

Q S X
P E

*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

FEBRUARY 1986.

Port Elizabeth Branch

>NOTICE OF MONTHLY MEETING<

MEMBERS ARE REMINDED THAT THE MONTHLY GENERAL MEETING OF THE BRANCH WILL TAKE PLACE AT THE SCOUT HALL, CORNER OF RITCHIE CRESCENT AND VAN PLETTENBERG STREET, KABEGA PARK ON FRIDAY 21st FEBRUARY, 1986 at 8.15P.M.

Committee

CHAIRMAN:	Brian ZS2AB	303498	VICE CHAIRMAN:	Lionel ZS2DD	321770
SECRETARY:	Marge ZS2OB	303498	TREASURER:	Dick ZS2RS	322111
AWARDS:	Bill Hodges	512580	MEMBER	Trevor ZS2AE	321746
	QX- PE:	ZS2OB and ZS2AB.			

bulletin roster



23rd February	Trevor ZS2AE
2nd March	Bill Hodges
9th March	Brian ZS2AB
16th March	Dick ZS2RS

PLEASE if you have items of news, information about DX, personal snippets, or anything that you find interesting, please pass it on to the bulletin reader.

BRANCH GET - TOGETHER.

THIS IS TO TAKE PLACE ON FRIDAY 28th FEBRUARY, 1986 AT THE TIVOLI RESTAURANT, PAMELA ARCADE, 2nd AVENUE, NEWTON PARK AT 7.30P.M. THE COST IS R12.50 PER PERSON AND THE MENU IS AS FOLLOWS:

STARTERS: Choice of an Italian Dish, Soup or Asparagus.

MAIN COURSE: Any steak, Calamari, Kingklip or Chicken Dish SALAD.

DESSERT and COFFEE.

The Restaurant is unlicensed, so please B.Y.O.B.

The Branch will be providing some wine.

PLEASE ADVISE MARGE OR BRIAN IF YOU WILL BE ATTENDING.

PHONE 303498 LATEST 24th FEBRUARY.

THIS and THAT

CONGRATS

To Bill Hodges who was elected to fill the vacancy of Awards Manager on Committee in place of Gordon ZS2GK.

WELCOME

A hearty and warm welcome to Owen Wheeler ZS2HZ who recently became a member of the Branch. May you and your family have a long and happy association with us.

TV STAR

Yet another member of the Branch has made an appearance on "The Box". It was good to see Peet van Heerden ZS2BX on a programme about Nieu Bethesda. That makes three!

NEW QTH

We were glad to hear that Gordon ZS2GK and Joan Knapp had a safe trip to their new QTH in Div. 6. In the spirit of a true ham, Gordon was heard on bulletin net the day after they got there. Pete Smith ZS2PJ was also heard from, but on the landline! Pete and family had a good trip over to G-land, but the weather was very wet and cold. Pete was enquiring after his 1986 licence as it was needed before he could get a G-call. Hope to hear you on the air soon, Pete.

FOR SALE

3 band vertical antenna 12 AVQ. R150. Contact Beav n 306968 Home number.

WANTED

Yaesu Antenna Tuner from 180m up. Contact Beavan 306968.

All-wave commercial receiver in good condition. Along the lines of R1000. Please contact Chas Thwaites ZS2PA, Box 532, Kowie West 6171 or phone 0464-41486.



Many of you will have already received your calendar of events for the year and you will note that the most important events for the League and the Branch are listed, together with a space for any further proposed happenings. Many thanks are due to Dick ZS2RS whose brainchild this calendar was, and we hope to see you at all our functions and meetings.

VIDEOTAPE OFFER TO MEMBERS.

DO YOU OWN EITHER A VHS OR BETA VIDEO RECORDER? IF YOU DO, YOU CAN TAKE ADVANTAGE OF OUR SPECIAL MONTHLY OFFER. OUR VERY GENEROUS DONOR MAKES AVAILABLE TO US EACH MONTH, (SUBJECT TO AVAILABILITY OF STOCK), 2 TOP-QUALITY VHS OR BETA THREE-HOUR BLANK VIDEO TAPES WHICH WE SELL AT R15 EACH. ALSO AVAILABLE ARE TWO VHS TAPES OF ANOTHER MAKE WHICH WE SELL AT ONLY R12 EACH. THE PROCEEDS OF THESE SALES GOES TOWARDS FUNDING QSX-PE. CONTACT MARGE ZS2OB. STRICTLY FIRST-COME-FIRST-SUPPLIED.



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FOR ALL YOUR COMMERCIAL PRINTING REQUIREMENTS

TRY US FOR YOUR QSL CARDS!

MINUTES OF THE GENERAL MEETING OF THE PORT ELIZABETH BRANCH OF THE SOUTH AFRICAN RADIO LEAGUE HELD AT THE SCOUT HALL, KABEGA ON FRIDAY 17th JAN. 1986.

PRESENT: 27 members and social members and visitors.

The Chairman welcomed all to the first meeting of 1986 and wished all a very happy New Year. A special welcome to Steve ZS5NB and all the ladies. Pete ZS2PJ who was present and would soon be leaving for a two-year stay in the U.K. and Gordon ZS2GK and Joan Knapp who were leaving for Div. 6 were wished farewell and happiness in their new QTHs. We were very sorry to see them leave, particularly as Pete had previously been Treasurer and Gordon who was leaving a vacancy on the Committee now.

APOLOGIES: ZS2RB, MG, DT, GW, CG, RL, SR, EQ, MM and MF.

MINUTES: The Minutes of the meeting held 15th November 1985, having been published and circulated in QSX-PE were taken as read, proposed by Fred ZS2JS and seconded by Buck ZS2RM.

ARISING: (1)Members were welcome to take out the books provided they were logged and returned the following month. We did not have many duplicate copies. Several boxes of books had been received from Jeff ZS1VS for which many thanks. These included some old reference books on Fax, V.H.F. and T.V. which might be of interest.
(2)There were also several boxes of componenets donated by Pete ZS2PJ. They had originally belonged to ZS2KS and could be taken for a nominal donation to the Branch.
(3)There were also some boxes of valves of the less common types used in rigs. A list would be published in QSX-PE.

FINANCE: Dick ZS2RS said that the invoice for the crystals for the Mailbox had arrived. The crystals were for the existing frequency and for Grahamstown repeater. Brian ZS2AB said he would do the modification and the Mailbox could be put on the air for the Grahamstown users.

CORRES: Details of VHF/UHF Contests.
Details of Morse Code Proficiency Test.
Card of thanks from Clive and Jane Fife.
Several Branch Newsletters.

GENERAL: (1)Errol Levendall had donated 1000 polystyrene cups for use at meetings. These should last for several years!
(2)With regard to the repeat of the Branch bulletin on Monday evenings, this appeared to be not worth continuing as on several occasions there had been no one reporting in. Members at the meeting did not listen to the repeat and it was therefore decided to discontinue this service.
(3)It was stated that Ron Harvey ZS2RU was running Morse Code practice sessions on 145,550mHz at 6.30p.m.
(4)The 2 metre beacon was running at the QTH of Lionel ZS2DD. Once the antenna had been complete and final checks made, it would be installed at the original site on Villa d'Este. Dick ZS2RS said that the mains supply and antenna brackets were still there.
(5)The Chairman said it was with regret that the Branch was losing Gordon ZS2GK, a member of the Committee and he called for nominations to fill the vacancy.
ZS2VM proposed by ZS2GK. Viv declined.
Bill Hodges proposed by ZS2VM and seconded by ZS2RS. Bill accepted and was unanimously accepted. Bill would take over the duties of Awards Manager.
(6)A volunteer was required to look after the Library and Colin ZS2AO offered his help and this was gratefully accepted.
(7)As members had been told, it had been decided to have a party or get-together early this year in place of the usual Christmas party. This had been arranged and would take place at the Tivoli Restaurant in Newton Park on Friday 28th February, Full details in next month's QSX-PE. The following said they would be attending:

ZS2HZ, DH, AO, VM, AP, WG, DD, BY, RS, AB and Bill Hodges and it was decided to invite Mr. and Mrs. MacLeod.

(8) It had been decided to have a few DF hunts again this year and the first would be taking place on Sunday 2nd February starting at the Glenroy Shopping Centre near Walker Drive at 2pm. The Branch had several DF sets which members were able to use.

(9) Lionel ZS2DD reported that he had recently taken a trip down the coast and had checked on the condition of the Cockscomb Repeater. He had been able to get as close as 9 kilometres and through his binoculars had been able to see that it was still standing but that the rx antenna appeared to be missing. A letter had been sent to SATEPSA asking for their help with getting there by helicopter, but as yet no more had been heard. Several members said they were willing to climb up and do repairs.

(10) Brian asked for assistance with the Technical classes for this year. Viv ZS2VM said that he was prepared to help with certain sections, but that he was away every second week. Willing members were asked to give a small portion of their time for the furtherance of the hobby.

(11) Our guest speaker for the evening, John ZS2JR was unfortunately overseas. He had intended giving a talk on Comet Halley. Instead a video of the Diamond mine and town of Oranjemund would be shown.

(12) Dick ZS2RS said that he had a 2 metre antenna which he would donate for use on the Cockscomb repeater.

(13) Owen ZS2HZ was welcomed as a full member of the Branch. He had recently decided to transfer his membership to P.E. Branch.

There being no further business, the meeting was closed and tea was taken. There after the video of Oranjemund was shown.

sgd:
B.A. Weller ZS2AB
Chairman

sgd:
M.T. Weller ZS2OB
Secretary

WISE WORDS.

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DON'T REMOVE THE LITHIUM MEMORY BACK-UP BATTERY in your transceiver or receiver without first investigating the possible consequences. ARRL Technical Adviser, Robert Parnass, AJ9S, writing in QST, warns that some transceivers are operated by system instructions stored in RAM rather than ROM. AJ9S reports that one US Amateur removed the lithium battery from his rig and found that the radio no longer worked after it was replaced. His radio had to be returned to the service agent for re-programming. This may have severe repercussions for some models as the life of a lithium cell is about seven years.

The American radio-amateur James Brantley K6KPS was recently punished for a very strange transgression of the Radio Regulations. Apparently he called CQ for hours on end and also called imaginary stations with imaginary callsigns for hours on end. The FCC considered it as broadcasting and not two-way communication. He appeared in court and was fined 2000 dollars, which shows how strictly the Americans consider breaking the rules.

Schoolboy howler:

"Lot's wife was a pillar of salt by day...but a ball of fire by night".

Out of the mouth of babes:

"We've moved into a house now, so me and my brother have got a bedroom each. But Mummy and Daddy still have to share".

MOBILE TRANSCEIVER INSTALLATION.

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A. General Information.

1. The mobile radio unit must always be fitted in a position such that:
 - (a) The operator has easy access to the controls and microphone when wearing a safety belt.
 - (b) The controls and microphone must be situated in front so that the driver can see them without turning his head.
2. Before drilling any holes, make sure what is behind the material to be drilled. It may be a petrol tank, fuel line, brake fluid line, battery, etc. In case of a "double skin" satisfy yourself that it is safe to drill through both skins.
3. Self tapping screws should be used with care. They give a sharp protrusion on the other side of the material and sometimes work loose; this could be potentially dangerous. Use bolts with locking nuts or plain nuts with lock washers.

B. Antenna Mounting.

1. The antenna must not be installed on a vehicle so that the rod can of its own accord hinge down and protrude out from either side of the vehicle thereby causing a hazard to passing pedestrians or cyclists, etc.
2. Antenna mounted on the boot lid. It should be appreciated that mounted in this position, the rod will be horizontal when the lid is open and therefore potentially dangerous to the human eye. This is particularly so with the type that clamps to the rim of the boot lid. The rod must be adjusted so that when the boot is open, the rod does not protrude in a manner which could cause an accident.
3. When the antenna rod is cut to the correct frequency, do not leave a sharp point at the top of the rod.

C. Vehicles fitted with Electronic Devices.

1. An additional precaution is necessary in relation to vehicles fitted with electronic ignition, fuel injection or any other such electronic device where temporary loss of service could be hazardous.

In theory, any of the above systems could be affected by the presence of an RF field of sufficient intensity, which when detected may cause the device to malfunction. The source of RF may be a mobile radio installed in the vehicle itself or a transceiver operating in another vehicle alongside. If interaction occurs, loss of control could result for the duration of the mobile transmission.

D. Installation of Front Mount Equipment.

1. Before fitting the transceiver in the selected position, ensure that as far as it is reasonable to know, the vehicle safety design will not be modified. If the vehicle is designed such that the fascia, glove pocket, parcel shelf, etc, can collapse under impact in the event of an accident, then the fitting of the transceiver unit to these may modify this feature.
2. Fitting positions above the driver's or passenger's head must be avoided. (Four wheel owners take note).
3. Care should be taken to ensure that the microphone lead is not installed such that the lead can interfere with the vehicle controls. The microphone clip should be fitted such that the microphone is easily accessible.

E. DC Supply to Equipment.

1. The correct rating of LT leads must be used as given in the installation instructions.
2. Select a route for the cables, ideally on the opposite side of the

vehicle to the fuel pipe and clear of tubes (not the thermionic type!) controlling the vehicle's braking system, fluid or air. If the LT cables have to be run near fuel or brake pipes, great care must be taken when using an electric drill and under no circumstances may cables be attached to these tubes by tape or any other means.

3. Try to avoid cable routes where the wiring may be walked on or easily damaged by other means. If this is unavoidable the cables must be suitably protected by, for example, flexible conduit or metal capping.
4. Whenever cables pass through a bulkhead, a grommet must be fitted. It is always better to use an existing hole rather than drill another, providing it is in the right position, is large enough and has a grommet.
5. The cables must be adequately secured throughout the LT run, and clear any moving parts.

F. Supply from a 12v. battery.

1. Each LT wire should be run back to the vehicle battery as a continuous unbroken run.
2. The live lead must be fused to the correct current rating as stated in the Instructions, with the fuse holder to be fitted in this lead close to the battery. By this means, in the event of a short circuit along the route, the cable will be protected. Connection to the battery should be made to the lug and not to the battery terminal direct.
3. The 'earth' lead to be connected to the chassis end of the battery earth braid, not directly to the battery terminal. The reason for this is to ensure that if the battery earth becomes disconnected, the starter motor will not find its earth return via the transceiver wiring.

G. Supply from a 24v. Battery.

1. Most mobile transceivers operate on a nominal 12v. supply, therefore an approved 24v/12v Regulator or convertor must be used.
The supply should NOT be taken from a 12v tap on the vehicle battery.

H. Remote (Boot) Mount Equipment.

1. Try to fit in a vertical position on the near or off-side, rather than in a horizontal position on the floor. It is common practice to throw coats, etc, into the boot which may cover the unit if mounted on the floor and thus cause overheating. The possibility of covering a unit mounted vertically is much less.

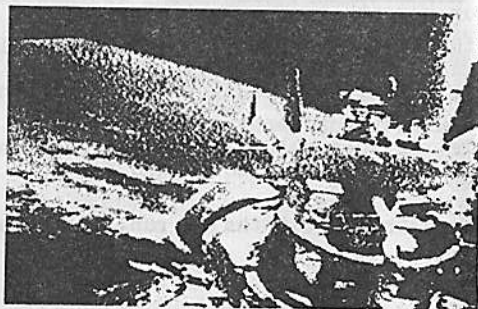
Happy and safe mobileing. Thanks to Eric Meyer ZS6ME.

Note from the Ed. Once all this is done and the vehicle properly suppressed, mobile operation is not only good fun making the time pass more quickly and the journey much shorter, making friends along the way, but it is also extremely useful for getting directions in places where you don't know the way or need to find a service station. Talking to DX stations whilst 'mobile' is great fun and an even greater sense of achievement. Try it sometime.

A BATTERY fires AMPS round a CIRCUIT. An AMP rides round the CIRCUIT on a MEGACYCLE. MEGACYCLES are parked on a GRID. Flemmings Right Hand Rule states that: All AMPS must ride their MEGACYCLES on the right hand side of the wire. A CHARGE occurs when all the AMPS run down the CIRCUIT at the same time. All AMPS meet at an ACCUMULATOR. A JOULE is a fight between two AMPS. You receive a shock when an AMP isn't wearing any shoes. An AMMETER is an animal that eats AMPS. An AMP is a little animal that crawls along a wire. An AMP lives in an OHM. In summer an AMP lives in a COULOMB. POLARISATION is the changing of an OHM into a COULOMB.

PICTURES FROM SPACE.

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"Live Shuttle Picture Transmitted Over South Africa On SSTV"
(Photo courtesy of ZS6WW & ZS6BTD)

There were nearly a hundred two-way contacts that I made. The schedule with JSC was the first time that we had an uplink image. The first picture that went up was one of my wife. It was received excellent...noise free. It was great! It was on a later pass that they sent pictures of all five wives up. I turned that one around and sent it back down just to prove that we had it on board. We talked to what was supposed to be the Japan Amateur Radio League, but the call I was given to use was not the call of the fellow I talked to. The most exciting contacts were the ones with the clubs. That is what I was after.

On flight day five, I was discouraging pix, I just wanted to talk to folks. I was looking primarily for clubs and used frequencies that were given to the clubs. I found that about a third of the contacts I made were indeed with youth clubs. There were several boy scout groups. The kids would get on and ask questions about space. It was a lot of fun to answer these questions. I talked to a foreign amateur in a kibbutz in Israel. That was a schedule that had been set up earlier but had gone by because of the flight plan change. It was reset again. I had heard that Roy Neal K6DUE was going to be at the site to film the contact. It was a good contact. On comments about QSOs to Great Britain, England said "It was a schedule made when I had visited them on a trip to England some time earlier. I had talked to some Australians and I had some European contacts. There was no problem making two way ham contacts when over land. The trouble was with competition. I tried the format that Owen Garriot W5LFL has used on STS-9 of listening for 30 seconds and then listing the calls but found that didn't work because other folks on the ground didn't hear those calls and kept transmitting. I couldn't get them to stop even though I had acknowledged them. There was a lot of misunderstanding about when I would be taking (ATV) images on board. A lot of folks would turn on and transmit a lot of warbling. I tried to discourage that mode. I recorded a lot of the warble, but it didn't come across as an image because no one could hold the frequency long enough to get a complete image up. We may be able to resurrect that with the tapes. I never saw a clear image from a random station. The other ham on board, John-David Bartoe did very little operating, but "Gordie" Fullerton (shuttle commander) did quite a bit. He operated two way and the ATV using my callsign. I went out of my way to acknowledge low power transmission. I consider the mission a success. It started a little shaky. The amateur portion went as planned. All of the gear (Motorola HT, ROBOT modified 1200C SSTV Converter, recorder, Panasonic Color Camera) worked very well. It was on constantly and transmitting for maybe two or three hours at a time. Everything worked as designed. I am impressed by all of it.

In an after flight telephone interview conducted between astronaut Tony England and W5YI REPORT'S Fred Mia, WØORE had the following comments (edited): "I put the ham gear together on the end of flight day two," Tony told me, "I didn't transmit until the end of flight day three because the antenna wasn't up in the window. The first we transmitted was a scene (SSTV) from the cockpit. The first two way radio contact that I had was with the Wales Amateur Radio Club GW6GW. It was a prearranged schedule, but because of the change in the flight plan, none of the schedules were on time. The club at JSC set up a new list of possible times...most of them I could not confirm because I couldn't be sure I would be free.

Further reports from WORE stated that although there was a tremendous amount of Slow Scan TV signals being uplinked to the Shuttle Challenger, nearly all the pictures were on top of each other and extremely difficult for Tony England to make them out. In after the flight comments, Tony England said that he did not recognise any of the Slow Scan pictures or callsigns sent by amateurs on Earth other than the ones transmitted by JSC. It is hoped that tape replays of uplinked video will be successful in recognising some of these pictures. Talk of future SSTV experiments is being discussed among NASA officials on future shuttle flights.

Thanks to Colin ZS2A0 for this article.

WHAT'S IN A NAME?

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To refer to children as harmonics may be cute but it doesn't fit the facts of life, electronic or human. Figure it out. A harmonic is an integral multiple of a single fundamental frequency. A ham harmonic, it follows, would have to be the offspring of a single parent. Parthenogenesis (look it up in your dictionary!) occurs in plants but not in people. A better term would be heterodyne, which is a third signal that results from the mixing of two frequencies. And if you think your kids are especially bright, you can call them SUPER-heterodynes!

AN AMATEURS PLEDGE.

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I am proud of this callsign because I am the only person in the world who has the privilege of using it. It identifies me more than my own name, as thousands of unseen friends will know me only by my call sign.

What I do on the air with this cherished call sign will bring me untold friends or enemies for life. It all depends on me as I will not be judged by looks or station in life, but by my manners and the consideration I show my fellow Amateur while on the air.

I value my friends more than any possession. To make this friendship stronger I pledge myself to be a better operator by following these good operating practices:

1. I will listen on the frequency before testing or transmitting.
2. I will give the frequency immediately to a station calling 'break' or emergency. I will assume that his call is urgent.
3. I will acknowledge a joining station immediately as he may have an important message.
4. When wishing to join a QSO I will announce my call only, between transmission breaks.
5. When working mobile or on known mobile frequencies I will keep contacts short and allow time between transmission for new callers or urgent traffic.
6. I will not forget mobilers are in motion and must have priority with short contacts. They are handicapped with low power
7. I will always be helpful and tolerant with my fellow amateur.
8. I will gladly take or give advice when I know it will help my fellow amateur or our hobby.
9. I will serve the public whenever the opportunity arrives.
10. I will do all in my power to cause my fellowmen to respect all Radio Amateurs.

Ray K. Bryan W5UYQ . QST.

Inscription put by wife on grave of her husband, in Hindhead churchyard.
"Rest in peace
Until we meet again...."

R. S. G. B. 50 MHZ RESEARCH PROJECT.

by Ray Cracknell G2AHU.

(1)Extended Groundwave.

This term is used to replace the old "quasioptical" which was used to define the limits of VHF propagation in the pre- and post-war periods. It was of course universally assumed that propagation was restricted to just beyond the visual horizon. This groundwave decreased with increased frequency so that the range at 50 MHz should be shorter than at 28MHz for example. Due in the main to much improved receivers, we now know this not to be the case and that out groundwave range is much greater at 50 or 144 MHz than it is at 28 MHz and propagation beyond the expected limits of direct groundwave is supported first by obstacle scatter or "gain" and secondly by defraction from turbulence or moisture irregularities in the atmosphere. At 50 Mhz our radio horizon lies far beyond the optical horizon as viewed from our antenna and for a typical station appears to be at about 200 km, but it depends on the effective radiated power, receiver efficiency, height of the antennas and the intervening topography. This radio horizon can be defined by what can be worked with a readable signal on 50% of days throughout the year. Thus on days when conditions are above average our radio horizon is extended and when below average the horizon becomes more restricted. Extended groundwave is therefore defined as propagation within the limits of the radio horizon. The relationship between effective radiated power (ERP) and groundwave range is very clearly evident. Antenna height and gain are more important than RF power and under no other mode of propagation does high ERP and a low angle of radiation have such a marked effect upon range and received signal strength as in extended groundwave propagation.

(2)Tropospheric Propagation.

At times it is found that the typically weak fluttery signals with a random fading pattern from the region of our radio horizon are replaced by strong clear signals with perhaps a slow phythmical fading pattern and that similar strong signsla come in from far beyond our horizon. This occurs when a moisture layer in the troposphere refracts signals back from a height of up to 8 or even 10 km. These layers are typically associated with high pressure and temperature inversions that are common in anticyclonic weather conditions. Clearly any propagation well beyond our radio horizon cannot contain any normal groundwave component or random scatter from obstacles or the atmosphere and is properly termed tropospheric propagation. When a tropo opening occurs ERP seems to have little significance if two stations are correctly orientated, that is generally but not invariably, orientation needs to be parallel to the isobards. The HQ and Scottish beacons are of special value in detecting the presence of a tropo opening. For stations on the eastern side of Britain, Dutch and Belgian TV can also be used as a guide, although it is of course unwise to transmit with a beam directed into the teeth of these signals when TV sidebands are heard in the 50 MHz band.

(3)Sporadic E.

The balance of evidence is now swinging towards acceptance of Sporadic E as capable of supporting transatlan'ic QSO's in midsummer. In the absence of any evidence of a reasonable alternative, especially during years of low solar activity, we are justified as describing the contacts experienced at 50mHz as multi-hop Es. Nevertheless we can only prove it to be so if intermediate Es can be shown to be operative. For this reason reports of QSO's with Iceland and Greenland from America and Europe are especially important. More evidence of these has been collected in the last batch of reports. It was a strongly held belief that Es is a summer phenomenon only. This assumption is fair in so much as the openings that do occur away from midsummer tend to cluster more toward the mid-day, but this is not an exclusive tendency and Es openings have been observed in the early morning right through to December 1985.

Numerous cross-band European contacts were reported including Greenland, Gibraltar and many W's before 50MHz transmission time of 23h30 UT. The real 'glamour' two-way openings to North America occurred during the evenings and nights of 2/3 and 30/31 July 1985. It is interesting that these openings did not extend to Norway. The following points are relevant:

- (a) Openings occurred during periods of intense Es ionization.
- (b) The openings in 1984 closely approximated to the same dates.
- (c) Transmission loss was remarkably low.

The first and third points are highly supportive of a multi-hop Es theory but the second not necessarily so unless we accept that mid-summer Es along the line of the great circle route are nothing like sporadic as we have tended to believe.

The finding that when a 50MHz opening occurred 28 mHz would also be open was also confirmed. If the duration of openings is taken into account a much greater improvement in mid-summer is apparent. Some of the June/July openings lasted from before the early morning session on 50MHz (i.e. from about 06h00 UT.) until after midnight (23h00 UT) while many of the Oct/Nov openings lasted for no more than 30 minutes. The lack of signals to monitor may mean that even these figures are an underestimate.

To be continued. Many thanks to Mike Bosch ZS2FM.

Valves ex ZS2PJ ex ZS2KS.

39	6BM8(4)	10C1	UF43
42	6BA6(11)	10F9	UF41
57(7)	6BR7	10P14	UCH81(2)
58(6)	6BF5	10LD3	UB41
78	6BE6	6LD20	UBC41(2)
80(2)	6AL5(2)	12BE6	UBF80(2)
83V	6AW8A	12AV6	UY41(3)
2A3	6BZ7	QQV03-10	PCF80
2A5	6BS8	EF37A	PCL83
2B7(3)	6CB6A(3)	EF39	PCC84
5J6	6GK6	EC92	HBC90
5V4(3)	6LD3	EH90	KC3
5Z3	6BZ6(4)	ECF80	
5R4(4)	6CL8(2)	EBC41	
6A8(2)	6DC6	EBC33	
6J5	6DE7	ECC33	
6E5(2)	6SA7	ECC35	
6V5	6SF5	EAF41	
6A7	6JS6A(2)	EF80(6)	
6C5	6JS6C(4)	EF41	
6V6(7)	6O80WA	ECL80	
6V8(18)	6DQ6B(2)	EF92	
6J6(2)	5763(4)	EL85	
6C9	6146(4)	EM4	
6F15	7056	EZ40	
6P25	2E26(3)	EZ80	
7C5(2)	5AV8	EF91(7)	
7Y4	12AT7(14)	DK91(2)	
6AQ5(10)	12AU7(7)	DF91(2)	
6AV6(2)	12AX7(5)	DF96	
6AN8A(7)	12AH7	DAF91(4)	
6AM8	12AZ7	UCH42(2)	
6AK5(3)	8077	UCL82	
6BH6(3)	8032	UL41(3)	
6AK6	35W4	UL84(4)	
6BL8	50C5(2)	UCH21	

These valves were amongst the items passed on to Pete ZS2PJ after the death of Frank ZS2KS. Most of the valves are used, but there are a number of new valves amongst the collection. The used ones have been tested by Frank and marked with a percentage emission. Any which you may find useful are yours for a small contribution to Branch funds.

NO WARRANTY, NO RETURNS, NO REFUNDS.

FIRST COME, FIRST SERVED.

AVAILABLE AT THE FEBRUARY MEETING.

NO TELEPHONE ORDERS PLEASE.



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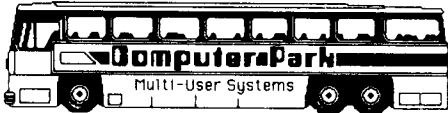
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