

RAMBLER

AMATEUR RADIO



CLUB CALL: VE3RAM

MONITORED FREQS
3760kHz, 146.94 MHz

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1968 EXECUTIVE

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POT HOLE NET: Official Club. Net. Meets every Saturday and Sunday at 10 AM local time on 3760 kHz. On Saturdays only, the Club sponsored SWAP NET follows immediately after roll call. All amateurs are welcome to participate.

MONITORING FACILITY: VE3CGO monitors 3760 kHz SSB and 146.940 MHz FM daily from approx. 8AM to 6.30 PM for mobile or out of town traffic. Call VE3CGO if you have traffic for Ottawa, require assistance, telephone calls etc.

NOTICE OF MONTHLY MEETING

PLACE: NRC Sussex Street, Room 3039

TIME & DATE: 8.00 PM THURSDAY 10 October 68

PROGRAM

BUSINESS

TALK: EXPERIENCES OF A DX STATION (3 yrs 4X4PQ & 3 yrs VU2FN)
by VE3ECN

COFFEE & COOKIES

RAG CHEW

REPORT ON THE LAST MEETING

- (a) The last meeting featured a talk and demonstration by Gord, VE3GAH on Heathkits latest SSB gear, the HW-100. Gord illustrated his talk by means of his own HW-100 and a gigantic block diagram which he prepared especially for the occasion. Many thanks Gord for a very interesting insight into the mysteries of this nice piece of equipment!
- (b) The Club membership officially approved the proposed new Club Public Service Project designed to assist the National Museum of Science & Technology in obtaining radio and communications equipment depicting the evolution of these arts. At a subsequent Executive Meeting VE3SH and VE3GX were appointed as a Committee of two to initiate the Project.
- (c) Bob Miller, VE3CFM of the Hamilton Amateur Radio Club was welcomed as an out of town visitor to the meeting.
- (d) Stan Dabrowsky, VE3ECN, a former member of our Club was welcomed back to Canada after a three year stint as VU2FN. (Stan is the guest speaker for our October meeting)

REPORT ON THE TRANSMITTER HUNT

The second Hidden Transmitter Hunt of the year was held Sunday 15 September 68. This time, two of the members participating constructed ferrite rod direction finders with sense antennas to get the desired cardioid pattern. Gord VE3GAH found the "bunny" 27 minutes after start time. The team effort of VE3GFL/VE3FTJ Hutch and Fred came second using a transistor portable radio with a time of 51 minutes. Our revered President VE3GGQ Ted came third with a time of 53 minutes. The Hunt was called off after one hour had elapsed and all assembled to compare notes and gaze in wonder at the various devices. Bags of fun was had by all and more lessons learned. Lots of data on DF loops etc. is available in recent ARRL antenna handbooks as well as the regular edition of the Handbook. Be ready for the next one! Get that transistor radio perking or start construction on a device. We will be giving prizes in the future, but of course will make the hunt a little harder as time goes on. Who knows we may even issue a challenge to the Radio Division of DOT to compete for some coveted trophy! They already have cars equipped for business and might welcome a busman's holiday! Our thanks to the "bunny" for the use of his equipment. Your carrots are on the way Mike (VE3DNJ).

OTTAWA DISTRICT FM REPEATER VE2CRA

When VE2CRA was originally installed on the hill near Camp Fortune P.O., the only commercial station on site was CFMO (FM). Now CJOH (TV), CBOT (TV) and CBOFT (TV) also share the site. It was feared that the high power field and possible beat frequencies from these new stations would degrade the performance of the repeater receiver significantly. In view of this, plans were made to remote the repeater receiver at a cable television site approximately one mile distant. Fortunately to date no difficulty has been experienced but in the near future CBO (FM), CKOY (FM) and CKGH (FM) will also be on the air from the same site! To make matters worse, two other stations have applied for FM licences (CJRC and CKPM). The combined RF fields should be well over the megawatt region.

The new receiver site is some 300-400 feet below the present site but it is anticipated that a 4 element colinear (5 db gain) antenna plus a pre-amp should compensate for the differential in height. The present receiver has a cavity in the antenna system to reduce de-sensitization resulting from the proximity of the repeater transmitter. This cavity which introduces a 3 db loss will not be necessary at the new site. All of these factors should make the new receiver site equal, or better than the present site.

When the receiver and transmitter are separated, it will also be possible to remove the cavity in the repeater transmitter (also 3 db loss) thereby increasing the power from the present 15 watts to 30 watts output. It is planned to ultimately increase the transmitter output to approximately 90 watts.

The new receiver and new antenna have been installed and are operational at the new site. All that remains is to connect the receiver and transmitter together by land line. Land line was selected because the cable TV site owners do not wish a transmitter operating in the vicinity of their equipment. 420 MHz would be the answer otherwise. The only land line available is a commercial circuit which must be rented from the telephone company. The Executive of our Club agreed that it would be appropriate for the Mobile Club to contribute to this cost. The suggested annual contribution based on membership is \$12.00 per year. It is recognized that many of our members are also members of the OARC and contribute however the Executive are of the opinion that a contribution is in order. The membership will be asked for their approval at the October meeting.

RAMBLINGS

Our heartiest congratulations to VE3DNJ Mike and XYL Jenny on the new arrival-- a transmitter---their first -Douglas Heath -...- W2YYP Gary and family have finally arrived at their destination --Sacramento Calif. They have located a very nice house just 10 mins away from work--Garry is on the air with a random piece of wire and it is hoped that we will make contact with him in the near future -...-NEWS FLASH Art Blick VE3AHU is now the new President of RSO our congratulations Art...I am sure that you will do an excellent job -...- VE4BY ex 3CSF Hank and Fran Ballon were in Ottawa on a visit recently--nice to see them in person and to see their new jr op -...- Dont forget to check page 3 for another excellent transistor article by our new poppa VE3DNJ !

TECHNICAL TOPICS-Transistor Switching

One of the most satisfying applications of solid state in amateur practice is for switching and control circuits in transmitters and receivers. The lack of reliability of inexpensive relays is no secret- any way of ridding equipment of their presence is, in general, a "great leap forward" (as the Maoists would say).

Recently, a number of new transistors capable of switching up to 300 volts have been announced; some of these are available locally at a low price. The possibilities for relayless VOX, grid-blocked keying, receiver muting, etc. are tremendous.

An ideal switch, be it relay or transistor, will have a very high resistance when "off", and a very low resistance when "on". A transistor may be made to fulfill this requirement without resorting to complicated bias or matching networks. The basic transistor switch is shown in Figure 1.

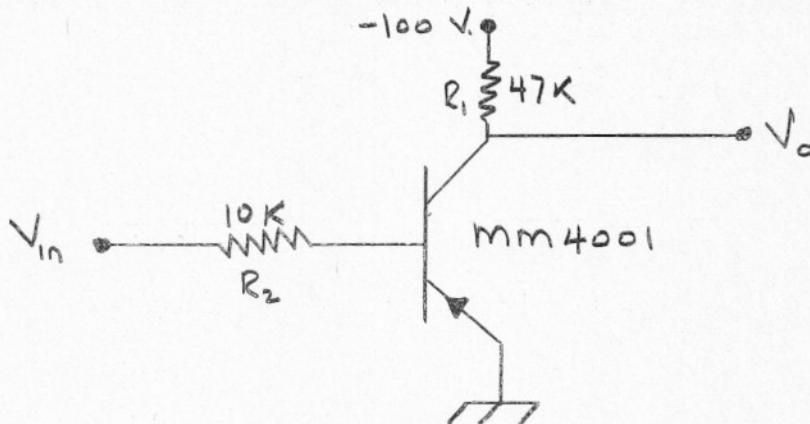


Figure 1.

As has been mentioned in the previous edition of the Rambler, positive or zero bias of the base of a PNP transistor (with respect to the emitter) will cut off the current through the device, while a negative base voltage will turn on the current. In Figure 1, if V_{in} is positive with respect to ground, the voltage V_o will be -100 volts since the transistor is cut off and no current flows through the $47K$ collector resistor. If V_{in} is made negative by a volt or so, the transistor draws heavy current and because of the voltage drop across R_1 , V_o falls to near zero. The voltage V_{in} may be derived from a separate voltage source, or from a resistive voltage divider. In the case of a VOX circuit, V_{in} may be obtained by clipping, rectifying, and filtering a little audio from the speech amplifier. Only a small voltage and current are required. Suitable combinations of circuits similar to Figure 1 may be used to bias the transmitter tubes to cutoff while receiving and vice-versa.

A PNP transistor was shown in Figure 1 since switching of negative voltages is most common in transmitter control and receiver muting applications. If it is desired to switch a positive voltage, an NPN transistor could be used in an identical manner except that all voltage polarities must be reversed (ie. $+100$ volts on the collector, and a positive base voltage turns the transistor on).

For the CW man, transistor switching can be a real bonanza, giving a very easy route to full break-in. A circuit similar to Figure 1 could be used for grid-blocked keying. The control voltage may be derived directly from the internal square wave generated by all electronic keys.

A few general points:

- (1) When using the output of one transistor switch to drive another, they should be both of the same type (ie. preferably both silicon).
- (2) In general, the emitters should be grounded (as per Figure 1).
- (3) Use a resistor in series with the base to limit base current to a safe value.
- (4) The critical transistor rating is BV_{CEO} (from the transistor spec. sheet). Allowing the collector voltage to exceed this value will result in transistor breakdown.

Two new transistors for high voltage (BV_{CEO} of 150 v. and 250 v. respectively) are the $MM4001$ and $MM4003$; both available at Cesco for just over \$2.00.