FEEDBACK

The OFFICIAL Newsletter of the
Georgian Bay Amateur Radio Club Inc.

Sponsoring
VE3OSR FM REPEATER 146.940- BARROW BAY
VE3OST FM REPEATER 145.290- OWEN SOUND
VE3GBT FM REPEATER 146.895- MARKDALE
VE3IJD PACKET BBS 145.630 KEADY

APRIL 1996

REGULAR EVENTS

GBARC MEETINGS: 4th Tuesday of each month at the Billy Bishop Airport 7:30 P.M.

BREAKFAST MEETINGS: 2nd and last Saturday of each month at HARVEY's , 10th Street West OwenSound at 9:30 A.M.

GBARC INFORMATION: Information regarding membership should be directed to VE3NEM Tom Merner RR#4 Owen Sound, N4K5N6 371-0655

FEEDBACK: Submissions or letters to the editor should be directed to VE3TSA Tom St.Amand, 1232 3rd Ave . East, Owen Sound N4K2L5

Minutes of GBARC meeting 26 March 1996

The meeting came to order at 7:40 P.M. with 11 members present and 1 guest with Tom VE3TSA standing in for Brad VE3RHJ in his absence.
ATTENDEES: VE3NBJ, VA3ACI, VA3JRF, VE3XOX, VE3HMZ, VE3TSA, VA3CJM, VE3TWK, VE3NEM, KA1QU, N1QCM AND 1 GUEST VE3DTS.
The minutes of the February meeting were accepted as printed, motioned by VA3ACI and seconded by VE3NBJ.
There was no OLD BUSINESS to report on due to the brevity of the February meeting. Tom VE3NEM reported our bank balance at $617.33 with no outstanding bills to pay. This does not include the HobbyMarket investment made by the Bruce Amateur Radio Club of $250.00. Many thanks to BARC.

NEW BUSINESS

As Richard VE3WUD has stepped down as club secretary Marvin VA3ACI agreed to be interim secretary and record the club minutes at the April and May meetings till a new secretary is elected.
The club nominating committee for the Election of Club officers, Bob VE3LKD was not in attendance so a report was not available.
Gary VE3IOD has agreed to take over as the 2 metre net controller from John VA3JRF. John will update Gary as to these duties. Thanks to John for his efforts.
A letter of thanks from the CNIB was read by Tom VE3TSA for all in attendance, for our donation of $100 to the CNIB Amateur Radio Program. A printout of this letter was in the March FEEDBACK.
Jack KA1QU discussed the identification of club members at public events, for example, the Santa Claus Parade. Jack showed us jackets that were used by the Cumberland ARC, an eye catching baseball cap and a T-shirt from the London ARC. It was generally agreed that some sort of identification should be used when we attend a function of this sort. Whether this be a T-shirt, cap, arm band, club crest, vest or some combination will be decided by a committee comprised of Jack VE3TWK, Norm VE3NBJ and Jack KA1QU.
Bob VE3XOX talked about Amateur Radio identification on MTO road signs, such as the ones seen advertising CFOS callsigns and frequencies. These signs are already in place on Highways 21, 26, 6 and 10 there for the benefit of travellers into the area. It was felt that perhaps Bayshore Broadcasting would allow us to include the callsign and frequency of our repeater on their signs. It was also felt that the responsibility for making this request should rest with our club president Brad VE3RHJ even though he was not present.
Bob VE3XOX and Tom VE3TSA gave a brief update on the status of the HobbyMarket. We now have about 30 tables spoken for and as time presses on we should attain our goal of 80 tables. Bob attended the Brantford Fleamarket and handed out 300 information flyers and also 66 vendor agreements, many of whom approached Bob.
The winner of the 50-50 draw was Jack VE3TWK. The meeting was adjourned at 8:20 P.M. motioned by Jack KA1QU and seconded by Bob VE3XOX. Eight members retired to Tim Hortons for coffee and conversation.

These minutes were recorded by Tom VE3TSA.

YOUR PRESIDENT SPEAKS ON THE MORSE CODE DEBATE

by VE3RHJ

I may be the only ham in Canada who DOESN'T have an opinion on whether we should keep the Morse code requirement. And quite frankly, I'm bored reading about it in the letters page of The Canadian Amateur. So, as a public service, I offer this list of the arguments (spoken and unspoken) from both sides of the debate.

FOR

+1. If I had to do it, everyone should have to.

+2. It's traditional.

+3. It keeps out the riff-raff.

+4. An obstacle shows dedication.

+5. You appreciate more a licence you work for.

+6. If the CW requirement is dropped, theory will go next.

+7. If it's not required, CW will die out.

+8. You might need to handle a CW emergency some day.

+9. CW gets through where other modes don't.

+10. CW rigs are easy to build.

+11. It's required by international treaty.

+12. It's an international language.

AGAINST

-1. I can't be bothered.

-2. Only old fogies care about CW.

-3. It scares people away from ham radio.

-4. It's too hard to learn.

-5. I won't use CW, so why should I learn it?

-6. We need all the new hams we can get.

-7. No one uses CW after they get their license.

-8. Even the military and Coast Guard have dropped CW.

-9. Who needs CW when we have packet and the Internet?

-10. Everyone buys commercial rigs nowadays.

-11. Other countries have dropped the CW requirement.

-12. CW is a relic -- we have to move with the times.

Henceforth, irate correspondents should make their arguments by number. TCA can simply use the headlines "FOR" or "AGAINST".

For example:

FOR: +3, +5, +7. -- Elmer Coots, VA6CW

AGAINST: -5, -8. -- Joe Newbie, VO3SSB

This will greatly abbreviate the TCA letters page, and probably save a few trees in the process.

Brad, VE3RHJ (a few days after April 1st)

An NE-602 RF Signal Generator

Useful test equipment from a versatile IC.

by Julian Kerr

The Signetics NE-602 chip has intrigued many people, partly because it is versatile and partly because it is well behaved. What does "well behaved" mean? It means that the chip does what it's supposed to do with little effort on your part. It is an RF device, so you have to be careful with matters such as component selection and layout, but it will work well for you if you just follow a few simple rules. I experienced no problems in a weekend of experimentation in preparation for this article.

Another of the NE-602's attractions is that it is easy to get. As an electronics hobbyist, I am frequently distressed at published circuits that work wonders, but require chips that aren't available through most distributors. Furthermore, major industrial distributors will normally deal with individuals on a cash-up-front basis only (some will do COD), and have a minimum order of $50 or $100. Fortunately, the NE-602 is available by mail from Digi-Key at P.O. Box 677, Thief River Falls MN 56701-0677; (800) 344-4539.

The NE-602 is an 8-pin mini-DIP integrated circuit double-balanced mixer with a built-in oscillator (see Figure 1a). The mixer works up to 500 MHz, while the oscillator works up to 200 MHz. There are two balanced inputs (labeled "Input-A" and "Input-B") and two balanced outputs (labeled "Output-A" and "Output-B"). Both the inputs and the outputs can be used in a single-ended, rather than balanced, configuration. The pinouts of the NE-602 (see Figure 1b) are listed in Table 1.

Much of what has been written thus far about the NE-602 has centered around its uses as a receiver or a frequency converter. Indeed, the NE-602 makes a dandy little single-chip RF front end and will provide a high degree of sensitivity and a low noise figure in that application. In addition, because it is a double-balanced mixer, the LO and RF signals are suppressed in the outputs, so only the sum and difference IF frequencies (LO ± RF) exist in the output. In this article we are going to examine the largely-overlooked oscillator function of the NE-602.

NE-602 Oscillator Circuits

In normal receiver or frequency converter applications, the local oscillator signal generated inside the NE-602 is suppressed in the output. This is an excellent feature to have in a receiver front-end, accounting for the use of double-balanced mixer circuits in high priced communications receivers. But if we unbalance the RF input (pins 1 and 2), then the LO signal will appear on the two output terminals of the NE-602 (pins 4 and 5).

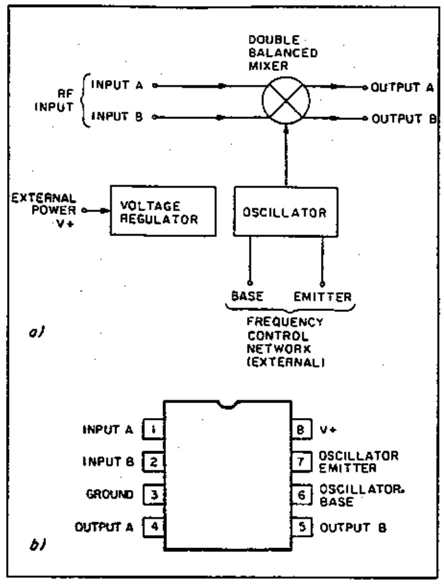


Figure 1. a) Internal circuit of NE-602 in block form; b) pinouts of the NE-602.

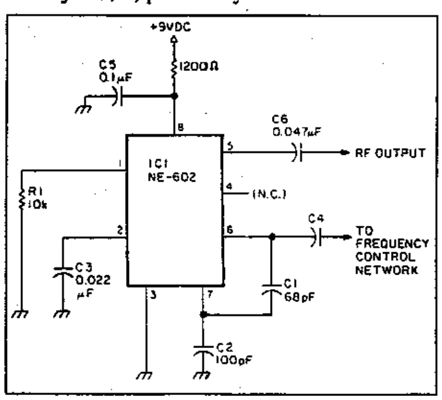


Figure 2. Generic NE-602 oscillator circuit.

Figure 2 shows the basic configuration of the NE-602 in oscillator mode. Input-A is grounded through a 10k ohm resistor, while Input-B is bypassed to ground for RF signals through a capacitor (C3). The value of this capacitor is dependent on the operating frequency. The value shown will work nicely in the HF and low VHF range, but for lower frequencies use a higher value. In general, the capacitor should be 0.001 µF to 0.01 µF for VHF, 0.01 µF to 0.05 µF for HF, and 0.05 µF to 0.33 µF for VLF through low HF frequencies.

As is true for all bypass capacitors, mount C3 as close to the body of the NE-602 as possible. Use disk ceramic, mica or other capacitor types that work well at the frequency of operation. Not all capacitor types that work well in audio or other low frequency circuits will work at RF. The catalog description of the capacitor will tell you its intended uses.

The NE-602 works from DC power supplies in the +4.5 to +8 volt range, and draws 2.4 to 2.7 mA of current. If higher voltage operation is required, then you must use one of two tactics. For +9 volt DC power supplies (meaning battery operation is possible), insert a 1000 to 1500 ohm resistor in series between the V+ power supply and the V+ terminal (pin no. 8) on the NE-602. For even higher voltages, use a three-terminal IC voltage regulator that drops the voltage to 5, 6 or 9 volts. In the latter case, use the 1000 ohm series resistor as well.

The V+ pin is bypassed to ground for RF by a capacitor (C5). The same approximate value ranges described above for C3 are also valuable for this application. Again, mount the capacitor as close as possible to the body of the NE-602.

The output signal can be taken from either pin no. 4 or pin no. 5. I used pin no. 5 because of layout considerations on the perforated board that I used.

The NE-602 oscillator circuit contains an NPN transistor and supporting circuitry, and can be used in all of the normal oscillator configurations that don't require access to the collector terminal. Two examples are the Colpitts oscillator and the Hartley oscillator. For the purposes of illustrating NE-602 oscillator circuits, all but one example will be of the Colpitts oscillator configuration because the Colpitts oscillator uses a tapped capacitor voltage divider (C1/C2) for feedback, while the Hartley configuration uses a tapped inductor. The latter is a little harder to build; the Colpitts works well for most applications.

The values of C1 and C2 determine the stability of the oscillator, and indeed whether or not the circuit will oscillate at all. The approximate values are as follows:

$$\text{Equation 1:} \quad C1 = \frac{100\text{ pF}}{\sqrt{F_{MHz}}}$$

$$\text{Equation 2:} \quad C2 = \frac{1000\text{ pF}}{F_{MHz}}$$

In terms of standard capacitor values, these equations translate to the approximate values shown in Table 2. These values are not absolute, and I found it possible to make good oscillator circuits with values different from these, including the project at the end of this article.

An example of the output signal from the circuit of Figure 2 is shown in Photo A. This signal is from a 10 MHz crystal oscillator (see below), and appeared on both pins 4 and 5. It had an amplitude of about 180 mV, which is more than is normally needed for a signal generator.

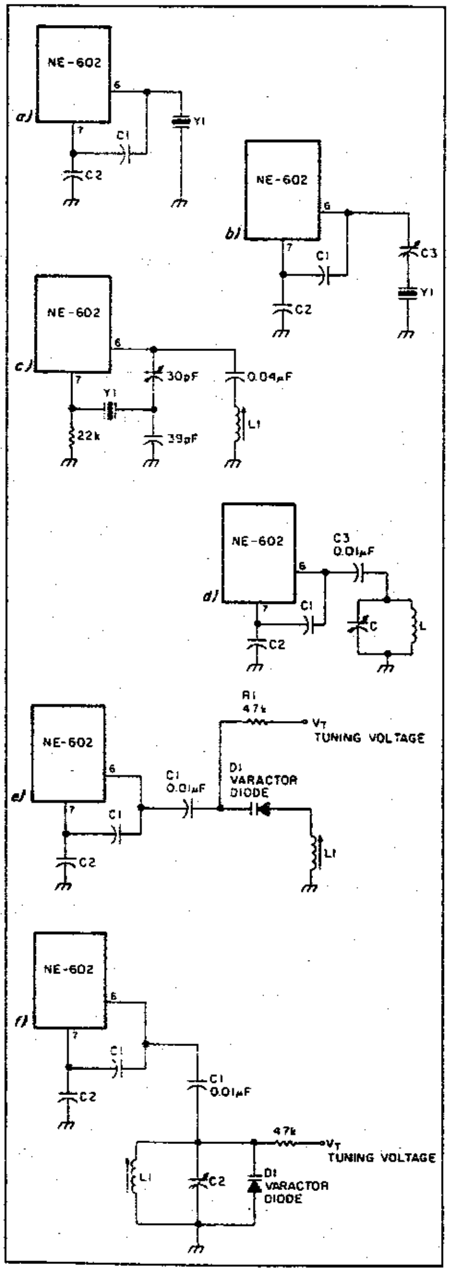


Figure 3. Oscillator frequency control networks: a) simple fundamental mode crystal oscillator; b) adjustable fundamental mode crystal oscillator; c) Butler third overtone oscillator; d) LC tuned VFO; e) series tuned voltage variable VFO; f) parallel tuned voltage variable VFO.

NE-602 Oscillator Frequency Control Networks

The rest of the oscillator circuit consists of the frequency control network (not shown in Figure 2). This network can be a piezoelectrical quartz crystal resonator, a ceramic crystal resonator, or an inductor-capacitor (LC) network. Figure 3 shows several possible variations on the frequency control network.

Figure 3a shows a crystal oscillator circuit. The piezoelectric quartz crystal (Y1) is operated in the parallel fundamental mode, so it is connected in parallel with the oscillator circuit. Because a crystal has an extremely high resistance to DC, there is no need for a DC blocking capacitor between the NE-602 and the crystal.

One problem with the circuit of Figure 3a is that the frequency is not adjustable. The frequency of any crystal resonator is a function of, among other things, the capacitance of the load seen by the crystal (most crystals are calibrated for 20 or 32 pF loads). Because of tolerances in the crystal manufacture, and the values of the external capacitor network (plus stray capacitance, which is significant in RF circuits), the actual frequency and the marked frequency might be different. By placing a variable trimmer capacitor in series or parallel with the crystal (Figure 3b), we can make the actual oscillating frequency adjustable. You can use an insulating tuning wand (a.k.a. "diddle stick") to adjust C3 for the correct operating frequency.

The non-Colpitts oscillator circuit referred to above is the Butler overtone crystal oscillator shown in Figure 3c. The previous two crystal oscillators operate in the fundamental mode, while in Figure 3c the crystal oscillates in the third overtone (similar to harmonic) mode. A fundamental mode crystal is only good to about 20 MHz because the crystal slab becomes too thin above that frequency and is therefore likely to fracture. But, in the overtone mode we can accommodate high HF and VHF frequencies without making the crystal too thin for safe operation.

A variable frequency oscillator (VFO) circuit is shown in Figure 3d. In this circuit the resonator is replaced with an inductor-capacitor (LC) network that tunes the oscillator. Because the inductor has a low resistance and is connected to ground, a DC block capacitor (C3) is used between the LC network and the NE-602. A variation on this theme is the Clapp oscillator in which the inductor and capacitor are in series rather than parallel.

Figures 3e and 3f show voltage-tunable oscillator circuits. The series-tuned version is shown in Figure 3e; Figure 3f shows the parallel-tuned version. In both cases, the tuning element is a voltage-variable capacitance diode (varactor). In these diodes, the junction capacitance of the diode changes as a function of the applied reverse bias voltage (Vt). In this configuration, Vt is a positive voltage between 0.5 and some maximum limit (+9, +18, +30 or +40 volts depending on the diode).

The voltage-tunable oscillators can be used to make signal generators in which the operating frequency is set by a DC power supply and a potentiometer. Alternatively, the same circuit can be used to make a sweep generator or FM generator, or be used to generate the FM signal in a transmitter.

Signal Generator Project

The signal generator that I needed was a crystal-controlled circuit that would operate on the HF ham bands as well as 10 MHz (for use as a frequency standard). Although I selected an adjustable fundamental mode crystal oscillator similar to Figure 3b, you can use any of the standard oscillator configurations, depending on your own needs. Another requirement for my own signal generator was

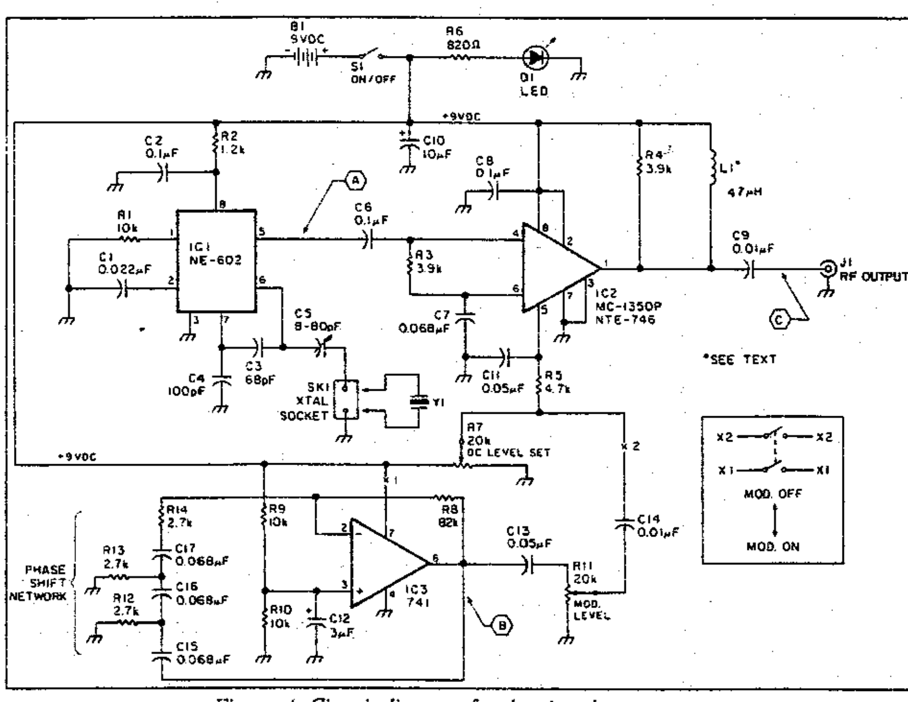


Figure 4. Circuit diagram for the signal generator.

that it be amplitude-modulated at some frequency between 300 and 1500 Hz (the exact AF frequency was not important). The final circuit is shown in Figure 4.

The crystal oscillator is an NE-602 (IC1) connected in a fundamental mode circuit with a trimmer capacitor for varying the oscillating frequency of the crystals. Because a number of different crystals will be used, and I didn't want to switch them in and out of the circuit (too complex), I used a panel-mounted crystal socket (SK1).

The crystal should be a fundamental mode crystal cut for 3 to 18 MHz operation, and calibrated for 32 pF. Suitable crystals, as well as sockets, can be ordered from a number of sources. Limited selections (with predetermined frequencies) can be found at mail order computer dealers, or the parts houses that support them. But custom (as well as standard) crystals can be ordered from Jan Crystals at P.O.B. 06017, Fort Myers FL 33906; (800) JAN-XTAL; or in Florida, (813) 936-2397.

Integrated circuit IC2 serves as both an output buffer amplifier for the oscillator and an amplitude modulator. It is the MC-1350P (also available as the NTE-746 from replacement part dealers), and is billed as an IF/RF gain block. It is frequently used in the IF amplifier stages of FM and communications receivers. It is an 8-pin mini-DIP IC.

This chip is especially useful for three reasons. First, it will operate at the desired frequencies. Second, it is also fairly well behaved, although it seems a little more touchy than the NE-602 device in the circuits that I've tried. This touchiness is probably due to the very high gain that is possible when the output terminal (pin no. 1) is tuned to the input frequency. Third, it has a single terminal that makes it really useful as an amplitude modulator: the AGC terminal (pin no. 5).

The AGC terminal on the MC-1350P is intended for gain control applications. A DC potential applied to this pin will change the gain of the circuit. Two voltages are applied to the AGC terminal in this project: a DC level set by potentiometer R7, and the modulating audio signal. The latter signal is set by potentiometer R11. The DC voltage is normally supposed to be between 3 and 9 volts, so the DC level control is used to set the value at some midpoint that will allow the audio signal to go through positive and negative excursions without exceeding either limit.

The modulating signal is produced by IC3, a 741 operational amplifier connected in the RC phase shift oscillator configuration. Because only a single DC power supply is used, the 741 is operated with a bias voltage applied to the noninverting input (+IN) through a voltage divider (R9/R10).

The oscillating frequency of the 741 is set by a 180 degree phase shift network consisting of C15, C16, C17, R12, T13 and R14. When combined with the 180 degree phase shift caused by connecting the 741 in the inverting follower manner, the network will produce the 360 degrees needed for oscillation. The oscillating frequency is set by:

Equation 3: $$F_{Hz} = \frac{1}{2\pi\sqrt{6}\,RC}$$

where R = R12 = R13 = R14, and C = C15 = C16 = C17. With the values shown in Figure 4, the circuit oscillates at a frequency just under 400 Hz. The feedback resistor (R8) should have a value that is at least 29 times the value of R used in Equation 3.

If you want to be able to turn the modulation on and off, then insert the switch shown in the inset to Figure 4 at the points marked "X1" and "X2."

Results

As the old proverb says, the proof of the pudding is in the eating. Photos B, C and D show oscilloscope photos of the waveforms in this circuit. The 10 MHz RF carrier is shown in Photo B (although at a different time base than Figure 2); this signal appears at point "A" in Figure 4. The audio modulating signal appears at point "B," and is shown in Photo C. Finally, the modulated RF signal from the output of IC2 (point "C") is shown in Photo D.

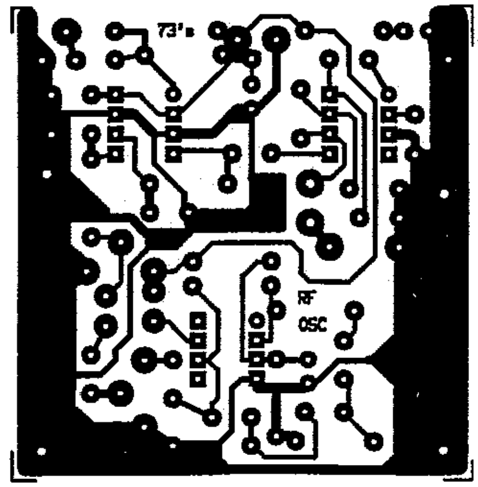


Figure 5. PC board foil pattern.

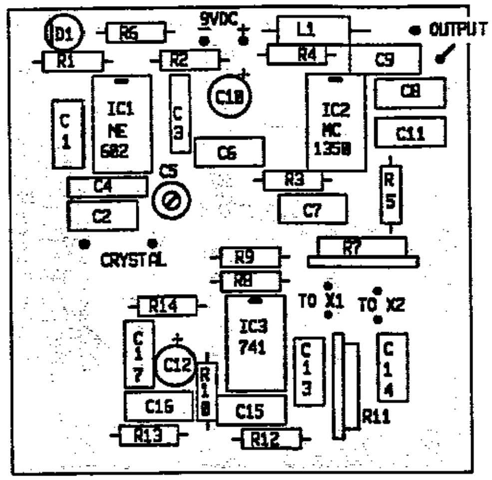


Figure 6. Parts placement.

Pin. No.	Function
1	Input-A
2	Input-B
3	Ground
4	Output-A
5	Output-B
6	Oscillator Base
7	Oscillator Emitter
8	V+

Table 1. The NE-602's pinouts.

Frequency (MHz)	C1 (pF)	C2 (pF)
0.5	150	2000
1.0	68	470
5.0	45	220
10.0	32	100
20.0	22	50
30.0	18	47
50.0	14	22

Table 2. Capacitor values for oscillator circuits.

Parts List

IC1	NE-602
IC2	MC-1350P (or NTE-746)
D1	Red LED
Y1	Crystal frequency of your choice
R1,R9,R10	10k resistor
R2	1.2k
R3,R4	3.9k
R5	4.7k
R6	820 ohm
R7,R11	20k potentiometer
R8	82k
R12,R13	2.7k
C1	0.022 µF capacitor
C2,C8	0.1 µF
C3	68 pF
C4	100 pF
C5	8-80 pF variable
C6,C9,C14	0.01 µF
C7,C15,C16,C17	0.068 µF
C10	10 µF/35V electrolytic
C11,C13	0.05 µF
C12	3.3 µF electrolytic
S1	SPST switch
L1	47 µH Digi-Key TK-3922
SK1	Crystal socket
B1	9-volt battery

Misc: Battery clip, case, PC board. A blank PC board is available for $4.50 + $1.50 shipping from FAR Circuits, 18N640 Field Court, Dundee IL 60118.

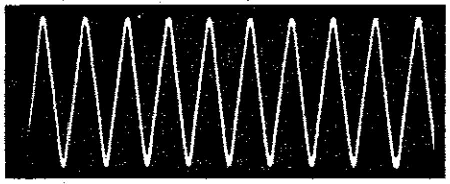


Photo A. Oscilloscope photo of the waveform from the output signal at pin no. 5 (see the circuit shown in Figure 2).

Photo B. Output waveform: RF from NE-602.

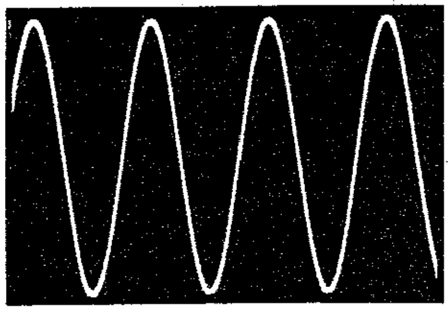


Photo C. Output waveform: AF from 741.

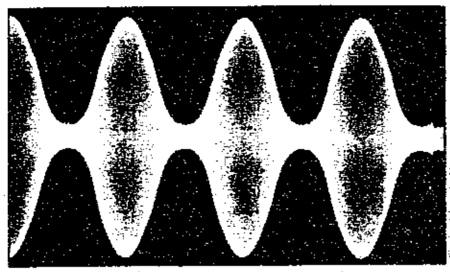
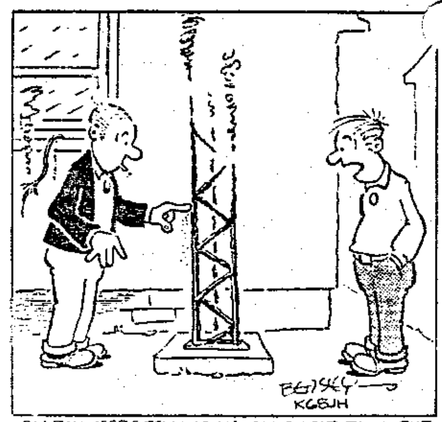


Photo D. Output waveform: modulated RF from MC-1350P.



OL' RAY KEEPS TELLING ME IT WAS ACID RAIN, BUT I THINK HE WAS JUST RUNNING TOO MUCH POWER!

What is Electricity ?

and

Where Does it Go After it Leaves the Toaster ?

Here is a simple experiment that will teach you an important electrical lesson: On a cool, dry day, scuff your feet along a carpet, then reach your hand into a friend's mouth and touch one of his dental fillings. Did you notice how your friend twitched violently and cried out in pain ? This teaches us that electricity can be a very powerful force, but we must never use it to hurt others unless we need to learn an important electrical lesson.

It also teaches us how an electrical circuit works. When you scuffed your feet, you picked up batches of "electrons," which are very small objects that carpet manufacturers weave into carpets so they will attract dirt. The electrons travel through your bloodstream and collect in your finger, where they form a spark that leaps to your friend's filling, then travels down to his feet and back into the carpet thus completing the circuit.

Amazing electronic fact: If you scuffed your feet long enough without touching anything, you would build up so many electrons that your finger would explode! But this is nothing to worry about unless you have carpeting.

Although we modern persons tend to take our electric lights, radios, mixers, etc. for granted, hundreds of years ago people did not have any of these things, which is just as well because there was no place to plug them in. Then along came the first electrical pioneer, Benjamin Franklin, who flew a kite in a lightning storm and received a serious electrical shock. This proved that lightning was powered by the same force as carpets, but it also damaged Franklin's brain so severely that he started speaking only in incomprehensible maxims, such as "A penny saved is a penny earned." Eventually he had to be given a job running the Post Office.

After Franklin came a herd of electrical pioneers whose names have become part of our electrical terminology: Myron Volt, Mary Louise Amp, James Watt, Bob Transformer, etc. These pioneers conducted many important electrical experiments. For example, in 1780 Luigi Galvani discovered (this is the truth) that when he attached two different kinds of metal to the leg of a frog an electrical current developed and the frog's leg kicked, even though it was no longer attached to the frog, which was dead anyway. Galvani's discovery led to enormous advances in the field of amphibian medicine. Today, skilled veterinary surgeons can take a frog that has been seriously injured or killed, implant pieces of metal in its muscles, and watch it hop back in the pond just like a normal frog, except for the fact that it sinks like a stone.

But the greatest pioneer of them all was Thomas Edison, who was a brilliant inventor despite the fact that he had little formal education and lived in New Jersey. Edison's first major invention in 1877, was the phonograph, which could soon be found in thousands of American homes, where it basically sat until 1923, when the record was invented. But Edison's greatest achievement came in 1879, when he invented the Electric Company. Edison's design was a brilliant adaptation of the simple electrical circuit. The Electric Company sends electricity through a wire to a customer, then immediately gets the electricity back through another wire, then (this is the brilliant part) sends it right back to the customer again.

This means that an Electric Company can sell a customer the same batch of electricity thousands of times a day and never get caught, since very few customers take the time to examine their electricity closely. In fact, the last year any new electricity was generated in the United States was 1937; the Electric Companies have been merely re-selling it ever since, which is why they have so much free time to apply for rate increases.

Today, thanks to men like Edison and Franklin, and frogs like Galvani's, we receive almost unlimited benefits from electricity. For example, in the past decade scientists developed the laser, an electronic appliance so powerful that it can vaporize a bulldozer 2,000 yards away, yet so precise that doctors can use it to perform delicate operations to the human eyeball, provided they remember to change the power setting from "vaporize bulldozer" to "delicate."

un-attributed

From: VE3IJD TO: GBARC

On behalf of the McDonald family, namely Randy, Jason and Jeremy, I want to extent a sincere thankyou to all those who supported us through donations to a trust fund set up by Bill, VE3HMZ. I also want to thank again those who came out to the benefit dance put on by the Keady Community. Your support towards us was felt by the whole family.

No one knows the fright of a fire until one goes through it and it's not supposed to happen to "me".We're very thankful that no one was burned or hurt. It was a very close call that all five boys were not in the small room when things started. I'm still sure that my youngest and two of his friends would have been burned, those snowmobile suits made of nylon attract fire and melt quickly.

We moved back into the house on March 29, the fire was January 5,1996. There is no smoke smell as most of the burned material was removed,including all the drywall and insulation in the whole house.This is when you find yourself in the middle of "Nows the Time to Change It " syndrome.We had the wiring totally upgraded,siding on the house, etc, etc,,to the tune of about $6500. This coupled with the fact that neither snowmobile was insured put us behind the eight ball about $11,000, money that could have went to better places,,like a bit of tuition next year.....ah !!!

Continued on next page --->

We do quite a bit of outdoor cooking, yes ,even roasted tomatoes and onions and our favorite barbeque didn't fare well. A neighbour pulled it out of the fire, fearing the tank would blow..I wish he's left it alone to blow...it needed replacing anyway as those who cooked on it during field day are aware...so.. Randy has her eyes on a new one... I had my eyes on Dayton..her eyes are stronger than mine.. guess that means she'll be cooking over a new barbeque at field day......... Once again , thanks for being there,,,,Gene.....

GBARC WANTS YOU!

MEMBERSHIP: I know that some of last year's members haven't renewed with GBARC, and some of our new hams haven't joined. Please tell us why! If the club is doing something you don't want, or not doing something you DO want, becoming a member is the only way to change things. If you're happy with what the club is doing, please show your support by joining! It needs money and people to keep GBARC going; let's not lose a good thing by saying "let George do it."

OSCVI: On Saturday, May 18th, the Owen Sound Collegiate & Vocational Institute is having a reunion parade. They've asked us to provide communications for the event. This will be a smaller version of the Santa Claus parade -- even using the same route -- and will run from 10 am to noon. A crowd of 10,000 is expected. We'll provide only communications (no crowd control), so perhaps 5-10 operators will be needed. This is a terrific opportunity to "sell" amateur radio and GBARC, so please help!

HOBBY MARKET: Unless you've just returned from Florida, you know the GBARC hobby market in Saturday, June 1st. We STILL need to sell more vendors' tables at this event, so if you're planning to turn some of your spare junk into cash, please send your table reservation in now! If you're not a vendor, remember that we'll need help for setup, tear down, security, and talk-in. Please contact VE3XOX, VE3NEM, VE3TSA, or VE3JRF to volunteer.

FIELD DAY: The weekend of June 22nd is Field Day! Call it a contest, a preparedness exercise, or a social gathering: we'll set up a tent and some portable rigs somewhere, and for 24 hours straight we'll work the radios and chew the rag. If you're a Basic licensee and you want a taste of HF, here's your chance -- we'll have HF operators supervising so you can use the rigs. Mainly, it's our big social event of the year. Mark your calendars! (Location still to be determined.)

ADVANCED COURSE: I've had a few queries from people wanting to upgrade from the Basic licence, asking if we will hold an Advanced licence course. We can do this, but we'll need more than "a few." If you'd be interested in taking such a course, please let me know.

- Brad VE3RHJ