ANODE

Editor's Comments

**February 2005
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I found an interesting project dept.

Spectrum Analyser Project - Tune your browser to :-

`http://users4.ev1.net/~wsprowls/index.html`

This appears to be a 'Morse' Issue with three articles about morse. Enjoy

2005 Construction Project Competition announced

The South African Amateur Radio Development Trust has announced details of its 2005 Construction competition. The Trust introduced the construction competition last year and awarded the prize to Louis de Bruin ZS5LP for a mixer/transceiver control unit, which was donated to the SARL for use in on the air activities such as the President's net.

For 2005, the project is a low power two-band HF CW transceiver for 20 and 40 metres, fully tuneable with an output of at least 10 watt. The design must use locally available components and in kit form must not cost more than R500 excluding the cabinet.

Entries are invited in two stages. First stage is a paper design, which

Is Morse Code Dead?

Especially with the recent ITU Conference decision to not require CW testing on an international treaty basis, there is lots of talk about CW having died. It seems quite often that those proclaiming its death have a personal hatred of Morse code and the effort required to learn it. Unfortunately CW is a subject that cuts deep into the hearts of many hams, either pro or con and evokes strong emotions. In an effort to cut through the emotions, I have assembled some actual data to try and convince myself if CW is really dying or not. This page is the result of my investigation.

Let me first state that I like CW and use it quite a bit, but I also use voice and the digital modes. I don't believe that dropping CW testing will kill ham radio as we know it. I also believe that before jumping to conclusions, one should investigate the facts and the data available. That is what I am documenting here.

Conclusions
Based on the data presented here, it appears premature to announce the death of Morse code on the amateur HF bands. Instead, there may be an increase in activity in recent years. Based on various data sources, it appears that the overall activity on the ham bands is close to evenly split between SSB and CW, with digital modes accounting for less than 10% of the total activity. Overall SSB does enjoy about

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must include full specs and a detailed write-up. Entries for the first stage must be received by the Trust before 31 March 2005.

Three entries will be selected which will each receive R1000 for stage two. Stage two is the building of a proto-type, which must be complete in a cabinet with construction details, circuit diagrams and operating instructions. The completed unit with all its paperwork must be received by 31 May 2005.

The winner of stage 2 will receive an Icom IC-V8 hand-held transceiver sponsored by Multiscource and the two runners up the 2005 ARRL Handbook.

Full details of the competition can be found on the SA Amateur Radio Development Trust website at www.amateurradio. org.za or can be obtained by sending an Email to saardt@intekom.co.za or fax to 012 991-5651. Written requests for competition details should be addressed to P O Box 90438, Garsfontein 0042.

Computer-Read Morse
From: "Len Anderson"
<lenover21@aol.com>
Subject: Computer-Read Morse (Was Re: Morse Code Binary?)
Date: 2005-02-06 22:22

In article <F0aNd.1542 $oO.1242@newsread2.news. atl.earthlink.net>, robert casey <wa2ise@ix.netcom.com> writes:

Besides, if something is digital, why would you have to try so hard to make it computer compatible? Telling "S" from "O" is hard if you don't already know from looking at other characters what the speed >must be. Something easy for the brain but hard for computers to do when the sender varies his speed.

Reply:
It is not "hard" for a semi-modern computer to do. All it means is that the programmer has to write more source code to perform a task called "rate adaption."

Lay folk take the very easy approach to visualizing what the computer does (via its programming) as simple decoding of groups of binary state combinations. That's common observation. What isn't so obvious is that, with a clock rate of 20 MHz or better, the computer [program] can test a time sequence for relative occurrences of On versus Off by periodic sampling.

Segregation of a single O from a single S in morse code can be done by comparing the time length of the On. That is different in morse code for an approximately equal character bit group time. [dashes are supposed to be longer in duration than dots] At a dot rate of 1 KHz (faster than 100 WPM equivalent), the repetitive period is 1000 microsec-

onds. The computer hardware (under program control) can sample that at a, say, 10 microsecond period. That allows 100 samples of each dot or dash which can be stored in temporary computer memory. [that's more memory than is actually needed but this is just an example] Already knowing the sample rate (from the hardware and the time of execution of the iterative routine), another routine can test each sample in turn and accumulate the relative length of each On versus a character group's total time length. That would differentiate dashes from dots.

The difficulty for the programmer is setting up a set of rules to determine the relative lengths. Such does NOT have to be precisely 3:1 in ratio of dashes to dots. It can be as coarse as 2:1, which would be called "sloppy" manual sending. :-)

Once there has been a differentiation of dashes versus dots, a variation of the rate-adaptive routine can be used to differentiate the longer time between character spaces. Again, the routine's testing can use a wide range of time intervals. When spaces between characters are determined, the much-simpler task of decoding character combinations into ASCII (or equivalent) character combinations can be done (probably by a look-up table stored in memory). With that completed, the computer-handle able charac-

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ters can be displayed on a screen or sent to a paper print device.

I've not done the above but am describing what a programmer acquaintance had already done some years ago using a desktop computer having a 20 MHz clock rate CPU and very moderate RAM for temporary program memory. My (then-new) Icom R-70 was lent to him for some on-air real-time testing on amateur as well as commercial morse code signals (there were very few non-amateur morse signals heard then). With a simple audio- to-digital interface (peak detector with quick fall time), it would "read" every morse signal with a 2:1 dash-dot ratio or better, even in moderate noise. The first few characters of a string of characters might be lost until the rate-adaptive routine adjusted itself, but otherwise was quite acceptable.

You might ask "why" do that at all? Answer: It was someone else's personal intellectual exercise to accomplish a seemingly difficult task. Just a fun task for him and of some interest to others who liked to program. It was a hobby project and it proved what was set out to prove to the programmer.

That morse decoder wasn't carried to any perfection. It could have been developed further to be quicker in rate-adaption, to add more noise-elimination and so forth. There was NO D E M A N D f o r that commercially, nor was it done for prospective program sales in the future. [hardware already existed to do all the rate-adaption and decoding of repetitive teleprinter codings in a single IC a decade or so ago] Program notes and source code printouts filled a large loose-leaf notebook and were freely shown. Of particular note was the flow-diagrams of the various iterative subroutines, much more readable to me than the C source code (maybe it was Pascal?) of the executive program. The same executable program would work fine with modern desktops or portables having 2 GHz clock rates and 100 MHz rate memory fetch cycles...even to using already- established routines to determine real-time hardware execution times necessary to determine word-per-minute equivalent rates.

[portions of this example description were already in this newsgroup a few years ago, principally in reply to Ed Hare and some others]

It is less a matter of "adapting morse code to computers" than it is making the computer adapt to decoding morse. A big question is WHY BOTHER?

'Morsemen', hoping to show they are "superior" to mere machines as well as modern technology, will insist and insist that their human abilities (honed to a fine edge) are oh-so-much-better than any (hack, ptui) computer thingy. They can evidently work miracles using morse code mode communications, far beyond the best that can be done by all other radio services and commercial communications. :-)

"Morse code gets through when all other modes do." - Brian Burke
[Whoops! - Shouldn't that be don't? Ed]

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"Today is the tomorrow you worried about yesterday..." - anon.

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{——}

The HAM and programming

What does he use?
[With a huge variety of programming languages to choose from, what does the Amateur need to learn to program ?]

The average radio ham is not a programmer normally but that's not to say he cannot write programs for his computers. I have said on many of my training courses that "If you can write a shopping list, you can write a program". Formal training shouldn't stop you from writing good functional pro-

The HAM and programming

grams for your computer.

How To start writing programs

Set out what you want to do in any form that is comfortable to you. [I usually do this in Word-Pad but you can use Excel or any other medium you like] A simple list of requirements as headings will usually suffice. Then copy these further down the page and insert expansions on each point to explain to someone else what you want the program to do.

Having broken the stages down into simple ones, it becomes very easy to 'code' the various sections. You can also go back later and insert additional functions that you thought of during the process. You can also put in pictures at points in the text to show what sort of dialogue window you want the program to have. [You can capture using Alt+Print Screen and paste into WordPad/Excel etc]

This definition of the program will serve you as your specification should you decide to hire/persuade/coerce someone else to write the program!

Writing 'pseudo code'

A lot of programmers [not necessarily professional] will write the program first in what is called 'pseudo code'. This is not really a programming language but a way of thinking through the program code.

An example of pseudo code

NOTE I put all code and examples of code into Courier font (looks like a typewriter) to highlight it.

***

Since a string that is provided to our engine will most likely (but not always) require searching and replacing, I'll wrap all the search-and-replace functionality into a single method called Expand(). The pseudo-code for Expand() looks like this:

```
Accept a string and an
SQL statement (so that
the correct entity or at-
tribute data can be re-
placed)
Find first occurrence of
a tag
While an occurrence is
found
   Get the entire tag and
its exact position
   Get a replacement
value for the tag **
   Strip out the tag and
replace it with the new
data
   Find another tag oc-
currence in the string
Loop
```

Notice the asterisked line above, which gets a tag's replacement value. Let's pseudo-code its functionality as well:

```
Accept a string (the tag)
and an SQL statement
(this was passed in to
the above Expand()
method)
Determine if the string
matches any of our string
constant tags
   If so, get the value
and exit
Get the tag's data (which
is a column name)
Create a recordset using
the SQL statement
Get the data for the col-
umn name from the record-
set
Exit program
```

***

When you have this imitation program written, it will be a simple matter to translate the code to the programming language of your choice.

What low cost languages are available? [of particular relevance to the HAM]

Basically what can you get for free and are they of any real value. Well most free stuff nowadays means that there are some later 'strings' or baggage. However there are a great number of training languages which generally means that they come to you free of charge, (well maybe the time on-line costs) but the cost of usage is zero.

Basic and its derivatives

Basic was originally designed as a training language. Nowadays versions usually are 'Visual' that is they are meant for a graphical user interface

The HAM and programming

(Continued from page 4)

such as MS Windows or X. The language is supported in all versions of Windows(TM) and can access the operating system, its 'objects' and applications through the use of COM/DCOM. Versions 1,2 and 3 were 16bit in executable (.EXE) and could even work in Windows 3.x. Version 4 is/was available as a 'training' version but was hamstrung by not using too many forms (windows) and code modules. Version 5 was available for 'free' as well but could only create ActiveX type controls for use on web pages.

Visual Basic (Last version 6 Service Pack 6) was the last in a line of Basics that go back to the days of DOS/CPM and before. 'VB.NET' versions 2003/4/5 are available as 'training' editions or 'Express' versions from MS but these are NOT Basic languages any more. Whilst you are supposed to be able to do so much more with them, you will take a lot longer to learn and familiarise yourself with these .NET languages. .NET languages are . NOT a good starting point for writing simple programs.

Visual Basic Scripting is now at version 5.6 and is very good at automating web pages and tasks in MS Windows. The language is supported in all versions of Windows(TM) and can access the operating system, its 'objects' and applications through the use of COM/DCOM.

Other Basics are available for 'free' and even compile to executables for Windows and Linux. Such usefull ones are Liberty Basic and Quick Basic types. These are not necessarily to be written off as useless. They can produce quick and very user friendly programs which run either as text based interface or console mode or even produce graphic windows for a user interface.

Pascal and its derivatives

Pascal/Turbo Pascal was incredibly popular some years ago as it was strict in its methods of assigning variables and coding. It wouldn't let you make mistakes in your program and would not compile to object code if you did make a mistake. Nowadays the version is also a visual programming language known as Delphi or Kylix by Borland. Windows and Linux programs can be written with the same code base and can be used on either operating system.

C/C++ and its derivatives

The C language was used to write the original Unix operating system and is still reckoned to be one of the most efficient programming languages bar an assembler (Machine code). Its support is wide ranging from web sites and tutorials to free downloads of source code

and working programs.

C++ (c plus plus) has enjoyed great popularity with Windows and Unix programmers. It is highly structured and less tolerant of programmer's mistakes than C. In C you could bring down the entire system (usually DOS sometimes Windows) with a "BUG" in your program. In C++ its compiler will ususally 'catch' the bug before you get to run the program. If you are working to build a small efficient program though, C still produces smaller and faster programs.

Assembler (Whoa! Which processor?)

Well if you really want to program you should consider that 'real programmers' only write in machine code. (They also dream in hexadecimal.) Also 'wimp programmers' or 'hackers' would write in an assembler language for a specific processor. Intriguingly the one for the PC written by MS is still available for free download.

There are plenty more to choose from out there. Take your pick (pun intended)

All of the above?

You can write in Basic and use an assembler to write code for use by the Basic program. This will speed up some operations but make your program com-

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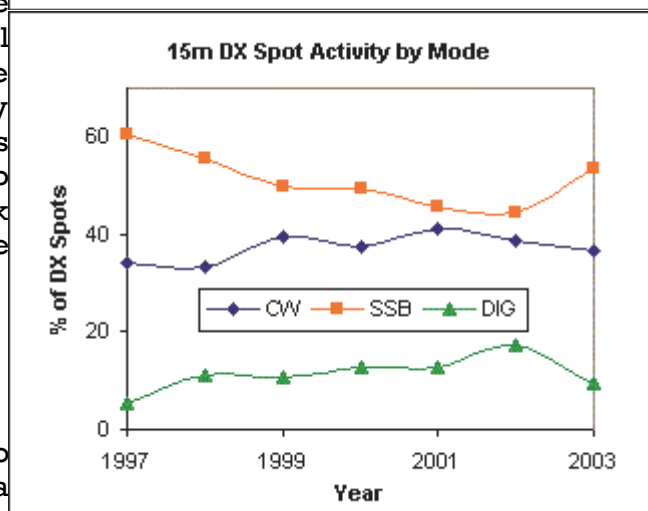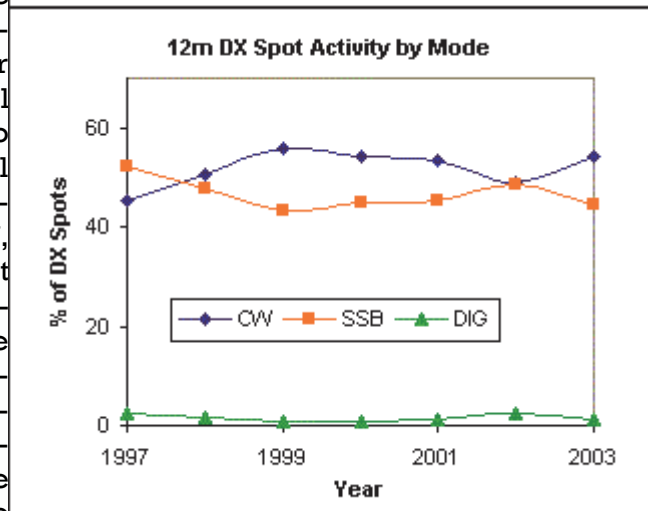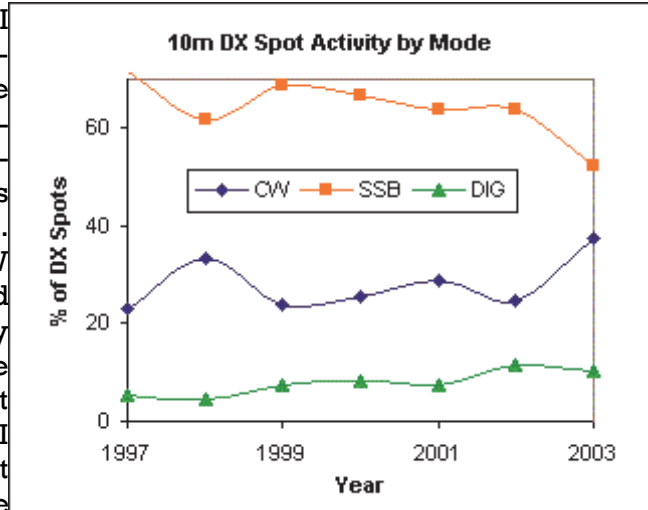5% more activity than CW, but that is not an overwhelming percentage.

Based on the analyses presented below, it appears that the CW issue in ham radio is often based on emotion rather than fact. The data do not indicate an overall decrease in CW activity. The argument being used by CW opponents that CW is dying seems to have no merit. On the other hand, the argument that relaxing the CW test requirement to 5 WPM would lead to the destruction of the Amateur Radio Service does not seem to have merit, either. The data show that when the code testing was relaxed in 2000, CW activity remained stable in the following years.

Therefore, if more newer hams started using SSB, the same percentage also started using CW. I interpret that to mean that most hams will use the mode that meets their objectives, whether it is CW or not. Of course, there will always be vocal minorities in both the pro and con CW camps.

Therefore I would recommend that the CW testing requirement be relaxed for access to the HF bands. However, CW testing should not be totally dropped, since there is still a lot of CW activity. I recommend that CW testing be treated as an operating mode for the General Class license to ensure that all amateurs are familiar with CW, but it should not be used as a barrier. Taking the data interpretation one step further, I would conclude that those with access to the HF bands will discover what the DXers already know: CW works and if you want to seriously work DX, then the use of CW is useful.

Data

It's not easy to find actual data on the operating habits of hams, since we are such a diverse group with a wide variety of personal interests, family situations, work requirements, etc. We also span a

10m DX Spot Activity by Mode

12m DX Spot Activity by Mode

15m DX Spot Activity by Mode

Year	% CW	% SSB	% DIG
1997	38.7	56.7	4.6
1998	42.1	52.2	5.8
1999	45.0	49.7	5.3
2000	43.1	51.1	5.8
2001	45.0	48.7	6.3
2002	43.2	48.5	8.4
2003	43.7	48.8	7.5

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wide age and experience range and, as in all facets of hu-

17m DX Spot Activity by Mode

20m DX Spot Activity by Mode

80m DX Spot Activity by Mode

man social behaviour, tend to stick around with friends who we like and share ideas with.

Thus, looking at my operating habits or talking to my friends would not be objective ways to evaluate the issue of whether CW is dying or not.

It suddenly dawned on me that there is a large database of objective information on operating habits freely available. It's called the DX Cluster Database, which is maintained by several groups. The largest appears to be sponsored by the DX Summit. The database consists of archived DX spots posted by operators all over the world to notify others that particular DX stations are active. Avid DXers routinely monitor and post to the DX cluster system and these posts are archived. This information has

the added advantage of being unbiased, in that the data was not collected to support a pro or anti CW viewpoint, but reflects the actual operating habits of hams who want to work DX.

In order to use this data source, I made a series of queries to the data archive for each band and years from 1997 to 2002. The database limits query results to 10,000 records, so the data used represents the last 10,000 spots of each year. Once the data was gathered, by using the frequency sub-bands, it was possible to sort the information into CW, SSB and digital (DIG) modes. With data for all of the bands, then we can look at the trends and see if there is evidence that CW is dying as an active mode on the ham bands. Of course the 30m band does not permit SSB operation and the 60m band does not permit CW operation, so these bands were excluded from the evaluation. In addition, since the 40m band is a mess with differing frequency allocations in various parts of the world, 40m was also excluded.

A second source of information is available on the ARRL web site in the form of two surveys conducted in March 2003 and June 2002. Both of these surveys asked questions on CW usage on the ham bands. Of course, it can be pointed out that the surveys only reflect the habits of the people who access the ARRL web page and may
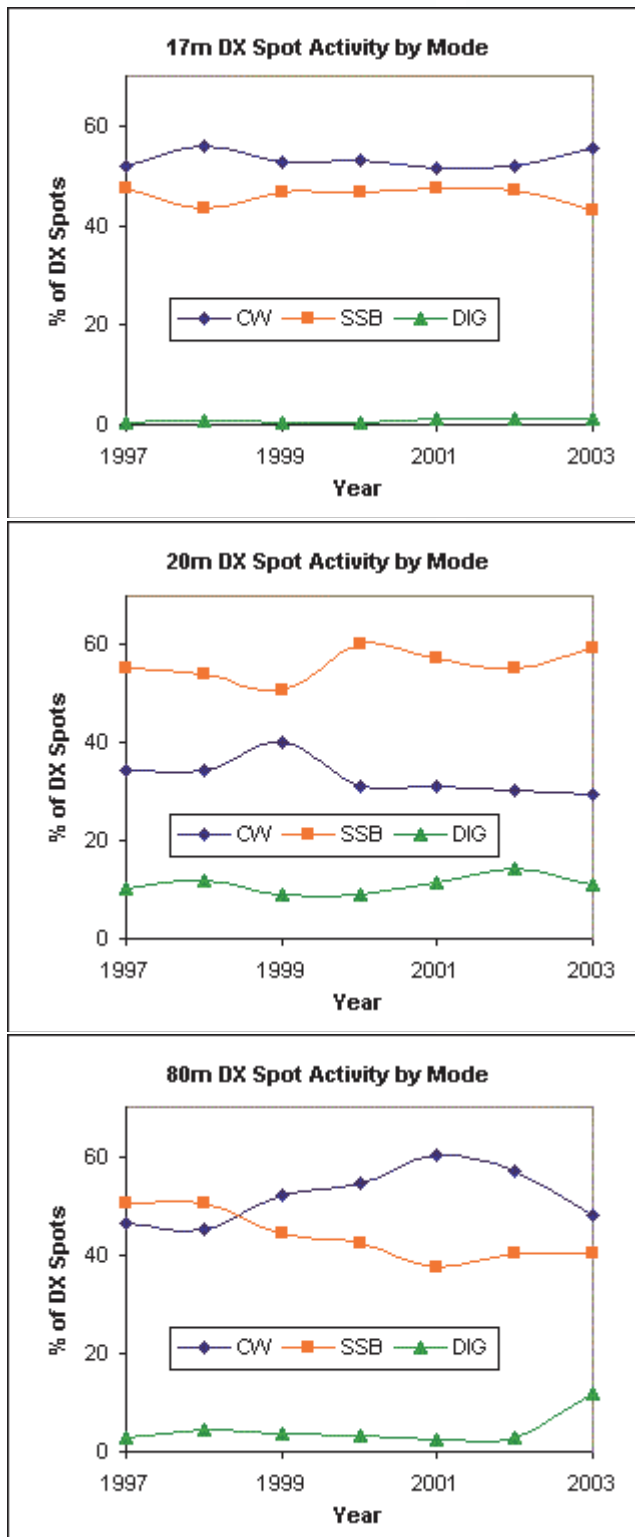
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not be applicable to all hams. That's why we need to do some comparisons and validate the survey results against other data using unbiased statistics.

Validity

As a cross check on the validity of the data, the ARRL posted on it's web site 2 different surveys relating directly to CW operation. In one survey, the question was asked What percentage of your operating time is spent using CW?. Of 3073 respondents, 44.0% said that CW was their primary operating mode, while 32.6% said they did not use CW at all. Based on the data in the survey a weighted average of 40.7% CW operating time would be expected. Of major interest is the extremely skewed distribution of results. It seems that lots of hams use mainly CW and lots of hams hardly use CW and the percentage of hams who use CW a little bit is pretty small. It seems that people either love or hate CW and not much in between.

The second survey asked the question What's your average CW speed during casual conversation?. Of 2894 respondents, 31.2% said they didn't use CW, which compares fairly well with the results of the previous survey's non-CW users. Based on the number of respondents, a 90% confidence interval of the estimated percentages would be about 1.7%,

so there is no statistically significant difference between the 2 responses of 32.6% and 31.2% for non-CW users. Interestingly, the majority of people responding who use CW indicated that their preferred CW speed is in the 10 - 20 WPM range, not too fast or too slow and in the range required under the old General class CW exam of 13 WPM.

Assuming that the respondents in the first survey based their answers on operating during 2002 (the survey was conducted in March 2003), then we would expect that the DX spots should reflect the operating practices, if the results are valid. In fact the DX spot data base for all of the surveyed bands shows that of 45,328 DX spots during the end of 2002, 19,564 or 43.2% were in the CW sub-bands. Based on the number of spots, a 90% confidence interval of about 1% is expected. Comparing the 43.2% of the spots with the 40.7% CW operating time from the first survey shows a difference of 2.5%. Indeed, using the overall statistics for 1997 to July 2003, the percentage of CW spots is 42.9%, representing a difference of only 2.1%. Due to the subjective nature of the survey question, it appears that the statistics are fairly consistent. Overall, a little over
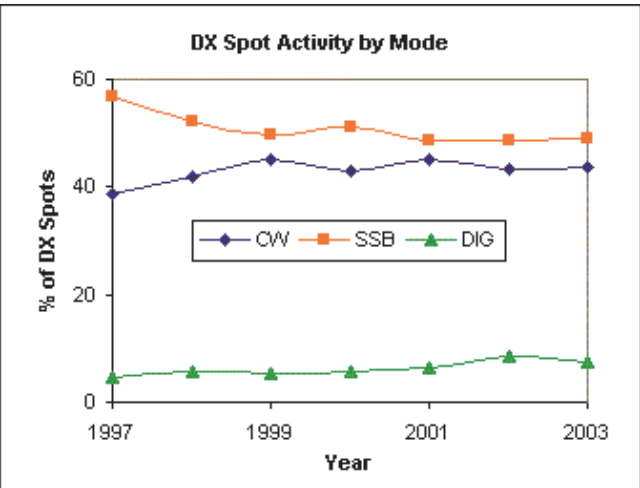
40% of the total amateur operating time in 2002 appears to have been on CW.

Summary

The data abstracted from the DX Cluster database is shown in the table and figure above. Note that the overall SSB activity declined during the period 1997 to 1999, while CW activity increased. Since that time both SSB and CW activity has remained essentially flat showing no major trends. Meanwhile, the relative digital activity has shown a slow but steady increase. Overall, SSB does seem to be more popular than CW, but only by about 5%. During the last 3 years, SSB has accounted for less than half of the DX spots.

Thus, the overall statistics do not seem to support the conjecture that CW is dying and that the CW sub-bands are dead. In fact, there is almost as much DX activity on CW as on SSB. Since

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the digital modes are taken out of part of the CW sub-bands, it can be seen that for at least the last 3 years, more than half of the DX activity has been in the CW/digital sub-bands, not on SSB.

The following sections will show the activity by band, starting with the traditional 10, 15, 20 and 80 meter bands, then the 12 and 17 meter WARC bands. I think we'll find a couple of surprises that go against "common knowledge" on both sides of the code vs. no-code fence.

10 Meters

The DX spot activity for the 10 meter band is shown in the graph. Note that there are several fluctuations in the data points, however, the long term trends clearly show a decline in the SSB activity with a corresponding increase in both CW and digital activity. This result is surprising, since 10 meters is where the Novice and Technician Plus Code licensees have HF voice privileges. I would have thought that the voice activity of these operators would indicate an increase in SSB activity, but the statistical trends do not bear that out. Instead, one could hypothesize that these licensees are abandoning SSB for both CW and the digital modes. Note that the overall CW activity was only about 30%, but in 2003 has come fairly close to the overall 40%

activity level estimated from other considerations.

15 Meters

The DX spot activity for the 15 meter band is shown in the graph. Note that the long term trends clearly show a decline in the SSB activity with a corresponding increase in both CW and digital activity. The incomplete data for 2003 shows an upswing in SSB activity and a slight decline in CW activity. However, the majority of the difference in activity appears to be at the expense of the digital modes. It will be interesting to see whether this trend continues. Once again, overall CW activity appears to be close to the previously estimated 40%.

20 Meters

The DX spot activity for the 20 meter band is shown in the graph. Note that the long term trends clearly do not show a decline in the SSB activity. Over the last 3 years, however, there has been somewhat of a decline in SSB activity. The incomplete data for 2003 may indicate that SSB activity is on the rise, but the decline in CW activity is minimal, with the biggest decrease being the digital modes. Once again, it appears that CW activity recently has been fairly stable at around 30% within the confidence intervals of the data.

Since 20 meters is considered the work-horse band for both DX and the digital modes, it will be interesting to see how the trends continue. This band seems to have the highest overall DX activity and the most digital activity. The level of CW activity does seem to be less than the 40% estimated from other sources.

80 Meters

The DX spot activity for the 80 meter band is shown in the graph. Note that the long term trends clearly show a decline in the SSB activity. In addition, except for 1997 and 1998, there has been more CW activity than SSB activity. The increase in CW activity from 1998 to 2001 is clearly offset by diminished SSB activity, with the small amount of digital activity also declining. The incomplete data for 2003 indicate that SSB activity is flat, and the decline in CW activity is replaced by digital activity. For this band the CW activity is significantly higher than the 40% estimate from other sources.

12 Meters

The DX spot activity for the 12 meter band is shown in the graph. Note that the long term trends are hard to define and do not appear to be statistically significant. However, except for 1997, there has been more CW activity than SSB activity.

A Super Selective Cw Tracking Filter

[Cut down drift, enhance your signal-to-noise ratio and reduce QRM - all in one package.]

For years, the most widely used method of obtaining selectivity for the reception of CW has been the reliable and effective single crystal filter. Versions of these filters are found on most quality CW receivers. A CW crystal filter can provide a 3dB bandwidth *of* between 20 and 4 *60* Hz at 455 kHz. The usefulness of this narrow band characteristics of a crystal has been' well proven during the course of modem ham radio.

By limiting the bandwidth to the amount necessary for optimum signal readability, the signal-to-noise ratio can be greatly enhanced and QRM drastically reduced. In order to keep the CW station tuned in at maximum strength, the receiver must be stable and the operator must retune to compensate for the slight drifting present in most ham receivers. Older receivers using vacuum tubes must be warmed up for 15 minutes or so to obtain low drift. The diagtam in Figures la and lb, show the effect of slight mistuning or receiver drift on the strength of a CW station Fig. la, shows a representation of a typical single crystal filter bandpass characteristic. Note that on either side of the peak, the response falls rather rapidly (12 dB per octave). At plus or minus 40 Hz, the response is down 24 dB. Consequently, a slight mistuning or receiver drift causes a 24 dB signal strength reduction as shown in Fig. lb. The operator must then adjust the receiver tuning in order to move the 40 Hz up into the maximum response of the crystal. One can now ask the question: How can the signal be automatically positioned at
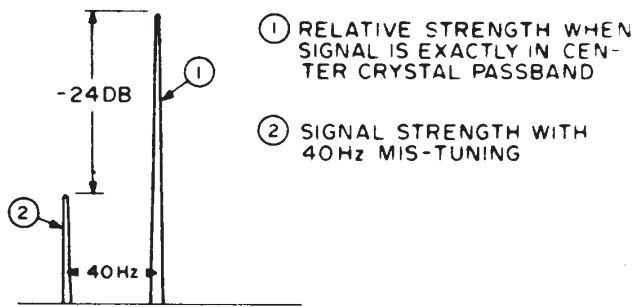

① RELATIVE STRENGTH WHEN SIGNAL IS EXACTLY IN CENTER CRYSTAL PASSBAND

② SIGNAL STRENGTH WITH 40 Hz MIS-TUNING

Fig. 1b. Results of mistuning or receiver drift causing 24 dB signal strength reduction.
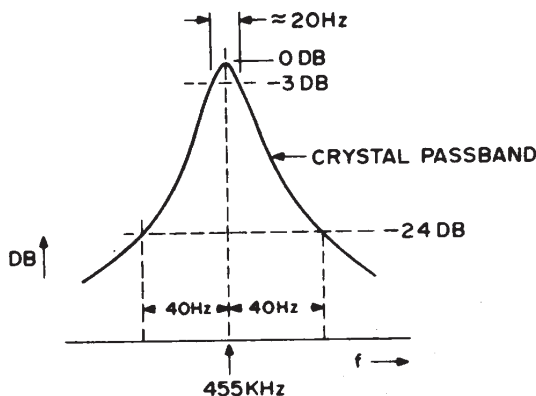

Fig. 1a. The effect of slight mistuning or receiver drift on the strength of a CW station.

the maximum response point of the filter regardless of receiver drift? One rather infrequently used technique, for obtaining high selectivity which has been known for some time, is the capacitor sampling technique.

Fig. 2, shows a network consisting of a resistor, 4 capacitors, and rotary switch. (An number of capacitors greater than 2 can be used.) The rotary switch is only a convenient representation of electronic switching. Assume

A Super Selective Cw Tracking Filter

that the switch is rotating at a frequency of say 1000 Hz. Let us look at the output of the network when the input frequency matches the frequency of switch rotation. If the R and C's are large enough, a capacitor will charge up to the average value of signal voltage it sees when it is connected. This Cl charges to zero volts because it always sees an equal amount of positive and negative voltage when it is connected. C2 charges to nearly the peak value of the sine wave. The resultant of complete cycle of switching is shown in Fig. 3. When the switch rotation frequency or the input signal frequency is changed, the response falls off at a rate of 6dB per octave. The bandwidth of this type of filter is determined by the RC, time constant. The greater the R and/or C, the narrower the bandwidth. Extremely narrow bandwidth can be obtained as low as 1 Hz at 1 kHz. The center frequency. of the pass band is equal to the frequency of rotation of the switch.

It now becomes clear as to how the tracking capability is obtained. One merely has to use a 'voltage controlled oscillator (VCO) to drive the capacitor switch and phase lock the- VCO to the input signal as shown by the block diagram of Fig. 4.

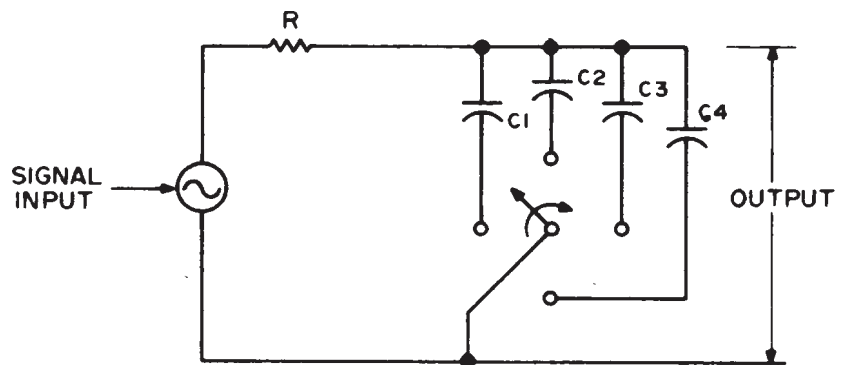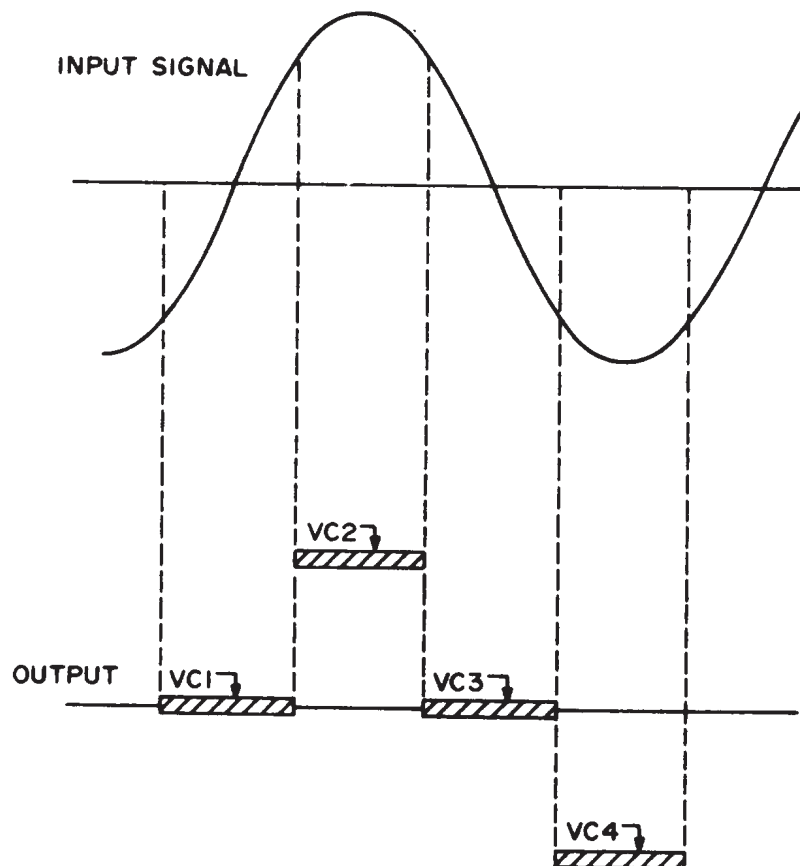The dual flip flop and the 7402

Fig. 2. Network.

Fig. 3. Complete cycle of switching.

A Super Selective Cw Tracking Filter

(Continued from page 11)
decoder turn transistors Q1 through Q4 on in sequence and thereby connect the capacitors in the circuit in sequence. The action as explained earlier forms a narrow band network cies. The filter network has a tendency to respond to harmonics of the desired frequency. To minimize this effect, low pass filters can be used ahead of and after the switched capacitors network.
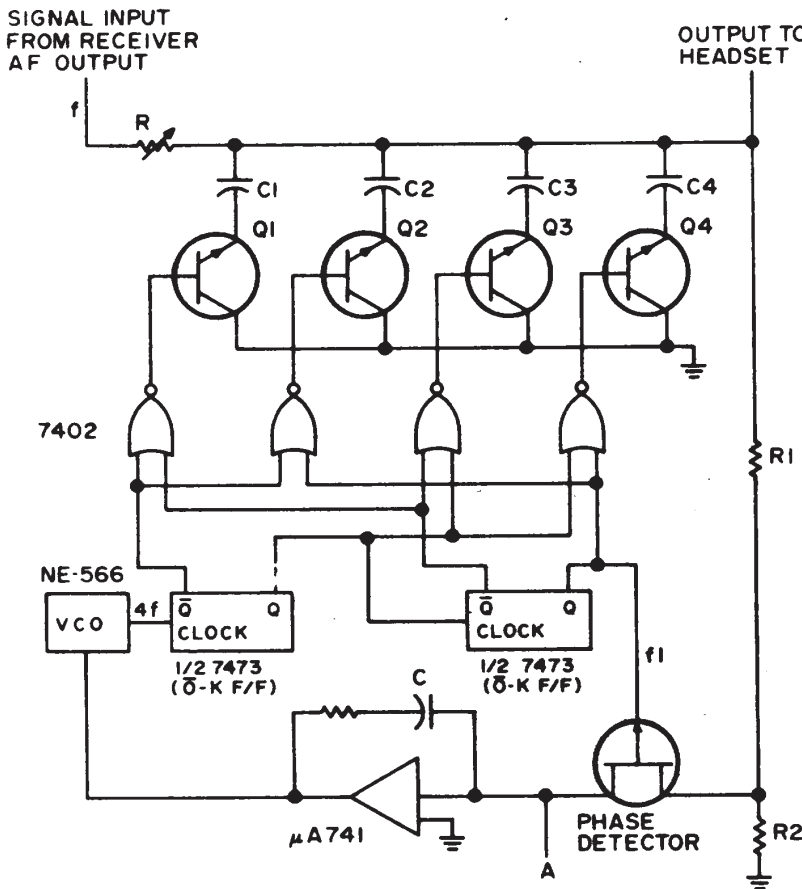
Fig. 4. Phase locked VCO to the input signal.

between the receiver af output and the headsets. A small amount of signal is picked off at the filter output by resistor network R1 and R2 and is compared to the flip flop divider output by the phase detector FET. The resultant difference dc roundtable QSO's Where the other stations may be on slightly different frequen-

The output low pass filter can also be" used to smooth the output shown in,Fig. 3, into a sine wave. An experimental unit was constructed and the results were excellent. This is the first CW filter I've, seen where the pass band can be made as narrow as desired without oscillationAt can be made narrow to a point where

the dots and dashes actuaily run together even at slow speeds. Perfect tuning is always maintained by the phase locked loop.

By **W2FSO from**
AUGUST 1974 73 MAGAZINE

Is Morse Code Dead?

(Continued from page 9)
The data from 1999 to 2002 may indicate a slight drop in CW activity, but the incomplete 2003 data may indicate a rebound. With over 50% of the activity being on CW, the CW activity is significantly above the estimated 40% level. Unfortunately, the data also shows that digital activity is almost non-existent.

17 Meters

The DX spot activity for the 17 meter band is shown in the graph. Note that there does not appear to be any long term trend and that activity on all modes has stayed fairly flat. However, for all years there has been more CW activity than SSB activity. The incomplete 2003 data may indicate an increase in the relative amount of CW activity, however, we will have to wait to see how the trend develops. With over 50% of the activity being on CW, the CW activity is significantly above the estimated 40% level. Unfortunately, the data also shows that digital activity is essentially non-existant.

The HAM and programming

(Continued from page 5)

plex and tricky to keep up-dated. But if you are writing for yourself and maybe a few others, it can be easily managed.

You can also write programs for Windows in VB and call routines written in C/C++ that have been placed into a DLL (Dynamic Link Library). This can provide small sized programs that run rings round professionally written C++ applications. Little wonder a lot of starting out professionals have written programs or applications this way.

Personally I am very much in favour of BASIC as it is easy to learn and use as well as debug on a current or last years PC.

Which operating system should I write programs for?

What processor are you going to write programs for? Do you know where and how the program is going to be used? These and other questions should be answered carefully with the original layout of the program done above. You could write a simple program for use by HAMs on your cell phone or PDA.

CP/M / Z80 - (Was I serious?) Well yes I was. There are a lot of 'junked' CP/M machines out there that are still in working order. The Z80/8080 processors don't need noisy cooling fans or much in the way of RFI screening either. There are zil-

lions of Z80 based modems as well that can do quite a bit in the way of processing. Not to mention most of the Nokia cell phones are based on the Z80.

Symbian (What's that?) Well its another operating system used in Cell phones. Take a look.

Linux/Unix - There are now a lot of programs written by amateurs for use on the Linux operating system. Most are free to use and free to download.

MS Windows - Quite a number of programs have been written by amateurs for use under the MS Windows operating system. Most are free but not all as the amateurs in question don't want to be amateur for the rest of their life. Writing the program shouldn't take you long but the learning of the operating system will take some time.

DOS - (Really?) Well again I am. MS DOS and other Disk Operating Systems are now available for little or no cost either second hand or 'thrown out' along with the hardware. Ask any thirty-plus HAM, you will probably find he has one in the garage that he used to use for Packet, RTTY or Morse.

[A search on google for 'programming' and 'how to' produced 68 million hits!]

Ok, where do I get started?

Some Links :-

www.programmingtutorials.com
www.cprogramming.com
www.accu.org/resources/public/terse/learn.htm

VB&JS Scripting
http://msdn.microsoft.com/library/default.asp?url=/library/en-us/dnanchor/html/scriptinga.asp

VB&JS Downloads
http://msdn.microsoft.com/library/default.asp?url=/library/en-us/dnanchor/html/scriptinga.asp

Pseudo code
www.estec.esa.nl/outreach/gatutor/pseudo_code.htm
userpages.wittenberg.edu/bshelburne/Comp150/Algorithms.htm

Pascal, Delphi & Kylix
www.devq.net/pascal/
bdn.borland.com/museum/
www.borland.com/delphi/
www.borland.com/kylix/

John Brock (Formerly ZS6BZF Nowadays 'PieRat') 2005-02-13

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Email: **zs6wrmail@mweb.co.za**
        [NEW EMAIL ADDRESS]

Bulletins (Sundays at ...)
11h15 Start call in of stations
11h30 Main bulletin start

Frequencies
439.000MHz 7.6MHz split
(West Rand Repeater)
145,625 MHz (West Rand Repeater)
 10,135 MHz (HF Relay)

Radio Amateurs do it with more frequency!

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West Rand members - we need your input!

To make this the best ham radio magazine in South Africa we need your input. Please submit articles, comments, suggestions etc.

Please send plain text with no formatting to the email address below.

In July 2003, we re-published an Anode Compendium on CD. It has the issues from July 2000 until June this year. This included the new Adobe reader. It has been updated, check with the chairman for details.
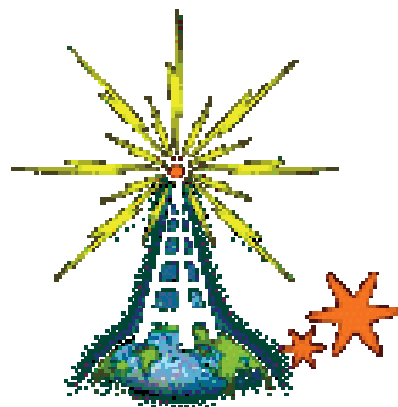
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