

CHRISTMAS
GREETINGS

DECEMBER 1987



Q S X

P R E



PORT ELIZABETH
BRANCH S.A.R.L.
P.O. BOX 10402
LINTON GRANGE

Port Elizabeth Branch

NOTICE OF MONTHLY MEETING

MEMBERS ARE REMINDED THAT THERE WILL BE NO MEETING DURING DECEMBER.
 THE FIRST MEETING OF 1988 WILL BE HELD ON 15TH JANUARY.
 THE MINUTES OF THE LAST MEETING HELD IN 1987 WILL BE HELD OVER FOR THE
 JANUARY ISSUE OF QSX-PE.

COMMITTEE

CHAIRMAN:	BRIAN WELLER ZS2AB	30-3498
VICE CHAIRMAN:	LIONEL COOMBE-DAVIS ZS2DD	32-1770
SECRETARY:	MARGE WELLER ZS2OB	30-3498
TREASURER:	LYNNE CROTHALL ZS2MM	35-4671
SPECIAL/SOCIAL EVENTS:	BEAVAN GWILT ZS2RL	30-6968
AWARDS:	BILL HODGES ZR2AA	51-2580
EDITOR QSX-PE:	MARGE WELLER ZS2OB	30-3498
MEMBERS:	DICK SCHONBORN ZS2RS	32-2111
LIBRARIAN:	COLIN ASHWELL ZS2AO	31-2471
(NON-COMMITTEE POST)		

BULLETIN ROSTER

DATE	COMPILER	40M NET	2M NET
20 DEC.	DICK ZS2RS	ZS2RS	ZS2AB
27 DEC.	BRIAN ZS2AB	ZS2AB	ZS2DD
3 JAN	LIONEL ZS2DD	ZS2DD	ZS2MM
10 JAN	MARGE ZS2OB	ZS2AB	ZS2RL
17 JAN	LYNNE ZS2MM	ZS2MM	ZS2AB

Sunday Bulletin Information

PRIMARY FREQUENCIES FOR BULLETINS AT APPROXIMATELY 08:40
 H.F. 7098 KHZ IN 40 METRE BAND
 V.H.F. 145,650 MHZ VIA TOWN REPEATER

BRANCH V.H.F. SERVICES PROVIDED

TOWN REPEATER (P.E. CENTRAL)	145,050 / 145,650 MHz
GRAHAMSTOWN REPEATER	145,150 / 145,750 MHz
LADY'S SLIPPER REPEATER	145,100 / 145,700 MHz
COCKSCOMB REPEATER	145,000 / 145,600 MHz
R.T.T.Y. BULLETIN BOARD	145,150 / 145,750 MHz
BEACON (C.W. ID ZS2PE)	144,910 MHz

****WE LIKE BEING YOUR BRANCH****

CHAIRMAN'S XMAS MESSAGE

CHRISTMAS TIME AGAIN! HOLIDAY TIME FOR MOST FOLKS. A TIME TO RELAX AND ENJOY BEING WITH FAMILY AND FRIENDS. BAND CONDITIONS ARE BETTER THAN THEY HAVE BEEN FOR SOME YEARS, SO WE WHO ENJOY THE UNIQUE HOBBY OF AMATEUR RADIO ARE ABLE TO "BE WITH" MORE FRIENDS THAN MOST OTHER PEOPLE.

A TIME, ALSO, WHEN MANY PEOPLE WANT TO "BE WHERE THEY ARE NOT", EITHER TO VISIT FAMILY, OR TO GET TO THE SEASIDE, OR IF THEY LIVE AT THE SEASIDE, TO GET AWAY FROM THE SEASIDE, AND TRAFFIC DENSITIES RISE DRAMATICALLY. IF YOU ARE GOING AWAY OVER THIS PERIOD, DO DRIVE CAREFULLY AND KEEP A WARY EYE OPEN FOR THOSE WHOSE LEVEL OF RESPONSIBILITY DROPS TO ZERO WHEN THEY GET INTO A CAR!

SPARE A THOUGHT FOR THOSE WHO WILL BE ALONE AT CHRISTMAS AND THOSE WHO WILL BE WORKING TO KEEP THE WORLD RUNNING.

MARGE AND I WISH YOU ALL A BLESSED CHRISTMAS AND A HAPPY AND PROPEROUS 1988.

BEST WISHES,
BRIAN WELLER, ZS2AB. CHAIRMAN.



THIS AND THAT

PERMANENT LOAFERS CLUB!

TWO OF OUR MEMBERS RECENTLY BECAME MEMBERS OF THIS CLUB - CLIFF ZS2AP AND JULIAN SB3M AND WE HOPE THEY ENJOY THEIR RETIREMENT AND HAVE LOTS OF TIME FOR AMATEUR RADIO AND THEIR OTHER INTERESTS. ENJOY!

FREE ADVERTISING - 'S.A. ELEKTRONIKA'

THE EDITOR OF "S.A. ELEKTRONIKA" HAS KINDLY OFFERED THE BRANCH SIX MONTHS FREE ADVERTISING OF THE COMPONENTS FOR SALE FOR BRANCH FUNDS. THIS WILL TAKE A FULL PAGE IN THE MAGAZINE AND WILL REACH READERS COUNTRYWIDE. THIS IS ONE OF THE BETTER MAGAZINES AVAILABLE IN THE COUNTRY AND CATERERS FOR THE BEGINNER TO THE ADVANCED AMATEUR AND IS AVAILABLE FROM MOST ELECTRONIC COMPONENT SHOPS OR DIRECT FROM S.A. ELEKTRONIKA, BOX 376 PORT ALFRED 6170. THE BRANCH WILL BE TAKING OUT A YEAR'S SUBSCRIPTION FOR THE BRANCH LIBRARY. SEE ADVERT ON BACK COVER FOR MORE DETAILS.

VOLUNTEER FOR LIBRARY - PLEASE!

AND TALKING ABOUT THE LIBRARY - WE ARE LOOKING FOR A VOLUNTEER TO HOUSE THE LIBRARY AT THEIR HOME IN P.E. THE BOOKS ARE STORED IN A SMALL TWO-DOOR WARDROBE SO SPACE IS NOT TOO MUCH OF A PROBLEM, BUT THE PERSON SHOULD BE PREPARED TO ALLOW MEMBERS ACCESS TO A BOOKS AT TIMES OTHER THAN THE MONTHLY MEETING. THIS WOULD BE DONE AT SPECIFIED TIMES ON SPECIFIED DAYS WHICH ARE THE MOST CONVENIENT TO THE VOLUNTEER. THIS HAS ARISEN DUE TO THE FACT THAT THE LIBRARY CUPBOARD HAS TO BE STORED AWAY FROM THE MEETING AREA AND MEMBERS FEEL THAT THERE IS NOT ENOUGH TIME TO MAKE USE OF THE FACILITY ON THE EVENING OF THE MEETING. PLEASE LET BRIAN KNOW IF YOU ARE WILLING - AND YOU WILL HAVE THE ETERNAL THANKS OF THE BRANCH MEMBERS - PHONE 303498.

HOW THE RED CROSS SPEAKS TO THE WORLD

THE INTERNATIONAL COMMITTEE OF THE RED CROSS BEGAN BROADCASTING IN MAY 1945. IN EUROPE, MANY EX-PRISONERS OF WAR WERE WAITING TO BE TAKEN BACK TO THEIR HOMES AND THEY WANTED THEIR FAMILIES TO KNOW THEY WERE ALIVE. HOWEVER, NORMAL COMMUNICATIONS HAD BROKEN DOWN. UNTIL THE END OF THE 1940s, LISTS OF PRISONERS OF WAR AND OF DISPLACED CIVILIANS WERE BROADCAST BY THE INTERNATIONAL COMMITTEE OF THE RED CROSS FROM THE STUDIOS OF RADIO-GENEVE, AND WERE HEARD BY LISTENERS IN VARIOUS PARTS OF EUROPE. (IN THE FIRST THREE AND A HALF YEARS OF OPERATION, MORE THAN 600 000 NAMES WERE BROADCAST.)

THE I.C.R.C. REALISED THE USEFULNESS OF RADIO FOR RAPID COMMUNICATION IN TIMES OF CRISIS. THE 1948 INTERNATIONAL BROADCASTING CONFERENCE IN MEXICO CITY GRANTED THE I.C.R.C. ITS OWN FREQUENCY - A UNIQUE ASSET AMONG INTERNATIONAL HUMANITARIAN ORGANISATIONS.

TEST TRANSMISSIONS BEGAN IN 1951, WITH THE OBJECT OF FINDING OUT WHETHER LISTENERS IN DIFFERENT PARTS OF THE WORLD COULD HEAR THE BROADCAST. THESE CONTINUED SPORADICALLY UNTIL 1965, WHEN THE I.C.R.C. INSTALLED ITS OWN STUDIO AT ITS GENEVA HEADQUARTERS AND FORMED THE RED CROSS BROADCASTING SERVICE. BROADCASTS BECAME MORE REGULAR AND IN 1978 THE SWISS P.T.T. GAVE PERMISSION FOR THE I.C.R.C. TO BROADCAST ONCE A MONTH OMNIDIRECTIONALLY IN ENGLISH, FRENCH, GERMAN, SPANISH AND ARABIC. BEAMED TRANSMISSIONS WERE ALSO MADE TO AFRICA, ASIA AND THE MIDDLE EAST.

TODAY, R.C.B.S. BROADCASTS OMNI-DIRECTIONALLY TWICE A MONTH ON 7,210KHZ IN ENGLISH, FRENCH, GERMAN AND SPANISH. FURTHER BROADCASTS IN ENGLISH, FRENCH, SPANISH, PORTUGUESE AND ARABIC ARE BEAMED TO AFRICA, ASIA, LATIN AMERICA AND THE MIDDLE EAST. THE PROGRAMMES ARE BROADCAST FROM THE SWISS PTT'S TRANSMITTERS ARE SCHWARZENBURG (DIRECTIONAL) AND BEROMUNSTER (OMNIDIRECTIONAL): FACILITIES ARE PLACED AT THE I.C.R.C.'S DISPOSAL FREE OF CHARGE BY THE P.T.T. AND SWISS RADIO INTERNATIONAL. LISTENERS REPORTS ARE RECEIVED FROM EVERY CONTINENT AND ARE REGULARLY ANSWERED BY QSL CARD.

SHIPS RADIO OPERATORS.

IT SEEMS AS IF THE DAYS OF THE SPECIALIST SHIPS RADIO OPERATORS ARE NUMBERED. PRESENTLY IT IS A REQUIREMENT THAT MOST OF THE BIG SHIPS MUST HAVE A RADIO OPERATOR WHO IS PROFICIENT IN MORSE CODE. ACCORDING TO LLOYDS OF LONDON, FROM 1991 IT WILL NO LONGER BE NECESSARY FOR SUCH AN OPERATOR TO BE EMPLOYED. ALL COMMUNICATIONS WILL BE CARRIED OUT BY THE OFFICER ON THE BRIDGE. ALSO THE HF FREQUENCIES WILL ONLY BE USED INFREQUENTLY. IN THE FUTURE THE EMPHASIS WILL BE ON VHF AND HIGHER, DIRECTLY OR VIA SATELLITE. IT LOOKS AS IF IT IS THE END OF AN ERA WITH A LONG AND GLORIOUS HISTORY.

SAMUEL 'MICHAELANGELO' MORSE?

DID YOU KNOW THAT SAMUEL MORSE, ONE OF THE ORIGINATORS OF THE TELEGRAPH AND FATHER OF THE MORSE CODE WAS ALSO A WELL-KNOWN PAINTER? ESPECIALLY IN THE LAST FEW YEARS HIS PAINTINGS HAVE REALISED HIGH PRICES. INCIDENTALLY, IN THE CODE FIRST USED BY MORSE, THE LONG SOUNDS HAD THREE DIFFERENT LENGTHS. THIS SOMETIMES LED TO GREAT CONFUSION AND IN 1851 THE CODE WHICH IS STILL USED TODAY WAS FINALISED.

LONG-DISTANCE CALLS?

RADIOTELEPHONES IN MOTORCARS ARE NO LONGER SOMETHING NEW, BUT THE BRITISH TELECOMMUNICATION SERVICE HAS COMPLETED THE FIRST TESTS TO USE RADIO-TELEPHONES IN ORDINARY PASSENGER AIRPLANES. THE IDEA IS TO BE ABLE TO MAKE TELEPHONE CALLS TO ANY PLACE IN THE WORLD. THE FIRST ATTEMPTS WILL BE MADE VIA THE INMARSAT SATELLITE WHICH WILL RETURN THE SIGNALS TO EARTH STATIONS WHICH WILL BE CONNECTED TO THE PUBLIC TELEPHONE SYSTEM.

THE SUNS INFLUENCE

ALTHOUGH OUR SUN HAS LITTLE IMPORTANCE AMONG THE MILLIONS OF STARS IN THE MILKY WAY GALAXY, IT IS VERY IMPORTANT TO US HERE ON EARTH, BECAUSE IT PROVIDES OUR LIGHT, HEAT AND NATURAL ENERGY. THE MAJORITY OF STARS, AND OUR SUN IS NO EXCEPTION, ARE NUCLEAR FURNACES RADIATING WAVES, IN VARYING DEGREES, ACROSS THE ELECTROMAGNETIC SPECTRUM. WITH THE ADVENT OF THE OPTICAL TELESCOPE IN THE 15TH CENTURY, ASTRONOMERS LEARNT MUCH MORE ABOUT THE STARS, OUR SUN AND THE PLANETS WHICH MAKE UP OUR OWN SOLAR SYSTEM.

RADIO ASTRONOMY.

DURING 1931, AMERICAN RADIO ENGINEER KARL JANSKY, USING SPECIALISED APPARATUS, DETECTED RADIO NOISE AROUND 21MHZ, COMING FROM THE SAGITTARIUS ARM OF THE MILKY WAY. AT FIRST, FEW PEOPLE REALISED THE IMPORTANCE OF JANSKY'S DISCOVERY. AFTER ALL, ASTRONOMICAL OBSERVATIONS FOR AT LEAST THE PREVIOUS 300 YEARS HAD BEEN MADE WITH AN OPTICAL TELESCOPE. TO SUGGEST THAT INVISIBLE WAVES COMING FROM THE STARS COULD BE RECORDED ON A PAPER CHART TOOK A FAIR BIT OF UNDERSTANDING.

THE FACT THAT STARS HAD BEEN EMITTING RADIO WAVES FOR UNTOLD MILLIONS OF YEARS REMAINED UNKNOWN UNTIL THE ART OF MAKING RADIO RECEIVERS WAS ABOUT 35 YEARS OLD. IT IS GENERALLY ACCEPTED THAT RADIO WAVES TRAVEL AT THE SPEED OF LIGHT, 300 000 000 METRES PER SECOND, IN OTHER WORDS ALMOST 6 MILLION MILLION MILES IN ONE YEAR, OR IN ASTRONOMICAL TERMS, A LIGHT YEAR. FOR EXAMPLE, RADIO WAVES FROM THE CRAB NEBULA, IN THE CONSTELLATION OF TAURUS, TAKE SOME 3300 YEARS TO REACH US, WHEREAS RADIO WAVES FROM OUR SUN, A MERE 93 MILLIONS MILES AWAY, ARE RECEIVED ON EARTH JUST 8,3 MINUTES AFTER THEY ARE GENERATED.

RADIO TELESCOPE.

THE WORK OF A VISUAL ASTRONOMER IS LIMITED TO THE HOURS OF DARKNESS AND THEN THE SKIES MUST BE CLEAR AND, UNLESS HE IS STUDYING THE MOON, FREE OF MOONLIGHT. A RADIO TELESCOPE, HOWEVER, CAN RECORD CELESTIAL RADIO WAVES AT ANY TIME, UNAFFECTED BY OVERCAST SKIES, BUT ITS RESULTS ARE SOMETIMES TROUBLED WITH STATIC FROM ELECTRICAL STORMS AND A VARIETY OF MAN-MADE INTERFERENCES. BRIEFLY, A SIMPLE RADIO-TELESCOPE COMPRISES A HIGH-GAIN DIRECTIONAL AERIAL, SECURELY MOUNTED AND POINTED TOWARD THE SOURCE BEING OBSERVED. IN SOME CASES AN AERIAL HEAD AMPLIFIER IS USED BEFORE THE INCOMING SIGNAL IS FED TO THE MAIN RECEIVER, USUALLY A PURPOSE-BUILT SUPER-HETRODYNE, WITH A D.C. AMPLIFIER CONNECTED TO ITS DETECTOR CIRCUIT TO DRIVE A PEN RECORDER.

ALTHOUGH CERTAIN FREQUENCIES ARE SET ASIDE INTERNATIONALLY FOR ASTRONOMICAL OBSERVATIONS, A RADIO ASTRONOMER CAN USE ANY PART OF THE RADIO FREQUENCY SPECTRUM PROVIDING THAT IT SUITS HIS OBSERVATIONAL REQUIREMENTS AND IS FREE OF TERRESTRIAL TRANSMISSIONS. FOR AN AMATEUR TO MAKE A USEFUL CONTRIBUTION IN THE FIELD OF RADIO ASTRONOMY, HE WOULD NEED A VERY LARGE AERIAL SYSTEM WITH PRECISE SETTINGS BOTH IN ALTITUDE AND AZIMUTH, A LOW-NOISE, HIGH-GAIN RECEIVER AND ACCESS TO A COMPUTER, TO EXTRACT ANY MEANINGFUL INFORMATION FROM THE DATA GATHERED DURING HIS OBSERVATIONS. THE HIGH INSTALLATION AND RUNNING COSTS OF A RADIO OBSERVATORY PREVENT THE MAJORITY OF AMATEURS SETTING UP SUCH A PROJECT.

RADIO NOISE.

THE NOISE COLLECTED BY A RADIO TELESCOPE IS VERY SIMILAR TO THAT WHICH IS GENERATED WITHIN THE WIRING AND COMPONENTS WHICH MAKE UP THE TELESCOPE'S RECEIVER. THEREFORE, IT IS IMPORTANT THAT THIS INTERNAL NOISE LEVEL IS MEASURED BEFORE THE AERIAL IS CONNECTED, SO THAT THE INCOMING WAVES ARE POSITIVELY IDENTIFIED. WHEN THERMIONIC VALVES WERE USED, A GREAT DEAL OF NOISE CAME FROM THE VALVE ITSELF AND THE HIGH ELECTRICAL CURRENTS FLOWING THROUGH ITS ASSOCIATED COMPONENTS. MUCH OF THIS PROBLEM WAS OVERCOME WHEN TRANSISTORS REPLACED VALVES, BECAUSE THEY ARE FAR LESS NOISY AND REQUIRE ONLY A FRACTION OF THE CURRENT TO DRIVE THEM.

SHORTWAVE COMMUNICATIONS.

FROM ITS BIRTH TOWARD THE END OF THE 19TH CENTURY, THE STORY OF RADIO HAS BEEN A FASCINATING ONE. VERY SOON ENTHUSIASTS WERE BUILDING RECEIVERS AND TRANSMITTERS WHICH ALLOWED THEM TO LISTEN TO SIGNALS TRAVELLING AROUND THE WORLD AND ENABLED PEOPLE FROM THE ENDS OF THE EARTH TO CONVERSE WITH EACH OTHER. WE OWE A GREAT DEAL TODAY TO THOSE EARLY RADIO AMATEURS WHO PIONEERED THE SIGNAL PATHS AROUND THE EARTH, OFTEN WHEN CONTEMPORARY THINKING SAID IT WAS IMPOSSIBLE.

BETWEEN THE TWO WORLD WARS GREAT STRIDES WERE MADE IN OPENING UP THE SHORT-WAVE BANDS FOR BOTH COMMUNICATIONS AND BROADCASTING. THIS WAS EXCITING BECAUSE THERE WAS MUCH TO LEARN ABOUT ECHOING AND ROUGH SIGNALS, FADING, SUDDEN IONOSPHERIC DISTURBANCES AND SOMETIMES COMPLETE AND EXTENSIVE RADIO BLACKOUTS. SCIENTISTS WERE AWARE THEN THAT THE COMPLEX RAYS FROM THE SUN CAUSED CHANGES IN THE IONOSPHERE WHICH, OF COURSE, EXPLAINED WHY SHORTWAVE SIGNAL PATHS VIA THE IONOSPHERE VARIED BETWEEN DAY AND NIGHT.

THE RESEARCH AND EXPERIMENTAL SECTION.

THE RADIO SOCIETY OF GREAT BRITAIN, FOUNDED IN 1913, HAS ALWAYS ENCOURAGED ITS MEMBERS TO SEND REPORTS OF THEIR FINDINGS TO THE SOCIETY FOR PUBLICATION, AND IN THE 1930S THEY SET UP A RESEARCH AND EXPERIMENTAL SECTION WHICH HAD SEPARATE GROUPS AND ITS OWN COLUMNS IN THE RSGB'S MONTHLY JOURNAL, "THE T AND R BULLETIN".

IN JANUARY 1936, MISS NELL CORRY G2YL BECAME AUTHOR OF THE "28 MC/S GROUP" REPORT WHICH SHE COMPILED EACH MONTH FROM HER OWN 10M WORK AND FROM INFORMATION SHE RECEIVED FROM AMATEURS AND SHORTWAVE LISTENERS AROUND THE WORLD. FORTUNATELY FOR POSTERITY, NELL WAS A VERY METHODOICAL INDIVIDUAL AND KEPT DAILY RECORDS OF THE 28MHZ INFORMATION SHE RECEIVED UNTIL EARLY 1940, IN A SET OF FOUR DIARIES WHICH HAVE SURVIVED THE PASSAGE OF TIME AND ARE NOW IN THE AUTHORS COLLECTION. ANALYSIS OF THESE DIARIES REVEALED THAT OVER THE 4-YEAR PERIOD 1936-1939, AURORA WAS REPORTED ON 53 DAYS, ECHOING ON SIGNALS ON 26 DAYS, FADEOUTS ON 140 DAYS AND A "HISSING" NOISE ON 107 DAYS.

SOLAR RADIO NOISE.

IT WAS THIS HISSING NOISE THAT WAS THE IMPORTANT REVELATION AND FURTHER INVESTIGATION BY THE AUTHOR SHOWED THAT DURING 1935, DENIS HEIGHTMAN G6DH, A MEMBER OF THE RESEARCH AND EXPERIMENTAL SECTION, HEARD THIS STRANGE "HISSING" SOUND ABOVE THE BACKGROUND NOISE OF HIS 10M RECEIVER. DENIS, AN EXPERIENCED WIRELESS OPERATOR, CONSISTENTLY NOTED THAT THE "HISSING" OCCURRED ONLY DURING DAYLIGHT HOURS AND USUALLY PRECEDED A RADIO DISTURBANCE. VERY SOON HE RIGHTLY CONCLUDED THAT THE "HISSING" NOISE WAS COMING FROM THE SUN AND IN 1936 HE REPORTED HIS FINDINGS TO THE EDITOR OF WIRELESS WORLD AND PROFESSOR (LATER SIR) EDWARD APPLETON. LATER, HE OUTLINED HIS OBSERVATIONS IN A COMPREHENSIVE ARTICLE PUBLISHED IN THE RSGB'S T & R BULLETIN.

FROM NELL CORRY'S DIARIES AND HER JOURNAL REPORTS, THE AUTHOR FOUND THAT SOME 24 OTHER RADIO AMATEURS AND SHORTWAVE LISTENERS HAD HEARD THE "HISSING" NOISE AND FURTHERMORE IT WAS NOT LIMITED TO 28MHZ BECAUSE AT MIDDAY ON 31 JULY 1938, MISS BARBARA DUNN G6YL HEARD THE HISSING NOISE IN THE 5M BAND CONFIRMED BY 2BIL AND DENIS HEIGHTMAN HEARD IT AGAIN AT 56MHZ ON 25 JUNE 1939.

ALTHOUGH AMATEUR RADIO ACTIVITY WAS SUSPENDED AT THE OUTBREAK OF WAR ON 3 SEPTEMBER 1939 A FEW CARRIED ON LISTENING AND THE HISSING WAS HEARD AGAIN DURING FEBRUARY, MARCH AND NOVEMBER 1940 AND MARCH, JUNE AND JULY 1941. THE NEXT KNOWN REPORT ABOUT SOLAR NOISE CAME IN FEBRUARY 1942 WHEN BRITISH RADAR RECEIVERS WORKING BETWEEN 60 AND 80 MHZ SUFFERED SEVERE INTERFERENCE WHICH CONTEMPORARY SCIENTISTS ATTRIBUTED TO A LARGE GROUP OF SUNSPOTS. ALSO IN 1942 AMERICAN SCIENTISTS DISCOVERED RADIO NOISE IN THE MICROWAVE PART OF THE SPECTRUM COMING FROM WHAT IS CALLED THE "QUIET" SUN.

SINCE THE WAR, MANY RADIO OBSERVATORIES HAVE STUDIED THE SUN AT A VARIETY OF RADIO FREQUENCIES AND IT IS NOW KNOWN THAT WHEN SUNSPOTS ARE PRESENT THE SUN IS SAID TO THE "ACTIVE". THEN, DEPENDING ON THE TYPE OF ACTIVITY, SOLAR RADIO NOISE WILL BE HEARD, AT VARYING DEGREES BETWEEN 30 AND 300MHZ WITH A PEAK IN THE 130-170MHZ RANGE.

PRACTICAL OBSERVATION.

DURING THE MID-1930S, SEVERAL ASTRONOMERS GAVE THE 28MHZ PROPAGATION GROUP INFORMATION ABOUT THE SUN, DERIVED FROM THEIR VISUAL OBSERVATIONS. WITH THE DISCOVERY OF THE "HISSING" NOISE IN 1935, GROUP MEMBERS SHOWED THAT THEY COULD OBSERVE THE SUN BY RADIO WHICH WAS UNAFFECTED BY OVERCAST SKIES. THE PRE-WAR JOURNALS DESCRIBED HEIGHTMAN'S DISCOVERY AS "THE HISSING PHENOMENON" WHICH WE OFTEN HEAR TODAY IN THE 2M BAND WHEN THE SUN IS "ACTIVE". THROUGH YEARS OF CONCENTRATED EFFORT BY BOTH OPTICAL AND RADIO ASTRONOMERS, WE NOW KNOW THAT WHEN GREAT ERUPTIONS OCCUR ON THE SUN, VAST AMOUNTS OF NUCLEAR WASTE ARE EJECTED, ALONG WITH STREAMS OF PARTICLES. THESE MAY STRIKE THE EARTH'S ATMOSPHERE SOME 20-40 HOURS LATER, DISTURBING THE IONOSPHERE AND H.F. COMMUNICATIONS, OR CAUSING AN AURORA TO MANIFEST, WITH CONSEQUENT RISK OF DISRUPTION TO OUR V.H.F. SIGNALS. RADIO PROVIDES AN EARLY WARNING OF THESE EVENTS, BECAUSE, WHEN A SOLAR ERUPTION TAKES PLACE, IT EMITS RADIO WAVES WHICH ARRIVE HERE IN 8,3 MINUTES, SOUNDING LIKE A "WHOOOOOOOSH", OR HISSING, ABOVE THE RECEIVER BACKGROUND NOISE.

THE SPECTROHELIOSCOPE.

SOME YEARS AGO, CMDR HENRY HATFIELD, SEVENDAKS, BUILT A COMPLEX OPTICAL INSTRUMENT CALLED A SPECTROHELIOSCOPE TO STUDY THE SUN'S SURFACE. HENRY USES THIS INSTRUMENT WHEN THE SKIES ARE CLEAR IN CONJUNCTION WITH HIS 136 AND 1296MHZ RADIO TELESCOPES AND CAN OFTEN SEE THE ACTIVE AREA, SUCH AS A FLARE OR FILAMENT WITHIN A SUNSPOT GROUP WHICH IS CAUSING THE PREVAILING RADIO NOISE.

SOME SPECTACULAR EVENTS.

IN JULY 1974, I HAD AN 8-ELEMENT YAGI DIRECTED TOWARDS THE SUN AND FEEDING A 136MHZ RECEIVER, ANOTHER SYSTEM WITH A 3-ELEMENT BEAM FACING NORTH-EAST ON 70MHZ, A VERTICAL DIPOLE CONNECTED TO A SET MONITORING THE R1 TV CHANNEL 49,75MHZ, AND A LONG WIRE AERIAL FEEDING THE 10M BEACON MONITOR. SUDDENLY ONE MORNING A MASSIVE SOLAR FLARE OCCURRED AND I HEARD THE NOISE SWEEP ACROSS THE FREQUENCIES AND GET STRONGER. BEING INQUISITIVE I USED THE H.F. RECEIVER TO FOLLOW THE NOISE AND FOUND THAT IT OVERPOWERED ALL SIGNALS DOWN TO 8MHZ FOR ABOUT SIX MINUTES AND THEN GRADUALLY FADED AWAY BACK UP TO 136MHZ.

EARLY IN AUGUST 1972, THE STATIC DISCHARGES FROM A LOCAL THUNDERSTORM WERE FREQUENTLY CAUSING LARGE SPIKES TO BE DRAWN ON THE CHART OF MY RADIO TELESCOPE. THEN SUDDENLY, A LARGE BURST OF RADIO NOISE FROM THE SUN 93 000 000 MILES AWAY, OVERPOWERED THE LOCAL STATIC FROM 90 TO 200MHZ, FOR SOME EIGHT MINUTES. THIS MASSIVE BURST WAS THE FORERUNNER OF A VERY BIG SOLAR STORM WHICH OCCURRED TWO DAYS LATER, UPSETTING THE IONOSPHERE AND CREATING ONE OF THE MOST EXTENSIVE AURORAS FOR MANY YEARS, VISIBLE AS FAR SOUTH AS SPAIN. THE EFFECT ON V.H.F. WAS AMAZING; ONE AMATEUR TOLD ME "IT WAS LIKE AN UMBRELLA, TONE-A SIGNALS WERE COMING FROM ALL DIRECTIONS".

ALTHOUGH SUNSPOTS ARE STATIONARY, THEY APPEAR TO TRAVEL ACROSS THE SUN'S DISC DUE TO ITS 27-DAY ROTATIONAL PERIOD. THIS MAKES IT POSSIBLE FOR A VERY LARGE SUNSPOT GROUP TO RE-APPEAR FOR A SECOND AND THIRD TIME, AND IT IS NOT UNCOMMON FOR A SUNSPOT TO BE ACTIVE WHEN IT APPEARS ON THE EAST LIMB AND REMAIN SO UNTIL IT TURNS THE CORNER ON THE WESTERN LIMB, SOME 13 DAYS LATER. A TYPICAL EXAMPLE OF THIS WAS THE SOLAR EVENT WHICH BEGAN WITH A FEW SMALL BURSTS OF RADIO NOISE ON 6 SEPTEMBER 1974, DEVELOPED INTO A SEVERE RADIO NOISE STORM LASTING SEVERAL DAYS AND ENDED ON THE 19TH. DURING THE EVENT THERE WERE MANY INDIVIDUAL BURSTS LASTING FROM 1 TO 16 MINUTES, COVERING FROM 50 - 150MHZ. ALL THIS RESULTED IN AN EXTENSIVE AURORA ON THE 15TH AND FREQUENT REPORTS BY THE BBC WORLD SERVICE ABOUT IONOSPHERIC DISTURBANCES AFFECTING THEIR LONG DISTANCE SIGNAL PATHS.

THE UNEXPECTED.

PATIENCE IS A DOMINATING FACTOR IN SOLAR OBSERVATION. MANY DAYS AND SOMETIMES WEEKS CAN PASS BY WITH NOTHING MORE THAN A RECEIVER NOISE TRACE ON THE RECORDING CHART. THEN SUDDENLY THERE IT IS - SOLAR NOISE, AND YOU HAVE THE FIRST WARNING OF AN AURORA OR IONOSPHERIC DISTURBANCE WHICH MEANS DX BY TONE-A FOR THE V.H.F. ENTHUSIAST AND (MOST LIKELY) DEAD BANDS FOR THE H.F. OPERATOR. WHATEVER HAPPENS, IT IS IMPORTANT THAT WE AMATEURS RECORD OUR OBSERVATIONS FOR POSTERITY JUST AS METHODICALLY AS OUR PREDECESSORS DID MORE THAN FORTY YEARS AGO. (TAKEN FROM 'OUT OF THIN AIR'.)

AZIMUTH BEARING AND DISTANCE

Degrees and Kilometres

```
10 LET f = Pi/180
20 PRINT "HOME"
30 GOSUB 200
40 LET x = e
50 LET y = n
60 GOSUB 200
70 LET b = COS n * COS y * COS (e-x) + SIN n * SIN y
80 PRINT "DISTANCE = ";6367 * ACS b,
90 LET a = SIN n - b * SIN y
100 LET b = ATN (SIN (e-x) * COS n * COS y/a) + Pi * (a<0)
110 PRINT "AZIMUTH = "; (b+ (Pi+Pi) * (b<0))/f
120 GOTO 60
200 PRINT "LATITUDE DEGREES"
210 INPUT n
220 PRINT "MIN"
230 INPUT a
240 PRINT "n/s"
250 INPUT n$
260 PRINT "LONGITUDE DEGREES"
270 INPUT e
280 PRINT "MIN"
290 INPUT b
300 PRINT "e/w"
310 INPUT e$
320 CLS
330 PRINT n;" ";a;" ";n$,e;" ";b;" ";e$
340 LET n = f * (n + a/60)
350 IF n$ = "s" THEN LET n = -n
360 LET e = f * (e + b/60)
370 IF e$ = "w" THEN LET e = -e
380 RETURN
```

SUGGESTION: ADD YOUR OWN SOUND, COLOUR, GRAPHICS ETC.
IF YOU DON'T WANT A LONG STRING OF DECIMALS, USE THE COMMAND INT. E.G.:-
LET a = (INT(a*10))/10 WILL RENDER ONLY ONE DECIMAL PLACE.
IF YOU HAVE NO COMPUTER, OR HAVE DIFFICULTY WITH THE PROGRAM, WANT
BEARINGS, - GET HOLD OF JIM, ZS2LR ON 2 METRES.

COMMENT FROM JIM: THE PROGRAMME IS PURE BASIC AND SHOULD BE COMPATIBLE WITH
MOST MACHINES. I HAVE ONLY TESTED IT ON A SPECTRUM 48k MACHINE.



Instant Printing

9 ST. PATRICK'S ROAD
PORT ELIZABETH
6001



TELEPHONE 22614

FOR ALL YOUR COMMERCIAL PRINTING REQUIREMENTS

TRY US FOR YOUR QSL CARDS!

HERE ARE A FEW USEFUL CO-ORDINATES:-

	DEGREES	MINUTES	DEGREES	MINUTES
PORT ELIZABETH	33	58 S	25	40 E
UITENHAGE	33	40 S	25	28 E
GRAHAMSTOWN	33	19 S	26	31 E
EAST LONDON	32	58 S	26	55 E
KINGWILLIAMSTOWN	32	51 S	27	22 E
STUTTERHEIM	32	33 S	27	28 E
DURBAN	29	55 S	31	0 E
GEORGE	33	58 S	22	24 E
MOSELBAY	34	11 S	22	8 E
PLETTENBERG BAY	34	4 S	23	22 E
CAPE TOWN	33	35 S	18	22 E
SALDANHA	33	0 S	17	56 E
ALEXANDER BAY	28	40 S	16	30 E
LUDERITZ	26	38 S	14	31 E
WALVIS BAY	23	0 S	14	31 E
WINDHOEK	22	34 S	17	6 E
KIMBERLEY	28	43 S	24	46 E
BLOEMFONTEIN	29	12 S	26	7 E
WELKOM	27	59 S	26	45 E
JOHANNESBURG	26	15 S	28	0 E
PRETORIA	25	45 S	28	10 E

SOME DX HEADINGS-

SAN FRANCISCO	37	48 N	122	24 W
KANSAS CITY	39	7 N	94	39 W
NEW YORK	40	43 N	74	1 W
WASHINGTON D.C.	38	54 N	77	1 W
MONTREAL CANADA	45	31 N	73	34 W
TORONTO CANADA	43	39 N	79	23 W
MEXICO CITY	19	24 N	99	9 W
CARACAS VENEZUELA	10	30 N	66	56 W
SALVADOR	12	59 S	38	31 W
SAO PAULO BRAZIL	23	32 S	46	37 W
MONTEVIDEO	34	53 S	56	11 W
TIERRA DEL FUEGO	54	30 S	67	0 W
LONDON	51	30 N	0	10 W
PARIS	48	52 N	2	20 E
BERLIN	52	33 N	13	30 E
OSLO	59	55 N	10	45 E
WARSAW	52	15 N	21	0 E
ROME	41	54 N	12	29 E
ATHENS	37	58 N	23	43 E
MOSCOW	55	45 N	37	35 E
TEL AVIV JAFFA	32	4 N	34	46 E
BOMBAY	18	58 N	72	50 E
COLOMBO	6	56 N	79	51 E
SINGAPORE	1	22 N	103	48 E
JAKARTA	6	10 S	106	48 E
PAPUA NEW GUINEA	6	0 S	150	0 E
HONG KONG	22	15 N	114	11 E
TOKYO	35	42 N	139	46 E
VLADIVOSTOK	43	10 N	131	56 E
HAITI	19	0 N	72	25 W
DARWIN	12	28 S	130	50 E
BRISBANE	27	28 S	153	2 E
MELBOURNE	37	49 S	144	58 E
HOBART	42	53 S	147	19 E

IT MATTERS NOT WHERE YOU ARE:

BEARING FOR NORTH POLE = 0 DEGREES

BEARING FOR SOUTH POLE = 180 DEGREES

SCIENTISTS TUNE IN TO THE SOUND OF AN ELECTRON

A TRANSISTOR SO SMALL THAT IT HAS BEEN CALLED 'ONE DIMENSIONAL' HAS BEEN DEvised BY AT&T BELL LABORATORIES SCIENTISTS. THE TINY DEVICE ALLOWS RESEARCHERS TO ISOLATE THE NOISE CAUSED BY A SINGLE ELECTRON IN SILICON, THE MATERIAL OF COMPUTER CHIPS.

NOISE IN SEMICONDUCTOR CHIPS, LIKE A STEREO SYSTEM, CAN DISTORT THE INFORMATION BEING TRANSMITTED. THEREFORE, SCIENTISTS HAVE BEEN SEARCHING FOR THE CAUSE OF NOISE IN SOLID STATE DEVICES AS A MEANS OF ADVANCING THE TECHNOLOGY. NOISE STUDIES WITH THE 'ONE DIMENSIONAL' TRANSISTOR, NOW UNDERWAY AT AT&T BELL LABORATORIES ARE LEADING TO NEW UNDERSTANDING OF THE PROBLEM. ULTIMATELY, THEY MAY LEAD TO EVEN MORE EFFICIENT SEMICONDUCTOR DEVICES.

'DON'T EXPECT TO SEE THIS DEVICE TURNING UP IN COMMERCIAL CHIPS,' SAID BILL SKOCPOL OF THE QUANTUM ELECTRONICS RESEARCH DEPARTMENT. 'IT'S A UNIQUE RESEARCH TOOL THAT LETS US SEE AND MEASURE ATOMIC EVENTS OCCURRING IN A SEMICONDUCTOR THAT UNTIL NOW WE'VE ONLY BEEN ABLE TO THEORIZE ABOUT. WE'VE ALREADY VERIFIED SOME THEORIES ABOUT WHAT CAUSES NOISE,' HE SAID.

THE TRANSISTOR IS ONLY ONE-TENTH OF A MICRON WIDE AND A MICRON LONG (A MICRON IS A MILLIONTH OF A METRE). IF ROADS WERE PRINTED ONE-TENTH OF A MICRON WIDE ON A ROAD MAP, THEN A 25MM LONG MAP COULD DETAIL EVERY HIGHWAY AND ROAD IN THE UNITED STATES OF AMERICA.

SOME NOISE IN TRANSISTORS IS BELIEVED TO BE CAUSED BY ATOMIC DEFECTS IN CRYSTALS OF THE SILICON-DIOXIDE INSULATOR. THESE DEFECTS, CALLED ELECTRON TRAPS, CAN CAPTURE AND MOMENTARILY RETAIN AN ELECTRON. THE TRAPPED PARTICLE REPELS OR SCATTERS OTHER ELECTRONS AS THEY STREAM THROUGH THE ADJACENT SILICON, IMPEDING THE ELECTRICAL CONDUCTION. WHEN ONE ELECTRON ESCAPES THE TRAP, ANOTHER IS CAPTURED. THE SUCCESSIVE CAPTURE AND RELEASE OF ELECTRONS IS BELIEVED TO BE THE SOURCE OF LOW FREQUENCY NOISE WHICH INTERFERES WITH THE PROPAGATION OF SIGNALS IN A TRANSISTOR.

'IN CONVENTIONAL TRANSISTORS, SMALL AS THEY ARE, THE COUNTLESS NUMBER OF ELECTRONS MOVING THROUGH THE TRAPS GENERATE A STORM OF NOISE, AND IT'S DIFFICULT TO STUDY THE BASIC MECHANISM CAUSING IT,' SAID SKOCPOL. 'WE DISCOVERED THAT A TRANSISTOR AS SMALL AS THIS ONE WOULD LET US FOCUS ON A SINGLE TRAP'.

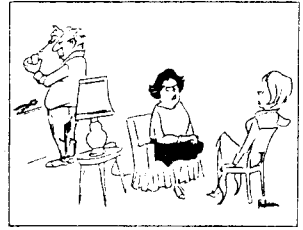
THE PROCESS MIGHT BE COMPARED TO APPLAUSE IN A THEATRE. WHEN THE AUDIENCE APPLAUDS, WAVES OF SOUND FILL THE THEATRE. THE TRANSISTOR IS LIKE A DEVICE THAT WOULD ISOLATE THE SOUND OF ONE PERSON CLAPPING.

'OUR STUDIES ARE DIRECTLY IN THE TRADITION OF RESEARCH IN PHYSICS AND ELECTRONICS THAT BELL LABORATORIES HAS BEEN INVOLVED WITH SINCE THE INVENTION OF THE TRANSISTOR,' SAID SKOCPOL. 'BY INCREASING OUR KNOWLEDGE OF HOW ELECTRONIC DEVICES WORK AND OF WHAT CAUSES PROBLEMS, WE CAN HOPE TO IMPROVE THE PERFORMANCE OF DEVICES USED IN COMPUTERS AND COMMUNICATIONS SYSTEMS.'

ONE EARLY RESULT OF THE AT&T BELL LABORATORIES EXPERIMENTS HAS BEEN THE CONFIRMATION OF THEORIES THAT ELECTRON TRAPS IN A TRANSISTOR OCCUR NEAR THE INTERFACE OF THE SILICON AND OXIDE METALS. THE EXPERIMENTS RESULTED IN THE FIRST MEASUREMENTS OF THE DISTANCE OF TRAPS FROM THE INTERFACE AND OF THE ENERGIES OF TRAPPED ELECTRONS.

WITH ACKNOWLEDGEMENTS TO "ARCHIMEDES" JULY 1985.

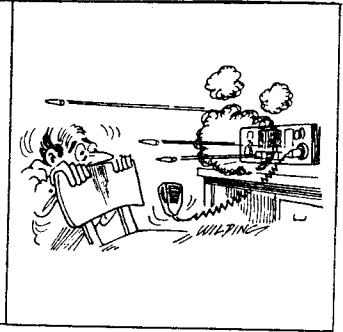
LAUGH IN A MINUTE



"The day he takes early retirement — I'll take late employment."



"It used to take the staff hours to louse up a project. Thanks to you, that time has been cut in half."



AMATEURS AND THE PHONETIC ALPHABET

LISTENING TO THE PHONETICS USED BY AMATEURS ON OCCASIONS, HERE IS ONE ALPHABET THAT WOULD REALLY GET THEM STUMPED. TRY IT FOR SIZE!

- A FOR 'ORSES (HAY FOR HORSES)
- B FOR MUTTON (BEEF OR MUTTON)
- C FORTH HIGHLANDERS (SEAFORTH HIGHLANDERS)
- D FOR ENTIAL (DIFFERENTIAL)
- E FOR ADAM (EVE OR ADAM)
- F FOR VESENCE (EFFERVESENCE)
- G FOR POLICE (CHIEF OF POLICE)
- H BEFORE BEAUTY (AGE BEFORE BEAUTY)
- I FOR NOVELLO (IVOR NOVELLO)
- J FOR ORANGES (JAFFA ORANGES)
- K FOR ANSWERS (KAY FRANCIS)
- L FOR LEATHER (HELL FOR LEATHER)
- M FOR SIS (EMPHASIS)
- N FOR DIG (INFRADIG)
- O FOR THE GARDEN WALL (OVER THE GARDEN WALL)
- P FOR COMFORT
- Q FOR BILLIARDS (CUE FOR BILLIARDS)
- R FOR MD ('ALF A MO)
- S FOR YOU (AS FOR YOU)
- T FOR TWO (TEA FOR TWO)
- U FOR ME (YOU FOR ME)
- V FOR FRANCE (VIVE LA FRANCE)
- W FOR QUILS (DOUBLE YOU OR QUILS)
- X FOR BREAKFAST (EGGS FOR BREAKFAST)
- Y FOR MISTRESS (WIFE OR MISTRESS)
- Z FOR BREEZES (ZEPHYR BREEZES)

JUNK?
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