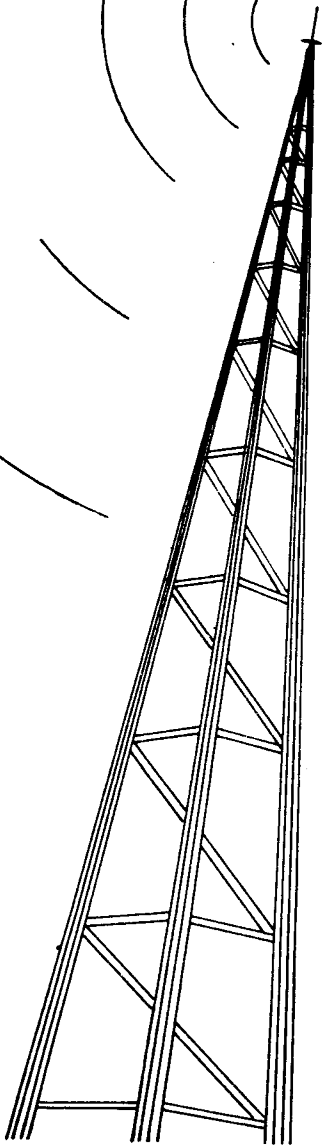


QSX PE

Port Elizabeth Branch of the

South African Radio League

P.O.Box 462, Port Elizabeth. 6000.

National Call	145.5 Mhz
P.E. Repeater	145.05/65
Grahamstown	145.15/75
Lady's Slipper	145.10/70

ZS2PE

Bulletin: Sunday 08h40
HF: 40m – 7098 KHz
VHF: FM-145,700 MHz

Port Elizabeth Branch
›NOTICE OF MONTHLY MEETING‹

MEMBERS ARE REMINDED THAT THE FIRST MEETING OF THE YEAR WILL TAKE PLACE ON FRIDAY 21st JANUARY, 1983, AT THE Y.M.C.A., [illegible], PORT ELIZABETH AT 8p.m. ALL ARE WELCOME.

****

COMMITTEE [illegible].

Chairman:	Dick ZS2RS (3?111)	Vice Chairman	Trevor ZS2AE (321746)
Secretary:	Marge ZS2OB (303498)	Treasurer	Brian ZS2AB (303498)
Projects:	Lionel ZS2[illegible] (3?1770)	Special Events:	Colin ZS240 (312471)
			Fred ZS2[illegible] (31119 -0[illegible])
Awards:	Attie ZR2[illegible] (33?9?)	[illegible]:	ZS2OB and ZS2AB.

THE COMMITTEE AND EDITORS OF QSX-PE WISH TO TAKE THIS OPPORTUNITY TO WISH ALL THE MEMBERS OF THE LEAGUE AND BRANCH, ALL THE VERY BEST OF WISHES FOR 1983. MAY YOU HAVE GOOD HEALTH, HAPPINESS AND PROSPERITY AND GOD'S BLESSINGS ON YOU AND YOUR FAMILIES. LET US ALL MAKE A RESOLUTION TO WORK TOGETHER FOR THE GOOD OF THE LEAGUE AND AMATEUR RADIO.

****

NEWS

SILENT KEY: It is with very deep regret that we have to announce the passing of Priscilla Bowes-Taylor, ZS2-070, xyl of Geoff [illegible] of East London, very unexpectedly on 2nd January. Priscilla was at one time on the Committee of the P.E. Branch and was responsible, with Geoff, for producing QSX-PE and was keenly interested in and worked very hard for the welfare of the Branch. To Geoff and family, we extend our deepest sympathies and condolences.

RADIO LICENCES: These were due on 1st January, and we hope that no one has slipped up and forgotten to pay theirs. If so, DO IT NOW!

A.G.M. 1984 COMMITTEE: As yet, we have not been inundated with helpers for this Committee, and as you can appreciate, there is a fair amount of work and organisation to be done, so if you feel that you can help in any way, PLEASE don't be shy to let us have your name. The more help we get, the less for everyone to do.

CONGRATULATIONS: To Pete Smith who has now the callsign of [illegible]P and is keenly trying out his new rig. What about the cw now, Pete? Congrats also to Del ZS2NS who is the proud possessor of a new Kenwood TS930S rig. Good dx-ing.

So many of the members and their families took off for distant parts during the holidays that they are far too numerous to mention, but we hope that everyone enjoyed themselves and are refreshed and ready to start work again.

FOR SALE: FOR SALE: FOR SALE: FOR SALE: FOR SALE: FOR SALE:

IBM 2970 Golf-ball type teleprinter on floor stand R100.
Contact Fred Hurter. Phone 24585.

ARI FUNDS.

1) 5 el 6m beam of unknown commercial make. Not new but in fair condition. Any reasonable offer considered.
2) 5 over 5 el 2m skeleton slot of commercial make. Brand new. Donated by Van ZS2Y. Reasonable offers around R50 considered. May be seen at QTH of Brian ZS2AB, 25 Olive Schreiner Avenue, van der Stel. Phone 303498.

MINUTES OF THE GENERAL MEETING OF THE PORT ELIZABETH BRANCH OF THE S.A.R.L. HELD ON FRIDAY 19th NOVEMBER, 1982, AT Y.M.C.A., HAVELOCK ST. PORT ELIZABETH.

****

PRESENT: 28 members and visitors.

APOLOGIES: ZR2DY.

The Chairman extended a warm welcome to all present, especially the ladies, Clive Cornell ZS6ABF and Bill Browne ZS2BY ex ZS5B, both of whom have settled in Port Elizabeth, and also to several members of the Algoa Branch.

MINUTES: The Minutes of the meeting held 15th October, 1982, having been printed and circulated in QSX-PE were taken as read, proposed by Trevor ZS2TJ and seconded by Bill Hodges.

ARISING: The consensus of opinion was that the new format of QSX-PE was quite acceptable and the layout was good.

FINANCE: The Treasurer reported that all was quiet at this time of the year.

CORRES: (1) Letter from Australian Boy Scout Association - this will be passed on to the local Scouts.
(2) Letter from HQ re Motions for 1983 A.G.M.
(3) Council Meetings from HQ - 25th Aug. and 20th Sept.
(4) Letter of thanks from Cyril and Bette Goodman.

ARISING: The Chairman proposed that Headquarters should investigate the feasibility of publishing an examination manual similar to the R.S.G.B. This should be submitted to the P.M.G. for approval and to overcome ambiguity. This was agreed to by ZS2VM and ZS2BY. It was decided that this proposal should be submitted to H.Q. as a motion from the Port Elizabeth Branch and this was seconded by ZS2KX.

GENERAL: The Chairman reminded members of the annual get-together to be held on 20th Nov. This year, the function was being held with the Algoa Branch and would take place at the Hong Kong Restuarant and the cost would be R18 per double, which would include some wine.
Gus ZS2MC was out of hospital and on the mend.
The Chairman thanked Brian and Marge for the stout effort on QSX.
Gordon Knapp said that on behalf of all the candidates who had written the technical examination, he wished to extend thanks to Brian ZS2AB and Al ZS2U for all their hard work. This was unanimously seconded.

There being no further business, the meeting was closed and tea was taken. Thereafter, a most interesting film on the "Confederate Airforce" in Texas was shown by courtesy of Colin ZS2AC.

sgd: R.J. Schönborn ZS2RS, Chairman
sgd: M.T. Meller ZS2CB, Secretary

****

BULLETIN ROSTER.

16th Jan.	Dick ZS2RS
23rd Jan.	Trevor ZS2AE
30th Jan.	Marge ZS2CB
6th Feb.	Brian ZS2AB
13th Feb.	Lionel ZS2DD

THE THINGS PEOPLE SAY.

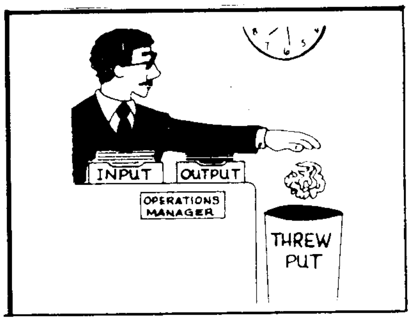
"Would you please QSY 2 k'm up in frequency OK? I'll call you there".

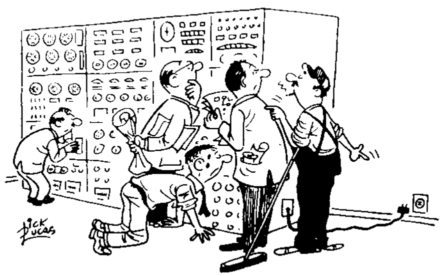
Heard on 2m by [illegible].

6 METER BEACON FREQUENCIES.

50,005	[illegible]	BRAZIL
50,023	HH2PR	HAITI
50,025	6Y5RC	JAMAICA
50,030	[illegible]	[illegible]
50,035	[illegible]	[illegible]
50,050	K6PV	CALIFORNIA
50,075	ZS5VHF	S.A.
50,080	TI2NA	COSTA RICA
50,088	[illegible]	CANADA
50,089	[illegible]	U.S.A.
50,093	[illegible]	MICHIGAN
50,098	[illegible]	ARIZONA
50,100	[illegible]	R.S.A.
50,104	[illegible]	HAWAII
50,104	[illegible]	[illegible]
50,110	[illegible]	[illegible]
50,110	[illegible]	[illegible]
50,500	[illegible]	[illegible]
51,998	[illegible]	[illegible]
52,200	VK8VF	AUSTRALIA
52,300	VK6RTV	AUSTRALIA
52,350	[illegible]	AUSTRALIA
52,400	VK7RNT	AUSTRALIA
52,440	[illegible]	AUSTRALIA
52,450	[illegible]	AUSTRALIA
52,500	JA2IGY	JAPAN
52,500	ZL2VHF	[illegible]
52,800	[illegible]	AUSTRALIA
53,000	[illegible]	[illegible]
53,100	[illegible]	[illegible]

Acknowledgements and thanks to "[illegible]" Pietermaritzburg Branch.





South African Radio League — **Suid-Afrikaanse Radioliga**

HEADQUARTERS
P.O. BOX 3911 ● TELEPHONE 43-4441
CAPE TOWN 8000

HOOFKANTOOR
POSBUS 3911 ● TELEFOON 43-4441
KAAPSTAD 8000

RAS/el

12th November, 1982

Dear O.M.,

COMMERCIAL TRAFFIC ON AMATEUR BANDS

Council has received distressing news concerning a breach of the Regulations in respect of Commercial Traffic by Radio Amateurs in South Africa.

Some examples heard on 2-metres:

1. "Please 'phone 'so-and-so' and tell him I will be late for my appointment."

2. "John, I am at our exhibition stand but get through to Mr. van der Merwe and make sure he brings all the brochures covering the models ....." etc. (fictitious names used).

3. "Go and see Mr. 'so-and-so', he is a good prospective customer. He is interested in ..... product because ....." (QSO includes long spiel on the merits of the product).

4. "Please get ..... to 'phone the ..... Hotel and make sure my booking is OK, as I will be arriving late."

5. "I am stuck on the ...... Road. Phone ..... Garage and get them to tow me in."

6. "I am standing next to .... Brickworks' lorry. His wheel has dropped off. Please 'phone Mr. .... at ......(telephone)".

and many more. Many transmissions similar to the examples above are continually being repeated by the same people.

Our regulations are very clear on this subject and if we, as Radio Amateurs, are unable to curb this practice, the PMG will surely step in an enforce the Regulations, and all of us will suffer in the end.

If you hear this sort of traffic on the air, please notify Headquarters of date, time, call-signs and brief content of the QSO, before it becomes too late for the South African Radio League to act on behalf of all Radio Amateurs.

We MUST maintain a high standard.

Yours sincerely,
SOUTH AFRICAN RADIO LEAGUE

R.A. STRATFORD ZS1RO
HON. SECRETARY.

Jean Baudot

Ian Sinclair

BAUDOT — the name might ring a few bells if you are into computing: drop the last two letters and you get baud, which is a unit for the speed of transfer of information. The old-fashioned teleprinter, for example, operates at a rate of 110 baud, but a modern cathode-ray terminal may work at 2400 baud or higher. Having established the connection, let's look at the story of J. M. E. Baudot.

Jean Baudot was born in 1845 at Magneaux in France, and you will search in vain for details of his early life, unless you are prepared to look through a fairly large library. You won't find his name mentioned, often; it's the usual problem — a brilliant engineer whose name has entered our language hardly gets a mention, even in his own country.

He seems to have had the conventional schooling of the French middle classes at the time, which was, incidentally, one of considerable social unrest, with minor revolutions breaking out all over Europe. His firm interest, from the time that he left school, was the growing technology of the electric telegraph, and it was to this that he turned his attention when the time came to earn his own living.

Dots and Dashes

In these early days, the universal code for telegraph use was Morse code, which relies on the use of two types of electric impulse, a long (dash) and a short (dot) — the form of the code is shown in **Figure 1**. Now there is nothing wrong with this as a code, and it is used, to a limited extent, to this day, but it was devised in 1832, long before electrical communications began to evolve into the systems that were beginning to be commonly used in the 1870s. Baudot, in particular, thought that the use of Morse code was very restricting. In 1874, he was working on the development of what we now call time-multiplex telegraphy, which allowed one telegraph line to carry several sets of messages between different sets of transmitters and receivers, with no interference between the signals. The system that he was working with was a completely mechanical one; each signal source was connected to a separate contact of a group arranged in a circle, over which a revolving contact, like the brush of a dynamo, revolved at high speed, connecting each contact in turn to the single telegraph line. The current return was through the earth, which is why we use the term "earth" to mean current return path to this day. At the receiving end, a similar arrangement was used to connect the signals from the telegraph line to the different receivers but obviously, the sytem could operate correctly only if the motors driving the rotating contacts were synchronised.

Another of the problems of using this system with Morse code was that each dash was liable to be broken up, by the action of the rotating brush, into a series of dots, on different channels; unless the speed of the brush was varied, so that it spent more time on a contact transmitting a dash than on one transmitting a dot, it inevitably scrambled the message. Many other people, at the time, were trying to synchronise the movement of the rotating brushes to the varying dots and dashes of Morse code, but Baudot came up with a completely different answer.

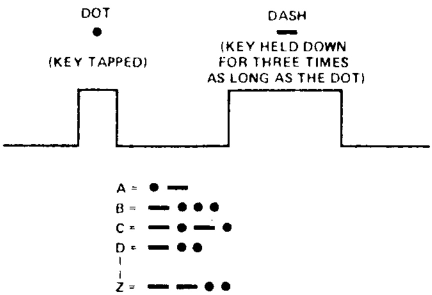


Figure 1. International Morse Code. The length of the pulse determines the meaning — dot or dash.

A name to ring bells with.

Hobby Electronics, December 1982

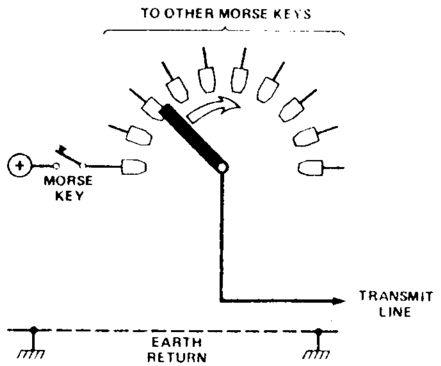


Figure 2. Early multiplex telegraphy.

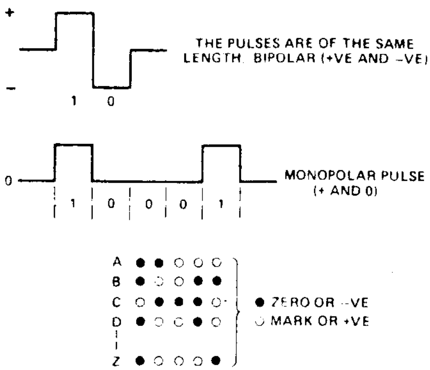


Figure 3. The modern 5-bit code. The bipolar version (top) is preferred because the difference between signal levels is easier to detect. This signal later became standardised as RS232.

Digital Codes

His approach was to use an entirely different code, one which used what we would now call digital signals — on and off — as distinct from the Morse code signals of 'long' and 'short'. The important point about Baudot's signals was that they were separated by *equal* time intervals. For example, if we take the two Morse signals, R (. – .) and S (. . .), the time between the first and last dots of each letter is not the same, because the middle dash of the R takes about three times as long as the middle dot of the S. Baudot devised a new 5-digit code, using pulses and spaces of equal length, so that the time needed to transmit a five-character message was always the same. This was the breakthrough that multiplex systems needed because the speed of the rotating contact (commutator) could now be synchronised to the pulse rate of the code.

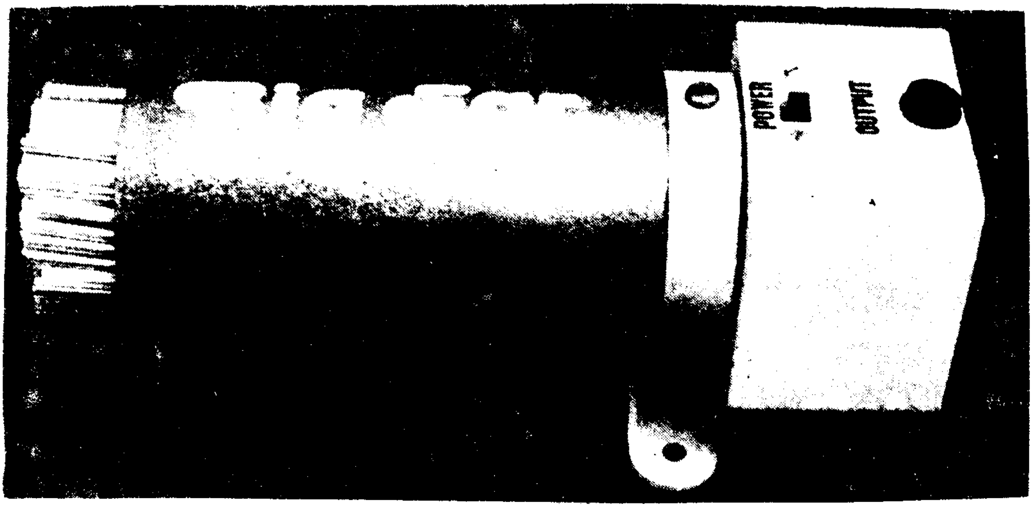
Baudot patented his five-unit code in 1874. Five digits gave a choice of 32 characters, so that the early Baudot codes allowed the transmission of the letters of the alphabet (upper case) plus a few punctuation marks and operator signals (eg, BELL), but no digits. A later version of the code used seven digits and it is this version which has evolved into the ASCII seven-bit code that is used almost universally in computers.

The Baudot code was a major step forward in telegraphy because, as well as permitting more efficient multiplexing, it also permitted the faster development of the logical accompaniment to multiplexing — mechanical methods of sending and receiving telegraph signals.

The transmitter was primitive — if the operator released the key too soon, the wrong character would be sent — but it was a step forward from manual transmission. It was soon superseded by other methods.

Baudot's equally ingenious receiver used a method that was to remain current right up to the time when fully electronic printers were developed. It can still be seen, with some modern improvements, in some Telex terminals. It all looks like a mechanical nightmare — and anyone who has tried to get an old-style teleprinter going will agree that it *is*. Baudot's work vastly improved the rate at which data could be transmitted, and the principles which he established are in use to this day, although the methods have changed — for the better! Baudot code was not entirely logical and it was improved by Don Murray in 1903, so that the modern 5-bit code and its 7-bit successor are often known as Murray-codes rather than Baudot codes. The principles, nevertheless, are those of Baudot, and a good reason for immortalising his name in the term "baud rate".

Big Ear



A high gain, directional microphone, ideal for nature studies.

Hobby Electronics, December 1982

THIS is one project where the mechanical work is greater than the electronic! The Big Ear consists of an omnidirectional microphone insert mounted in a length of common, garden variety 2½'' PVC pipe, and a simple two-stage amplifier circuit. It was originally designed for recording or listening to the sounds of wildlife; however, the prototype has also proved useful as a stethoscope, and for listening in to distant conversations (be warned — the listener may not always like what he hears!)

The length of pipe serves two purposes; first, it acts as a resonant cavity with many resonant frequencies extending from a few hundred Hertz right up to the top of the audio band. Any pipe or tube has a fundamental resonant frequency which is a function of its length, and it is also resonant at overtones (harmonics) of the fundamental frequency. In general, the fundamental frequency, f, of a pipe which is closed at one end is approximately equal to c/4l, where l is the length of the pipe and c is the velocity of sound (330 metres per second, for most purposes). Thus the fundamental frequency of a pipe 0.25m long will be at 330 Hz; the overtones produced by a closed pipe occur only at odd harmonics, therefore resonant peaks will also occur at 990 Hz (3f), 1650 Hz (5f), 2310 Hz (7f) and so on. The effect of these resonances is to accentuate any sound at those frequencies, increasing the gain of the system at specific points in the audio spectrum. The length of the pipe specified for this project has been arrived at after considerable experiment, and provides good results with minimum undesirable side-effects.

Second, the pipe provides a useful measure of directivity, due to diffraction effects. Diffraction is simply the change in direction of sound when it passes around an obstacle. The degree of bending depends on the ratio of the wavelength of the sound to the size of the obstacle and is greatest when the size of the object approaches the wavelength of the sound. In general, long wavelengths (bass frequencies) bend more easily because few everyday obstacles are more than about one metre long (the wavelength of a 100 Hz note, for example, is about 3.3m). The higher frequencies bend less easily and therefore are more directional, since they are reflected by common-sized obstacles rather than bending around them.

In the Big Ear, the pipe tends to 'hear' only those mid-range and high frequency sounds coming from directly in front, whereas sounds from the sides or rear will be rejected because they cannot bend around the edges of the opening. At low frequencies, however, the tube has no effect and so the response of the system reverts to that of the microphone insert, ie omnidirectional. To prevent these frequencies from being transmitted through to the output, the response of the amplifier is rolled off at the bass end. Overall, this combination of techniques gives a back-to-front ratio of 2:1

The Big Ear is designed to be hand-held, and for this purpose, a standard 2½" pipe clip serves quite well as a handle in normal use; it will also do as a tripod mount, should that be required.

The amplifier section has two outputs: a headphone socket for monitoring purposes and a ¼ jack socket for connection to the line input of a tape recorder.

The Circuit.

The circuit (**Figure 2**) consists of two op-amps contained in a single TL082 IC package. The circuit can be split into two sections: a voltage amplifier and an output buffer.

Starting at the input (where else?), notice that the microphone has three connections to it. This is because it is an electret insert which contains a FET preamplifier to provide a low impedance drive from the high impedance microphone source. Thus, it must be connected to the supply rail via R1.

The input from the mic is fed to the non-inverting (−ve) input of IC1a. The value of the coupling capacitor, C1, is chosen to filter out the very low frequencies generated by handling the unit. Otherwise, these would create low rumbling sounds which would seriously interfere with the performance, especially at high gain settings! The voltage gain of this stage, set by the ratio of the values of R4 and R5, is x1000.

The Big Ear was intended to be portable, and therefore a dual supply system, positive and negative rails, was not suitable because of the extra battery requirements. Instead, a half-supply voltage reference is created by the resistive divider network R3 and R6. The junction of the two resistors is bypassed to 0V by C3 to remove any noise from the signal.

The full gain of the first stage is not always required (the results could be ear-splitting), so the output from IC1a is coupled to the buffer stage, IC1b, via a volume control, RV1; coupling capacitor C2 is chosen to roll-off the bass response. IC1b is set-up as a unity gain amplifier; its output is at a low impedance and is sufficient to drive an ordinary set of headphones or the input circuit of a tape recorder, via socket SK1. Blocking capacitor C4 is included to prevent the DC level at the output of IC1b from reaching the load.

Construction

As the circuit is so simple, it was decided to build it on Veroboard; the usual precautions concerning layout, track cuts and solder bridges apply! Pay particular attention to the correct orientation of the electrolytic capacitors and the IC.

When the board is assembled, attach flying leads about 9" long to each of the off-board connection points. Next comes the mechanical assembly.

Mark out and drill the mounting holes as shown in **Figure 4.** These are easily made — but the slot for the slide-switch will cause greater problems! Carefully drill ¼" holes at each end of the slot, then file it to shape. A small flat file will be useful for finishing the task. Although the box cut-out for the microphone is shown as a square, this can be drilled out to 3/8" clearance, the size of the microphone insert.

Lastly, the wooden disc which holds the mic insert, and to which the length of 2½" pipe attaches, must be cut out; the dimensions are shown in **Figure 4**. Preferably, the disc should be cut from a solid piece of wood; the pipe is held by screws into the sides of the disc, and chipboard has a tendancy to fall apart if used in this fashion.

After the parts have been made, the Big Ear can be assembled. Mount the sockets, poteniometer and Veroboard; the mic insert should be a tight fit in the 3/8" hole through the centre of the wooden disc; glue it if you must, but the arrangement then becomes somewhat permanent! The disc itself is attached to the box by two small self-tapping screws, and the pipe can then be screwed onto the disc with three or four self-tappers. Finally, the flying leads should be connected as shown in **Figure 3**; the battery should be fixed to the base of the box with a piece of double-sided tape or Blu Tack, to prevent it rattling around inside.

At this point, the Big Ear is ready to use. Switch on and try it. There will be silence for a couple of seconds, then it should burst into life.

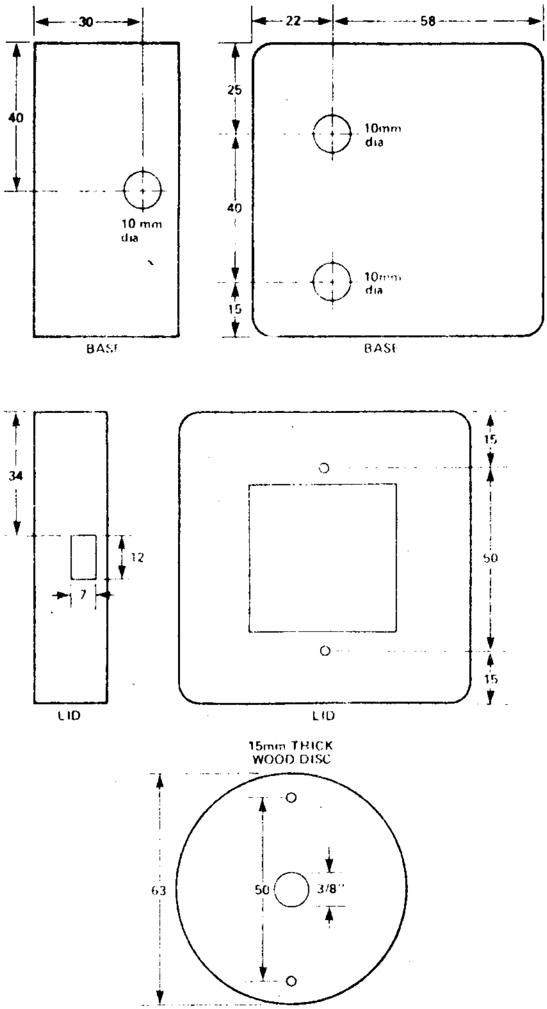


Figure 4. The mechanical details.

RESISTORS
(All ¼ watt 5% carbon)
R1 . . . . 470R
R2,3,4,6,7 . . . . 100K
R5 . . . . 82R

POTENTIOMETERS
RV1 . . . . 10K
log carbon

CAPACITORS
C1,2 . . . . 100n
C352* polyester
C3,4,5 . . . . 100u
16V electrolytic

SEMICONDUCTORS
IC1 . . . . TL082
dual op-amp

MISCELLANEOUS
SK1 . . . . ¾" stereo socket
SK2 . . . . ¼" mono socket
Small ABS case, approx. 80 × 60 × 40 mm; omnidirectional electret microphone insert; 0.1" Veroboard, 50 x 38 mm (20 holes x 15 strips); slide switch; PP3 battery clip; PVC pipe, 254 x 63 mm (10" x 2½"); wire, solder etc.

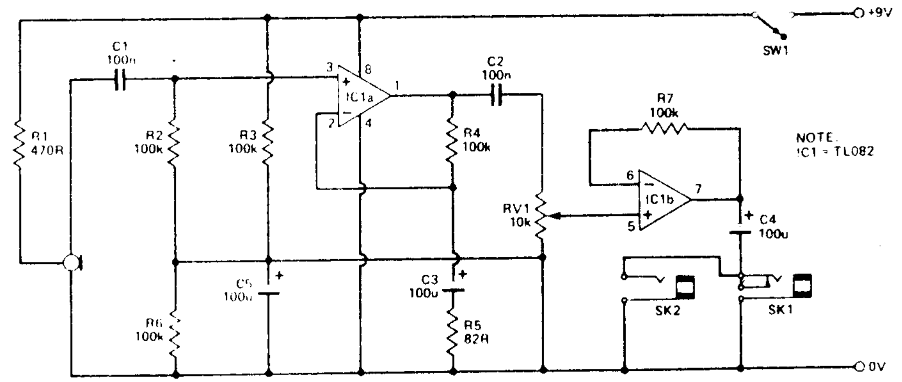


Figure 2. The internal circuitry of the Big Ear.

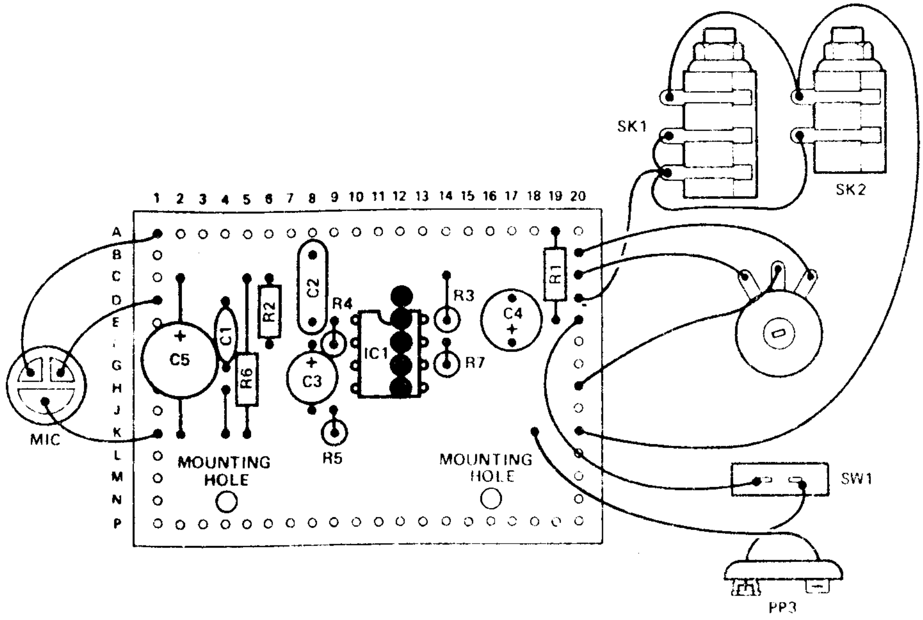


Figure 3. The project is simple enough to build on Veroboard. The diagram shows the component layout and the track cuts *viewed from the top.*