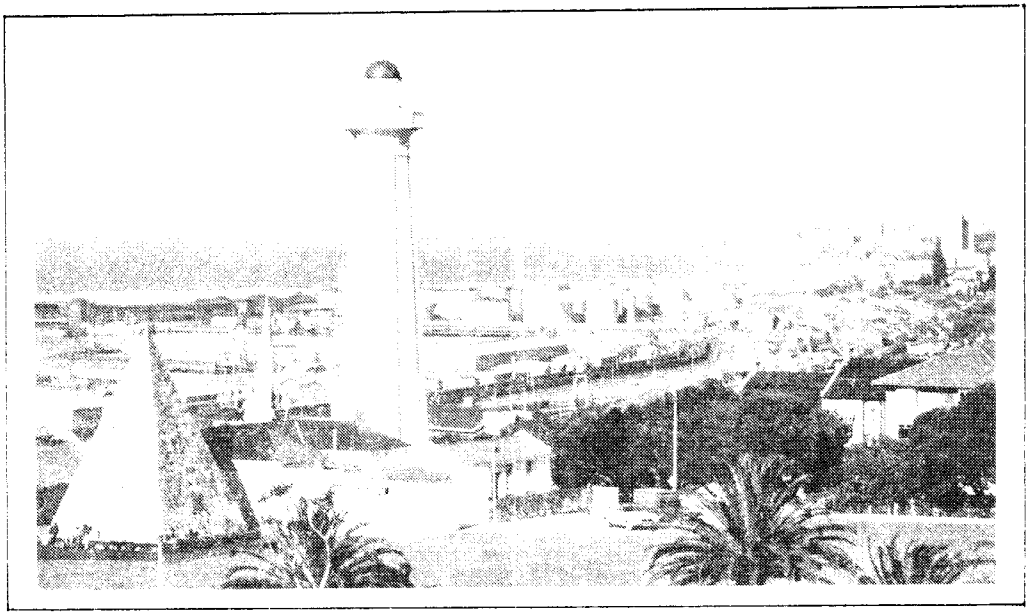
Q S X
P E



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

P.O. BOX 10402
LINTON GRANGE
6015

8

Port Elizabeth Branch
NOTICE OF MONTHLY MEETING

MEMBERS ARE REMINDED THAT THE GENERAL MEETING OF THE BRANCH WILL BE HELD ON FRIDAY 18th MARCH, 1988 AT ST. MARTINS CHURCH HALL, KABEGA PARK, PORT ELIZABETH AT 8.15P.M.
THE MAIN BUSINESS FOR THE EVENING WILL BE DISCUSSION OF THE MOTIONS FOR THE 1988 ANNUAL GENERAL MEETING.

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 ZR2AAN	51-2580
EDITOR QSX-PE:	MARGE WELLER ZS2OB	30-3498
MEMBERS:	DICK SCHONBORN ZS2RS	32-2111
LIBRARIAN: (NON-COMMITTEE POST)	COLIN ASHWELL ZS2AO	31-2471

BULLETIN ROSTER.

DATE	COMPILER	40M NET	2M NET
20 MARCH.	BILL ZR2AAN	ZS2AB	ZR2AAN
27 MARCH	DICK ZS2RS	ZS2RS	ZS2AB
3 APRIL	BRIAN ZS2AB	ZS2AB	ZS2RL
10 APRIL	LIONEL ZS2DD	ZS2DD	ZS2MM
17 APRIL	MARGE ZS2OB	ZS2AB	ZS2DD

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 ****

THIS AND THAT

SILENT KEY

IT IS WITH DEEP REGRET THAT WE HAVE TO ANNOUNCE THAT CYRIL GOODMAN ZS2KX BECAME A "SILENT KEY" ON SATURDAY 5TH MARCH 1988. CYRIL WAS BORN ON 4TH JUNE, 1902 AND BECAME A MEMBER OF THE LEAGUE IN 1952 AND HIS MEMBERSHIP CONTINUED UNBROKEN UNTIL THE TIME OF HIS DEATH. HE WAS ALWAYS EXTREMELY INTERESTED IN C.W. OPERATION AND SPENT MANY HOURS COACHING OTHERS IN THE ART AND MANY MEMBERS CAN THANK CYRIL FOR THEIR ZS LICENCES. HE WAS HON. SECRETARY OF THE BRANCH FROM 1962 TO 1965 AND ALSO HELD THE POSITION OF CHAIRMAN AND IN FACT EVERY POSITION ON THE COMMITTEE. HE WAS AWARDED LIFE MEMBERSHIP OF THE LEAGUE IN 1985 IN RECOGNITION OF HIS YEARS OF SERVICE. CYRIL OF LATE, IN SPITE OF POOR HEALTH, ATTENDED THE BRANCH ANNUAL GENERAL MEETINGS AND TOOK THE CHAIR DURING THE ELECTION OF THE NEW COMMITTEES AND WAS ALWAYS INTERESTED IN THE WELFARE OF THE LEAGUE AND THE BRANCH. HE IS SURVIVED BY HIS XYL BETTE ZS2LO AND WILL BE REMEMBERED FOR HIS DEDICATION AND SENSE OF HUMOUR. REST IN PEACE, CYRIL.

CARAVAN RALLY.

DON'T FORGET THE CARAVAN RALLY TO BE HELD OVER THE WEEKEND OF 26/27TH MARCH AT JEFFREYS BAY. MEMBERS WHO DO NOT HAVE CARAVANS ARE INVITED TO POP IN AT ANY TIME AND MORE ESPECIALLY FOR A LUNCH TIME BRING-AND-BRAAI ON SUNDAY 27TH. MAKE IT A DAY'S PLEASANT OUTING FOR YOU AND THE FAMILY.

THANKS.

MANY THANKS TO BEAVAN ZS2RL FOR HIS ORGANISATION OF THE COMMS. FOR THE ALGOA/VOLKSWAGEN MOTOR RALLY HELD DURING THE MONTH AND ALSO TO ALL THOSE WHO OPERATED FROM VARIOUS POINTS AND BASE STATIONS. YOUR HELP IS VERY MUCH APPRECIATED.

50 MHz BEACON.

A 50MHz BEACON WAS RECENTLY INSTALLED ON MALTA AND IS OPERATIONAL FROM THE MALTA AMATEUR RADIO LEAGUE PREMISES WITH THE FOLLOWING SPECIFICATIONS

FREQUENCY	50,085MhZ
MODE OF TX	FSK
CALLSIGN	9 H 1 SIX
POWER	25 WATTS
QTH LOCATOR	JM 5 FV
ANTENNA	A 5 ELEMENT BEAM WHICH WILL BE DIRECTED TO DIFFERENT AREAS, DEPENDING ON THE SEASONAL PROPAGATION VARIATIONS.

RECEPTION REPORTS SHOULD BE FORWARDED TO THE FOLLOWING ADDRESS:
9 H 1 ES, MALTA AMATEUR RADIO LEAGUE, P.O. BOX 575,
VALETTA, MALTA.

SOME FACTS ABOUT HEATSINKS

1. MOUNTING A HEATSINK WITH THE FINS IN ANY POSITION OTHER THAN VERTICAL, OR UNDER A SHELF, OR INSIDE A CABINET, GREATLY REDUCES EFFICIENCY.
2. HEAT SINKS SHOULD BE PAINTED MATT BLACK, OR BETTER STILL BLACK ANODISED; BARE METAL WILL REDUCE THE EFFECTIVENESS ABOUT 15%.
3. THE USE OF SILICONE GREASE, TO ENSURE EFFECTIVE HEAT TRANSFER, IS VERY IMPORTANT, ESPECIALLY AT HIGH POWER DISSIPATIONS.

****

RADIO AMATEURS SHOULD BE SEEN AND HEARD.
EDUCATION IS SOMETHING YOU GET FROM READING THE HANDBOOK.
EXPERIENCE IS SOMETHING YOU GET FROM NOT READING THE HANDBOOK.

MINUTES OF GENERAL MEETING OF THE PORT ELIZABETH BRANCH OF THE SOUTH AFRICAN RADIO LEAGUE HELD AT ST. MARTIN'S CHURCH, KABEGA PARK, PORT ELIZABETH ON FRIDAY 19TH FEBRUARY 1988.

PRESENT: 33 MEMBERS AND VISITORS.
APOLOGIES: ZS2s DT, JS, MM, JR, MC, R, LR AND KUS FAMILY.
THE CHAIRMAN WELCOMED ALL TO THE MEETING, ESPECIALLY GLYNN ZS2AAE, JOHAN ZS2HH, KEITH OLIVIER, QUENTIN CARR, EDDIE WALTERS, ROBBIE ZS2RB AND THEUNS REYNEKE, OUR NEWEST MEMBER, WHO WAS ALSO THE GUEST SPEAKER.
MINUTES: THE MINUTES OF THE MEETING HELD 15TH JANUARY, 1988, HAVING BEEN PUBLISHED AND CIRCULATED IN QSX-PE, WERE TAKEN AS READ, PROPOSED BY TREVOR ZS2AE AND SECONDED BY DICK ZS2RS.
ARISING: (1)AFTER THE LONG DISCUSSION AT THE LAST MEETING ON THE PROPOSED RESTRUCTURING OF THE LEAGUE AND THE REQUEST FOR MEMBERS TO SUBMIT THEIR OPINIONS IN WRITING, ONLY ONE HAD BEEN RECEIVED, FROM JIMMY ZS2MK AND HIS VIEW WAS SIMILAR TO THAT HELD BY THE MAJORITY.

(2)BEAVAN ZS2RL SAID THAT THE CARAVAN RALLY WOULD BE HELD ON 26/27 MARCH AT JEFFREYS BAY AND THERE WERE ABOUT 5 OR 6 MEMBERS WHO SAID THEY WOULD ATTEND. OTHER MEMBERS AND VISITORS WOULD BE MOST WELCOME AT ANY TIME AND A BRAAI WOULD BE HELD ON SUNDAY AT LUNCHTIME. IT WAS HOPED THAT AS MANY MEMBERS AS POSSIBLE WOULD ATTEND.

(3)THE FIRST OF THE ADVERTS FOR THE SALE OF COMPONENTS HAD APPEARED IN S.A. ELEKTRONIKA AND SEVERAL ORDERS HAD BEEN RECEIVED FROM OUT OF TOWN. IT WAS STILL OUR INTENTION TO HOLD A FLEA MARKET LOCALLY AND TO ADVERTISE IN THE LOCAL FREE NEWSPAPERS.

(4)COLIN ZS2AO SAID THAT THE LIBRARY WAS BEING USED BUT MANY MORE MEMBERS WERE INVITED TO MAKE USE OF THE FACILITY.

(5)BILL ZS2BY HAD RECEIVED A QUOTE FOR THE PAINTING OF THE BADGE FOR THE BRANCH ON MASONITE FOR R75 AND THE MEMBERS AGREED TO THIS.

(6)THE LICENCE FOR THE MOTOR RALLY HAD BEEN RE-ISSUED.

FINANCE: IN THE ABSENCE OF THE TREASURER, BRIAN SAID THAT THE USUAL MONTHLY EXPENSES HAD BEEN PAID. THE FIXED DEPOSIT WAS AN ODD AMOUNT AND IT WAS PROPOSED TO BRING THIS TO A ROUND FIGURE WHEN IT WAS DUE FOR RE-INVESTMENT.
CORRES: (1)DETAILS OF A.G.M. HOSTED BY HIGHWAY BRANCH.
(2)LETTER FROM ZS2MK ON RESTRUCTURING OF LEAGUE.
(3)LETTER FROM ZS2MK ADVISING OF SALE OF EQUIPMENT.
(4)LETTER FROM CHAIRMAN OF ALGOA BRANCH, PER KIND FAVOUR OF ZS2C.
ARISING: (1)BRIAN SAID THAT HE WAS UNABLE TO ATTEND THE A.G.M. AND DICK ZS2RS WAS APPOINTED AS THE BRANCH DELEGATE. PROPOSED BY ZS2AE AND SECONDED BY ZS2RL.

(2)NO CORRESPONDENCE HAD BEEN RECEIVED FROM H.Q. REGARDING THE REPEATER LINKING PROJECT. SOME INFORMATION HAD BEEN GLEANED FROM COUNCIL MINUTES.

(3)THE LETTER FROM ALGOA BRANCH WAS HANDED TO THE REPEATER WORKING GROUP WHO WOULD HOLD A SPECIAL MEETING TO DISCUSS THE MATTER.
GENERAL: (1)MEMBERS WERE REMINDED OF THE BRANCH PARTY TO BE HELD ON 29TH AT ALFIES RESTAURANT.

(2)NEXT MONTH'S MEETING WOULD BE USED TO DISCUSS THE MOTIONS TO THE A.G.M.

(3)BEAVAN GAVE DETAILS OF THE MOTOR RALLY AND SAID THERE WOULD BE A FINAL BRIEFING AT HIS QTH ON WEDNESDAY 9TH. BILL ZS2BY ASKED HOW LONG WE WOULD BE INVOLVED. THERE WERE ABOUT 40 CARS AND THE TIME WOULD BE APPROXIMATELY 4 HOURS. THE FREQUENCY TO BE USED WOULD BE 7076KHZ.

(4)A REQUEST HAD BEEN MADE FOR COMMS FOR THE MODEL AIRPLANE CLUB OVER THE EASTER WEEKEND BETWEEN P.E. AND UITENHAGE. ZS2AO AND ZS2RT OFFERED THEIR HELP.
THE MEETING WAS THEN CLOSED AND TEA TAKEN. A MOST INTERESTING TALK WAS GIVEN BY THEUNS REYNEKE ON M-NET AND BRIAN ZS2AB THEN SHOWED MEMBERS THE INSIDE OF A DECODER AND HOW IT WORKED, BUT NOT HOW TO CRACK THE CODE!

SGD:B.A. WELLER ZS2AB. CHAIRMAN. SGD. M.T. WELLER ZS2OB, SECRETARY.

DIGITAL SPEECH PROCESSING.

DIGITAL SPEECH PROCESSING OUTPACES TRADITIONAL ANALOGUE TECHNIQUES.

SPEECH IS THE MOST FUNDAMENTAL FORM OF COMMUNICATION TO MAN, YET IT IS ONE OF THE MOST COMPLEX SIGNALS TO MODEL OR RE-CREATE. THIS ARTICLE FROM I.D.C.O. PROVIDES INSIGHT INTO HUMAN SPEECH AND SOME MODERN TECHNIQUES USED TO PROCESS IT DIGITALLY.

FIGURE 1 IS A SPEECH SIGNAL PLOT OF THE WORD 'SALT'. FROM THIS PLOT IT IS APPARENT THAT SPEECH IS A MULTI-FACETED SIGNAL THAT VARIES WITH TIME. IT CAN BE DIVIDED INTO FOUR CATEGORIES OF SOUNDS:

- UNVOICED SPEECH
- VOICED SPEECH
- PLOSIVES
- SILENCE

THE FOUR DIFFERENT CATEGORIES HAVE BEEN MARKED ON FIG. 1. SOUNDS SUCH AS /AH/ OR /OO/ ARE CLASSIFIED AS VOICED. THESE SOUNDS ARE CHARACTERISED BY HIGH ENERGY, PITCH PERIODICITY AND RELATIVELY LOW FREQUENCIES. UNVOICED SOUNDS IN CONTRAST, HAVE NO PITCH, LOW ENERGY AND CONTAIN HIGH FREQUENCIES. EXAMPLES OF UNVOICED SOUNDS ARE /S/ OR /F/. PLOSIVES ARE SUDDEN TRANSIENT SIGNALS CREATED BY SOUNDS SUCH AS /P/ OR /T/. SILENCE IS IDENTIFIED AS THOSE AREAS WHERE THERE IS NO SOUND.

SPEECH DIGITISING TECHNIQUES.

SPEECH CODING (DIGITISING) IMPLIES REPRESENTING AN ANALOGUE SPEECH SIGNAL AS A SERIES OF DIGITAL STREAMS OR CODES. AN OBJECTIVE OF ANY DIGITAL SPEECH CODING TECHNIQUE IS TO CODE THE SIGNAL WITH THE LEAST AMOUNT OF BITS POSSIBLE. MANY TECHNIQUES EXIST TO CODE SPEECH DIGITALLY, EACH WITH ITS OWN MERITS AND IS BEST SUITED TO CERTAIN SPECIFIC APPLICATIONS. DESIGN OF DIGITAL SPEECH CODERS STRIVES TO OPTIMISE THE INTERPLAY OF FOUR PARAMETERS: BIT RATE, QUALITY, COMPLEXITY AND DELAY TIME.

BIT RATE IS THE NUMBER OF BITS PER SECOND THAT THE CODING METHOD PRODUCES AND QUALITY IS THE SUBJECTIVE EVALUATION OF INTELLIGIBILITY AND SPEAKER RECOGNITION. COMPLEXITY IS THE AMOUNT OF EFFORT REQUIRED TO CODE THE SIGNAL. DELAY TIME IS THE LENGTH OF TIME TAKEN TO ENCODE THE SIGNAL.

AS THE BIT RATE IS REDUCED, QUALITY NATURALLY DROPS OFF, UNLESS THE COMPLEXITY OF THE CODING SYSTEM IS INCREASED. BUT COMPLEXITY RAISES THE COST OF THE CODING SCHEME AND IN MANY CASES, THE PROCESSING DELAY. DELAY IS NOT A PROBLEM FOR VOICE STORAGE APPLICATIONS, BUT COULD CREATE ECHOES OVER TRANSMISSION LINES.

CODING STRATEGIES.

THE RESEARCH LABORATORIES OF THE MAJOR TELECOM COMPANIES SUCH AS AT&T, NORTHERN TELECOM, NIPPON TELEPHONE AND TELEGRAPH, SIEMENS AND PHILIPS ARE COMPETING INTENSELY WITH A WIDE VARIETY OF CODING SCHEMES. THERE ARE 3 BASIC CATEGORIES OF CODING STRATEGIES: WAVEFORM CODERS, VO-CODERS AND HYBRID CODERS.

WAVEFORM CODERS.

WAVEFORM CODERS REPRESENT SPEECH DIGITALLY SO THAT AN APPROXIMATION OF THE INPUT SIGNAL CAN BE REPRODUCED AT THE OUTPUT. IN OTHER WORDS, THE SALIENT FEATURES OF THE WAVEFORM ARE EXTRACTED AND STORED. WAVEFORM CODING IS ANALOGOUS TO A SUMMARY OF A BOOK, I.E. ONLY THE IMPORTANT INFORMATION IS KEPT AND AN APPROXIMATION OF THE ORIGINAL BOOK CAN BE RECONSTRUCTED.

A TECHNIQUE USED IN WAVEFORM CODING IS TO REPRESENT THE DIGITAL SPEECH AS A SEQUENCE OF STRAIGHT-LINE VECTORS. AN EXAMPLE IS ILLUSTRATED IN FIG. 2 THE ORIGINAL WAVEFORM AT (A) IS RECONSTRUCTED AS A SIMPLE SEQUENCE OF VECTORS IN (B).

VOCODERS.

VOCODERS ASSUME A MODEL OF THE VOCAL TRACT AND EXTRACT A SET OF PARAMETERS FROM THE SPEECH WAVEFORM. TO RECONSTRUCT THE WAVEFORM, THESE PARAMETERS ARE USED TO ADJUST THE MODEL TO PRODUCE AN APPROXIMATION OF THE ORIGINAL SIGNAL. THE MOST POPULAR VOCODER TECHNIQUE IS LINEAR PREDICTIVE CODING. L.P.C. MODELS THE VOCAL TRACT AS A SET OF SEQUENTIAL TUBULAR SECTIONS OF VARIABLE RADII. FIGURE 3(A) SHOWS THE VOCAL TRACT CONFIGURATION AND FIGURE 3(B) SHOWS THE MODEL AS A SEQUENCE OF TUBES. A MATHEMATICAL MODEL IS FOUND TO APPROXIMATE THE AIRFLOW IN THE TRACT MODEL. IF THE WAVEFORM AT THE VOCAL CHORDS IS KNOWN, THEN THE PARAMETERS OF THE DIGITAL FILTER CAN BE FOUND BY ANALYSING THE SPEECH WAVEFORM. TO RECONSTRUCT THE WAVEFORM, THE RETAINED PARAMETERS ARE PLACED IN THE VOCAL TRACT MODEL, THE VOCAL CHORD WAVEFORM IS APPROXIMATED AND THE OUTPUT WAVEFORM IS CALCULATED.

HYBRID CODERS.

HYBRID CODERS ARE ESSENTIALLY WAVEFORM CODERS THAT HAVE BORROWED SOME TECHNIQUES FROM VOCODERS. AN EXAMPLE OF A HYBRID TECHNIQUE IS ILLUSTRATED IN FIG. 4. A PITCH-PERIOD EXTRACTOR (WHICH IS A VOCODER FUNCTION) IS USED TO SEGMENT THE SPEECH WAVEFORM ACCORDING TO PITCH PERIOD PEAKS. THE SEGMENTS ARE COMPARED AND IF ADJACENT SEGMENTS ARE SIMILAR, THEN ONLY ONE IS CODED AND THE OTHERS ARE REPEATED. IN FIG. 4(B) SEGMENTS 3, 4 AND 5 ARE REPEATS OF SEGMENT 2.

DIGITAL SPEECH CODING APPLICATIONS.

WHY WOULD ONE WANT TO CODE SPEECH DIGITALLY? WHAT ARE THE ADVANTAGES OF REPRESENTING SPEECH DIGITALLY AS OPPOSED TO AN ANALOGUE REPRESENTATION? THE ADVANTAGES DEPEND ON THE APPLICATIONS. THREE APPLICATION AREAS FOR SPEECH COMMUNICATIONS ARE: TRANSMISSION, STORAGE AND ENCRYPTION. AN ADVANTAGE OF TRANSMITTING SPEECH DIGITALLY IS THAT THE DIGITAL SIGNAL IS IMMUNE TO MAGNITUDE AND PHASE DISTORTION AS WELL AS NOISE. BY STORING SPEECH IN BINARY FORM, DIGITAL MEMORY CAN BE USED. FOR EXAMPLE, RUGGED SOLID-STATE PRODUCTS CAN BE MADE FOR VERY HARSH ENVIRONMENTS USING BUBBLE MEMORIES. ANOTHER ADVANTAGE OF STORING SPEECH DIGITALLY IS THE INSTANTANEOUS ACCESS TO THE STORED DATA ON RANDOM ACCESS DEVICES SUCH AS HARD DISCS OR OPTICAL LASER DISCS. BY REPRESENTING SPEECH DIGITALLY ANY STANDARD DIGITAL ENCRYPTION TECHNIQUE CAN PROVIDE A SECURE MEANS OF TRANSMISSION OR STORAGE.

(FROM: DATAWEEK - NOV. 1987. THANKS TO BEAVAN ZS2RL)

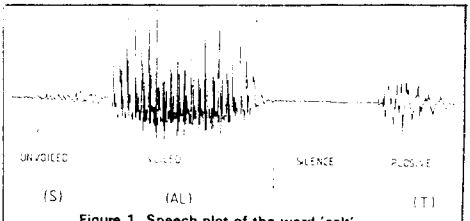
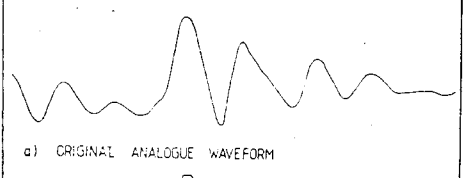


Figure 1. Speech plot of the word 'salt'.



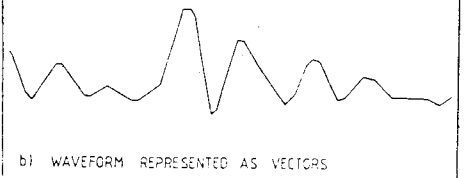


Figure 2. Example of waveform coding.

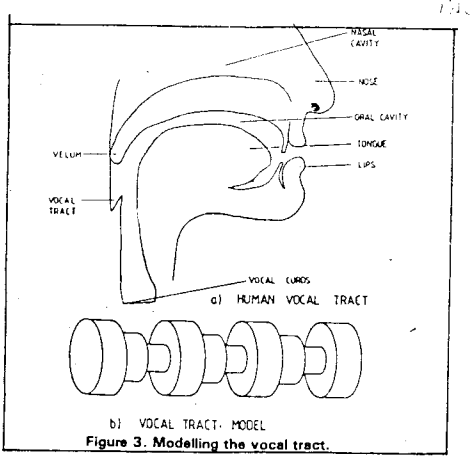


Figure 3. Modelling the vocal tract.

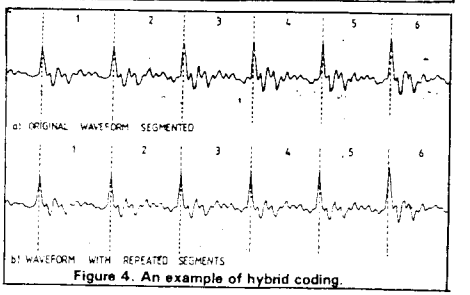
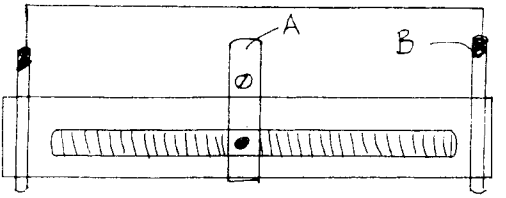
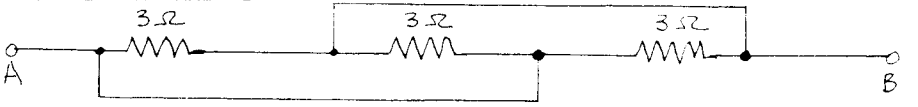


Figure 4. An example of hybrid coding.

TECHNICAL QUIZ.



THE ABOVE WIREWOUND RESISTOR HAS THE SLIDER IN THE CENTRE. WHAT VALUE RESISTOR MUST BE PURCHASED (?) TO GET 25 OHMS BETWEEN 'A' AND 'B' ?



THREE RESISTORS, EACH 3 OHMS, WIRED AS SHOWN. WHAT IS THE RESISTANCE BETWEEN 'A' AND 'B'?

(BLAME DUDLEY ZS2AW FOR THESE TWO..HI..IF YOU CANT GET THEM WORKED OUT, ASK HIM ^^)

DIPOLE INSULATOR AND AIR-CORED BALUN.

JIM, ZS2LR, UITENHAGE.

THE FOLLOWING INFORMATION WAS OBTAINED FROM THE OCTOBER 1980 ISSUE OF "QST" (ARRL):-

IN THE U.S.A. A COMMERCIALLY MADE AIR-CORED BALUN CONSISTS OF A TRIFILAR WINDING OF 12 TURNS OF 14 AWG (16 SWG) WOUND ON A ONE-INCH (25mm) PHENOLIC FORMER. IT IS CLAIMED THAT THE BALUN IS OPERABLE FROM 3 MHZ TO 30 MHZ AT A PEAK RATING OF 5 KW WITH LESS THAN 0,5 DB LOSS. HOME CONSTRUCTION OF SUCH A BALUN IS DESCRIBED AS WELL AS AN AIR-CORED BALUN FOR THE 160, 80 AND 40 METRE BANDS CONSISTING OF A TRIFILAR WINDING OF 13 TURNS WOUND ON A TWO-INCH (50mm) FORMER. THE INFORMATION MENTIONS THAT FERRITE CORED BALUNS DO A FINE JOB BUT THAT IF THE BALUNS ARE OVERLOADED OR SUBJECTED TO HIGH STANDING WAVE RATIOS, HARMONICS ARE GENERTED DUE TO SATURATION WHICH CAN CAUSE TVI. THE AIR CORED BALUN CANNOT SATURATE, RING OR GENERATE HARMONICS WHICH CAUSE TVI. IT IS LIGHT WEIGHT, CAUSES LITTLE SAG IN THE ANTENNA AND CAN BE CONSTRUCTED OF CHEAP AND READILY AVAILABLE MATERIALS. THE LOSSES ARE INDEED VERY LOW.

DUE TO THE COST OF TOROIDAL FERRITE CORES, THEIR SCARCITY AND THE POSSIBLE PROBLEMS MENTIONED, THE WRITER DECIDED TO CONSTRUCT AN AIR-CORED BALUN AS AN INTEGRAL PART OF A DIPOLE INSULATOR. THE RESULTS OBTAINED WERE TRULY WORTH THE EFFORT.

THE DRAWING SHOWS AN EXPLODED VIEW OF THE WRITERS CONSTRUCTION. THE INSULATOR WAS MADE OF LAMINATED PERSPEX AND T-SHAPED WITH THE VERTICAL PORTION OF THE T DIMENSIONED TO FIT INSIDE A PIECE OF 25mm PVC CONDUIT WHERE THE INSULATOR WAS SECURED WITH EPOXY GLUE. TERMINALS WERE PROVIDED ON THE INSULATOR FOR CONNECTION OF THE ANTENNA AND BALUN WIRES. A CHASSIS MOUNTING SO239 COAX SOCKET WAS CONNECTED AT THE BOTTOM OF THE PVC COIL FORMER, PUSHED UP AGAINST THE FORMER AND SECURED BY THE METHOD TO BE DESCRIBED. THE COILS WERE FIRST WOUND, BALUN CONNECTIONS MADE; THEN THE INSULATOR WAS SECURED IN THE FORMER; THEN THE COAX SOCKET WAS CONNECTED AND THE BALUN CONNECTED TO THE INSULATOR TERMINALS. THE BALUN WAS THEN WRAPPED WITH COTTON GAUZE BANDAGE IN SUCH A WAY AS TO COVER THE WINDINGS, FILL ALL THE GAPS THAT COULD ALLOW THE INGRESS OF RAIN WATER AND TO SECURE THE COAX CONNECTOR TO THE BALUN FORMER. THE COTTON WAS THEN IMPREGNATED WITH EPOXY GLUE AND ALLOWED TO CURE. AFTER CURING THE ANTENNA WAS ATTACHED TO THE INSULATOR AND CONNECTED TO THE TERMINALS. THE FEEDLINE WAS PLUGGED INTO THE COAX SOCKET AND TERMINALS AND COAX SOCKET AND PLUG WERE SPRAYED WITH "TECTYL" TO PREVENT INGRESS OF MOISTURE AND CORROSION.

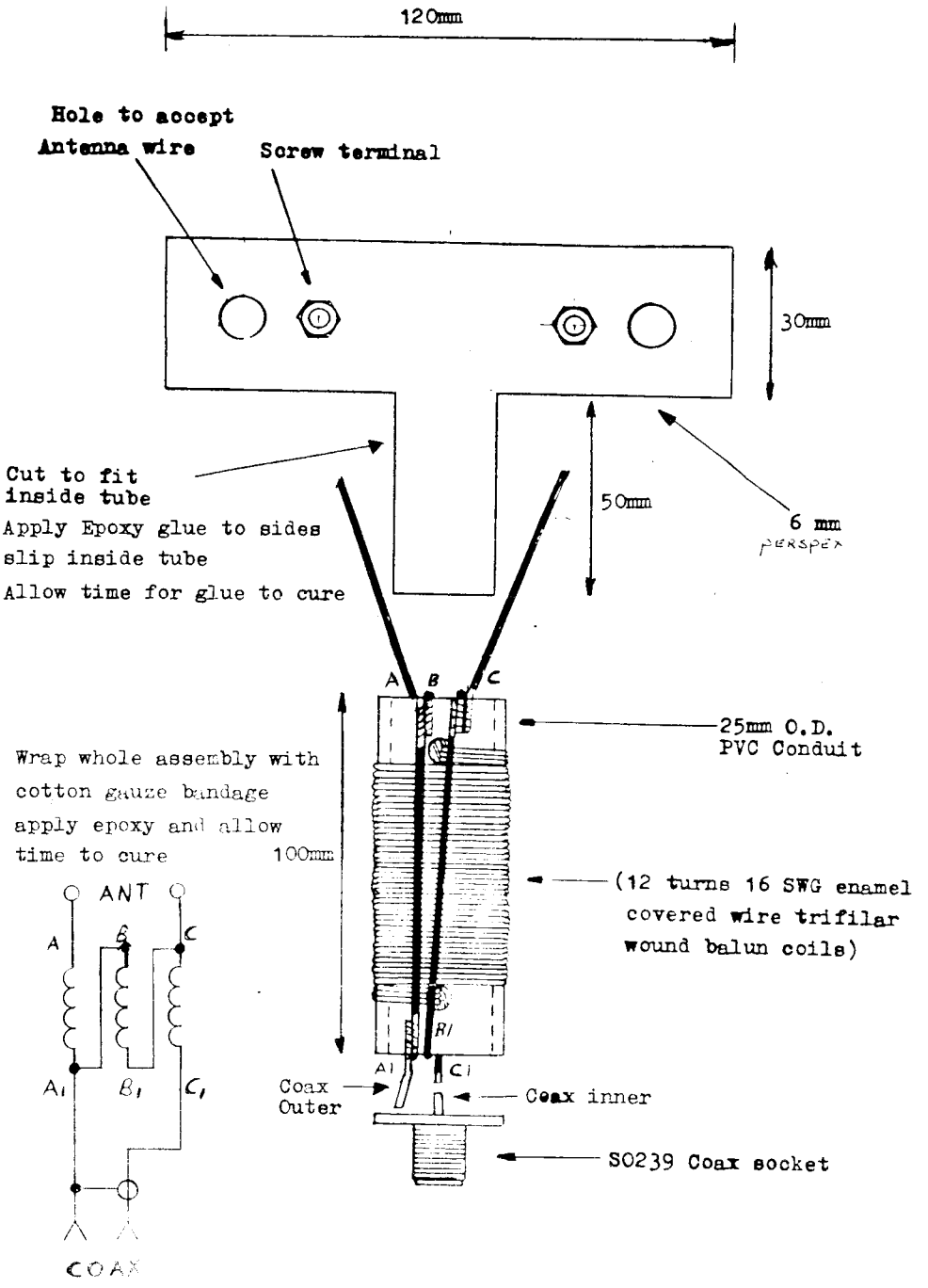
IN THE DRAWING THE INTER-CONNECTIONS OF THE BALUN COILS ARE SHOWN ON THE OUTSIDE OF THE COIL FOR REASONS OF CLARITY. IN FACT THE WIRES CAN BE ROUTED ON THE INSIDE OF THE COIL AND ONLY TWO SOLDERED CONNECTIONS ARE REQUIRED ON THE BALUN COILS, APART FROM THE JOINTS TO THE COAX SOCKET.

FOR SALE.

(1)KP 202 HANDHELD 6 CRYSTAL CHANNELS (VARIOUS EXTRA FREQUENCY CRYSTALS FREE) R250.00
(2)CDE 44 ANTENNA ROTATOR R300.00
(3)APPLE 2E 64K COMPUTER, MONITOR, 2 X DISK DRIVES, SERIAL AND PARALLEL PRINTER CARD AND CLOCK CARD. R800.00
PLEASE CONTACT ANDRE ZS2BK, PHONE 041-307078

DIPOLE CENTER INSULATOR AND 1:1 AIR CORED BALUN:

EXPLODED VEIW:



MOLNIYA

BY COLIN ASHWELL, ZS2AO.

EVERYONE KNOWS THAT THERE ARE ORBITTING SATELLITES AND GEO-STATIONARY SATELLITES, BUT I DOUBT WHETHER THE AVERAGE PERSON KNOWS MUCH ABOUT THE INCREDIBLE (AND INGENIOUS) "MOLNIYA" SYSTEM.

THIS CONSISTS OF A SERIES OF RUSSIAN SATELLITES THAT TRANSMIT SOVIET TELEVISION FROM A NON-STATIONARY ORBIT. INSTEAD OF MAINTAINING A RELATIVELY CONSTANT POSITION IN THE CLARKE BELT, MOLYNIYA (RUSSIAN FOR 'LIGHTNING') SATELLITES TRAVEL IN A U-SHAPED ORBIT WHICH TAKES THEM FROM ONE APOGEE OVER THE SOVIET UNION TO PERIGEE DOWN NEAR ANTARCTICA AND THEN BACK UP TO A SECOND APOGEE SOME 36 000 KM OVER HUDSON BAY, CANADA.

FOR ABOUT SIX HOURS THE MOLNIYA SATELLITE WILL MAINTAIN ITS POSITION IN A SMALL AREA DIRECTLY ABOVE HUDSON BAY, WITH ABOUT A ONE HOUR PERIOD AT APOGEE WHERE THE SATELLITE HANGS IN THE NORTHERN SKY, VIRTUALLY MOTIONLESS. IT IS DURING THIS SIX HOUR PERIOD THAT THE MOLNIYA TRANSMITS A SINGLE CHANNEL OF TELEVISION BACK ACROSS THE NORTH POLE INTO THE SOVIET UNION. IN SIBERIA THERE ARE A NUMBER OF EARTH TERMINALS WHICH TRACK THE MOLNIYA SATELLITES, PROVIDING REGIONAL TELEVISION AND RADIO SERVICES VIA TERRESTRIAL BROADCAST STATIONS TO NUMEROUS CITIES, VILLAGE AND RURAL AREAS.

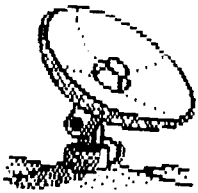
IN THE SOVIET UNION THIS SERVICE IS REFERRED TO AS ORBITA-1. OUTSIDE OF ITS ONE HOUR AT APOGEE, THE SATELLITE MUST BE TRACKED AT INTERVALS OF 10 TO 15 MINUTES. AT THE END OF THE SIX HOUR PERIOD, THE SATELLITE TELEVISION CHANNEL IS TURNED OFF AS THE GRAVITATIONAL FIELD OF THE EARTH ACCELERATES THE BIRD ALONG ITS PENDULUM-LIKE ORBIT CARRYING IT RAPIDLY OUT OF THE NORTHERN SKIES. THE SOVIET ENGINEERS HAVE A TOTAL OF FOUR MOLNIYA BIRDS INHABITING THIS PARTICULAR ORBIT, WITH THEIR LOCATION SPACED AT SPECIFIC INTERVALS SO THAT AS ONE IS LEAVING THE HUDSON BAY AREA, THE NEXT BIRD IN LINE IS JUST ARRIVING. BY SWITCHING VIDEO FROM ONE BIRD TO THE NEXT AT THIS TIME, SOMETHING AKIN TO CONTINUOUS TELEVISION COVERAGE CAN BE MAINTAINED OVER A 24-HOUR PERIOD.

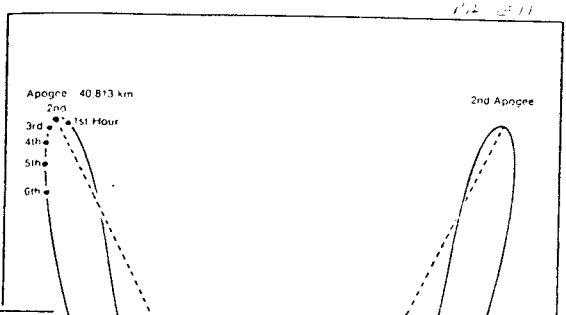
WHY SHOULD THE SOVIETS BOTHER WITH A NON-GEOSTATIONARY SYSTEM OF FOUR SATELLITES WHEN A SINGLE SATELLITE IN THE CLARKE BELT COULD GIVE CONTINUOUS COVERAGE WITHOUT REQUIRING COMPLICATED TRACKING EQUIPMENT?

AN OBVIOUS REASON IS THAT THE CLARKE BELT IS LOCATED OVER THE EQUATOR, SO THE NORTHERNMOST REGIONS OF THE SOVIET UNION CANNOT VIEW GEOSTATIONARY SATELLITES. ALSO, THE FIRST MOLNIYA SYSTEM WENT INTO SERVICE IN THE MID-1960'S WHEN THE SOVIETS DID NOT HAVE A POWERFUL ENOUGH ROCKET TO BOOST THEIR BIRDS INTO A GEOSYNCHRONOUS ORBIT. ONCE THE TECHNOLOGY AND HARDWARE WAS COMMITTED TO THE MOLNIYA PROGRAM, IT BECAME A VERY EXPENSIVE PROPOSITION TO SWITCH OVER TO A TOTALLY NEW SYSTEM.

AS CAN BE SEEN FROM THE DIAGRAMS, THE MOLNIYA SYSTEM OFFERS THE TVRO ENTHUSIASTS IN CANADA AND THE UNITED STATES A FASCINATING PEEK AT SOVIET TV. THE SIGNAL IS POWERFUL ENOUGH TO BE RECEIVED WITH DISHES DOWN TO 2 METRES IN DIAMETER.

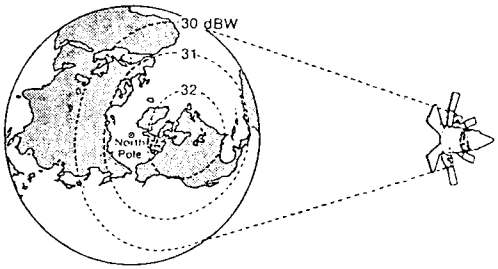
(EXTRACTS FROM "SPEC-COM" MAGAZINE AND "THE WORLD OF SATELLITE TELEVISION")





MOLNIYA NON-GEOSYNCHRONOUS ORBIT
for 13th MOLNIYA-3 launched July 18, 1980

MOLNIYA FOOTPRINT COVERAGE PATTERN



LAUGH LINES