

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

August 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 PLETTENBERG St. KABEGA PARK ON FRIDAY 16th AUGUST 1985 AT 8.15 PM.

GUEST SPEAKER AT THE AUGUST MEETING

AT THIS MONTHS MEETING, OM VAN ZS2Y WILL SHARE SOME OF HIS EARLY VHF AND OTHER HAM ACTIVITIES WITH US. VAN WAS VERY ACTIVE ON 2 AND 6 METRES IN YEARS GONE BY AND HIS TALK PROMISES TO BE VERY INTERESTING.

NOTICE OF ANNUAL GENERAL MEETING

ALL BRANCH MEMBERS ARE HEREBY NOTIFIED THAT THE 1985 ANNUAL GENERAL MEETING OF THE PORT ELIZABETH BRANCH OF THE SOUTH AFRICAN RADIO LEAGUE WILL BE HELD AT THE SCOUT HALL, VAN PLETTENBERG St. KABEGA PARK ON SATURDAY 21st SEPTEMBER 1985 STARTING AT 3.30 PM.

Committee

CHAIRMAN:	Brian ZS2AB(303498)	VICE CHAIRMAN:	Dick ZS2RS (322111)
SECRETARY:	Marge ZS2OB(303498)	TREASURER:	Pete ZS2PJ (301493)
AWARDS:	Gordon ZS2GK(306776)		Trevor ZS2AR(321746)
	Q SX-PE: ZS2OB and ZS2AB		

bulletin roster



25th August Gordon ZS2GK
1st September Brian ZS2AB
8th September Dick ZS2RS
15th September Marge ZS2OB

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 Q SX-PE. CONTACT MARGE ZS2OB FOR THESE TAPES. FIRST COME, FIRST SERVED.

THIS and THAT

FROM

THE EDITOR. Listening to various frequencies, one hears the strangest things these days! Someone is complaining with the performance of a repeater; someone else is very disappointed with the coverage of another repeater; someone else says "Why do we need so many repeaters?"; someone else is saying "What use is having an Electronic Mailbox?" Now, the strangest thing of all is that these people complaining do not contribute in any way to the upkeep, either technical or financial of these facilities. But listen - and you will find them using them! Strange world, isn't it? Surely, if there are any complaints, a phone call to the Branch Committee would be preferable.

Just read some of the newsletters of other Branches and take note of their House Rules. Most of them state, inter alia, that there will be no criticism of the League, the Branch or Radio ZS on the air, whatever frequency - the Branch meeting is the place for this, and if there happens to be a serious matter to put right, the Committee meeting is where this should be done. Now, nobody wants what after all is supposed to be a hobby, to become bogged down with too many rules and regulations, BUT please, more especially on HF, would it not be just plain courtesy to keep destructive criticism off the air completely - there is always someone out there listening! If you have anything bad to say and are not prepared to do anything about helping to correct what you see as a fault, then for heavens sake, don't say anything at all. We do, however, welcome all constructive criticism and would love to see EVERYONE at the Branch meetings, just for the sheer pleasure of having YOU and YOU and YOU there.

WELCOME On behalf of the Committee and members, we extend a very warm welcome to Beavan ZS2RL, Barry ZS2DT and Cor ZR2CG as Social members and wish you a long and happy association with the Branch.

WANTED Langley ZS2LW is looking for an HF ssb/cw transceiver at a reasonable price. Please contact him on 041-304423 or Box 10109, Linton Grange 6015.

Paul van Dongen one of our new members is looking for a good, second-hand communications receiver. If anyone can help, please write to him at 2 Van Riebeeck Street, Uniondale, 6460.

Viv ZS2VM is looking for a Yaesu FT7 transceiver or equivalent QRP rig similar to Argonaut. Contact him at 041-304433.

FOR SALE Heathkit Capacitor Checker: with manual. Any reasonable offers considered. Please contact Wolfe at 041-301510.

HOME AGAIN It really was good to hear Woody ZS1WD on bulletin net again after his long stay in hospital. We hear also that Buck ZS2RM is home again after a successful op and we wish you both very good health in the future. Keep smiling.



SATURDAY 24th AUGUST: Settlers Rally Air Navigation Exercise. Please contact Brian ZS2AB to confirm that you are able to provide comms.

SUNDAY 25th AUGUST: S.A.R.L. Fone Contest. The Branch hopes to participate for the Branch Trophy. We need 3 multi-operator stations and up to 4 single operator stations. Please contact Brian if you can take part.

SATURDAY 21st SEPTEMBER: BRANCH A.G.M. SCOUT HALL, KABEGA. The meeting will be followed by a Braai and Social get-together for families also. Full details next month.

SUBSCRIPTIONS. H.Q. have stated that the end of August is the cut-off date for renewal of subs so please let us have Yours, if you have not already paid. If you do not intend to renew, then please drop us a note saying so, in order to be able to correct our mailing list.

SAY YOU SAW IT IN **QSX-PE**

MINUTES OF THE GENERAL MEETING OF THE PORT ELIZABETH BRANCH OF THE SOUTH AFRICAN RADIO LEAGUE HELD AT THE SCOUT HALL, KABEGA PARK, PORT ELIZABETH ON FRIDAY 19TH JULY, 1985.

PRESENT: 28 members (33%) 5 Social members and 2 visitors. (35 total)

APOLOGIES:ZS2WG, ZS2MG, ZS2RM.

The Chairman welcomed all to the meeting especially our visitors Michelle, Andrew ZS2G, our guest speaker Gor ZR2CG, Beaven ZS2RL, Barry ZS2DT, Toff ZR2EY, John ZS2RG, Bill ZS2BY who was celebrating his birthday and brought his niece along, and Mike Robertson who was attending his first meeting in 12 years. How nice to see such a big crowd!

MINUTES: The Minutes of the General meeting held 21st June, 1985, having been published and circulated in QSX-PE were taken as read, proposed by Gordon ZS2GK and seconded by Dick ZS2RS.

ARISING: (1) Brian reported that the Grahamstown Repeater was now in working order after a fairly major overhaul and would be re-installed on Sunday 21st. It was to be hoped that this did not co-incide with electricity maintenance day.
(2) 30 voting slips had been returned in connection with the survey of the proposed installation of the Electronic Mailbox which represented about 28% of the slips sent out. 28 voted in favour and 2 against, the two not being in favour due to the cost of the project. However, these objections now fell away in view of the fact that the Branch had been donated a complete Apple system by Norman ZS2RL. Software had been donated by Chris Els ZS6CCM ex ZS2CJ and work would begin on the interface soon. Thus the R1000 budgeted had been saved and all those who had contributed were sincerely thanked.

CORRES: (1) Letter of thanks from Algoa Flying Club.
(2) Card of thanks from Max Levin ZS2HR.

FINANCE: (1) Gus ZS2MC was appointed as Honorary Auditor for the end of the financial year.
(2) Pete ZS2PJ said that a fair number of subs had been received but apologised for the fact that he had run out of receipts. The outstanding receipts would be posted with the next issue of QSX-PE.
(3) The Chairman reminded members of the cut-off date of the end of August as mentioned by HQ.


GENERAL: (1) There would be a social get-together on Saturday 27th July at the QTH of Colin ZS2AO. Curry and rice, lasagne, salad and dessert would be served and the cost would be R3 per person. Bring your own liquid refreshment. Please let the Secretary know if you will be attending.
(2) Members were reminded of the Callbooks purchased by the Branch and said they could get the information by phoning Brian or Marge 303498.
(3) As mentioned, a few members would take a trip to Grahamstown to re-install the repeater. It was hoped to erect a new mast sometime in the future.
(4) The computer had been returned after a minor repair to the disk drive. Many thanks to Barry ZS2DT who had donated an interface. As the computer caused a fair amount of QRM it was felt necessary to enclose it in a steel box. The Chairman said he had signed a contract on behalf of the Branch regarding the use of the computer and this was read to the meeting. It was hoped to get the Mailbox on the air as soon as possible.
(5) Permission had been received to instal the Town repeater on the new Police building in Mount Road. The repeater would give a greater coverage and would be subject to less interference. However, we would have to wait until all the police equipment was installed.


- (6) A suggestion had been received from the East London Branch that one of their repeaters be linked with the Grahamstown Repeater, in order to link up the east coast. Grahamstown Repeater was extensively used and this might cause inconvenience to all users if they were linked, unless there was some form of tone encoding used. The suggestion of a U.H.F. was discussed as the P.E. Branch still has a u.h.f. transceiver available. It would be necessary to establish whether there was a u.h.f. path between Grahamstown and E.L.
- (7) The Library was on the go, with the sorting of books having been started, but we were still awaiting information as to where the cupboard would be stored. It was hoped to have it ready for the next meeting.
- (8) The Chairman said we had been somewhat presumptuous in announcing that the Branch A.G.M. would be held at the Kabega Scout Hall, but permission had been given and this event would take place on 21st September. The meeting would be kept very short and the time given over to the social get-together to which family were also invited.
- (9) Bill Browne ZS2BY said that he had built up a modem suitable for use with the mailbox and that it set up and worked very well. XR2211s were somewhat difficult to get but as he went up to Randburg once a month, he would be able to buy them for members if required.
- (10) Cliff ZS2AP said that he travels to the Ciskei once a month and asked about getting a reciprocal licence. Lynn ZS2MM said he should contact Garth Laaks for information.
- (11) Thanks were extended to Cliff for his donation of a DX40 together with VFO and transformer. This would be lent to new licencees while they were operating c.w.
- (12) The Chairman said that if anyone had circuits for digital interfaces between modem and computer for the more popular computers, could they please let us have information so they could be published in QSX PE.

There being no further business, the meeting was closed and tea was taken. Thereafter a most interesting and informative talk with slides, video and practical demonstration was given by Cor ZR2CG on Fibre Optic Technology.


sgd:
B.A. Weller ZS2AB
Chairman

sgd:
M.T. Weller ZS2OB
Secretary





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FROM MORSE CODE TO THE DIGITAL DISK.

The first recorded data signal came from the telegraph. Samuel Morse in the US and William Cooke and Charles Wheatstone in Britain, simultaneously developed working telegraph systems in the late 1830s. An operator reading from plain English words keyed a sequence of long and short electrical impulses down a line. At the other end, an operator listened to the incoming pulses and mentally converted them back into words.

The Morse code, still used today, requires up to four pulses per letter so the operator can handle only a few words a minute. It is said that Morse got his idea from a description of an electromagnet. Whatever his inspiration, the first telegraph line in the US was completed in 1842. It ran from Baltimore to Washington. The earliest line appeared in England about the same time and, in 1857, the first of several unsuccessful attempts to lay a cable across the Atlantic was made. A cable was not laid between the US and Britain until 1866; its quality was such that only two words a minute could be transmitted.

By the turn of the century, the speed had risen to 400 words a minute, equivalent to a data-rate of 8000 digital pulses or bits per second. Because no operator can key at this rate, the text has to be prepared in advance "off line" as holes punched in paper tape. The technique is still used today, for telex transmissions. Speed is limited to around 67 words a minute, because the equipment relies on electromechanical relays and inertia puts a limit on their speed of operation.

The future of data storage and transmission relies on all-electronic technology, which owes its existence to Thomas Alva Edison and the phonograph which he invented just over 100 years ago. Edison used telegraph recording technology as a springboard for his phonograph. In 1877 he was building a repeater machine, which would record Morse code pulses arriving from the first leg of a long line and immediately reproduce them again down a further leg. It worked by embossing the characters on paper tape.

Edison found by accident that if he moved the embossed paper rapidly past a stylus, like scraping the teeth of a comb past a finger nail, the sound produced resembled human speech. This gave him the idea of recording sound as vertical indentations in tinfoil on a wax cylinder. Later he captured a bandwidth of 60 Hz to 3kHz, which is equivalent to that of a modern telephone line. Equipment of the time could not, however, reproduce all that was recorded.

In Britain, EMI has sold pop records with a computer program one side of the disc and music on the other. But vinyl pressings are a clumsy medium for data storage. They can be produced only by a factory press; once recorded the data cannot be erased and any wear or damage to the groove causes errors in the data stream. Magnetic, optical and solid-state storage media are far more efficient.

"New Scientist" 11 April 1985,

Thanks to Colin ZS2AC.

ELECTRONIC JARGON MADE EASY

Line driver - road hog.	Four bit latch - cheap lock.
Low pass - indecent proposition.	Hex code - witchcraft standards.
Floppy disk - Tired U.F.O.	CMOS - underwater vegetation.
Megahertz - large car rental firm.	Power connection - friend in high places.
Teuth table - torture rack.	Sync - a place to wash your hands.
Tuner - a salt water fish.	Bass - see tuner.
Banana plug - fruit marketing board advertisement.	

Thanks to Robbie ZS2RB.

RTTY WITH THE ZX81.

With a minimum of additional components and a suitable machine-code program the 16K ZX81, and the ZX Spectrum can be used to receive and transmit RTTY signals. We present here the necessary extracts from an article printed in Practical Wireless in June and July 1983 with thanks to that publication.

To receive and transmit RTTY with a computer, a system such as that shown in Fig 1 is needed. The receiver audio output in the form of RTTY five-element two-tone coded signals, is fed into a unit which converts the tones into TTL logic levels. This string of logic levels is then converted by the interface into a form which the ZX81 can understand and process. If a valid character is detected, it is printed on the screen.

In transmit mode the ZX81 generates the five-element code corresponding to the character to be sent and the interface converts these into serial form for feeding into the audio-frequency-shift keying generator. This circuit produces the two audio tones corresponding to mark and space depending on whether the interface output is a logic 1 or logic 0.

The tones are fed into the microphone socket of the transmitter. The circuit of the terminal unit is shown in figure 2 and can be broken down into three areas. The receive chain consists of IC1,2,3 & 4. The input-in the form of mark and space tones of 1445 Hz and 1275 Hz respectively is processed by a 741 op. amp. (IC1) to provide a high-level drive for the two phase-locked loop IC's. Diodes D1,2,3,4 provide input protection for the IC's. IC3 has its bandwidth set by C11 and its centre frequency set by R14 to 1445 Hz. IC2 has its centre frequency set by R8 to 1275 Hz. The output level of the 567's changes from a logic 1 (5v) with no signal input to logic 0 (0v) when an input within its bandwidth is present. As only a mark or space frequency (but not both) should be present at the PLL inputs, one output has to be inverted before being combined by a NAND gate (IC4d). TR2 performs this inversion. By using two NAND gates, a NORMAL or REVERSE sense TTL output is obtained which is fed into the interface board. Switch S2 provides this facility by selecting either the output from the first NAND gate or the output from the second NAND gate (IC4c) which is wired as an inverter.

With the two PLL chips tuned for 1445 and 1275 Hz, only signals with a shift of 170 Hz can be processed. Other shifts can be catered for by switching one PLL out of circuit and S1 does this while connecting the first NAND gate (IC4d) as an inverter. Now only the mark signal is used and the receiver must be offset to tune the mark frequency to 1445 Hz.

The AFSK generator is another PLL chip, the 566 used to generate a stable audio tone. Two tones are required, and TR1 shorts out R19 - one of the preset controls used to set the output frequency of the PLL to produce a second tone frequency when required. The gate of TR1 is either at logic 1 or 0 depending on the output state of the NAND gate IC4b. By taking the gate to the output of IC4a instead, the afsk output sense can be reversed and this is done by changing over the link on the PC board since this is not normally changed once the unit is set up.

The 566 has two outputs, a square-wave and a triangular wave, and the latter is used here to feed a 741 active filter (IC6). Preset control R24 is used to set the filter bandwidth to give equal output levels for both the mark and space tones at the wiper of R28.

During receive S3a switches IC5 off to prevent any possibility of stray pick-up affecting the receive side of the unit. D9 indicates that S3 is switched to TRANSMIT, and S3b operates the PTT of the transmitter. Power supply requirements are plus and minus 5 volts, and the supply with IC7 and 8 as stabilisers supply up to 120 mA if needed.

All components with the exception of the leds, switches and afsk control are mounted on the PC board. It should be noted that R19 and R20 must be multiturn preset potentiometers otherwise it will be extremely difficult to set the tone frequencies accurately. R8 and R14 must also be good

quality cermet types and preferably multiturn as well, although this is not as critical as with the afsk generator pots. Internal wiring between the PC board and the various switches and sockets should be lightweight screened cable and the unit should be housed in a metal cabinet to reduce RF pickup.

Setting up the unit requires a multimeter and a frequency counter capable of operating at 2 KHz. The afsk generator should be set up first as this can be used to set up the receive side.

Short the input to IC4a(SK2) to 0v and adjust R20 to give 1445Hz at the wiper of R28. Remove the short and set the output to 1275 Hz using R19. Repeat the process until you achieve the two tones, accurately set, at the output. If you have a 'scope then the levels of the two tones can be accurately balanced using R24. Note that R25 may need to be adjusted to achieve balance. If no scope is available then the output can be adjusted (balanced) by feeding the transmitter into a dummy load and adjusting R24 for equal power output with each tone.

Before setting up the PLLs, IC1 should be nulled. Short SK1 and adjust R5 so that the voltage at TPA is as near 0v as possible. A multimeter is satisfactory for this. The two tones can be used to set up the receiver PLLs by connecting the afsk output to the audio input (SK1) and adjusting R14 so that the red led D7 comes on for 1445 Hz. Repeat the process with the afsk generator set for 1275 Hz adjusting R8 until led D6 comes on. Check that when D6 is on, D7 is off and vice versa. This terminal unit can be used with any interface and computer requiring a 5 volt TTL compatible drive.

Part 2 of this article will be published in next months QSX and covers a suitable interface unit for the ZX81.

Negatives have been produced for the PC boards for this project and Clive Fife ZS2RT has a copy of the necessary software. I am sure that he will be willing to supply this to anyone interested in building up the system, possibly with a small donation to cover his costs.

As the components used in this section of the system are all fairly common, no difficulty should be experienced in obtaining them locally.

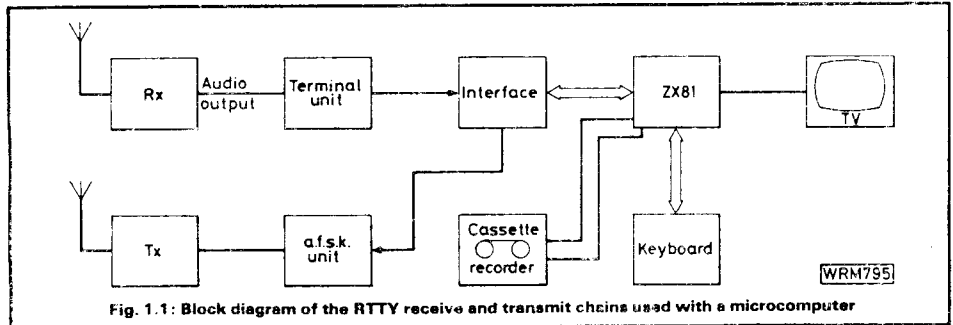


Fig. 1.1: Block diagram of the RTTY receive and transmit chains used with a microcomputer

Resistors

Carbon Film 1/4W 5%

270Ω	2	R9, 15
470Ω	1	R25
560Ω	1	R1
1kΩ	6	R2, 3, 6, 12, 17, 22
2.7kΩ	1	R27
4.7kΩ	2	R7, 13
8.2kΩ	1	R21
10kΩ	1	R18
22kΩ	2	R10, 16
100kΩ	1	R11
180kΩ	1	R23
390kΩ	1	R26
1MΩ	1	R4

Capacitors

Disc Ceramic

1nF	1	C14
10nF	8	C2, 3, 5, 9, 13, 19, 20

Polystyrene 160V 2%

4.7nF	2	C17, 18
10nF	1	C15

Polyester Min. Dipped 250V

47nF	3	C1, 4, 16
0.1μF	6	C6, 10, 23, 24, 25, 26

Tantalum Bead

1μF 35V	2	C7, 11
2.2μF 35V	2	C8, 12

Electrolytic p.c.b. Type

1000μF 16V	2	C21, 22
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Switches

Min. Toggle

s.p.d.t.	2	S1, 2
d.p.d.t.	2	S3, 4

Semiconductors

Diodes

1N914	5	D1, 2, 3, 4, 8
1N4001	4	D10, 11, 12, 13
Red l.e.d.	4	D5, 6, 7, 9

Transistors

BC108	1	Tr2
2N3819	1	Tr1

Integrated Circuits

NE566	1	IC5
NE567	2	IC2, 3
741	2	IC1, 6
74LS00	1	IC4
7805	1	IC7
7905	1	IC8

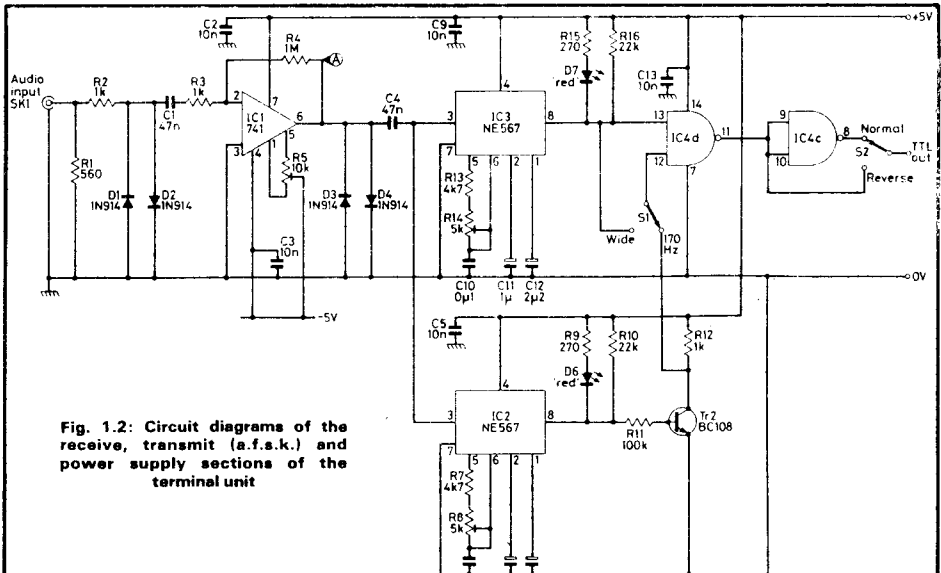
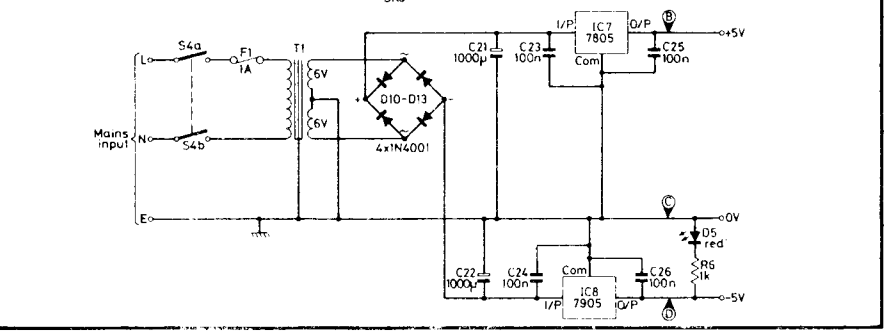
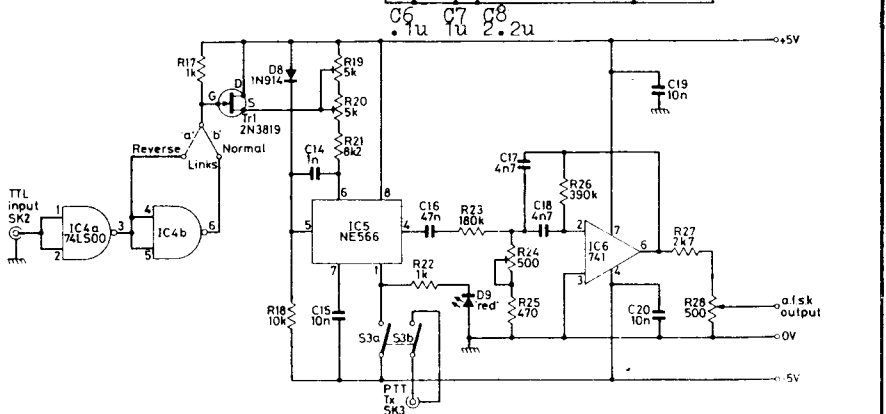


Fig. 1.2: Circuit diagrams of the receive, transmit (a.f.s.k.) and power supply sections of the terminal unit



- | | | |
|---|---------------------------------|--|
| Potentiometers | Cermet Top-adjust Preset | Miscellaneous |
| Min. Horiz. Preset | 5kΩ 2 R8, 14 | Mains transformer 6 + 6V 3VA p.c.b. mounting (RS207-829): 1A fuse and holder; Sockets (see text) (5); Metal case 200 x 125 x 75mm; Printed circuit board: Knob; integrated circuit d.i.l. sockets 8pin (5), 14pin (1). |
| 500Ω 1 R24 | | |
| 10kΩ 1 R5 | | |
| Cermet Multiturn Top-adjust Preset | 1/8 inch Spindle | |
| 5kΩ 2 R19, 20 | 500Ω 1 R28 | |



Mr M. C. Bosch ZS2FM
P.O. box 1614
Port Elizabeth 600
R. S. A.

our ref. 2841/IARU/SEPC

Perros-Guirec, June 3d, 1985

ZS2FM de F8SH

Dear OM,

I have received, some time ago through the ESGB Propagation Studies Committee of which I am a corresponding member a copy of both letter and report on propagation studies in your area sent to Ray Cracknell G2AHU Ex-Z22JV.


Acting as VHF sporadic-E coordinator for IARU Region 1 Division and being a member of CCIR Interim Working Party 6/8 whose main working program deals with VHF sporadic-E, I have been particularly interested by your report on Es propagation.

I don't know if systematic VHF sporadic-E observations are made in your area, but I think it would be quite interesting to have them. Ionospheric vertical soundings made in your part of Africa have until now indicated that the percentage of appearance of Es critical frequency higher than 7 MHz (this frequency being the lowest giving rise to VHF openings) is very low in comparison to that obtained in the same latitude range in the Northern Hemisphere, a thing nobody has been, until now, able to explain.

Reports of VHF sporadic-E openings in your area in the 30 to 150 MHz band would certainly be welcome and would constitute an important contribution of the Amateur Service to the work of CCIR IWP 6/8 if they could be regularly made during the season of maximum sporadic-E appearance (presumably during the period November to February in your area).

A few IARU Technical Propagation Reports have been written on 144-MHz sporadic-E events in the European area. If you happen to be interested in receiving them, please tell me. It will be my pleasure to send copies of these reports.

73


S. CANIVENC F8SH
VHF Sporadic-E Propagation Coordinator
I. A. R. U. Region 1 Division
Member I. W. P. 6/8 CCIR

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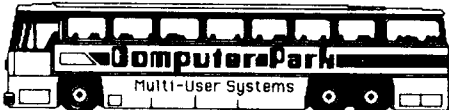
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