

# Q S X P E

## **ZS2PE**

FREQUENCIES:

Bulletin	3640 Khz
	7107 Khz
National Call	145,5 Mhz
P.E. Repeater	145,05/65
Grahamstown	145,20/80
Lady's Slipper	145,10/70

*Port Elizabeth Branch of the  
South African Radio League*

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



14 MAY 1979

PORT ELIZABETH BRANCH.COMMITTEE MEMBERS:

	Home	Phones. Business.
Chairman ZS2RS Dick	324737	541461
Vice Chairman ZS2DD Lionel	321770	422041
Secretary ZS2OB Marge	302334	-
Treasurer ZS2CY Frank	511259	-
Members:		
ZS2AB Brian	303498	21173
ZS2BK Andre	306893	28501
ZS2SS Selwyn	304651	543634

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The next general meeting of the Branch will take place at the Y.M.C.A. Havelock Street, Port Elizabeth at 8p.m. on Friday 18th May, 1979. There will be a talk on Antennas and Propagation by Peter Neveling. All are welcome.

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Peter Neveling ZS2PD will be starting classes for all those interested in sitting for the Postmaster General's technical examination. Watch for further details in QSX-PE and on the Sunday morning bulletins.

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The Bulletin roster for the next month is as follows:

20th May	Marge ZS2OB
27th May	Frank ZS2CY
3rd June	Brian ZS2AB
10th June	Andre ZS2BK

If you have any items of new and interest for the Bulletin, please give the Bulletin reader a call and let him know. He will most certainly appreciate it.

D.F. HUNT.

There will be a D.F. Hunt on Sunday 20th May starting at 2.30p.m. on the corner of Bayly Street and William Moffett Highway.

Starting at 2.30p.m. the fox will transmit on full power for a generous minute and thereafter for a generous minute every 5 minutes until 3.10 inclusive. At 3.15 p.m. on low power for a generous minute and at 3.20 p.m. From 3.25 till 3.30 there will be a continuous transmission on low power.

The fox and the hounds and anyone else who may be interested in a social gathering and chit-chat will meet at the Gray Dawn Bird Park for tea. Everyone will be welcome. Please make an effort to attend.

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On page 3, you will find a circuit for a very low frequency receiver which makes a very good project for the winter evenings when the static is low. The stations to listen for are:

FUB 17 kcs France	GBR 16 kcs United Kingdom
NAA 17,8 kcs U.S.A.	NBA 18 kcs Canal Zone
NPG 18,6 Washington	NPM 19,8 Hawaii
NSS 21,4 Annapolis	WWVL 20 kcs Ft. Collins Colorado.

Thanks to Dudley ZS2AW for this information and circuit.

MINUTES OF THE GENERAL MEETING OF THE PORT ELIZABETH BRANCH OF THE S.A.R.L. HELD AT THE Y.M.C.A., HAVELOCK STREET, PORT ELIZABETH AT 8P.M. ON 20th APRIL, 1979.

PRESENT: 10 members and 2 visitors.

APOLOGIES: ZS2TY, ZS2BF, ZS2AB, ZS2AE.

The Chairman welcomed the members and also Audrey XYL of Frank ZS2CY and Dennis ZS6EK who was passing through P.E. and staying overnight with Lionel ZS2DD.

MINUTES: The Minutes of the meeting held 16th April, 1979 having been circulated in QSX-PE were taken as read, proposed by Andre ZS2BK and seconded by Selwyn ZS2SS.

ARISING: Frank ZS2CY congratulated the Secretary on her first effort at QSX-PE.

FINANCE: The Treasurer said he had paid R17 to Headquarters as their share of subs and R3.90 for postage.

CORRES: The Minutes of a meeting held in Uitenhage by Uitenhage amateurs was tabled.

GENERAL: The Chairman said that the outing to Grahamstown had been very successful and thanked Andre ZS2BK for the use of his antenna, which had made a big difference to the repeater.

It was stated that the audio on the Lady's Slipper Repeater was faulty and would need to be repaired.

The Chairman expressed his thanks for QSX-PE.

The Chairman reported on the A.G.M. in Durban and said that all the arrangements were very good and he had no complaints as to the organisation. Among the items for discussion, the Chairman had proposed that sub-committees be set up in each division as had already been done in Johannesburg. The Band Planner said that Branches were free to do this and could then inform him of the sub-committees. This would avoid two or more repeaters on the same frequency accessible from the same town or city. The Band Planner could then work through the sub-committee. This would be discussed at the next committee meeting. Among other items was the increased share of subs. to be allocated to Branches and the possibility of subs. being substantially increased due to the increased running costs of the League. The motions were discussed and the Chairman reported as follows:

- |   |   |
|---|---|
| 1 - 7 Carried   | 14 and 15. Withdrawn.   |
| 8 Lost  | 16, 17, 18, 19. Carried.  |
| 9 Withdrawn   | 20. Branches to put their suggestions to Contest Committee for consideration.   |
| 10 Lost 1027 - 152 votes.   | 21. S.A.R.L. not being a member of the I.T.U. a representative from London would attend on our behalf.                              |
| 11. The Technical Committee in collaboration with the P.M.G. will prepare model answers for Radio ZS. | 22. Carried.  |
| 12. Not discussed.  | 23. Lost. 1669 - 363.   |
| 13. Lost 1597 - 435.  | 24. Lost 1776 - 256. The President would be the only person to deal with the P.M.G.   |
|   | 25. Lost. 1325 - 707. The opinion was that the S.A.R.L. had its own constitution and radical change was not desirable or necessary. |

The next Annual General Meeting will be held in Pretoria and in 1981 in Cape Town.

The V.H.F. Contest is to be held on 23/24 June. the H.F. Phone Contest on 19th August and the C.W. Contest on 9th September. A further V.H.F. Contest is scheduled for 10/11 October.

The Chairman spoke on the Branch voting strengths and pointed out the weaknesses where branches had split up and gave as examples Wolkberg/Impala, East London/Kaffraria and Cape Town/Tygerberg.

The business was concluded at 20h47 and tea was taken. Thereafter Andre ZS2BK showed the very interesting slides of his trip through Britain and France.

The Chairman thanked Andre for the slides, for the eats, and also thanked Dennis ZS6EK for attending the meeting.

sgd.

R.W. Schonborn ZS2RS

Chairman

sgd.

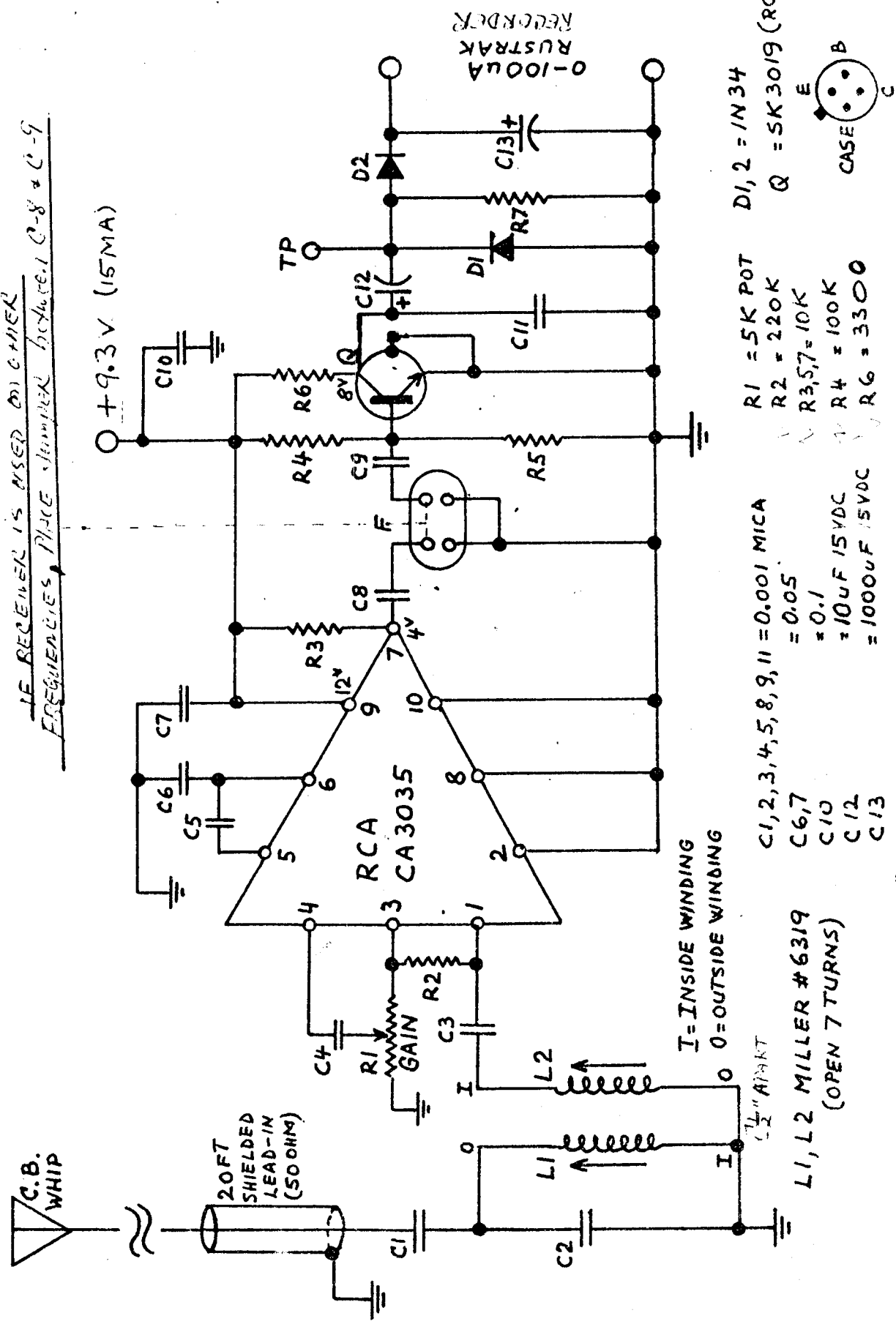
M.T. Colson ZS2OB

Secretary.

# SID (SUDDEN IONOSPHERIC DISTURBANCES) RECEIVER

FOR SES (SUDDEN ENHANCEMENT OF SIGNAL)  
MODIFIED TO RECEIVE 18.6 KHZ (NLK, JIM CREEK, WASHINGTON)  
USING CERAMIC FILTER, CR TUNABLE FROM 17.8 to 38 KHZ

IF RECEIVER IS USED ON OTHER  
FREQUENCIES, PLACE JUMPER BETWEEN C-8 & C-9



- R1 = 5K POT
- R2 = 220K
- R3, 5, 7 = 10K
- R4 = 100K
- R6 = 3300
- C1, 2, 3, 4, 5, 8, 9, 11 = 0.001 MICA
- C6, 7 = 0.05
- C10 = 0.1
- C12 = 10uF 15VDC
- C13 = 1000uF 15VDC
- D1, 2 = 1N34
- Q = SK3019 (RCA)



F = 18.6 CERAMIC FILTER  
(OPTIONAL)

To be able to hear the OSCAR satellites you need to know the time the spacecraft will be over your area. This information or orbital data as it is known is available from several sources such as :- 73 Magazine, QST and is transmitted daily by WIAW the ARRL headquarters station. The WIAW bulletins are broadcast on 35B, CW and RTTY. You can also tune in to the AMSAT net, details of this net appeared in the March issue of QEX-PE. I can supply information from time to time.

Information is usually given in the following format :-  
OSCAR 7 Reference orbits.

April 28 20350 0151Z at 90.5W Mode J  
April 29 20362 0050Z at 75.3W Mode J

Date, orbit number, time, longitude West, mode.

You will also be given the following information about the orbital period and the spacecrafts progression West.

OSCAR 7 progresses an average of 28.737571 degrees West per orbit in a period of 114.944858 minutes.

OSCAR 8 progresses an average of 25.808120 degrees West per orbit in a period of 103.228227 minutes.

The reference orbit refers to the time and the longitude the spacecraft crosses the Equator for the first time on the date given. Now to find out when the spacecraft will be heard in Port Elizabeth we add the progression per orbit to the longitude given in the reference orbit until we get 300 degs or more. Port Elizabeth is 334 degs. West, it is possible to hear the spacecraft from 300W to 360W. If you add eight progressions then you must add eight orbital periods, this is to keep the time and the longitude in step. This applies to evening passes only. The early morning passes are slightly different to arrive at. The OSCAR reference orbits are always given for the ascending node which means the spacecraft will be travelling from the South to the North when crossing the Equator at the time given. OSCAR will always be on the opposite of the Earth to us for the first equatorial crossing of the day GMT. To arrive at the morning pass we must add 180 degrees plus half a progression to the longitude West given in the reference data. Now add the degrees progression until you get 300 or more. For the time add half the orbital period to the reference data and then add the same number of orbital periods as you added progressions, this will give you the morning passes. The above calculations will give the time the spacecraft crosses the Equator, but as we are South of the Equator we must start listening about twenty minutes BEFORE the calculated time for the evening. For the morning passes we can start listening FROM the calculated time onwards. An example may help to make the calculations a bit clearer.

Morning Passes.

180 degs plus  $\frac{28.73}{2}$  plus 90.5 degs. equals 284.87 degs.

The time can be taken as 115 minutes or to make it easier 1 hour 55 minutes. This is near enough to calculate for a few days without getting too far out of step.

$\frac{1 \text{ hr } 55 \text{ min}}{2}$  plus 0151Z equals 0248Z.

For our side of the Earth the times and longitudes will be :-

April 28 20350 0248Z at 284.9W.

To the above time and longitude add the period and progression to arrive at the next orbit. Shown below.

20351 0443Z at 313.6W  
20352 0638Z at 342.3W

The above passes should be heard in Port Elizabeth.

#### Evening Passes.

Start by adding eight progressions to the reference longitude and then add eight periods to the reference time.

28.73 X 8 plus 90.5 equals 320.4 degrees.

1 hr 55 min X 8 plus 0151Z equals 1711Z.

We now have :-

20358 1711Z at 320.4W Adding a period and progression we get  
20359 1906Z at 349.1W.

The above two passes should be heard in Port Elizabeth.

These calculations are for OSCAR 7, exactly the same procedure is used for OSCAR 8 but substitute the orbital time and the progression given for this spacecraft.

Here are some reference orbits for those interested in listening to the spacecraft.

#### OSCAR 7.

May 18 20600 0050Z at 74.9W  
May 19 20613 0144Z at 88.5W  
May 20 20625 0043Z at 73.3W

#### OSCAR 8.

May 18 6114 0022Z at 50.2W Mode A  
May 19 6128 0027Z at 51.5W Mode J  
May 20 6142 0033Z at 52.8W Mode J

#### Notes.

OSCAR 7 is not maintained in any specific mode due to spacecraft problems.

OSCAR 8 modes of operation are Mondays, Tuesdays, Thursdays and Fridays - Mode A. Saturdays and Sundays - Mode J. Wednesdays are battery charge days - Mode D.

#### Spacecraft Frequencies.

	Uplink	Downlink	Beacon
OSCAR 7.			
Mode A	145.850 - 145.950 Mhz.	29.400 - 29.500 Mhz.	29.502 Mhz.
Mode B	432.125 - 432.175 Mhz.	145.975 - 145.925 Mhz.	145.972 Mhz.
OSCAR 8.			
Mode A	145.850 - 145.950 Mhz.	29.400 - 29.500 Mhz.	29.402 Mhz.
Mode J	145.900 - 146.000 Mhz.	435.100 - 435.200 Mhz.	435.095 Mhz.

I hope you have many Q30 through OSCAR.

THE SATELLITE EARTH STATION AT HARTEBEEESHOEK.

The Station uses two dish antennas (and associated equipment) to communicate internationally via two satellites in geo-stationary orbit about 35 000 km above the Indian and Atlantic Oceans. The antennas are steered continuously and automatically for the best signal. Angular accuracy of about  $0.01^\circ$  is maintained. This directional accuracy is necessary since the gain of each dish is more than 60 dB in the 4Ghz and 6Ghz bands which are used.

No feedlines are used. Signals are passed via corner reflectors which move with the dish, into a stationary horn, and then via a waveguide to the receiver. The receiver and transmitter (which use the same signal path to the antenna) are thus at ground level. In this respect this station is superior to those which have the transmitter and receiver at the focus of the dish, where maintenance is very awkward. Only about half a dB is lost between the dish and the ground installations, this distance being around 6000 wavelengths.

A parametric pre-amplifier is used in the receiver. The pumped element is cooled by the Peltier effect, so there is no messing about with liquid Nitrogen which is required in the case of cryogenically cooled amplifiers. At the input the signals are about -1000 dB (S6) and when one sees them later in the spectrum analyser they seem to be about 40 dB stronger than the noise.

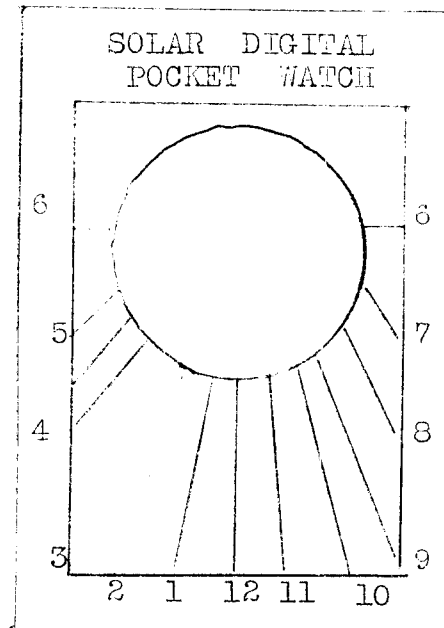
The final is a travelling wave tube, capable of 1500 W output, but normally runs at about 20 W (200 W for TV). The reason for this is that the tube costs in the region of R40 000 and running it cool extends its life considerably.

As the gain of the antenna increases the effective power of the transmitter more than a million times, an interlock device will switch off the transmitter whenever the antenna reaches a certain low angle. This will avoid harming people on the ground.

The station is not allowed off the air for more than 17,5 hours a year. To achieve such remarkable reliability the station has a number of special features. The electronics are run from a DC system in which storage batteries on trickle charge are ready to take over without a break. Three diesel powered alternators provide electricity on an "een aan die bas, een in die was, een in die kas" basis. Wherever possible, automatic changeover takes place.

Since the satellites are north of the Tropic of Capricorn, there are periods each year when the sun is directly behind the satellites. The UHF noise from the sun blots out the link completely. It occurs twice a year for 4 minutes.

A QSO via the satellite is a weird experience as there is a discernible delay along the 100 000 km path of about  $\frac{1}{3}$  second before you get an answer to a question!

A SOLAR POWERED DIGITAL POCKET WATCH.

Many of us have acquired one of these new digital watches which have come onto the market in recent years. The prices have really come down rapidly in recent months. In continuation of this trend RAGCHEW has patented a pocket model, which is not only one of the cheapest on the market, but is also solar powered.

The circuit diagram is shown above. Actual size will depend on the user's needs. The circle in the middle should be carefully cut out. This should not be too small (read on).

The watch is operated as follows: insert your middle finger into the circle, the finger pointing vertically. Align the device so that the line indicating "12" points approximately South, the shadow cast on the circuit board indicating the time. Whether it is morning or evening, day or night will have to be determined from other observations.

In common with other solar devices, the watch switches off at night.

With thanks to ZSLMO and Ragchew.