to vanished. No it wasn't game over, I discovered the station further down the dial, three or four lessons learned already. How do those fellows talk on the air? I found out a lot about ham radio when I received my first allied radio catalogue from Chicago. Unknowingly I was already bitten by Bugus Hamalotus. It was decision time, hobby or income, so at seventeen years old I ordered a test meter and a few parts to start a part time radio repair business, ham radio must wait. I didn't get much business and I also found that radio circuits were very very complex and that the road to the radio business would require work, study, sweat and sneers so if some of you old timers will remember when the next young would be ham asks a "stupid" question, some of us are not as bright as others, I muttered many an epitaph while trying to sort out some circuit.

In those days girls and gangs were the important interests for an eighteen year old, so my buddy and myself went down to the recruiting centre, no way could we be regarded as "Yaller". Square bashing, saluting, eventually landing in the UK I gravitated toward the radio and electronics aspects of army routine (my buddy did not make it).

Resistances in series and parallel, tubes, mutual conductance, resonances; all these things were like jewels, all free courtesy of Canadian Army courses. Transmitters, receivers, if it was not for the gravity of the situation I was having a ball. Radio courses in London Derby, good beer too. Eventually posted to an RCEME Mobile workshop, and mobile it was we were like gypsies. Aldershot, Epsom and Folkstone, not the healthiest parts of the world, but a lot healthier than London and some of the other U.K. cities.

Through air raids and buzzbombs we were gradually organized into a working unit, consisting of radio, armament, small arms and vehicle recovery sections. With an advanced unit, a sargeant and myself we went through France, Belgium, Holland and Germany. We repaired 19 sets, 22 sets of HP12's, mine detectors etc, till we dragged our butts. Some circuits we did not understand but we did keep the gear going by working many long hours and dodging "problems". Driving all over looking for army outfits which of course did not advertise their location. I picked up any electronic equipment which was not tied down, Messerschmidt H.F. rig, European radios, German army sets. As a born pack rat I had more parts stowed away in our truck than we were capable of carrying and was finally told to get rid of some of the "useless" junk. I "shed tears" as a pair of "Bottles" from Krupps test site were unloaded. Eindhoven multiband radios, black boxes, get rid of all these prizes? Well it had to be! A U.S. Army Handie Talkie I "smuggled" back to Canada (1945).

Now as I promised myself if I got back I'll get my ham ticket so July 3, 1946 I was an amateur radio operator, I was going on the air after ten years. The first signal exchange was with Andy VE3AOH, four or five blocks away in Kitchener.

The progressive radio club of Kitchener, Galt and Guelph and the A.W. Amateur radio club with hams VE3CY, VE3QW and others were of great assistance and I felt privileged and proud to belong to the ham fraternity.

VE3BIS

I got my advanced ticket in 1958. It was possible to use phone in those days by taking an advance exam and having the original licence endorsed for phone operation. So I actually started phone operation in 1947.

The DX bug called and during the sun spot cycles of the 40's and 60's it was fantastic to work New Zealand S9 plus on ten at 2 p.m. QSL cards were eagerly awaited. So running home brew receiver, transmitter and antenna (cash was still in short supply) I felt I had at last reached the goal I had wondered about. Some men "work" for worldly possessions, others "play" with hobbies, you cannot have one without the other, it is up to you to strike a balance, 73.

Dick VE3BIS

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Dick got his story in to me early so I was able to put it in this month. There was nothing received from DLS who has now dropped out of the club so we need a story for the May issue at fairly short notice and also one for June. I'd like to ask Bill, VE3EFZ, and Bill, VE3POF if they could get their stories in to me for those two dates. Whichever one I get first will be in the May Feedback.

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There have been a few problems with the repeater lately some of them due to Hydro failures and others that apparently cure themselves as soon as Jim haeds out there to see what is wrong. When Jim gets back from vacation we should be close to getting one of the new transistorised repeaters on the air at woodford.

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Cy discovered that the bandswitch in his TS520 was cracked so it has gone back to have a new one fitted. It only affected the 30 metre band that is the reason we never heard him on the net, it wasn't his antenna after all.

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Walt, VE3TFW has offered the use of his farm for Field Day if we need it this year.

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The next meeting will be at 8pm April 15th in the CIAG computer building as usual.

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While on vacation in the sunny south the 2m beam at VE3BIS came off the top of the mast. That will be the first job for Dick when he gets back home.

XJ3EFX sent in for the World Olympic Award and got it back the same week from Gary, XJ3GCO.

After working all the States in January it took till March 13th to get in all the QSL cards but the Bicentennial WAS application is off to ARRL now. XJ3HIR worked all the States by the middle of February but still has eight to get confirmed as of the middle of March. Tess still needs six or so countries for her World Olympic Award.

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Jim, VE3CRV, took off to the sunny south after the March Meeting and is at this time in the island of Curacao. Imagine going to a place like that without a rig and licence to operate.

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The first issue of MOA came out last month and it was noticed that they had our club listed as inactive . I sent in my quarterly report and at the same time I mentioned that some of our members were getting notices of late dues renewals when in fact their dues had been sent in and the cheque cashed.

As one of the RSO delegates for this area, my term is up on August 31st this year and I would like to see another club member stand for office in this position. I held the position for three years but the usual term is two. While on the subject I'd like to see more support for RSO and CARF as well as ARRL so that we can at least say that we did something to assist in the fight for our frequencies at the up coming WARC. The total cost of membership in all three organisations plus the local club will only come to \$25 and I can't think of any club member who can honestly say they are unable to afford it. If you think about it , it comes to less than 50c a week for the year and you will be getting four publications as well as having part of the say in what is happening in the field of Amateur Radio.

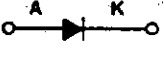
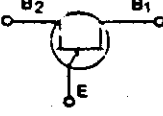


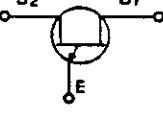
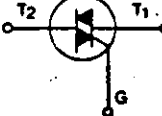


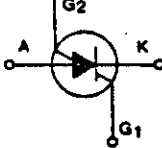

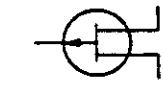
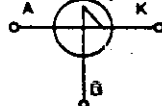
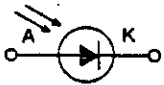
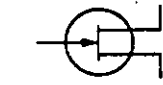
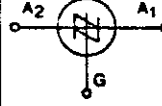
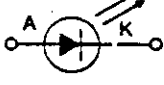
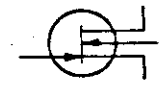
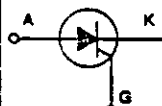
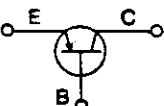

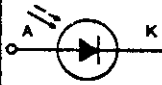
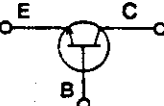

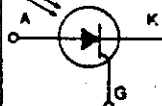
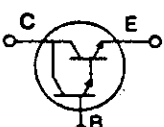

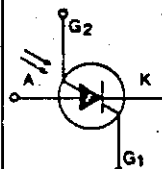
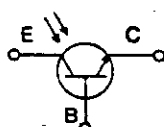
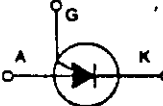
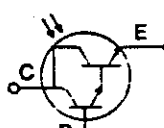
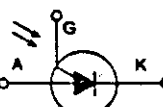
Strange as it may seem there are still a great many VE3's who feel that they don't need Rso, but RSO needs them and they are too selfish to see it that way.

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If you hear VE1BFV/1 grab him as he is on Sable Island , good for DXCC and Dave who is with the Dept. of Atmospheric Environment will be there for 6 months with a long wire and FT101. QSL's go via W5HMK.

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XJ3HIR and EFX only need to get an XJØ to have all the Olympic prefixes. We had hoped to get the VC9UM station from Winnipeg but missed him as there was no info on the operation till after he had QRT.

DIODES					
RECTIFIER DIODE		UJT (UNIUNCTION TRANSISTOR) (N-Type Base)		DIAC (BIDIRECTIONAL DIODE THYRISTOR)	
ZENER DIODE		CUJT (COMPLEMENTARY UNIUNCTION TRANSISTOR) (P-type Base)		TRIAC (BIDIRECTIONAL TRIODE THYRISTOR)	
BIDIRECTIONAL DIODE	Preferred 	BIDIRECTIONAL TRIGGER DIAC (NPN Type)		SCS (SILICON CONTROLLED SWITCH) (Reverse Blocking Tetrode Thyristor)	
TUNNEL DIODE		P CHANNEL F.E.T.		SUS (SILICON UNILATERAL SWITCH)	
PHOTO DIODE		N CHANNEL F.E.T.		SBS (SILICON BILATERAL SWITCH)	
LIGHT EMITTING DIODE, or SOLID STATE LAMP		N CHANNEL J-F.E.T.		SCR (SILICON CONTROLLED RECTIFIER) (Reverse Blocking Triode Thyristor)	
TRANSISTORS					
PNP		N CHANNEL DUAL GATE MOS F.E.T.		LAS (LIGHT ACTIVATED SWITCH) (Light Activated Reverse Blocking Diode Thyristor)	
NPN		P CHANNEL MOS F.E.T.		LASCR (LIGHT ACTIVATED SILICON CONTROLLED RECTIFIER) (Light Activated Reverse Blocking Triode Thyristor)	
DARLINGTON AMPLIFIER		N CHANNEL MOS F.E.T.		LASCS (LIGHT ACTIVATED SILICON CONTROLLED SWITCH) (Light Activated Reverse Blocking Tetrode Thyristor)	
LIGHT SENSITIVE TRANSISTOR (Photo Transistor)		THYRISTORS			
		PUT (PROGRAMMABLE UNIUNCTION TRANSISTOR)			
LIGHT SENSITIVE DARLINGTON (Photo Amplifier)		LAPUT (LIGHT ACTIVATED PROGRAMMABLE UNIUNCTION TRANSISTOR)			



OHM'S LAW

The values of current, voltage and resistance in a circuit are by no means independent of each other. The relationship between them is known as **Ohm's Law**. It can be stated as follows: The current flowing in a circuit is directly proportional to the applied e.m.f. and inversely proportional to the resistance. Expressed as an equation, it is

$$I \text{ (amperes)} = \frac{E \text{ (volts)}}{R \text{ (ohms)}}$$

The equation above gives the value of current when the voltage and resistance are known. It may be transposed so that each of the three quantities may be found when the other two are known:

$$E = IR$$

(that is, the voltage acting is equal to the current in amperes multiplied by the resistance in ohms) and

$$R = \frac{E}{I}$$

(or, the resistance of the circuit is equal to the applied voltage divided by the current).

All three forms of the equation are used almost constantly in radio work. It must be remembered that the quantities are in *volts, ohms and amperes*; other units cannot be used in the equations without first being converted.

POWER AND ENERGY

Power—the rate of doing work—is equal to voltage multiplied by current. The unit of electrical power, called the **watt**, is equal to one volt multiplied by one ampere. The equation for power therefore is

$$P = EI$$

where P = Power in watts

E = E.m.f. in volts

I = Current in amperes

By substituting the Ohm's Law equivalents for E and I , the following formulas are obtained for power:

$$P = \frac{E^2}{R}$$

$$P = I^2R$$

Energy

In residences, the power company's bill is for electric energy, not for power. What you pay for is the *work* that electricity does for you, not the *rate* at which that work is done. Electrical work

Ohm's Law for Reactance
Ohm's Law for an a.c. circuit containing *only* reactance is

$$I = \frac{E}{X}$$

$$E = IX$$

$$X = \frac{E}{I}$$

where E = E.m.f. in volts
 I = Current in amperes
 X = Reactance in ohms

Ohm's Law for Impedance

Ohm's Law can be applied to circuits containing impedance just as readily as to circuits having resistance or reactance only. The formulas are

$$I = \frac{E}{Z}$$

$$E = IZ$$

$$Z = \frac{E}{I}$$

where E = E.m.f. in volts
 I = Current in amperes
 Z = Impedance in ohms

TIME CONSTANT

Capacitance and Resistance

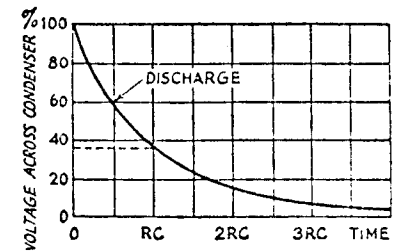
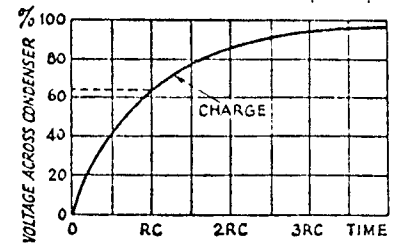


Fig. 2-20—How the voltage across a capacitor rises, with time, when charged through a resistor. The lower curve shows the way in which the voltage decreases across the capacitor terminals on discharging through the same resistor.

The formula for time constant is

$$T = RC$$

where T = Time constant in seconds

C = Capacitance in farads

R = Resistance in ohms

If C is in microfarads and R in megohms, the time constant also is in seconds. These units usually are more convenient.

Inductance and Resistance

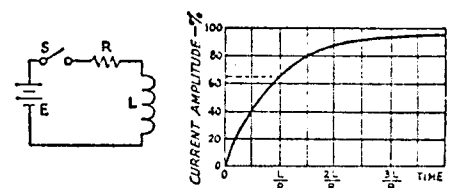


Fig. 2-21—Time constant of an LR circuit.

Theoretically, the back e.m.f. never quite disappears and so the current never quite reaches the Ohm's Law value, but practically the difference becomes unmeasurable after a time. The time constant of an inductive circuit is the time in seconds required for the current to reach 63 per cent of its final value. The formula is

$$T = \frac{L}{R}$$

where T = Time constant in seconds

L = Inductance in henrys

R = Resistance in ohms

The resistance of the wire in a coil acts as if it were in series with the inductance.

RADIO-FREQUENCY

Resonant Frequency

The frequency at which a series circuit is resonant is that for which $X_L = X_C$. Substituting the formulas for inductive and capacitive reactance gives

$$f = \frac{1}{2\pi\sqrt{LC}}$$

where f = Frequency in cycles per second

L = Inductance in henrys

C = Capacitance in farads

$\pi = 3.14$

These units are inconveniently large for radio-frequency circuits. A formula using more appro-

prate units is

$$f = \frac{10^6}{2\pi\sqrt{LC}}$$

where f = Frequency in kilocycles (kc.)

L = Inductance in microhenrys (μ h.)

C = Capacitance in picofarads (pf.)

$\pi = 3.14$

Example: The resonant frequency of a series circuit containing a 5- μ h. inductor and a 35-pf. capacitor is

$$f = \frac{10^6}{2\pi\sqrt{LC}} = \frac{10^6}{6.28 \times \sqrt{5 \times 35}} \\ = \frac{10^6}{6.28 \times 13.2} = \frac{10^6}{83} = 12,050 \text{ kc.}$$

The formula for resonant frequency is not affected by resistance in the circuit.

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WB8CRP CLEVELAND OHIO
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WR8 DETROIT MICH
WR2ADL

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WR2ADE OSWEGO NY
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VE3OCR OTTAWA ONT
WB8BBN CLEVELAND OHIO
WR3AAA BEAVER VALLEY PA
WR8ADF DETROIT MICH.

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WB8UWH YOUNGSTOWN OHIO
WR8ABZ JACKSON MICH
VE3WXR BROCKVILLE ONT (PROP 37/97)
WB3QCE PITTSBURG PA
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VE3SJI SAULT STE MARIE ONT

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WR2AEC SYRACUSE NY
WB8LY HUBBARD OHIO
WB8ARR COLUMBUS OHIO
WR8ADA FLINT MICH
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WR3 INDIANA PA
WR2AHS HORNELL NY

146.34/146.94
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VE3SAR SARNIA ONT
VE3KER KINGSTON ONT
VE3NEM NORTH BAY ONT
VT 36 SAULT STE MARIE ONT
VE3TIS TIMMINS ONT
VE3TAR COBALT ONT
WR3ACA ERIE PA
VE3OSR OWEN SOUND ONT
W1KOO BURLINGTON VT
WB8COM LANSING MICH
VE3NDT LONDON ONT (DORCHESTER TOWNSHIP)
VE2CRA OTTAWA/HULL ONT
VE3TOR TORONTO ONT
WR3ACS JOHNSTOWN PA
WA8PUD GRAND RAPIDS MICH
WR8ABD CLEVELAND OHIO
WR8ACW LIMA OHIO
WR2ACL TROY NY
VE3WAW WAWA ONT
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WR2 CUBA NY

146.37/146.97
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WR2AXR BROCKVILLE ONT
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146.40/147.00
VE3WIN WINDSOR ONT
WR2ACA BUFFALO (CHERRY CREEK) NY
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WR2AHG AUBURN NY
VE3KBR BELLEVILLE ONT

146.43/147.03
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WR2AHE ITHACA NY

146.46/147.06
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VE3LAC LONDON ONT
VE3III WINDSOR ONT
VE2BG MONTREAL PQ
WR2ABV SCHENECTADY NY
WR2ABG SYRACUSE NY
VE3YQT THUNDER BAY ONT
VE3STP RENFREW ONT
VE3TIR RAMORE ONT.

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147.72/147.12
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147.45
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147.54
147.57 RTTY AND FAX
147.60 PAIR WITH 147.00 OTHER THAN HERE
147.63 PAIR WITH 147.03 OTHER THAN HERE
147.66 PAIR WITH 147.06 OTHER THAN HERE