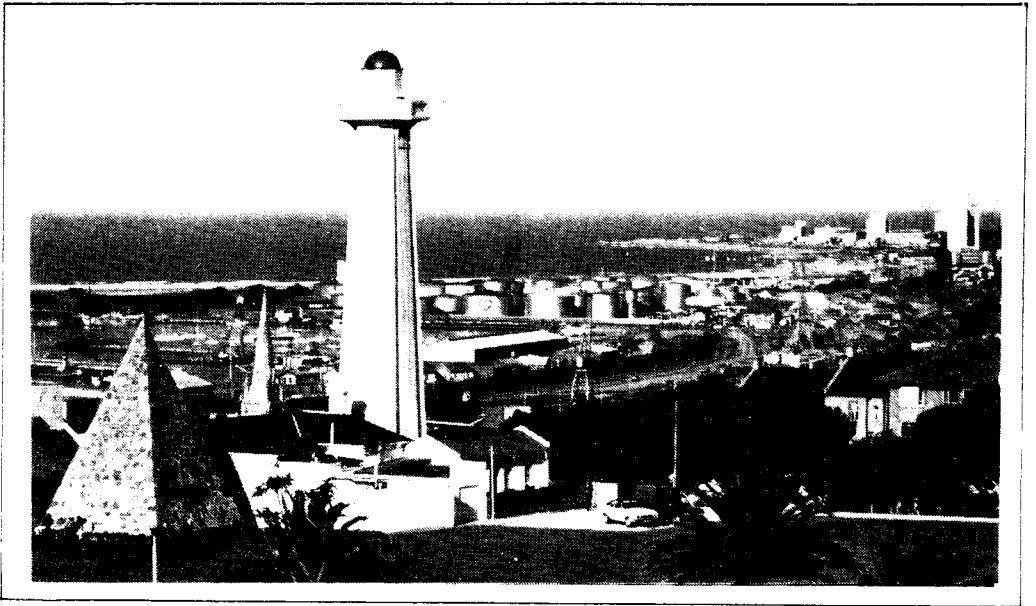




Q S X P E



**THIS NEWSLETTER IS PUBLISHED BY THE
PORT ELIZABETH BRANCH OF THE
SOUTH AFRICAN RADIO LEAGUE**

**P.O. BOX 10402
LINTON GRANGE
6015**

FAX (041) 30-7270

3 - 9 1

NOTICE OF MEETING

The March monthly general meeting of the Branch will be held on Friday, 15th March, 1991, at St. Martin's Church, Kabega Park, starting at 20:15 (8.15pm). We will no doubt receive a short report from Marge on the proceedings at the AGM.

After the tea break we will be entertained by Marge and Lynne. Details of the form that this will take are being withheld, and so are the reasons for withholding them, so you have to attend the meeting to find out for yourself just how - and how well - these girls can entertain. I can tell you that there is no truth in the rumour that two tables are being reinforced to take the strain of belly dancing.

Bring a few friends.

FREE VALVES!!!

If you're 'into' valves (those glass things that glow in older type radios) you can get a bunch of them FREE - you simply arrange with the donor about transportation - no doubt this, at least, will be at your cost.

OM Julian Scales, A226P, a Consulting Electrical Engineer, has boxes and boxes of valves to give away. Telephone him on code 09267 at 314172 (work) or 312264 (home), or write to him at PO Box 1190, Gaberones, Botswana.

HAM MAGAZINES ARRIVE

A large number of QST and Ham Radio magazines that the Branch ordered a while back have now arrived and are available from the Branch library. Contact our librarian, Vic ZS2SZ for particulars or simply rock up at the next general meeting and see what's in them.

EDITOR CHANGES HIS ADDRESS

Kindly note the new address and telephone number of the Editor of GSX-PE: 13 Risa Road, Providentia, 6070 Port Elizabeth. Now you have no excuse for not letting him have an article for your favourite Newsletter.

Did I hear someone say 'pity it's only the address that's changed and not the editor'?

STOP PRESS. Listen for VU2NSA, VU2MR and VU2MFY currently on a raft India/Indonesia/India. Frequencies: 14150, 21225 and 7050 kHz

**MINUTES OF GENERAL MEETING OF THE PORT ELIZABETH
BRANCH OF THE SOUTH AFRICAN RADIO LEAGUE HELD AT
ST. MARTINS CHURCH, PORT ELIZABETH ON FRIDAY 15TH
FEBRUARY 1991**

PRESENT: 28 members and visitors.

APOLOGIES: per register.

The Chairman welcomed all present, particularly John ZS2RG and John ZS2JR.

MINUTES: The minutes of the January 1991 meeting had been circulated in QSX-PE and were taken as read: proposed by Mike ZS2XE and seconded by Julian ZS2AAV.

ARISING: (a) Marge had phoned various places to ascertain prices for a lunch and a dinner but none had come back to her yet. Waldie ZS2WM offered to determine the price per head at the MOTH Club in Bird Street.

(b) Marge had received a letter from the Naval Cadet Corps with proposals regarding incorporation of the ZU syllabus into their curriculum. She will read this at the AGM next month.

(c) Marge brought eight car stickers at a price of R5 each. Anyone wanting more can let her know and she will have them made.

(d) Colin ZS2CTR had spoken to the East London Branch about holding a combined outing and they are very keen. We must decide on a venue. Port Alfred, Bathurst and Grahamstown were mentioned but no decision taken.

FINANCE: Colin ZS2CTR had apologised for not being at the meeting but had given Marge the financial statement which showed that our finances are healthy with a balance of R4772,34.

CORRESPONDENCE: An interesting letter had been received from Gerald ZS2AAX. Marge read the humorous response in Cape Town's RAGCHEW to our article in QSX-PE about their field station. Members thought that our editor might have a witty reply in the next issue of QSX-PE.

Minutes of Meeting (cont'd)

GENERAL: Al furnished the rules for the new QRP award as modified following reconsideration. It would now be known as the QRP 20 Club Award.

Marge wanted to know how many persons required boards for building the QRP rigs. Vic said he had someone looking for components in Johannesburg.

Vic had eight copies of "First Steps in Radio" available at R25 per copy.

Raphy ZS2SP suggested that we all wear tags bearing our name and call sign. Marge apologised for having forgotten to put out the name tags normally provided. Mike ZS2XE suggested that, to enable members to get to know one another more easily, a list of members' names and addresses be prepared on which they may insert their hobbies and occupations. One may thus identify others with common interests.

Motions for the 1991 AGM were discussed and the delegate briefed as follows:

Motions 1, 4, 5, 6, 7, 8, 9, 11, 13, 14, 19: FOR.

Motions 3, 12, 15, 16, 18: AGAINST.

Motions 2, 20, 21: DELEGATE'S DISCRETION.

Motion 10: This does not need to be a Rule.

Motion 17: The delegate should obtain more information and use her discretion.

With regard to Motion 3, the Meeting felt very strongly that no comment should be made by Council or any officer of the League on the contents of Motions from Branches. No other organisation is known to permit this, for a very obvious reason.

After tea, Wolf ZS2WG won the monthly draw, whereafter Gerhard, ZS2UM, gave a very interesting talk on instrumentation in the cockpit of aircraft.

The meeting closed at 11pm.

CHAIRMAN

SECRETARY

QRP POWER SUPPLY

We think that the power supply described on the following pages appeared in QSX-PE or QUA some years ago. However, we have no qualms about reprinting the article as an ideal project for powering last month's DC receiver and the QRP double sideband/CW transmitter to be featured in a forthcoming QSX-PE. We will also bring you one or two add-on improvements for the power supply to boost its general usefulness in the shack.

POWER SUPPLY for your QRP EQUIPMENT

CIRCUIT DESCRIPTION

The circuit diagram of the power supply is shown in Fig. 4. As the diagram shows, precautions have been taken to ensure that under no circumstances will the load be subjected to an over-voltage condition, that both the regulator and load are protected from mains-borne transients and r.f. interference and that the regulator is protected against certain type of abnormal load conditions.

Transient suppressor T1 prevents voltages exceeding 500 volts peak from being applied across the transformer primary winding. Voltages of this magnitude are common on the mains supply due to surges produced by lightning strikes, distribution system faults and switching of inductive loads.

Fuse F1. The lowest value of fuse which would reliably fail to be blown when the p.s.u. was switched on while supplying maximum load current was selected.

Capacitors C1 and C2 are 0.01 μ F disc ceramic types and are intended to suppress, at an early stage, any r.f. interference present on the mains supply.

Transformer. A transformer had to be selected which would supply the current at which the LM317 'limits' while still providing, after rectification and filtering, a d.c. voltage input to the regulator slightly exceeding the required output voltage plus the 3 volts minimum difference required between the input and output voltages to ensure that the regulator operates correctly. A 2 amp transformer having a nominal secondary voltage of 15 volts for a primary input of 220 volts was chosen.

AC Mains Input Voltage	Transformer Output Voltage	D.C. Input to Regulator	Voltage at psu output terminals	Load Current
231 volts a.c.	15.40 volts a.c.	19.90 volts d.c.	12.01 volts d.c.	10 mA
231 volts a.c.	14.95 volts a.c.	17.78 volts d.c.	12.02 volts d.c.	0.5 A
231 volts a.c.	14.77 volts a.c.	17.14 volts d.c.	12.02 volts d.c.	1 A
231 volts a.c.	14.55 volts a.c.	16.54 volts d.c.	12.03 volts d.c.	1.5 A

Diode Bridge. Diodes D1 to D4 are 3 amp, 200 volt P.I.V. Across each diode is a 0.01 μ F disc ceramic capacitor to suppress any interference which is produced by the switching action of the diodes.

Fuse F2. This fuse was incorporated before rather than after the regulator in order not to add unnecessary series resistance after the LM317 as this would degrade voltage regulation. Its main purpose is to provide a means of cutting off power quickly in the event of the crowbar over-voltage protection circuit operating.

Diode D5 and all the other diodes (D6, D7 and D8) which have been added to protect the regulator should be fast-acting. Ordinary rectifier diodes are inadequate because they look like an open circuit in the forward direction until minority carriers are injected into the intrinsic base region of the PIN structure. They should be capable of handling large current surges without excessive voltage drop but do not have to be power diodes. D5 is required if, as in this case, inductive loads such as relay coils are to be fed from the unregulated supply. Such a load can reverse the input voltage to the regulator on switch-off. Furthermore, when the input power is switched off, a heavy load operating from the unregulated supply could cause the input voltage to drop faster than the output voltage, causing a voltage reversal across the regulator, particularly if the output of the

regulator is lightly loaded. Thus the need for both D5 and D6. Further protection against voltage transients due to an inductive load on the unregulated supply would be afforded by either a substantial 24 volt zener diode or varistor such as the General Electric V33 ZA5.

Diode D7 prevents capacitor C6 from discharging through the internal low current paths of the regulator.

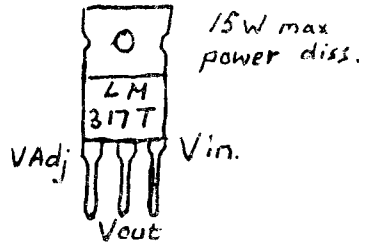
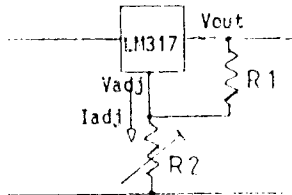
Diode D8 was included to protect the regulator in case it is used to drive an inductive load which could reverse the output voltage polarity.

Capacitor C7 was required to limit the maximum ripple voltage to approximately 3 volts peak to peak.

Supply bypass capacitors C8 and C10 could each be 0.22 μF or larger disc ceramic, 2 μF solid tantalum or 25 μF aluminium electrolytic, the different values being due to the higher effective series resistances of tantalum and electrolytic types. Points to note are that some disc ceramic capacitors tend to have a high impedance at frequencies near 500 kHz and that tantalum capacitors, if used, should have a conservative voltage rating and the maximum ripple (if known!) allowed by the manufacturer should be observed. When subjected to voltage spikes near the peak of the ripple they can 'sputter', short-circuiting momentarily, blowing out a poorly protected regulator. C8, C9 and C10 should all be located as closely as possible to the regulator terminals.

Bias resistors R1 and R2. The regulator develops a nominal 1.25V reference voltage between the output and adjustment terminals. Thus a constant current must flow through the output set resistor R2, giving an output voltage:

$$V_{out} = V_{ref} \left(1 + \frac{R_2}{R_1} \right) + I_{adj.} R_2 \quad (1)$$



Rearranging (1),
$$R_2 = \frac{R_1 (V_{out} - V_{ref})}{V_{ref.} + I_{adj.} R_1}$$

If program resistor $R_1 = 220 \text{ ohms}$, $I_{adj.} = 10^{-4} \text{ A}$ and $V_{ref} = 1.25 \text{ V}$

$$R_2 = \frac{220 (V_{out} - 1.25)}{1.272} \approx \frac{(V_{out} - 1.25) \times 173 \text{ ohms}}{1.272}$$

The 100 μA maximum current from the adjustment terminal represents an error, the effects of which can be minimised by operating with a minimum load current of approximately 5 mA. The use of an l.e.d. as an indicator lamp at the regulator output provides the required minimum load at all times. The current-set resistor R1 should be mounted close to the regulator output terminal and a single-point grounding system for all components should preferably be used, keeping all lead impedances as low as possible. Such precautions will help to improve voltage regulation. If proper care with construction is not taken, ground loop errors and lead resistance drops can easily become greater than regulator errors.

Capacitor C6 improves rejection of any 100 Hz ripple present at the input of the regulator. Without this capacitor, rejection is of the order of 65 dB. With a 10 μF solid tantalum capacitor it increases to 80 dB. Larger capacitance values show little improvement in rejection.

THE OVER-VOLTAGE PROTECTION CIRCUIT

This was included to provide protection to the load in the event of D6 becoming short-circuit or some other unforeseen fault occurring. This crow-bar circuit employs a 6 amp s.c.r. which fires, blowing the fuse F2, in the event of an over-voltage condition. The pre-set resistor R5 is set such that the s.c.r. will not be triggered under normal operating conditions. Capacitors C11 and C12 are included to prevent the s.c.r. from being triggered by voltage transients. An alternative overvoltage protection circuit using an MC 3423 IC is described in ref. (4).

HEATSINK

The heatsink should be sufficient to allow the junction temperature (T_j) of the LM317 to be kept at least 25°C below its maximum permissible operating temperature ($T_j \text{ max} = 125^\circ\text{C}$) at the maximum expected ambient temperature (T_A) for the maximum power that has to be dissipated under normal operating conditions, if maximum reliability is required.

A 100 mm length of Algora Engineering's standard heatsink material is reputed to have a thermal resistance of about 2.1°C/W. To calculate how much power could be dissipated by the chip mounted on the heatsink mentioned, while allowing a maximum T_j of 100°C, one can use the following formula:

$$\text{Watts} = \frac{(1) \text{ max. chip junction temp. } ^\circ\text{C} - 25^\circ\text{C} - (2) \text{ max. ambient temp. } ^\circ\text{C}}{(3) \text{ thermal resistance junction to case} + (4) \text{ thermal resistance case to heatsink} + (5) \text{ thermal resistance heatsink to air.}}$$

(1) for LM317 is 125°C.

(2) say 35°C if enclosure is well-ventilated.

(3) for LM317T is 4°C/W (for LM317K 2.3°C/W)

(4) using mica insulator and silicon grease is approx. 1 for a TO-220 pack.

(5) for heatsink mentioned, assume 2.1°C

$$\text{Max. power which can be dissipated under conditions specified} = \frac{125 - 25 - 35}{4 + 1 + 2.1} = \frac{65}{7.1} = 9.1 \text{ watts}$$

Expected operating conditions:

V_{in} at max. load = 16.54 volts d.c.

V_{out} = 12 volts d.c.

I_{max} = 1.5 amps

Thus max. required dissipation in chip (under normal conditions) is $(V_{in} - V_{out}) \times I_{max} \approx 4.5 \times 1.5 \approx 6.75$ watts.

The heatsink mentioned would therefore be adequate, providing that it is mounted with its fins vertical in free air.

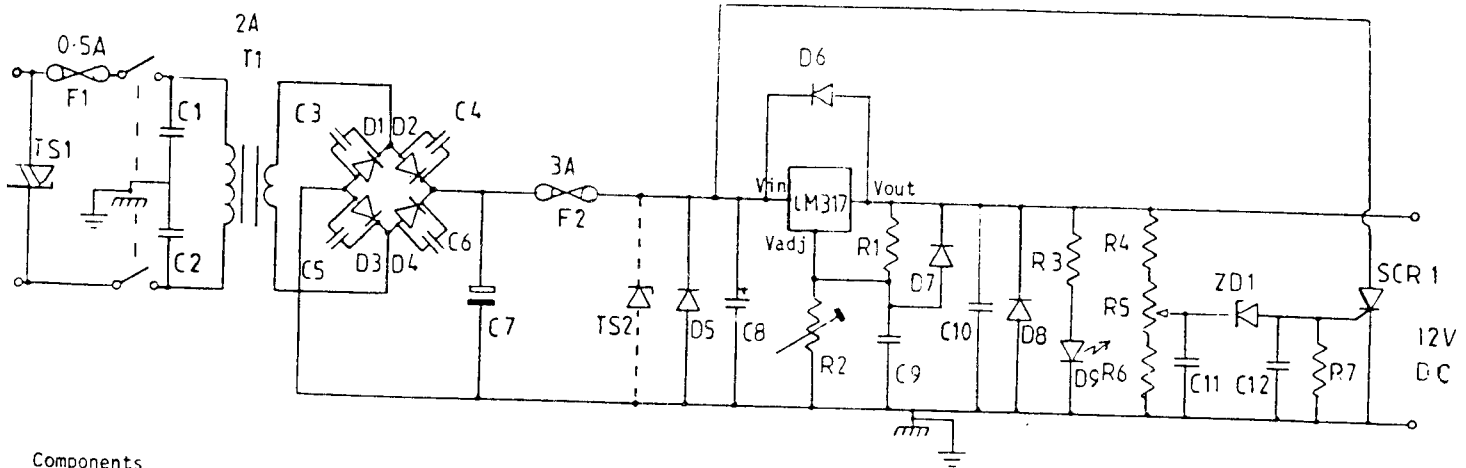
The information in the table below is useful when making such calculations.

Approx. thermal resistance, case to heatsink, θ_{cs} in °C/W			
Package	Direct contact	Contact with silicon grease	Contact with silicon grease and mica washer
TO-3	0.5 - 0.7	0.3 - 0.5	0.4 - 0.6
TO-220	1.0 - 1.3	0.6 - 0.8	0.8 - 1.1

- References:
- (1) National Semiconductor publications.
 - (2) "A note on overvoltage protection" by G4HSS in Radio Communication - March 1982.
 - (3) "13.8V power units - an amateur's approach" by G3ISD in Radion Communication - July 1983.
 - (4) "Overvoltage protection for 13.8V power supplies" by VK5IK in QST - Oct. 1983

QRP POWER SUPPLY

FIG. 4 - 12V 1.5A PSU USING LM317



Components

- | | | |
|--|--|--|
| TS1 = GE-MOV Varistor type V250LA4 | C1-6 = 0.01 μ F disc ceramic | R1 = 220 ohm |
| TS2 = GE-MOV Varistor type V33ZA5 OR 24V zener diode (only required if unreg. supply feeds inductive load) | C7 = 4700 μ F 40V electrolytic | R2 = 2.5 kOhm trimpot OR 1.2 kOhm fixed + kOhm trimpot |
| D1-D4 = 3A 200V PIV rectifier diodes | C8, C10 = 2 μ F 35V solid tantalum OR 25 μ F 40V electrolytic OR 0.22 μ F disc ceramic | R3 = 820 ohm |
| D5-D8 = Switching diode, eg. 1N5401 100V 200A surge | C9 = 10 μ F solid tantalum | R4 = 100 ohm |
| D9 = LED | C11 = 0.5 μ F polycarbonate, etc. | R5 = 500 ohm |
| ZD1 = 10V zener diode | C12 = 0.01 μ F disc ceramic | R6 = 3.3 kOhm |
| F1 = 0.5A fast-blow fuse | T1 = 220V : 15V 2A transformer | R7 = 1 kOhm |
| F2 = 3A | | SCR1 = 6A or larger s.c.r. |

RULES FOR QRP AWARD CHANGED

In our February issue we furnished details of a new award created by the Branch, known as the QRP 40 CLUB AWARD. Since then, there has been a rethink on the rules, and the following replace those published last month:

QRP 20 CLUB AWARD

This award is issued by the Port Elizabeth Branch of the South African Radio League. It is available to any radio amateur who has made two-way communication with radio amateurs in at least twenty different Maidenhead Locator zones in the Republic of South Africa, using a maximum input power to the final stage of the transmitter of five watts.

The award will be endorsed if all contacts were made using a maximum input power of one watt.

All contacts must be made from the same Maidenhead Locator zone.

All contacts must be made on or after 1st January 1991 and may be made on any mode on the 160m, 80m, 40m, 20m, 15m or 10m bands. Awards will be suitably endorsed if all contacts are made on a single mode.

Endorsements are available for each ten extra Maidenhead Locator zones contacted.

Stations must operate within the Regulations governing their licences.

Applicants may either send QSL cards verifying contacts or a copy of their logs certified by two members of their Branch Committee. Station locations must be clearly indicated on QSLs or in the log.

The award is available free of charge and applications should be sent to:

The Awards Manager
PE Branch, SARL
PO Box 10402
LINTON GRANGE
6015

The following eightytwo zones will count for this award:

JF	JG	KF	KF	KG	KG	KG	KG
86	76	05	27	00	21	40	50
87	77	06	28	01	22	41	51
88	80	07	29	02	23	42	52
89	81	08	36	03	24	43	53
95	90	09	37	04	25	44	54
96	91	15	38	05	30	45	55
97		16	39	10	31	46	56
98		17	47	11	32	47	57
99		18	48	12	33		61
		19	49	13	34		62
		25	58	14	35		63
		26	59	20	36		

HAMNET EAST CAPE OFFICE-BEARERS

The officers of Hamnet East Cape are listed below. We propose to provide a roneoed list of all Hamnet E.C. members as a supplement to QSX-PE next month.

HAMNET COMMITTEE

REGIONAL CO-ORDINATOR:	A.F.A. Akers	ZS2U
SECRETARY:	H.J. Voortman	ZS2CA
COMMITTEE MEMBERS:	K.R. Victor	ZS20C
	J.C.L. Moolman	ZS2KU
	J.C.A. Carr	ZS2C

HAMNET LIAISON OFFICERS

ALIWAAL NORTH:	B.H. Gold	ZS2EB
EAST LONDON:	W.H. Rivers	ZS2ELL
HUMANSDORP:	A. van der Merwe	ZS2JC
KING WILLIAM'S TOWN:	L.R.L. King	ZS2BZ
MOLTENO:	J.L. Botha	ZS2NH
QUEENSTOWN:	N.C. Holmes	ZS2AI

TUESDAY NIGHT IS NATTER NIGHT NOW

You no longer need to be interested in technical subjects to participate in the Branch's Tuesday evening nets. Although they started out as a technical forum, it has been found that the nets that attracted the most participation were those on which non-technical matters were discussed.

Consequently, the Tuesday evening get-togethers will henceforth be general 'natter nets'. If a technical subject comes up it will be purely coincidental and it will be disposed of as quickly as possible.

These get-togethers are a lot of fun so make a date to join us on the Town repeater (145,050/650 MHz) at 19:30 (7.30 pm) on Tuesdays. If, for any reason, you are not able to join the net on 2 Metres but would like to participate, let Viv ZS2VM know. He will look into the possibility of setting up an HF/VHF relay if there is sufficient interest.



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*** * PERSONAL NEWS * ***

Congratulations...

- to Brendon Robertson on becoming the first Novice candidate to pass the 5 wpm morse test in this area; and
- to those who will be celebrating:

Birthdays - March: Meruyn Akers ZS2F (20th); Andrew Gray ZS2G (21st). **April:** Rob Salmon ZR2AAQ (2nd); Ria Laaks (ZS2HB) (3rd); Iona Gertenbach (ZS2CV) (4th); Mike Jones ZS2MJ (5th); Hannes Vorster ZS2BE (7th); Ron Harvey ZS2RU (11th); Hans Rohwer ZR2AX and Van van der Merwe ZS2Y (both 16th); Allan Ansell ZS2AJ (17th); Jock Morris ZS2MD (18th); Margaret Bartie (ZS2WM) (19th); Kay Harvey (ZS2RU) and Trevor Scarr ZS2AE (both 20th).

Anniversaries - March: Maureen and Neil Fulton ZS2MG (21st); Yvonne and Fred Bonthuys ZS2EQ (31st). **April:** Kathy and Wolf Gerstle ZS2WG (6th); Rietjie and Sel Staples ZS6SS (10th); Claire and Jack Smailes ZS2SM (15th).

Welcome... to our new member Pierre Knobel, ZS2ABC, who has recently moved to Jeffrey's Bay. We hope you will enjoy your association with us, Pierre.

THE BRANCH TROPHIES

We have told you, in past months, about some Branch awards, namely the DF Hunting Trophy, the ZS20B DX Trophy and the ZS2AB Constructors' Trophy. We continue this month with ...

The VHF TROPHY

which is a silver floating trophy and is awarded to a member or members of the Branch who prove outstanding achievements on any or all of the VHF bands. Proof must be submitted to the Committee ...

AND

The HAM SPIRIT TROPHY

awarded at the discretion of the Committee to the member who has consistently demonstrated a willingness to become involved in activities relating to the Branch or who shows a genuine attitude of friendliness and help to members or at Branch level.

Next time: something else.

PORT ELIZABETH BRANCH COMMITTEE

CHAIRMAN	Marge Weller	ZS20B	30-4597
VICE CHAIRMAN	Lionel Coombe-		
	Davis	ZS2DD	32-1770
SECRETARY	Lynne Crothall	ZS2MM	35-4671
TREASURER	Colin Robertson	ZS2CTR	30-0570
SOCIAL	Marge Weller	ZS20B	30-4597
SPECIAL EVENTS, AWARDS, CONTESTS	Bud Voortman	ZS2CA	34-2770
HAMNET	Al Akers	ZS2U	30-2983
PROJECTS, PUBLICITY, NOVICE LICENCES	Viv Moore	ZS2VM	30-4433
EDITOR: QSX-PE	Garth Laaks	ZS2HB	33-1532
QXS COMMITTEE MEMBER	Viv Moore	ZS2VM	30-4433
LIBRARIAN, DF HUNTS, IPHA PROJECTS, PUBLICITY	Vic Olivier	ZS2SZ	30-2440
PACKET WORKING GROUP	Viv Moore	ZS2VM	30-4433
CO-ORDINATOR	Lionel Coombe-		
REPEATER WORKING GROUP	Davis	ZS2DD	32-1770
CO-ORDINATOR	Trevor Scarr	ZS2AE	32-1746

BULLETIN ROSTER

Bulletin readers please refer to your roster sheet.

SUNDAY BULLETINS

Bulletins are transmitted on Sundays at about 08:40
(after the Headquarters bulletin) on -

- 7,098 MHz (40 metre band SSB)
- 145,100 MHz (2 metre band FM - Lady's Slipper)
- 50,005 MHz (automatic link with 2 m Lady's Slipper)
- 14,130 MHz (20 metres SSB) when conditions require.

BRANCH VHF SERVICES

Town Repeater (PE Central)	145,050	/	145,650 MHz
Grahamstown Repeater	145,150	/	145,750 MHz
Lady's Slipper Repeater	145,100	/	145,700 MHz
6 Metre link with Lady's Slipper	51,400 MHz		(simplex)
Cockscomb Repeater	145,000	/	145,600 MHz
Karreedouw Repeater	145,075	/	145,675 MHz
University Repeater	145,175	/	145,775 MHz
6 metre beacon (ZS2SIX CW ID)	50,005 MHz		
2 metre beacon (ZS2PE CW ID)	144,910 MHz		

BRANCH MEETINGS

20:15 (8.15pm) on the third Friday of the month at St. Martin's Presbyterian Church, Great West Way, Kabega Park.

**** We like being your branch ****