

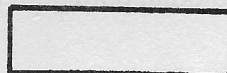
THE HAMILTON AMATEUR

HAMILTON AMATEUR RADIO CLUB INC.
P.O. BOX 253
HAMILTON, ONTARIO
L8N 3T8

FIRST
CLASS



Gerry Goldberg VE3HLI
17 Cottrill
Hamilton, Ont. L8S 3L5





THE HAMILTON AMATEUR RADIO CLUB INC.

Club StationVE3DC...VE3RCB

2 Meter Repeater....VE3DRW.....Input : 146.160 Mhz.
Output : 146.760 Mhz.

1977 OFFICERS and DIRECTORS

<u>PRESIDENT</u>	JOHN DYKSTRA VE3BOY	14 TALBOT ST. CAYUGA , N0A 1E0	772-5372
<u>PAST PRESIDENT</u>	DAVE. E. WALTON VE3FLZ	421 LODOR ST. ANCASTER , L9G 2Z9	648-6872
<u>VICE-PRESIDENT & PROGRAM DIRECTOR</u>	STAN. BOLIBRUCH VE3GFE	8 RUTHERFORD AVE. HAMILTON , L8M 1Y4	528-4002
<u>SECRETARY</u>	PETER GOODSON VE3DOU	28 RIVERDALE DR. HAMILTON , L8E 1J8	561-1659
<u>TREASURER</u>	PETE. C. WALTON VE3FEZ	421 LODOR ST. ANCASTER , L9G 2Z9	648-6872
<u>EDITOR</u>	NORM. FREIDIN VE3CZI	42 LESTER ST. HAMILTON , L8V 4P5	388-9813
<u>PUBLISHER</u>	GERRY GOLDBERG VE3HLI	17 COTTRILL ST. HAMILTON , L8S 3L5	528-7688

COMMITTEE CHAIRMEN

Club Station Licencee	(VE3DC)	VE3BKM	VERN. HUCKLE	388-6989
Red Cross Station Licencee	(VE3RCB)	VE3FHQ	Glenn A. Gibson	385-2786
Repeater Licencee	(VE3DRW)	VE3CFM	Bob. Miller	529-2950
Health and Welfare		VE3GFE	Stan. Bolibruch	528-4002
Photographer		VE3FLZ	Dave. Walton	648-6872
Public Service		VE3FHQ	Glenn A. Gibson	385-2786
Technical		VE3DVV	John VanDenBerg	692-3221
Refreshments		VE3ARX	Bill. McCaslin	634-5190
Refreshments		VE3AHB	Irwin Merritt	634-3197

Membership Year.....January 1st to the following December 31st each year.

Membership Fees.....\$6.00 per year (all classifications.)

PLEASE ADDRESS ALL CORRESPONDENCE TO : THE SECRETARY
HAMILTON AMATEUR RADIO CLUB Inc.
P.O. BOX 253
HAMILTON , ONTARIO
L8N 3C8

***** FEBRUARY MEETING PROGRAM *****

Date: February 16, 1977

Time: 8:00 P.M.

Place: Chedoke Continuing Care Centre

Speaker: Bill Montgomery Jr. VE3GZM

Topic: Microprocessors

THE PRESIDENT'S PAGE

It seems like the club is going to burst at the seams, with activity and projects.

The Technical Committee has started its new project; Introduction to Integrated Circuits, which starts in this month's bulletin, and the response from the members is fantastic, last count 100 boards had been ordered. Stan VE3GFE was having trouble with the counting and Peter VE3DOU was getting confused on how many to order!

Glen VE3DSP received the 45,000 resistors on a group quantity purchase and another large order has recently been placed.

Glenn VE3FHQ is ordering more and more co-axial cable as the spools of 500 feet are gone in no time.

John VE3DVV is receiving lots of inquiries referring to the Robot 400 boards and components.

Several members, including myself, have been to the computer group meetings in Toronto and Waterloo.

Hope you were listening on 75 meters on Jan. 29th, the Simulated Emergency Net set up between St. Catherines and Hamilton via the MARCO Net (W4IET) Net Control.

Frank VE3HSN and Jim VE3FCI were operating the station VE3BKM at the Chedoke Hospital, a job well done.

With the bad weather conditions, many stations have handled emergency traffic via VE3DRW. I myself, got into a snowbank across the CNE tracks at Nelles Corners. Thanks to the Amateurs on the Hamilton Repeater the CNE Station was notified, and I received assistance. It gives you a queer feeling sitting across the tracks and knowing a train passes every hour. The 2 meter rig in the station wagon was the reassuring factor "Help is only a mike's push away!"

See you at the Club Meeting.

73's

John Dykstra VE3BOY
President

It has been brought to our attention that there is a request for a Tutor to assist a White Caner, who lives in the East End on Oriole Cres. He is very interested in obtaining his Amateur Radio License and anyone who would like to assist, please contact Stan VE3GFE at 528-4000

It has recently been learned that Alex Smith VE3BON passed away on Thursday, Feb. 3/77 at St. Josephs Hospital. I am sure all those who knew Alex will miss his absence at our club activities.

Editor's Editions

The time has come to stay inside and enjoy the warmth and comfort of ones favorite place in the home, for most of us, the Ham Shack or Workshop probably have a welcome area of enjoyment.

As our President has commented, the club activities have grown by cycles and kilocycles and again we have emerged upon another great activity in the "IC Project" which everyone has been talking about and is being spearheaded by our Technical Committee. I am sure that, after the great job that Glen VE3DSP did in getting the QSY Group organized, this IC Project should at least equal or exceed the personnel involment in that, there has already been 65 people who have put forth their money toward the IC Project.

Another successful venture, that has taken place in the Hamilton area, was the first social getogeather, which met Jan. 28/77 at the Stoney Tavern in Stoney Creek, Ont. This effort was not a club organized event, and although the "advertising" was started by myself, I must point out that ALL of the "background" organizing was done by a new Ham in our midst, in the person of Barry VE3ISX. After meeting Barry during an eye-ball QSO one Sunday morning, I realized that Barry's idea had great merit and encouraged him to set it up and let's see what happens. The rest is history, despite the storm outside, we had 20 - 25 people sitting together, sharing jokes and general kibbitzing while enjoying a good meal at a reasonable price. An experience that was long overdue in Amateur Radio Circles in this area. Due to the success of the first gathering, another on is inevitable, and will be on Friday, Feb. 25/77. All Amateurs are Welcome and Bring the MYL.

While on good happenings, much appreciation should be extended to Bill VE3ARX and Geoff VE#GLL for a fantastic effort in setting up the "Order of the Gavel" Award. I can think of nothing more satisfying than having such a nice memory of the year or so that was spent in frustration and glory while keeping the Hamilton ARC active and growing to its present status. Thanks again Bill & Geoff.

It has been brought to my attention that we have enthusiastic people who are just obtaining their Amateur Tickets, and have also expressed a desire to assist with Bulletin Work, organizing activities and other useful tasks. It looks like our club is finally coming out of its doldrums, as we stride forward with an enthusiastic and aggressive club executive who are trying new and different ideas.

73's

Norm Freidin VE3CZI
Editor

Minutes of Hamilton A.R.C. January 19/77

- Meeting opened at 8:04 PM by Pres. John VE3BOY
- Treasurer's Report listed the Net Balance at \$838.42
- Membership was presently at 121
- Henry Wild VE3HTD presented auditors report signed by himself and VE3HBY
- Moved by VE3GEQ, seconded by Stan VE3GFE to accept Treasurer's report.
- Carried
- Dave VE3FLZ reported that VE3DHJ was in Joseph Brant Hospital, Room 419.
- Glenn VE3FHQ reported that the SET exercise was set up for Saturday, Feb. 5/77 at 12:30. All interested to report at Chedoke Hospital for briefing at 12:30 PM
- Glenn also mentioned that he had obtained more RG-58/U (500 ft) along with 500 ft of RG-174/U which are available to members at our cost.
- Glen VE3DSP and Stu VE3SG gave further information on the SET on Feb. 5/77.
- Glen VE3DSP read a letter from D.O.C. which requested an opinion as to whether there should be RTTY allowed to operate on 160 meters.
- Moved by VE3FLZ to recommend to D.O.C. that they allow RTTY operation within a specified sub-band on 160 meters.
- Carried. Secretary to advise DOC
- John VE3BOY read a letter inviting members to the Oakvill Club Dinner-Dance on Feb. 12/77
- John VE3BOY asked the general membership to vote to set aside \$300 towards a repeater budget which would be used to either build up a newer solid state machine, or buy a used solid state commercial unit.
- Carried, unanimously
- VE3DJF donated \$25.00 towards the repeater fund, plus \$30.00 gift certificate from the Golden Steer Steakhous to be raffled at tonight's meeting.
- VE3BOY asked the club members to donate a battery charger to the hospital for a wheelchair. Pete VE3FEZ volunteered to donate same.
- Glen VE3DSP mentioned that the club can obtain resistors 10 to 1Meg 1/4watt, 20 of each value for \$15.00
- Glen VE3DSP proposed a project to learn about IC circuits through the bulletin. Members would have to obtain proto-boards to experiment with the IC's and experiments mentioned in bulletins. Cost would be about \$30.00. Good response from members indicated that the project would be on. Purchases would be on a group basis.
- VE3FHQ moved that participants pay treasurer for the boards in advance. Seconded by John VE3CNF. Carried.
- Fred VE3GCP mentioned CARF wanted a brochure telling about Ham Radio and he wanted help in designing this. He also had a copy of CARF proposal for 1979 conference.
- Instructors package and Advanced Study Guide will available for Sept.
- Bill VE3ARX and Jim VE3FMT present the "Order of the Gavel" Certificates.
- Coffee Break---
- Draw on \$30 gift certificate from VE3DJF was won by Fred Spring, Greensv
- Draw netted \$51.00 for repeater maintenance.
- Stan VE3GFE introduced Tom VE3GEQ who showed a film and slides on CSA Testing.
- Meeting adjourned at 10:45 PM

AMITY "GOOD TURN DAY"

"Good Turn Day" is again being conducted by the Boy Scouts of the Hamilton Area, on March 12, 1977 Saturday.

Again this year, Amity would appreciate the volunteer services of 4 to 7 mobiles to co-ordinate the organization of the pick-up locations with a Base Station at Amity at King William & Ferguson.

Anyone able to assist, please contact Glenn VE3FHQ at 385-2786

Kustoms Kapers

If you are planning on visiting the USA with a 2 meter rig in your car, you may have problems when passing through customs on your return to Canada. Border personnel may not know the difference between your rig and a CB rig.

The following suggestions for hams going to the USA with 2 meter equipment in their car.

1. Carry with you a) a photocopy of your station license and b) a photocopy of your bill of sale. In some circumstances, further proof of purchase may be required.
2. On entering the USA, stop at Canadian Customs first and have your unit examined and duly recorded on a Form Y38. The Y38 will be signed and stamped by the officer on duty.

If a problem is encountered on returning to Canada, your unit does not have to be seized and held for further proof. Simply suggest to the officer that he give you a K5 detention form which will allow you to travel home and clarify the situation with the local Canadian Customs port in London. Handy indeed if you happen to have a problem at the Blaine crossing in B.C. or some other far off port of entry.

It has been mentioned that the depressed market for 23 channel CB rigs in the USA has made the price very attractive for Canadians, and border personnel are aware of the situation. Border officers are also aware of the difference between an XM and a VE callsign, but can you prove you are a VE?

(Credit: Dick Reiber VE3IBV and London ARC Bulletin)

All men make Mistakes-----

----- Husbands just find out about them
sooner!

" COMMUNICATIONS BETWEEN NATIONS "

Keep in mind that the 1977 ARRL National Convention will be the greatest event for Amateur Radio for Canada for this decade. Yes, it's 10 years since it was first held in Montreal, Canada and no doubt it will be another 10 years before Canada will be so honored again. -- Yes, it's "A chance of a lifetime" to attend such a convention right at home-- or almost at home for all VE3's.

To date several large firms have made their display registrations. It promises to be the largest display of new amateur radio gear -- so don't miss it! Convention registrations are coming in, and Arizona, Alberta, Ontario & New Brunswick have already been heard from. Stress early registration to avoid disappointment. Remember Toronto is a people city & a great place for the whole family. Advertise the Convention, Toronto & Ontario as a wealth of intrigue, excitement, wonders & pleasant surprises for everyone. There will be a great program for the XYL's & YL's.

While Scarborough A.R.C. is hosting the 1977 ARRL National, they are receiving full co-operation & support from all the Local clubs, R.S.O. and of course A.R.R.L. The Nortown ARC is looking after the Friday nite eye-ball activities. The Metro ARC is looking after the handicapped, wheel-chair, White Cane visitors & anyone who needs a hand! Local groups such as TFMCS, CANADIX, WCWA, etc. have already made commitments for forums, booths, or hospitality rooms, etc.

As you can see, with Grey Cup fever faded out, the 1977 ARRL National fever is spreading, but let's have your help to spread it further & faster. This is going to be the Convention to be remembered. so let's all get on the publicity Band--160,75,80,40,20,15,10,2 etc. wagon now & keep it rolling.

5 points to keep in mind.

- 1977 ARRL National Convention, Sheraton Centre, Toronto, June 3-4-5
- Pre-register early for convention with S.A.R.C.
- Pre-register early for accommodation with Sheraton Centre or your choice
- For further info write: 1977 ARRL Convention, P.O. Box 1011, Stn "C", Scarborough, Ont. M1H 2Z4
- Bring your XYL, YL & family to Toronto in 1977!

Let's all help SARC with publicizing this convention when you are on the air. I was at the 1967 ARRL National in Montreal, and it is nothing like your average local Hamfest or Conventions... VE3CZI

HERE & THERE

- Do you remember when 10-4 meant a day in October?
- RSO Fees have gone to \$7.00 for both full & associate members, from \$5.00 and \$3.00 respectively. Rising costs were cited. Also noted, that CARF has also increased its membership fees to \$7.00 from \$5.00.
- THE ONTARIO SCIENCE CENTRE STATION VE3OSC TO REOPEN Good News that that Ontario Science Centre is once again to open the "Ham Shack", and relocate in a more accessible part of the building. Recently when the announcement came that this important exhibit was closing, many concerned radio amateur - individuals and societies - wrote protesting letters to the powers that be, deploring this move, and requesting reconsideration. So, many new plans are now being formulated for a bigger and better radio amateur display, including Ham Radio movies to be shown including the new one by ARRL introductory Amateur Radio. It is planned that an organization of amateurs will be formed to man the station, and operate for the edification of visitors. The new proposed site is beside the laser beam display, and a very prominent location is assured. (RTTY News)
- Burlington A.R.C. Auction will take place on March 8/77 at the Central Arena, Burlington, Ont.
- Nortown ARC Auction will take place on March 18/77 at 8 PM at the Centennial Library, 578 Finch Ave. West. Toronto, Ont.
- Going East this year on holidays, take in The All Saints Maritime Convention at St. Andrews-by-the-Sea, N.B. This year being held at the famous Algonquin Hotel on Sept. 3, 4, & 5, 1977. A full program, including technical forums, flea market, exhibits, prizes and awards, Ham forums, a family program, Banquet & Dance. If more info is desired, write - Hamfest 77, R.F. 325 - 8 Rothesay, New Brunswick. EOG 2WO
- The famous Rochester Hamfest will run three days this year - May 20, 21 & 22nd, 1977. A card to "Hamfest", P.O. Box 1388, Rochester, N.Y. 14603 will put you on the mailing list.
- Oakville A.R.C. are again presenting their Annual Dinner-Dance on Feb. 12/76 at the Knights of Columbus Hall, 1494 Wallace Road, Oakville, Ont. Tickets are \$6.00 per person, contact T. Story VE3IBF or Chas. Power VE3APR for information or tickets.
- 1977 CJ Dinner will again be held at the Town and Country Restaurant, Mutual Street, Toronto. Saturday, April 16/77. Info on luncheon and Dinner Tickets to be available shortly. (RSO)
- RSO QSL cards: New cards may now be ordered. Same design as before, but now black on white. 500 cards @ \$17.00; 1000 cards @ \$24.00 (RSO)

THUMPERS

Over the past few years I have monitored 2 meters on a regular basis and I have come to the conclusion that there are a few categories of Thumpers that are outstanding. These are listed below:

Early Morning Thumpers: The first thing they do in the morning is to check and make sure that the repeater is on. Early morning Thumpers usually get up between 6:15 and 7:15.

Late Night Thumpers: Some of these could possibly be early morning Thumpers, and they give the repeater a little thump before they go to bed.

73 and 88 Thumpers: After they have a QSO, always have to thump the repeater a few times with the one that they just finished talking with, Just a friendly little way of saying good-bye.

Repeater Checker Thumpers: From time to time, on an irregular basis, all repeaters in an area get a thump one right after another. If at anytime, these Thumpers find that one of the repeaters are not on the air, immediately notify one of the controllers of the repeater.

Casual Thumper: From time to time throughout the day checks to make sure that the repeater is still on the air.

Rapid fire Thumper: This is done by those who like to see how many times they can push their mike buttons in three seconds.

Guess who Thumper: He will always return a thump to the Casual Thumper, but doesn't like to give his call. (Credit: Int'l Repeater Group Bulletin)

A Fox Hunt with a twist after KL7DOB's car was robbed of about \$2000 in tools and gear plus a Tempo hand-held. A strange voice on WR7AFN wanting help in finding out "how come I can't hear this radio on my CB set?" was answered by "Observer" and others offering to help the newcomer out. When they met, the Tempo was recovered but the culprit took off cross-country. KL7DOB trailed his footprints home through the snow, found all the missing gear there. (hr report)

Single chip tranceiver manufacturer is Lithic Systems. The 70 by 100 mil chip needs only receive and transmit crystals, appropriate tuned circuits, mike and speaker to complete. It operates from 2.7V delivers 60 mw of RF with 40 ma drain on transmit. 1.5ma drain on squelched receive. The chip, LP 2700 works anywhere from the broadcast band through to over 100 MHz. (hr report)

THREE FAITHFUL FRIENDS: An old wife, an old dog, and READY CASH!

number in the lower left-hand corner of the envelope or package. This Bureau can also be used as an incoming QSL address - just keep a stamped, self-addressed envelope on file at the same address - for all except Canadian and US cards.

THE TEN COMMANDMENTS FOR Amateur Radio Operators

1. Beware of the lightning that lurketh in an undischarged capacitor, lest it cause thee to be bounced upon thy buttocks in a most ungentlemanly manner.
2. Cause thou the switch that supplieth large quantities of juice to be opened and thusly tagged, so thy days may be long in these earthly vales of tears.
3. Prove to thyself that all circuits that radiate and upon which thou workest are grounded, lest they raise thee up to high-frequency potential and cause thee to radiate also.
4. Take care that thou use the proper method when thou takest the measure of high-voltage circuits so that thou dost not incinerate both thyself and the meter; for verily, though thou hast no account number, the meter hath one and wouldst bring woe unto the Supply Dept.
5. Tarry thou not amongst those who deal in intentional shocks for they are no longer here.
6. Tamperest not with interlocks for this will incur the wrath of thy seniors.
7. Work not upon energized equipment, for, if thou dost, thy buddies will surely be buying beers for thy widow and consoling her in other ways not generally acceptable to you.
8. Never service high-voltage equipment alone, for electric cooking is a slothful process and thou mightst sizzle in thine own fat for hours on end.
9. Trifle thou not with radioactive tubes and substances lest thou commence to glow in the dark like a lightning bug, and thy wife have no further use for thee.
10. Commit thou to memory the works of the prophets, which are written in the books of instruction, which give the straight dope and console thee, so thou canst not make errors.

(Credit: I.E.E.E. Newsletter via Bill, VE3EKA)
via - Ottawa Groundwave

* * * * *

A FREE OUTGOING QSL SERVICE is available to CARF members as well. Sort your cards by country and alphabetically by call-sign and send them in bulk to: CARF QSL BUREAU, BOX 66, ISLINGTON, ONTARIO M9A 4X1. Be sure to put your membership number in the lower left-hand corner of the envelope or package. This Bureau can also be used as an incoming QSL address - just keep a stamped, self-addressed envelope on file at the same address - for all except Canadian and US cards.

(hr report)

A HISTORY OF VE3DRW

In the late 60's membership in HARC was declining. Something had to be done to pull the club back together, to give it a common purpose or goal for the members to work towards. The idea for a club repeater seemed to be the answer. It was suggested by one of our past presidents, Ken Christmas VE3FHB. Ken had long been concerned over the steady decline in membership and apparent loss of interest in club activities. Ken suggested the idea to Bob Miller VE3CFM and the two of them began developing the idea and bringing it to reality. The bulk of the credit however has to go to Ken who was able to line up the necessary equipment and get the station on the air. Putting a repeater on the air in those early days of repeaters was not without its problems. Questions arose-- What frequency should be used?, Where would it be located?. Through the auspices of the technical committee of 3RPT we had 16/76 assigned by the then Chairman of the newly formed Southern Ontario and Western New York repeater Council. As the club was meeting at the Red Cross Building that location was selected. The antenna raising party almost spelled disaster for DRW when a passing blonde distracted one of the "guys and

The formal announcement that the station was on the air was made through a demonstration at the September 1969 club meeting. Within a month "DRW" had an operating autopatch, one of the first in Canada. DRW's initial set up at the Red Cross building is still evidenced by its quarter wave ground plane antenna visible on the roof.

Through the efforts of Bill McCaslin VE3ARX DRW found its new home on a 22 story apartment building on Hamilton Mountain in the fall of 1970. The autopatch feel victim to the move but this was inevitable as the DOC had issued interim guidelines preventing autopatch operation in connection with repeaters. Although the new site had provision for autopatch it was never activated.

DRW's trials and tribulations were not at an end however. The originally assigned frequency of 16/76 was found to interfere with simplex operation in Toronto and Buffalo. Two powerful voices at the repeater council were successful in swaying a majority vote to move DRW's output to 79. Although this was a backward step in DRW's development the club conformed with the vote and in July 1971 the output moved to 79 giving DRW a non standard pair.

Eventually sanity returned to the council and DRW returned to 16/76 in September 1974.

How has DRW performed over the years? As a tribute to technical performance it is still on its original transmitter (plus a few new tubes!) and the old receiver was only changed last year. If its reliability DRW is tops. Even when the location was changed DRW's voice was silent only a little over an hour.

Currently DRW is composed of a progress line transmitter and receiver with a duplexer to permit simultaneous use of the colinear antenna. An integrated circuit timer and identifier plus a touch tone control receiver round out the station.

Where do we go from here? The next step will be an all solid state repeater with improved front end noise figure to give DRW bigger "ears". It will be a sentimental occasion to retire the old "prog line" but I'm sure it will standby in case of difficulty.

The club certainly owes Ken Christmas a vote of thanks for his foresight in selecting the repeater as the corner stone to cement the club together. His dream has become a reality and his original objective has certainly been fulfilled.

Before ending this brief history it is perhaps worthwhile to comment on DRW's operating philosophy. The repeater was conceived as an open, ragchew repeater with no fancy frills or extras. The success of the almost continuous operation lies in the fact that it has been "left alone" with maintenance done only when required and then performed to commercial standards. Murphy's law would certainly apply. The more gadgets, the more things there are to go wrong. Even the demand for autopatch has by and large been eliminated since the Burlington club will support (with appropriate membership fees) this service. Hamilton has a repeater which meets the needs of most of its users. Who could ask for more. Happy QSOing!

Circuit Board Production - Cont'd

The clear film approach described in Method 1 may be used with larger symbols. For example 2:1 is convenient, or alternately the layout may be arranged on suitable white drawing board such as Bristol board or similar smooth textured white materials. Artists sketch materials are not suitable because of a craying tendency when ink is applied. Make two parallel marks on the drawing, spaced by a major dimension and indicate what this distance should be in the final negative. White liquid eraser may be used to blank out errors.

The enlarger can now be used as a camera. The lens is corrected for typical conjugate focal distances and negatives of excellent quality can be produced. If the master is on acetate film, a suitable light box with a difused aperature (opal glass or defusing plastic) placed on the enlarger board will serve well for lighting. Place the master on the light box and tape in place. Temporarily cover the master with a sheet of thin white paper and mark the extremities of the drawing. Place the light box on the enlarger board. Locate any negative having low density borders, in the negative carrier, emulsion down and with lights out, turn on the enlarger. Adjust the enlarger head, lens (full aperature) and position of the light box such that the projected aperature is larger than the diameters of the master, and the negative grain is sharply focused. Adjust the lens to about F8 and turn off the enlarger. Remove the negative and paper and insert a strip of lithographic film emulsion down. A red photo safelight may be used and under this illumination, the emulsion side of the film will appear brighter than the anti-halation side. Turn on the lamps in the light box for about 2 seconds and then remove the film for processing.

If the master is arranged on drawing board, the same procedure applies, except that the light box is not required, being replaced by suitable floodlamps arranged at low incidence angles to eliminate specular reflections into the lens. The master should be taped to the enlarger board after composition and focusing as described previously.

Lithographic film processing is conducted in a manner similar to conventional orthochromatic continuous tone materials. The film is designed and manufactured by several firms specifically for photo mechanical or line copy work. Properly exposed and developed, it produces extreme contrast from low contrast originals; that is to say the negative images tend to be water clear or extremely opaque. The film comes in various sizes, usually in packages of 50 sheets. The recommended developer is expensive and short lined. The author recommends the use of Kodak D11 or D8 as an alternative. The D11 can be thoroughly stirred and repackaged to make 1 liter batches and mixed unused developer will keep about 4 to 6 weeks. 250 ml of solution in an 8 x 10 tray is usually adequate. Any commercial stop bath and Edwal or similar rapid fixer mixed for films completes the litho processing requirements. Separate rubber tipped tongs for each tray will minimize developer contamination which must be avoided. Do not store used chemicals.

Arrange the three trays for developer, stop bath and fixer in that order from left to right. Add the chemicals to the trays.

Under red safelight conditions, immerse the exposed film emulsion side up in the developer, and use the tongs to agitate the film in the solution. At room temperature, development time is about 2 mins. Drop the negative into the stop bath and using the stop bath tongs, agitate 15 seconds. Drop the film in the fixer and agitate for 1 ½ to 2 minutes. A good rule is twice the length of time for the antihalation backing to disappear. Wash the film under running water for 2 minutes and squeeze away excess water with moistened cellulose sponge tongs or a film squeeze. Hang film by means of a clothes pin clip to dry. When dry, examine the film for the water clear and opaque conditions. If necessary, adjust exposure time in 50% increments until it does. Keep notes for future reference.

When a suitable negative is obtained, place it emulsion side down in the enlarger. Place a paper printing easel on the enlarger board and adjust it to the film format you have chosen. Insert a piece of white paper and turn off the room lights. Turn on the enlarger and adjust the magnification and focusing for a sharp image at the precise dimension required. Set the lens to F8, turn off the enlarger, replace the paper with a sheet of litho (emulsion up) and expose for 5 seconds. Process the film and examine for contrast. Repeat if necessary, varying exposure time. This negative is the opposite density of what is required and must be contact printed onto a second sheet, emulsion to emulsion. A vacuum frame with a clear plastic cover is highly recommended. Exposure can be affected by a 6 W lamp located about 3 - 4 feet from the film. Time will be about 6 seconds. If scratches in the plastic are troublesome, they can be eliminated by placing a diffusing screen over the frame surface and increasing exposure to compensate.

The process of contact printing, whether it be film to film or film to board is a matter of vital importance in the interests of satisfactory quality of results. The surfaces of interest must be in intimate contact at all points. Otherwise, penumbra effects and scattered light will reduce detail and dimensions in the reproduction. Exposure is also critical in all phases of the photographic process. Scattering of light at grain boundaries produces changes as related to the true image. The minimum exposure required to produce required results is the correct amount. Twice as much is not twice as good. Exhausted developers and short development time lead to the requirement of greater exposure for a given density and should be avoided.

Hardware arrangements for contact printing may take several forms depending upon the needs of the user. The simpler arrangement for film printing consists of a sandwich of single diamond glass with bevelled edges, a sheet of black paper, a pad of ½ or 1 inch thick plastic or foam rubber, a sheet of ½" plywood and three metal clips in that order. The material is cut to the same dimensions but larger than the maximum negative size by at least 1 inch in length and width. The clips are arranged to hold the glass near the wooden base such that the rubber is compressed to about half its normal thickness. The films are placed between the glass and the black paper with the original film against the glass. Clean the glass to remove finger prints for exposure.

..... To Be Continued

AN INTRODUCTION TO INTEGRATED CIRCUITS (AN HARC PROJECT)

Welcome to the IC Project. We hope it will be enjoyable and informative.

The materials supplied are meant to be experimented with therefore, try your own versions.

All materials will be distributed at the meetings ONLY. If you can not make the meeting, try and have someone else pick your parts up.

1: MATERIALS

You will require certain materials to be available. These are:

- Voltmeter.. capable of measuring up to 5 VDC.
 - 3 penlight cells (1.5V) or a 5 VDC supply
 - A battery clip to put the penlight cells in.
 - Misc hook up wire (24 guage suggested)
- Do Not use heavier than 22 Guage.

The initial kit material will include:

- Breadboard Kit
- 12 L.E.D. Diodes
- 4 Toggle switches
- 12 resistors 1K, $\frac{1}{4}$ W
- 12 resistors 470, $\frac{1}{4}$ W

2: DETAILS ON THE BOARD

The board is layed out with easy identification of any hole. Note that on coloum is headed "A" the other extreme is "L". These should be used as a bus for ground and +5 volts respectively.

Note that two clusters of holes exist each side of the center slot. Removal of the back protective cover will show how all the holes are connected together. This will permit you to connect several leads to one pin of the IC. (up to 4 plus the IC pin)

3: Locating Components on the Board

To aid, holes will be suggested for inserting leads. These are a suggestion only. You may modify as you wish because this is an experimental activity.

4: Types of IC to be reviewed.

This series will be based on Transistor-Transistor Logic (TTL). The initial IC's will be based on digital devices such as gates (AND, OR, NAND, NOR), Inverters, Flip Flops, counters and registers.

5: IMPORTANT NOTE

It is suggested that you use a small logbook and record about each IC the following as a minimum

- mechanical layout
- schematic
- components used
- conditions for each test
- results from each test.

Good luck on the experiments and let's compare notes on the results. We will probably publish in the succeeding issue, the expected results for the previous month. Compare your results. Pass along interesting results to the editor (via the club post box)

---- Note exchange bulletin club editors: This series of articles may be copied with the proper credit given. Any further information may be obtained by contacting the Hamilton ARC via the P.O. Box 253, Hamilton.

NEW HEATHKIT HW-201 HANDHELD TWO-METER TRANSCEIVER—a great value in personal and emergency communication gear



Compare the HW-201 with any other handheld two-meter transceiver. In value and performance, we think you'll agree it's unsurpassed.

A top-mounted knob selects any of five crystal-controlled channels—we even include a crystal for 146.94 to get you on the air fast. And, to save money, a single crystal controls both transmit and receive. A simplex offset switch and a 600 kHz crystal actually give two transmit frequencies for every crystal you buy—just like having a 10 channel transmitter! The transmitter output is one watt minimum with

0.005% (or better) stability. Frequency modulation and a separate built-in mike provide a better signal. The receiver features 0.5 μ V sensitivity for 12 dB SINAD and a squelch threshold of 0.3 μ V or less.

The HW-201 comes with built-in nickel-cadmium batteries and a separate AC charger. The battery-saver circuit uses a pulsing technique to extend the battery life by 75% in the standby/receive mode.

To make the HW-201 an even better value, we've included accessories worth up to \$60—a crystal for 146.94 MHz, a \pm 600 kHz offset crystal, a flexible "rubber duckie" antenna plus an output for an external antenna, a built-in nickel-cadmium battery pack and a separate AC charger. And you get them all at no extra cost when you buy the HW-201.

For personal and emergency communication, the optional HWA-201-3 Auto-Patch Encoder accesses telephone lines through repeaters with touch-tone input. The 12 digit-keyboard and keying light mount directly on the front of the transceiver. You can add the encoder when you build the transceiver or later.

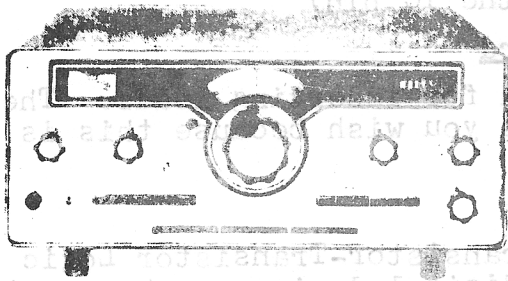
Finally, the HW-201 is both compact and lightweight—it weighs just two pounds, including batteries! The HW-201 and HWA-201-3 are not difficult to build, but due to compactness, some soldering experience would be helpful. Alignment requires only a VOM or VIVM.

Kit HW-201, Handheld Transceiver 239.95

Kit HWA-201-3 Auto-Patch Encoder 54.50

HWA-201-2, Carrying Case 17.50

NEW HEATHKIT HW-104 CW/SSB TRANSCEIVER—



The same basic circuitry as our top-of-the-line SB-104. The new HW-104 is 100% solid state, quiet and quiet—with an output you can instantly switch from 100 watts to 1 watt. Its coverage extends from 3.5 to 29.0 MHz. And, if you need the top end of 10 meters, add the optional HWA-104-1 accessory. Its coils and filters fit onto the "104's" existing circuit boards and take you up to 29.7 MHz.

The HW-104's performance is superlative. Transmissions are clean and crisp—at 100 watts third order distortion is 30 dB down and unwanted sideband suppression is 55 dB. In the receiver, broadband design virtually eliminates adjacent signal overload, yet sensitivity is less than 1 μ V. And because cross-

modulation and intermodulation have been dramatically reduced, signals seem to "pop out" of a quiet background.

dB and 200V position on the bandswitch, a 5 kHz \pm 1.5 kHz \pm 100 Hz 5 kHz markings on the Circular dial, 100 Hz \pm 5 kHz calibrator for accuracy to 2 kHz, 12 VDC powered and the optional noise blanker provides up to 50 dB effective blanking. For base use, the optional HP-1144 AC Power Supply. Plug-in speaker, control panel, and two wiring harnesses simplify construction. Alignment requires only a VVM, mike and dummy load.

Kit HW-104, Transceiver 799.95

Kit HWA-104-1, 10-M Accessory 27.50

Kit HP-1144, AC Power Supply 139.95

Kit HS-1661, Matching Speaker 29.95

Kit SBA-104-1, Noise Blanker 34.50

Kit SBA-104-2, Mobile Mount 47.50

Kit SBA-104-3, 400 Hz CW Crystal Filter 66.50

MONTREAL, QUEBEC H2M 1H1
795 Legendre St. E. Phone 514-384-91

OTTAWA, ONTARIO K1Z 5Z6
866 Merivale Rd. Phone 613-728-3731

HEATH
Schlumberger

MISSISSAUGA, ONTARIO L4X 2R7
1480 DUNDAS HIGHWAY E., 416-277-3191

EDMONTON, ALBERTA T5E 4C2
12663-97th Street Phone 403-475-9331

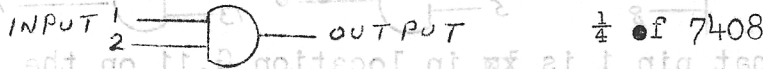
VANCOUVER, B.C. V5R 5J7
3058 Kingsway Phone 604-437-7626

IC Of The Month (Part 1) 7408 - 2 input, QUAD AND Gates

General

This integrated circuit is made up of 4 gates in one IC. Each gate has two inputs and performs a logical function which is termed AND. The name above states 2 inputs per gate, 4(quad) AND type gates.

The schematic for an AND gate is:



Notice that the diagram is simplified in that it shows no ground and no power supply. This is because the power supply and ground is assumed. There is one common power supply connection (pin 14) and one ground connection (pin 7) common to all of the gates on the IC.

This IC is fairly standard in that each input will load its driver with approx. 1.5ma. The output is capable of driving about 16ma. From this, you can see that one output is capable of driving about 10 inputs.

This circuit, like most TTL devices, can be used for frequencies up to 25 MHz

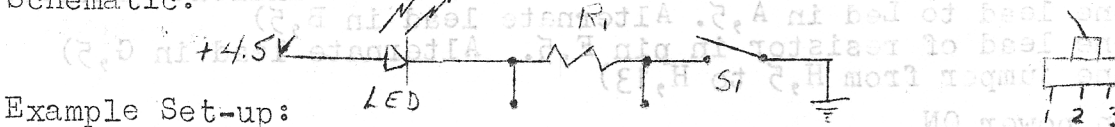
Method of Testing

To evaluate the action of the digital circuit, we will aid the volt meter by using other visual aids such as LED's. The following will provide aid on the LED's.

Using the LED as a Meter

The LED (Light Emitting Diode) is a special. Its electrical behaviour is like an ordinary low voltage diode. The special part is the fact that when current flows through the diode, the diode emits light. First test the diode to determine its operation:

Schematic:



Example Set-up:

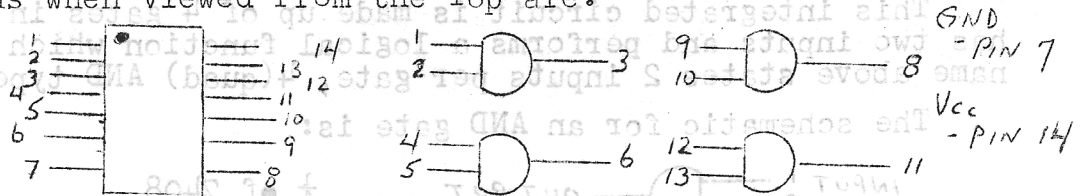
- Connect +4.5 of battery pack to A, 1
- Connect LED (any Led). One lead to A, 5
- One lead to B, 5
- Connect resistor R1 (1K). One lead to F, 5
- One lead to G, 5
- Connect Toggle switch. One lead to K, 5
- One lead to L, 5
- Connect -ve batt lead to L, 1

Testing LED

- Is the LED On?
- Operate the switch. Is the light on?
- (The LED should glow in one position of the switch unless the diode is backwards)
- Measure the voltage from neg battery lead to each junction of two components. What voltage do you get?
- Measure with the switch ON and OFF. ON _____ OFF _____
- Change R1 from 1K to 470 ohms
- Repeat above
- Is the LED brighter with 1K or 470 ohm or is there no difference?

IC LAYOUT

The pins are numbered 1 to 14. Pin 1 is identified by a dimple or notch. The pins when viewed from the Top are:



Preparation

Locate the IC so that pin 1 is ~~xx~~ in location G,11 on the board. Pin 7 should be in G,17 and pin 8 and pin 11 should be in F,17 and F,11 respectively.

Temporarily connect one of the toggle switches, as an On/Off switch, in series with one of the battery leads. Remember that Pin 7 is Gnd, so place a jumper from L,17 to G,17. Provide power to the gates by connecting B,11 to A,11

As a power indicator, connect one LED as follows:

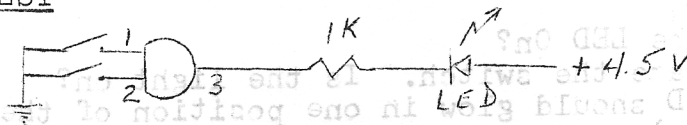
- One lead of Led to A,3
- One lead of Led to B,3
- One lead of 1K resistor to F,3
- One lead of 1K resistor to G,3
- Jumper K,3 to L,3

- Test LED per paragraph on TESTING LED.
- With Power ON. Record the voltage on each pin of the 7408

Testing Gate 1

- Install a toggle switch to ground IC at pin 1 (S1)
(one lead in L,11. Alternate lead in J,11)
- Install a 2nd toggle switch to ground IC at pin 2 (S2)
(one lead in L,12. Alternate lead in K,12)
- Install Led ~~xx~~ in series with 1K resistor to indicate output.
(one lead to Led in A,5. Alternate lead in B,5)
(One lead of resistor in pin F,5. Alternate lead in G,5)
(One jumper from H,5 to H,13)
- Turn power ON
- Switch S1 so that pin 1 is 0 Volts
- Switch S2 so that pin 2 is 0 Volts
- Is the LED on the output lighting?
- What conditions must be on the input to have the LED OFF?
- What conditions must be on the input to have the LED ON ?
- Test all combinations of the two input switches.
- Repeat the test for the other 2 gates.
- Measure the output pin voltages to see what it feeds to the LED.

SCHEMATIC OF THE TEST



SPECIAL NOTE:

The output LED is "ON" when the output is LOW (below 2.0 volts), and "OFF" when the output is HIGH (above 2.5 volts)

There will be more tests for IC next month plus the next chip.

73's

Technical Committee

Hamilton A.R.C. Swap ShopANTENNA EQPT

- VE3FBZ Jack 634-0959
 -Dow coax relay \$15.00
 VE3CZX Jack 844-4460 Oakville
 -TH-2 Tri-band beam \$100.00
 VE3EFD Bob 935-0907 St. Catherines
 - 14AVQ Vertical Antenna C/W 50 ft. coax and connectors \$75.00

Miscellaneous Parts

- VE3EFD Bob 935-0907 St. Catherines
 -assorted lengths RG-59 @7¢ ft.
 VE3FUF Eric 885-1918 Waterloo
 -16 pieces of 4k Rand part #2107B \$4.50 ea. From Randax memories used in the robot 400 scan converter.

V.H.F. EQPT

- V
 VE3COV Les 662-8783
 -2meter homebrew Tx c/w AC supply, 6146 Final, 144.360MHz crystal ask \$25.00 rig, \$25.00 for supply
 VE3FDN Ted 451-8874 after 6pm Brampton
 -Motorola HT-200 portable, crystaled up on 28/88 with manual \$90.00
 - Marconi DT-65 c/w cables and control head, crystals for VE3MHZ & VE3RPT c/w manual \$60.00
 - Heathkit HW-202 c/w GLB WOB channelizer, Mint condition, with manuals \$350.00
 -HW-30 'twoer' c/w Manual \$25.00
 VE3CZX Jack 844-4460
 -Armace 2meter converter \$20.00
 VE3EFD Bob 935-0907 St. Catherines
 TR-7200 G c/w 3 sets xtals c/w installed T.T.Pad \$275.00
 VE3CYC John 561-0736
 -TR22C XCVR C/W 3 sets xtals .52, Tor, DRW, KSR \$200.00
 VE3APK Charlie 827-2538 Oakville
 -G.E. Prog Line Base Station with homebrew Pwr. Supply & control head c/w VE3RPT crystals, single chan. unit \$45.00
 VE3HFE Harold 824-2606 Campbellville
 -Heath HW-202 crystaled for .94sx, .52sx, Tor, DRW, KSR, TTY \$250.00
 W8JGP Don Nottage 315-685-3554 Place Skaneateles, N.Y.
 -Beacon Synthesizer Jr. Model 144 Covers 133-149 with 5 KHz steps thumb wheel switches, 37 watts o/p \$500.00
 VE3DCP Glenn 385-8478
 -Railroad Motrac Transceiver, solid state rcvr., tube tx, 25 watts op. 2 channels capability, c/w DRW crystals no cables of accessories \$40.00
 VE3HXY Don 639-9067
 -Motorola 43 GGT, single channel c/w .52sx and all accessories \$500.

H.F. Eqpt

- VE3DFS Bob 634-2597
 -SB-220 Linear \$550.00
 -Remcte VFO for SB-101 \$165.00
 VE3FDN Ted 451-8874 after 6pm Brampton
 -HBR-16 Rcvr, Manual, plug in coils for 10-80m needs tuneup \$50.00

Swap Ahop Cont'

H.F. Eqpt. Cont'

- VE3ISQ Jim Galloway 634-1767
 -NCX-3 xcvr c/w HP-23 Heath AC power Supply \$250.00
 VE3APG Don
 -HW-16 Heath 3 Band xcvr \$100.00 VFO model VF-1 \$20.
 VE3BAL Phil 354-3730 Niagara Falls
 -Realistic DX-150 Rcvr. Gen Coverage #135.00
 VE3HXy Don 639-9067
 - Realistic AX-190 Ham Band Rcvr c/w calibrator and spkr. \$250.00

ACCESSORIES

- VE3ITA Larry 549-7393
 -Set GLB P.C. Boards, main board, Vev, and 5KHz, Boards only
 c/w assembly manual \$12.00
 VE3FDN Ted 451-8874 after 6pm
 - Heathkit vibrator pwr supply model GP-11, 12VDCin, 250 VDC out
 @100 MA c/w manual \$15.00
 -Heathkit O Multiplier Model QF-1 c/w manual \$5.00
 SWL ED Bailey 648-6798
 -E.F. Johnson Speed-ex semi-auto bug \$10.00
 VE3EFD Bob 935-0907 St. Catherines
 -Heath HW-A 2021 A.C. Power Suppl for H.W.-202 \$30.00
 -Taylor low pass filter \$25.00
 -Small arched - type SWR Bridge \$5.00

WANTS

- Les VE3EGT 547-2717 wants a duplexer
 -Gord VE3HSP 5299876 Wants VFO similar to HG-10
 -Fred VE3GCP 388-1976 wants 2-3in panel meters 0-20VDC, 0-10 amps
 -Dan VE3QV 223-4635 wants 75-A-4 or R-4c rcvr
 -Larry VE3ILK 826-2925 wants antenna transmatch
 -Cameron VE3GVG wants small value capacitors for padding coil
 -Jeff 643-1578 wants 2-3in crt with cover
 Don VE3HLY 6399067 Wants SB-610 monitor scope
 John VE3GTE 753-0536 Wants manual for Hallicrafter SR-42A