

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

JULY 1985

Port Elizabeth Branch

NOTICE OF MONTHLY MEETING

MEMBERS ARE REMINDED THAT THE MONTHLY GENERAL MEETING OF THE PORT ELIZABETH BRANCH OF THE S.A.R.L. WILL BE HELD AT THE SCOUT HALL, VAN PLETTEBERG St. KABEGA PARK ON FRIDAY 19TH JULY 1985 AT 8.15 PM.

=====

Committee

CHAIRMAN: Brian ZS2AB(303498) VICE CHAIRMAN: Dick ZS2RS (322111)
SECRETARY: Marge ZS2OB(303498) TREASURER: Pete ZS2PJ (301493)
AWARDS: Gordon ZS2GK(306776)
QX-PE: ZS2OB and ZS2AB Trevor ZS2AE(321746)

bulletin roster



21st July	Brian ZS2AB
28th July	Dick ZS2RD
4th August	Marge ZS2OB
11th August	Pete ZS2PJ
18th August	Trevor ZS2AE

dates to remember

SATURDAY 27th JULY. A Social get-together will take place at the QTH of Colin ZS2AO and Marlene Ashwell at 5 Hamerkop Street, Cotswold at 7.30p.m. Supper in the form of curry and rice, lasagne and salads and apple pie and custard will be provided and the cost is R6 per couple or R3 single. Please bring your own liquid refreshment and please let Marge ZS2OB know by 23rd July. Phone 303498.

SATURDAY 24th AUGUST: The Branch has been asked to provide comms for an air navigation exercise being organised by the Algoa Flying Club. This counts towards national championship points and the furthest points are quite distant from Port Elizabeth. In all, 17 operating stations are required, at points near Riebeeck East, Grahamstown, Carlisle Bridge, Bathurst, Port Alfred, Alexandria and Port Elizabeth and Addo areas. If you are able to help please let Brian ZS2AB know as soon as possible so that all arrangements can be made. 2 metres and probably 80 metres for the outlying stations will be used.

SATURDAY 21st SEPTEMBER. The Annual General Meeting of the Branch will take place at the Scout Hall, Kabega and will be followed by a Braai.

GUEST SPEAKER AT MONTHLY MEETING

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WE ARE VERY PLEASED TO ADVISE THAT OUR GUEST SPEAKER AT THE JULY MEETING WILL BE COR ZR2CG, WHO WILL PRESENT AN AUDIO-VISUAL LECTURE ON FIBRE-OPTIC TECHNOLOGY. COR IS A RECOGNISED EXPERT IN THIS FIELD AND HIS PRESENTATION WILL BE OF GREAT INTEREST.

THIS and THAT

THANK YOU

We would like to say a VERY BIG thank-you to various members who have been so generous with their contributions towards the electronic mailbox which is in the pipeline for the Branch. To Norman ZS2RI for the permanent loan of an Apple system - computer, disk drive and monitor; to Dick ZS2RS for the HF and VHF rigs; to Colin ZS2AO for arranging software from Chris ZS6CCM and to Barry ZS2DT for the interface unit. We have had a very good response to the voting slips sent out, with by far the majority being in the affirmative. Some members were concerned that the financial outlay was too big for the system to be used by so few, but ONCE AGAIN, the members have turned up trumps and the branch expenses will be absolutely minimal. THANK YOU AGAIN.

WELCOME

On behalf of the Committee and members, we would like to extend a very warm welcome to the following new members: Fred ZS2JS, Wolfie ZS2WG, Viv ZS2VM, Neil ZS2MG, Paul van Dongen of Uniondale. We wish you a long and happy association with the League.

FAREWELL

We were sad to say farewell to Malcolm Harwood ZR2ET who was transferred to Div 6 and to Colin Robertson ZR2DU who is taking up a position on the East London Branch Committee and we wish them well in the future in their new ventures.



We were extremely sorry to hear that Woody ZS1WD of Monte Vista, Cape has been in hospital for a while and had to have a leg amputated. Woody, we certainly hope that all goes well for you and that we will hear you from home soon. We miss you. Best wishes are also extended to Buck ZS2RM who is having an eye operation this month and our thoughts and prayers are also with you, Buck.

NEW SPECIAL OFFER TO MEMBERS.

DO YOU OWN EITHER A VHS OR BETA VIDEO RECORDER? IF YOU DO, YOU CAN TAKE ADVANTAGE OF OUR MODIFIED MONTHLY SPECIAL OFFER. OUR VERY GENEROUS DONOR HAS OFFERED US, EACH MONTH, 2 TOP QUALITY VHS OR BETA THREE-HOUR BLANK VIDEO TAPES. THESE ARE SELLING AT THE ALL-TIME LOW PRICE OF R15 EACH. FUNDS GO TOWARDS THE PRODUCTION OF QSX-PE. CONTACT MARGE ZS2OB FOR THESE TAPES. FIRST COME, FIRST SERVED.

CALLBOOKS

The Branch has bought both the Stateside and Foreign 1985 Call books and these will be kept at the QTH of Brian ZS2AB. Anyone who needs any information regarding names, addresses, etc can call him at 303498 preferably after working hours.

FOR SALE

QSL stickers, Great circle maps and log books available from the Treasurer Pete ZS2PJ at the meetings or phone 30-1493.

SUBSCRIPTIONS.

Headquarters recently announced on bulletin that because of computerisation, the membership list will be closed at the end of August. Please pay your subs to the Branch Treasurer as soon as possible so that you will not be removed from the list. ALSO please check to see if your name, callsign and address are correct on your subscription card and let HQ and the Branch know if they are not.

MINUTES OF THE GENERAL MEETING OF THE PORT ELIZABETH BRANCH OF THE SOUTH AFRICAN RADIO LEAGUE HELD AT THE SCOUT HALL, VAN PLETTENBERG ST. KABEGA PARK, PORT ELIZABETH ON FRIDAY 21st JUNE, 1985.

PRESENT: 24 members(34%) and 5 visitors.

APOLOGIES:ZS2LW, ZS2RB, ZS2BY, ZS2RM and Joan Knapp.

The Chairman welcomed all to the meeting and extended a special warm welcome to Dick ZS2DH, Cor ZR2CG, Owen ZR2HZ, Andrew ZS2G, and Barry ZS2DT. He mentioned that neither of the two proposed guest speakers could be present so he would be giving a short talk on the principles of RTTY in view of the proposed Electronic Mailbox.

The Branch would be losing a few members - Malcolm ZR2ET had been transferred to Johannesburg and would be joining Highveld Branch but would remain a Social Member; Peter ZS2PD was also transferring to Pretoria and would re-join Pretoria Branch; and Colin ZR2DU was going to take up a position on the East London Branch Committee. We were very sorry to see them go but wished them much luck in settling in their new work and QTHs and said their new branches would be rewarded by their membership. To compensate for their leaving, we were however gaining three new members Viv ZS2VM, Wolfie ZS2WG and Fred ZS2JS and a very warm welcome to them.

MINUTES: The Minutes of the general meeting held 17th May, 1985 having been published and circulated in QSX-PE were taken as read, proposed by Gus ZS2MC and seconded by Dick ZS2RS.

ARISING:

- (1)Someone commented that QSX had been neatly typed!
- (2)Three cartons of books had been received from Mike ZS2MJ. Neil ZS2AI and Max ZS2JR, mainly QST and 73. Several hundred other books were also donated and among them were several very interesting articles. Brian said he hoped to have a print-out of the catalogued articles available for members.
- (3)The Air Show had gone off very well and seemed to be enjoyed by all inspite of the fact that band conditions were not very good. Many thanks to all those who had come along to help and all those who just came along for a chat.
- (4) Brian mentioned the photographs which were on display of the trip to instal the Cockscomb repeater. He had written to the pilot thanking him and had received a reply saying that he would be back in the area in the near future. Gus ZS2MC proposed a vote of thanks to all concerned and this was unanimously seconded. Brian said that most of the thanks were due to Trevor ZS2AE and his son Toff ZR2EY. Unfortunately the trip in the helicopter had not been free and the cost to the Branch had been R250. However, this was only a fraction of the true cost as the trips to and from P.E. had not been charged. The whole operation was covered by a R5 000 000 insurance. At the moment, the repeater was usable but it was hoped to replace the receiver antenna which had been damaged in the operation. In appreciation of his hard work, Trevor received two video tapes for which he thanked the donors.

CORRES:

- (1) Letter from Helicopter pilot.
- (2) Several Branch Newsletters.
- (3) Letter from S.A. Radio Publications re advert.
- (4) Card of thanks from Gus ZS2MC.
- (5) Letter from W. Transvaal Branch re Code Proficiency Award.

ARISING:

The 1985 call books had been ordered from S.A. Radio Publications and would be kept at the Chairman's QTH who would be happy to supply information as requested.

FINANCE:

The Treasurer Pete ZS2PJ reported that R100 had been paid out for the Call Books and R250 for the helicopter trip. He would

be receipting subs from July 1st only, in order to facilitate the book-keeping.

GENERAL:

- (1) It was mentioned that as well as the VHS tapes, Beta tapes would also be available and many thanks were extended to the donor. These are sold to cover costs of printing of QSX.
- (2) The Grahamstown repeater would be off the air for a while but it was not certain whether it was a power failure or a fault in the repeater. Barry ZR2DN would be asked to remove the repeater and send it to Port Elizabeth if possible, and it was hoped to return it in the middle of July.
- (3) A donation of several hundred printed birthday/anniversary/special occasion cards had been received from a member who wished to remain anonymous and a card of thanks would be sent.
- (4) Electronic Mailbox. The Branch was on the lookout for a computer and rigs to use for this and several quotes had been obtained. The Branch was prepared to spend up to R1000. An offer of a permanent loan to the Branch of an Apple system had been made by Norman ZS2RI who said that mention could be made of this when the mailbox was advertised. However, the Radio Regulations clearly forbade advertising and legal opinion would be sought as to how this could be done. The members present agreed that we go back to Norman on the matter. Several voting forms had been returned and most of them had been in agreement with the expenditure of the funds. We would wait until the closing date for the voting forms to be returned and judge on the majority.
- (5) Peter ZS2GW asked about the feasibility of the Branch acquiring some test equipment as most of it was out of the range of member's pockets. The idea had great merit but as most of the equipment was exorbitantly expensive, it would be risky to loan this out in case it was inadvertently damaged.
- (6) The suggestion was also made that the Branch subscribe to magazines such as QST, 73 and Practical Wireless. Trevor ZS2AE said that he received 73, Lionel ZS2DD received QST and Brian ZS2AB received Radcom and they would be prepared to make these available for special articles.
- (7) Trevor ZS2AE asked that the Cockscomb repeater be used to test its capabilities, but he was sure it could handle all the traffic. He explained the pulse tone from the low battery alarm which would be heard on the squelch tail and said the battery would then lock out until charged. Peter ZS2GW asked about the QRM which appears from time to time and Brian said that it was probably the same problem which appeared on the Ladies Slipper Repeater. This seemed to emanate from another system in the area. It was envisaged that the Branch would write to the Post Master General to get the matter finally sorted out.

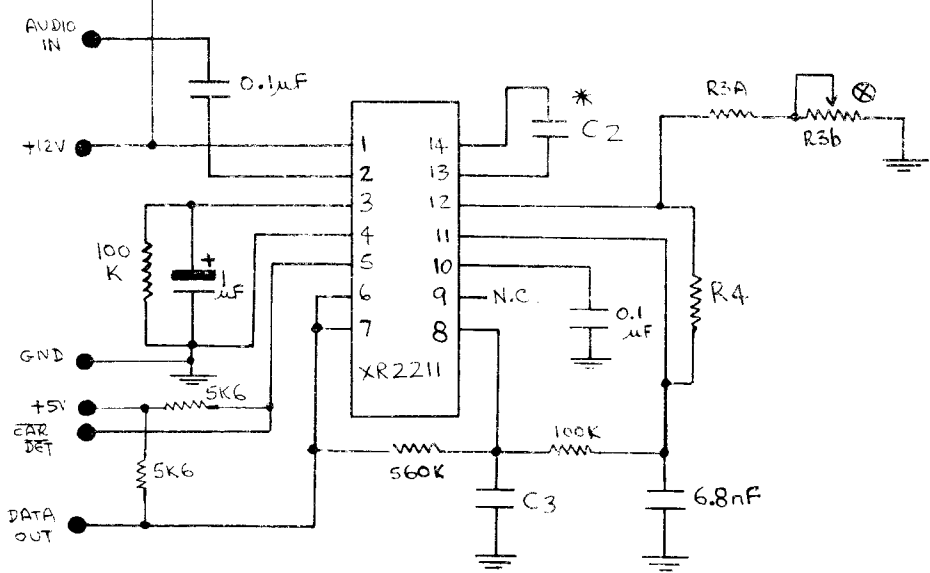
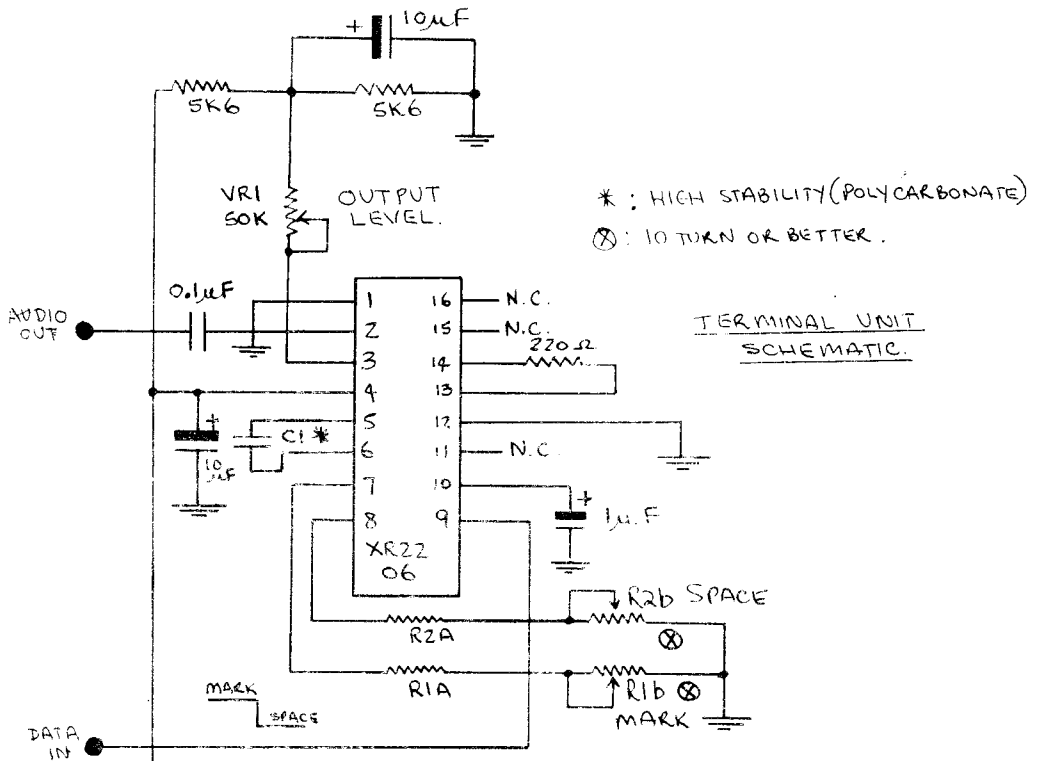
There being no further business, the meeting was closed and tea was taken. Thereafter and interesting and informative talk on the principles of RTTY was given by Brian ZS2AB.

sgd:
B.A. Weller ZS2AB
Chairman

sgd:
M.T. Weller ZS20B
Secretary

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THE ELECTRONIC MAILBOX.

Suggestions for terminal units for use with the P.E. Branch RTTY Mailbox.

With the commissioning of the P.E. Branch RTTY Mailbox system in the offing we are presenting readers with some circuit ideas for terminal units for RTTY reception and transmission. As the system will be operative only on VHF at first, simple units will provide good communications. The circuits presented have been gleaned from various sources, and, as we do not have any first-hand experience of their operation, we present them for YOU to try. These circuits represent the necessary tone-generation and detection for RTTY use and we are not going to attempt to provide logic I/O interfacing details as there are so many different arrangements required for use with different computers. If any one has details of expansion systems necessary for the different computers, please let us have the details and we will publish them.

The design presented here is one which is certainly not original, in terms of the components used, but it has been put together in as simple and versatile a way as possible, to give the user, whether an old timer or new on the RTTY bands, the maximum flexibility.

The heart of the T.U., the demodulator, is built round the EXAR 2211 phase lock loop f.s.k. demodulator, no doubt a familiar device to many of our readers. This beast is capable of excellent performance with a well-designed circuit, which means following the manufacturers data sheets very closely. I do not for a moment pretend that this demod will haul in noisy and weak signals on the h.f. bands the way the DT600 and ST6 do, but it is capable of good h.f. copy with a fair signal and on v.h.f. it provides first class copy with never a dropped bit. A big advantage of this type of design is that it becomes very easy to change frequency shifts, etc. for different modes and speeds of operation.

CIRCUIT DESCRIPTION. The A.F.S.K. modulator uses the EXAR 2206 function generator I.C. This device produces a very reasonable sine wave, which can be injected directly into the mic input of your rig. The output impedance on pin 2 is about 600ohm, so it will drive virtually any rig. The preset pot VR1 is a level control. Make sure you run at a suitably low level so as not to cause over-modulation and subsequent splatter especially on the h.f. bands. The frequency determining components are C1 and the two resistors R1 and R2. Tone accuracy depends on the stability of these components, so a polycarbonate or polypropylene capacitor is recommended. The variable portions of R1 and R2 should be 10 turn pots to allow accurate setting up of the tones. The purity of the sine wave output could be improved by adjusting the 220ohm resistor but it is doubtful if that is of any real benefit.

The demodulator, as we said before, consists of the 2211 phase lock loop circuit. The loop free-running frequency (i.e. with no input signal (is set at midway between the mark and space tones (2210Hz for 2125-2295Hz operation). This frequency is determined by C2 and R3. The same constraints apply to these components as to C1 and R1 in the modulator. R4 determines the bandwidth and hence the capture range of the loop. A large value (180 Kohm) narrows the capture range, which improves noise immunity but makes tuning difficult, especially on an ordinary h.f. transceiver's v.f.o. It also limits the maximum baud rate which can be received. A value of 100k for R4 represents a good compromise for adequate h.f. copy and operation up to 300 baud ASCII. C3 and other nearby components also determine the maximum baud rate, and the values in the table and on the circuit diagram should be adhered to. A useful feature is the carrier detect output. This provides a convenient autostart facility. The resistor and capacitor on pins 3 and 4 of the 2211 determine the delay on this signal and can be changed to suit specific needs. Both the modulator and demodulator are built on one small p.c. board and may be used alone if desired.

SETTING UP: The modulator is adjusted by first connecting a frequency counter (or your tuning scope) to the AUDIO output of the T.U. With a high (+5 volts) on the DATA IN line, adjust R1 for a frequency of 2125Hz. Pull the DAT IN line to ground and now adjust R2 for the space tone of 2295 Hz. The two adjustments are not inter-dependant so there is no need to re-adjust R1. The demodulator free-running frequency is adjusted as follows: Tie the AUDIO line to ground to make sure no spurious noise gets into the loop. Then disconnect one side of R4 from the p.c. board and with a counter or scope connected via a high impedance probe to either pin 13 or 14 of the 2211, adjust R3 for a frequency of 2210Hz. Reconnect R4 after the adjustment is made. These adjustments apply to 2125/2295 Hz operation, but the procedure for other tones or shifts is identical.

	C1 = C2	C3	R4	R1	R2	R3
45 baud RTTY: 2125/2295 Hz	33nf	68nf	180k	12k/5kp	12k/5kp	12k/5kp
110/330 Baud ASCII 2125/2295 Hz.	33nf	10nf	100k	12k/5kp	12k/5kp	12k/5kp
1200 Haud ASCII 2125/2975 Hz.	33nf	2,7nf	33k	12k/5kp	8k2/5kp	12k/5kp

Many thanks to Chris ZS6CCM and Tom ZS6MT for this article and to Brian ZS2AB for re-drawing the diagram.

PROPAGATION FORECAST BULLETIN NR 25.

There is much to be said for contests, especially the most popular of all, the ARRL Field Day, generating band occupancy far beyond other contests. Field Day can be a two day lesson in radio propagation. If June 22 and 23 had been just another early summer weekend, would thousands of stations all over North America have been clamouring for attention on 21, 28 and 50MHz?

Of course not, and this lesson should be written into propagation textbooks in large black letters, NO AMATEUR BAND HAS VALUE UNLESS IT IS USED. Fifteen, ten and six meters have had much less use than they merit, since solar flux and sunspot numbers dropped to near minimum levels months ago. The solar flux was 69 on Field Day Saturday and 70 on Sunday, but E skip on these bands made this one of the most exciting field day weekends on record. The sun has been spotless for several days, and it is likely to continue that way through this week. A rise is expected near the end of June but whether the numbers rise or fall, E skip will continue to dominate the propagation picture for another five or six weeks, and it is not predictable in any precise way.

June 24, 1985. Thanks to Percy ZS2RM

KNOW YOUR CITY?

Do you really know enough about our city, its surrounding areas, or even enough about our country, to be able to inform our DX contacts and to answer any questions they may have? Some amateurs are very interested in our country and would like as much information as possible. They never get bored and usually go on asking questions. This makes for a much more interesting QSO and certainly more pleasant than just your name, QTH and signal report, please qsl via box....! Ask your publicity association for literature, they will be pleased to let you have some, and you and your contacts will benefit greatly!

BEYOND THE BLUE HORIZON.

The CONJS-B over the horizon radar has been operating in Maine USA since towards the end of 1982 and consists of separate static transmitting and receiving sites about 204 km apart. The transmitting antenna as illustrated in Fig 1.2 consists of four separate 12-element sub-arrays with a gain in the region of 20dB. The dipole elements vary in length and are chosen to cover specific bands of frequencies between 6.74 and 22.25MHz as shown in the allocation chart Fig. 1.3 and occupying ALL THE SHADED AREAS. Until now they have taken care to avoid interference to other vital services and amateur radio. However, the transmitting antenna system will later be extended to provide an azimuthal coverage of 180 degrees and two extra frequency bands will be included to provide coverage between 5 and 28MHz. As already mentioned, the e.r.p. from the present system is approximately 100 megawatts and the switchable antenna beam width is 7.5 degrees although the total present arc of coverage is 60 degrees as shown in Fig. 1.4 The fully operational system will cover an azimuth of 180 degrees.

The receiving and operations centre is located at Columbus in Maine but this may later be transferred to another site. The receiving antenna array is illustrated in Fig 1.5 which in A shows the general arrangement of wide band triangular elements (137 in all) operated against a back screen reflector some 15m high and 1.19km in length with a ground screen projected outwards from the array for a distance of 228 m as in diagram B. The beam width is approximately 2.75 degrees and steerable.

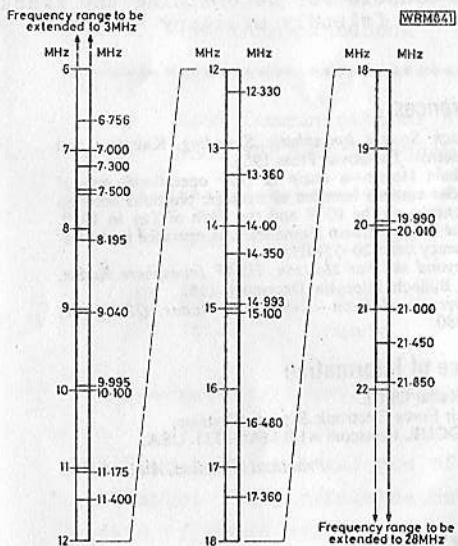


Fig. 1.3: The shaded sections of the frequency range 6 to 22MHz are those expected to be used on a non-interference basis. The range may be extended later down to 3MHz and up to 28MHz

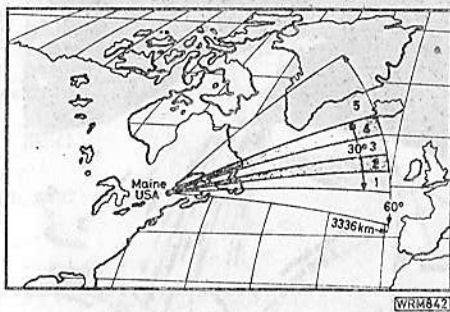


Fig. 1.4: The experimental OTH-B radar system has an interrogate mode (area 5) to provide data on areas of interest within the total coverage of 3336km (1800 nautical miles) by 60 degrees

GENERAL FUNCTION.

Radiation from the transmitter in Maine is reflected from the ionosphere to illuminate sections of the North Atlantic, each 926km long (including a large portion of South Greenland) and out to a range of 3336km as in Fig 1.6. The normal surveillance mode with the experimental system now in operation is for the 7.5 degree transmit beam to step-scan four adjacent sections (1,2,3 and 4) successively to provide a total azimuth coverage of 30 degrees in width at any one time. Within each section 2.5 degree receive beam picks up energy reflected from targets (see also Fig. 1).

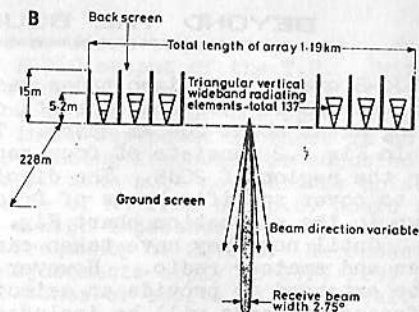
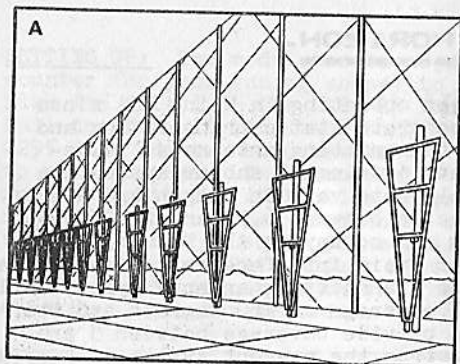


Fig. 1.5: The OTH-B radar receiving antenna, (a) Impression of the antenna; (b) Dimensional schematic

The received signals are digitised and then processed so that each is resolved into 4096 time delay (range information) and Doppler frequency (radial velocity) cells. The blanking, peak detection is taken care of by the processing function which also takes care of interference. Target contacts are fed to an operations processor which, in turn, provides and maintain the tracks together with geographical co-ordinates. All information is then formulated for display. The displays for OTH-B radar are called Detection Tracking Consoles and give information graphically and in alpha-numeric. These operate in conjunction with a Senior Director alpha-numeric terminal and identification console for determining the tracks related to flights of commercial aircraft and friendly military aircraft.

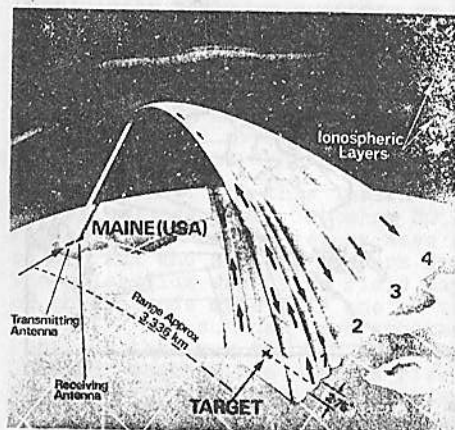


Fig. 1.6: Radiation from the CONUS-B OTH radar in Maine

References

- (1) *Back Scatter Ionospheric Sounding*. Kabanov and Osetrov. The Soviet Press 1965.
- (2) Chain Home—a chain of fully operational coastal radar stations installed at strategic positions between Ventnor on the IOW and the Firth of Tay in 1939. The original Chain Home stations operated in the frequency band 20–55MHz.
- (3) *Beyond the Far Horizon, USAF Ionosphere Radar*. G. Bulloch. Interavia. December, 1982.
- (4) *Over the Horizon—Ionospheric Radar*. QST April, 1980.

Source of Information

OTH Radar Office.
U.S. Air Force Electronic Systems Division.
Code OCUE, Hanscom AFB.MAO1731. USA.

Practical Wireless, August 1983

IT'S VERY INTERESTING.

The Health Education division in Malawi set an examination for students and these are some of the answers from various papers.

1. Benjamin Franklin produced electricity by rubbing cats backwards.
2. A circle is a line which meets its other end without ending.
3. By self pollination a farmer may get a flock of long-haired sheep.
4. A person should take a bath once in summer time and not quite so often in winter time.
5. For fractures, to see if the limb is broken, wiggle it gently back and forth.
6. For nose bleed, put the nose lower than the body.
7. For snake bite bleed the wound and rape the victim in a blanket for shock.

S A Radio Publications

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- o 1985 ARRL Handbook R42-30
- o ARRL Antenna Handbook R19-45
- o Satellite Experimenters Handbook R29-50
- o 1982 ARRL Handbook R10-00

- o RSGB Communications Handbook R33-05
- o RSGB VHF/UHF Handbook R30-76

- o NEW! NEW! NEW! NEW! NEW!

UHF Compendium 'English' written and
published in Germany R40-50

The Branch has a catalogue of many more books which could still be available. This catalogue can be consulted at the meeting. An update of books available and prices will be received shortly.

SHOWROOM HOURS.

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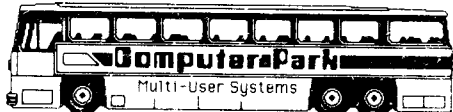
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