

# HAMS Keywite

November 2009

# NEWS

[www.marc.org.za](http://www.marc.org.za)

PO Box 1076, Hilton, 3245

## M I D L A N D S   A M A T E U R   R A D I O   C L U B



AFFILIATED TO  
THE SARL & IN  
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CARBINEERS

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### The Chairman's Ruminations

This year has certainly flashed by, and December is upon us and 2010 begins in a month, with the much awaited FIFA World Cup in June.

The club can look back on 2009 with a good sense of pride, with a revised constitution agreed at a Special General Meeting in September. Then in October we had 12 new members write and pass their ZU exams. It has been a long time since the club had members write the Radio Exams. Lets hope this is a new start for the club, I know that a number of new members wish to write their Class A exams next year and we will facilitate this effort.

Our repeater network has had its fare share of troubles with trip outs, and a lighting surge that destroyed the UHF repeater at Gilboa. We are able to replace this repeater and hope to have a replacement in by the end of the year. Next year we will continue to link up the various repeater sites and have good coverage of a large part of the Midlands.

It is reported that we have passed the minimum of the solar cycle and that solar cycle 24 has began, it has been a very slow start with very few sun spots produced during the year. There has been some activity in recent month but very little in the last week or two. Latest predictions are that this cycle will peak in May 2013. This date does seem to be a moving feast, as was the start of cycle 24 that was more than a year late. So 2010 should see and improving radio activity as bands open up over longer distances. So it's time to dust off the DX equipment and clean up the antenna systems. Opportunities are out there for those to try and call.

We have had a number of interesting meeting on various subjects and will continue to look for item of interest for members. The gathering at Midmar went off very well and Craig ZS5CD showed those there some ingenious ideas on methods and material for building a range of antennas. Thanks to Craig.

May I on behalf of the committee wish you all a very happy Christmas and a prosperous and rewarding 2010. I look forwarding to see you at our end of year gathering on the 5<sup>th</sup> December.

Enjoy the air waves.  
Mike ZS5 BGV

## Diary of Events

- 5 December    MARC year-end Christmas braai at the clubhouse. Meat will be provided by the club.  
 6 December    PEARS HF Contest  
 15-17 January  PEARS VHF/UHF Contest

<b>The M.A.R.C. Infrastructure</b>			
<b>Voice Repeaters (FM)</b>		<i>Visit <a href="http://www.marc.org.za/pages/freq.htm">www.marc.org.za/pages/freq.htm</a> for updates of this list</i>	
VHF	Tx	Rx	Equipment
Howick	145.6625MHz CTSS 88.5	145.0625 MHz	SCR200 20W, Diamond X-200 on rx and tx
Estcourt - off air	145.700 MHz	145.100 MHz	Emcom SA256 25W, Diamond X-200 on tx
Franklin - off air	145.725 MHz	145.125 MHz	GE MVP 10W - off air
Worlds View	145.750 MHz CTSS 88.5	145.150 MHz	Emcom SA256 25W, Diamond X-200 on rx and tx
Greytown	145.775 MHz	145.175 MHz	Home Brew @ 20w, Diamond X-200 on rx and tx
Underberg	145.7875MHz CTSS 88.5	145.1875MHz	Q8000 30W
Windy Hill	Will be taken over by Hamnet - off air		
<b>UHF</b>			
Mt Gilboa	439.225 MHz	431.625 MHz	General Electric MII, Diamond X-200 on rx and tx
Zwartberg	438.775 MHz CTSS 110.9	430.175 MHz	GE MVP 15W - off air
<b>APRS</b>			
The national APRS frequency is 144.800 MHz (Tx & Rx). The I-Gate is at ZR5S (Blackridge). Fixed stations should beacon at approximately 30min intervals with a path of WIDE5-5. Mobile stations should beacon at approximately 1min intervals with a path of WIDE5-5. We have aprs digi's throughout KZN. A PBBS (mailbox) is on ZS0PMB-1 for emergency use. A KA-NODE is on ZS0PMB-7			
<b>Packet Radio</b>			
Hilton	144.625 MHz (Tx & Rx)	AEA PK-88, Slim-Jim	
The PBBS (mailbox) is on ZS0HIL-1. The digi is on ZS0HIL-2. Use Winpack to connect to the PBBS and leave a message for someone.			
<b>ECHO-LINK "voip"</b>			
Our node number is 244279 Call Sign ZS5PMB. This Echo-link facility is available on the Midlands linked Repeater network.			
<b>E-QSO "voip"</b>			
We are in the "101ENGLISH" virtual room, on the "repeater.dns2go.com" server. This is linked to RF at Blackridge on 433.400 MHz simplex.			
<b>BEACONS</b>			
Hilton	50.321 MHz (Tx)	ZS5SIX FSK	
<b>WEB SITES</b>			
MARC'S very own website	<a href="http://www.marc.org.za">www.marc.org.za</a>		
SARL's website	<a href="http://www.sarl.org.za">www.sarl.org.za</a>		
HAMNET website	<a href="http://www.hamnetkzn.org.za">www.hamnetkzn.org.za</a>		

## Regular Events

### The KwaZulu Natal Net:

Starts at 06h00 on 7.055 MHz. in winter and 3.650Mhz in summer and continues until 07h40. Colin ZS5CF hosts the net from 06h00 & Gary Potgieter (ZS5NK)-takes over later on.

### MARC Sunday Morning Net:

Times: 07h45. Club bulletin is presented at 08h00 and the national bulletin at 08h30.

Frequencies:    HF:     3.620MHz  
                   VHF:    145.750, 145.6625, 145.775MHz  
                   UHF:    439.225MHz

**Hamnet Bulletins:**    Sundays at 07h00 on 145.625MHz and 3.670MHz  
                                   Wednesdays at 19h30 on 145.625MHz and 3.670MHz

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## Editor's Waffle

Some of us were reprimanded on our forum for using the term "on the side" - "(which side)". I use that term at times, and picked it up from other hams. From the reprimand I got the impression that the term might have originated from CB. But as my radio origins stem from the military and not from CB, I am unfamiliar with their terms except for a few like "10-4" and "good buddy", I went and asked Google. What emerged is quite interesting. It's origin is unclear but is used by some CB operators, but is also widely used by hams. It is obviously causing discontent to some, who say that terms like "I'll be listening" or "standing by" should rather be used. The latter is universally used, even outside the radio world, and seems to be generally accepted in the ham world. I found many arguments for and against both terms, they seem to fall into a grey area - questions can also be asked of the latter term, like "standing by what?"

What is clear though is that the obvious CB terms are not appreciated. Even our training manuals warn against this:

*"Don't say "Over" or (worse) "Over and out". That really pegs you as a beginner.  
Never ever say "good buddy" or "10-4" or any other CB jargon!"*

I suppose many of us fall into bad habits, like using 73's (best wishes), saying "over over" and "on the side", using Q codes on air, not leaving a pause between overs, especially when talking with Echolink operators etc etc. What is important is that we should lead by example by being courteous and by using good operating procedures - don't forget, there are many listeners out there. But don't lose focus - this is a hobby to be enjoyed by all.

Talking about hobbies to be enjoyed - it was absolutely fantastic hearing all our newly qualified hams on air this month. Our repeaters are alive again! May it continue! Congratulations to all our new members on passing their exams! Also well done to Shaun, ZU5DF and Farhaadh, ZU5FHR who were amongst the top 8 candidates who achieved 100% in the exams!



The past weekend at Midmar Dam was a huge success, once again. A couple of us camped there, some from Friday night already. We made well over 300 contacts on various bands during the weekend. Most of these were worked on Saturday, late into the night. The weather on Saturday was partly cloudy and mild, ensuring sunburns to those of us who did not wear hats. Craig, ZS5CD, gave a talk on antenna design, and displayed numerous diy antennas. The talk was well received and emphasised the importance of having good antennas, irrespective of what rigs were used. More importantly, it showed once again, how relatively easy it is to construct good antennas. Thanks Craig!

We had a good turn out of club members, despite the preceding wet weather. I counted 17 MARC members in total, plus a few visitors - Marjoke

(ZS5V) also had a turn at operating the radio on 20m. Highway was also well represented. Please visit our websites [www.marc.org.za](http://www.marc.org.za) and [www.harc.org.za](http://www.harc.org.za) for more photos of the weekend.

The setting was perfect with large trees. Craig strung his 40/80m dipole about 15m in the air between old trees, and this elevation ensured fantastic comms. My simple NVIS antenna connected to my Land Rover, compared well on 40m, but was pretty useless on 80m when compared to Craig's dipole. 20m on the NVIS was fine, and 59 signals were received from Cape Town. However, we struggled to find many stations on this band - most seemed to be bogged down on 40m. A handful of contacts were also made on 10m.

We are certainly looking forward to the next camping weekend, probably in March next year!

73 until next month.  
Mike, ZS5ML

## Morse Code (Compiled from various web sources)

When reading a recent email on our forum, discussing the origins of the word "ham", "lids" was mentioned, and morse code was typed in what looked like an incorrect format, I decided to look up some aspects of Morse Code. While I'm a "lid" or "ham" in the original sense of the word when it concerns Morse Code, I will list some interesting facts and claims about this form of communication.

Morse was invented by Samuel Finley Morse (1791-1872), an American painter and inventor. He built the first American telegraph around 1835. He patented a working telegraph machine in 1837. He used a dots-and-spaces code for the letters of the alphabet and the numbers. This code was later improved to use dots, dashes and spaces. Morse could send up to 10 words per minute by 1838. In 1843, he sent the first famous message on the telegraph line between Washington DC and Baltimore "What hath God wrought?". The telegraph revolutionised long distance communication. The "American" code was modified as a result of a conference in Berlin in 1851, standardising the code on a more rational basis, and spaces within letters were removed. It also provided accented letters for the other European languages. This code is known as the International Morse Code, and except for some minor changes in 1938, remained the same since its inception.

How did he come up with the codes? He used the principle that the commonest letters have the shortest codes. To find the most used letters, he went to his local newspaper. There he found compositors making up pages by hand from individual letters - the capital letters were in a case, set above the case of small letters. (btw, it is claimed that this is the origin of 'upper and lower case' letters). Morse simply counted the number of pieces of each type of letter, cleverly thinking that this must be related to the number needed. Hence 'e' has the shortest code, 'dit', and 'z' is 'da-da-di-dit' and 'q' 'da-da-di-dah'.

An interesting observation is that 'V' is 'di-di-di-dah', which is also the opening phrase of Beethoven's Fifth (V'th) Symphony. Morse was 20 years younger than Beethoven - was he a fan of the composer?

A review of the frequency of Morse code sounds within the 26-letter-English alphabet revealed the following:

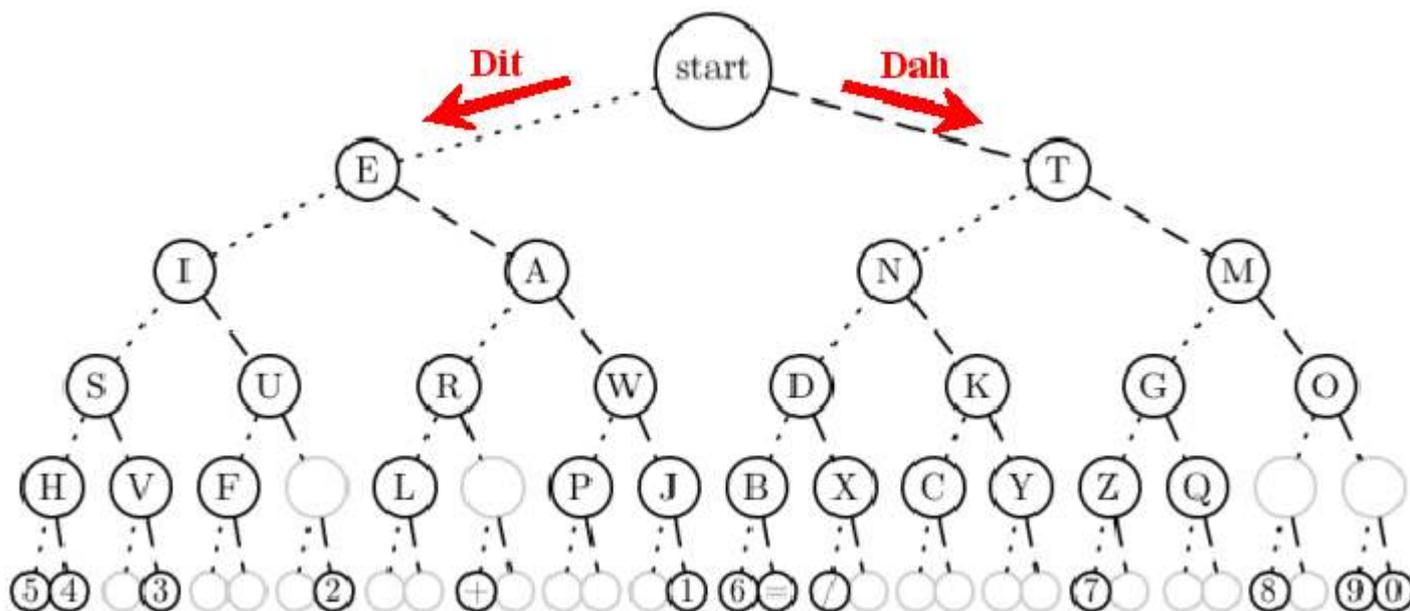
di sound 38.4%	(di has a short vowel sound as in the word di-lem-ma)
dit sound 17.4%	(the dit's only function is to end a character or letter)
da sound 30.2%	(the da is sounded within a character or letter)
dah sound 14.0%	(the dah sound ends a character or letter).

The International Morse Code was used in World War II and in the Korean and Vietnam wars. The shipping industry also used it extensively. Amateur Radio use only made up a small part of Morse Code usage, but prepared many hundreds of operators for military duty in communications. In the early 2000 most countries had dropped the ability to decipher Morse Code from the requirements for obtaining an amateur radio licence.

<b>A</b>	. -	<b>M</b>	--	<b>Y</b>	-. --	<b>period .</b>	.-.-.-
<b>B</b>	-...	<b>N</b>	-. .	<b>Z</b>	--..	<b>comma ,</b>	--..--
<b>C</b>	-. -. .	<b>O</b>	---	<b>1</b>	.-----	<b>?</b>	..-.-.
<b>D</b>	-..	<b>P</b>	.-.-.	<b>2</b>	..----	<b>-</b>	-.....-
<b>E</b>	.	<b>Q</b>	--.-	<b>3</b>	...--	<b>+</b>	.-.-.
<b>F</b>	...-.	<b>R</b>	.-.	<b>4</b>	....-	<b>/</b>	-.-.-.
<b>G</b>	--.	<b>S</b>	...	<b>5</b>	.....	<b>@</b>	.-.-.-.
<b>H</b>	....	<b>T</b>	-	<b>6</b>	-.....	<b>"</b>	.-.-.-.
<b>I</b>	..	<b>U</b>	..-	<b>7</b>	-----	<b>=</b>	-.-.-
<b>J</b>	.----	<b>V</b>	...-	<b>8</b>	-----.	<b>!</b>	-.-.-
<b>K</b>	-. -	<b>W</b>	.-.-	<b>9</b>	-----.	<b>:</b>	-----.
<b>L</b>	.-..	<b>X</b>	-.-.-	<b>0</b>	-----	<b>;</b>	-.-.-.

If you search the web you will find a multitude of web sites with programs promising that the above can be learnt in no time and that they will have you operational in no time. Yeah right, not at my age ..... di-di-di-dit di-dit

But there is a clever crib sheet available, which can be used if the morse code comes through extremely slowly. It is a dichotomic search, which operates by selecting between two distinct alternatives (dichotomies) at each step. When you hear a morse code, start in the centre, and for each dit move left and for each dah move right. eg, if you hear .-.-., you move left to E, then right to A, right again to W, and then left for the last dit. You end up at P.



One day maybe, I will still learn morse, not because of it's usefulness, but because of the challenge and possible fun aspect. At the moment there are more interesting projects to fill my limited free time.

**Where does SOS stem from?** It is commonly used to demonstrate Morse Code

The apparently well-known SOS distress call is not quite what it seems. Fancifully represented as 'Save Our Souls', it actually means no such thing. It isn't even SOS; it is a procedural signal, and the three dots - three dashes - three dots are sent as a single signal without the gaps that would be present if three separate letters were being sent. The distress call is

di-di-di-da-da-da-di-di-dit

and not

di-di-dit da-da-dah di-di-dit

The International use of the signal was proposed at the Second International Radio Telegraphic Convention in Berlin on November 3rd 1906; "SOS" had been part of the German Radio Regulations since April 1st 1905. The first Conference had been held in 1903, but the nature of procedural signals was not part of its remit. The 1906 Conference made the "SOS" signal obligatory from July 1st 1908.

Prior to the 1906 Conference there was no standard signal. Marconi operators used "CQD" from February 1904, the D being an extension to the standard CQ signal to signify distress. In 1906 the Navy suggested "NC", this being the equivalent flag signal, but by this time "SOS" was more or less in place.

Marconi operators were rather resistant to adopting "SOS" - one result was that distress signals from the Titanic were sent by its Marconi operators using both "CQD" and "SOS".

T	F )	th (
D	V )	TH (
P \	M )	R+vowel /
B \	N ) NG )	H 9 or 6
K —	SH )	S, Z o
G —	ZH )	
CH /	vowel+R )	S+vowel )
J /	L )	Z+vowel )
W ✓	Y ✓	

Above is an example of Pitmans shorthand, discussed in last month's HHN. Looking at that, I would prefer to rather learn Morse Code....

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**Build a 2 Meter, 5/4 Wave Antenna** By Mike Martell N1HFX  
 (with dimensions changed to metric)

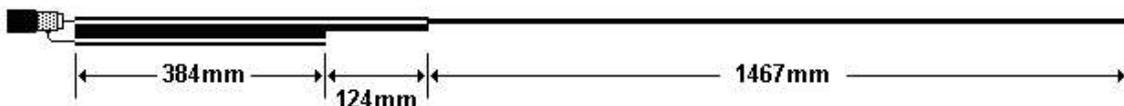
....I decided to build a 2 meter 5/4 wave antenna. This antenna is unique in that it is enclosed entirely in 20mm PVC which makes the design a little more complicated. The primary problem is that PVC tubing has a significant velocity factor which causes RF to slow down. This means that an antenna encased in PVC will normally need to have it's physical length reduced by about 19%. To further complicate the design, a 5/4 wave antenna's impedance has a highly inductive component which must be tuned out to get a good match. Fortunately, the design in Figure 1 solves all of these problems.

This antenna is made with the following components:

- About 600mm feet of outdoor type 300 ohm TV twin lead (Used for matching system.)
- About 1.5m of 1mm<sup>2</sup> stranded insulated wire (Used for radiating element.)
- About 1.5m of RG58/U coax
- One PL259 Connector
- One PL259 female to female coupler
- About 2.5m of 20mm PVC tubing.
- Two 20mm PVC end caps
- About 2.5m of 6mm hardwood dowel
- About 25 small tie wraps
- Miscellaneous PVC cement, solder, small piece of tubing, etc.

The twin lead was originally cut for 508mm with 124mm cut back on the braid or ground side. The 1mm<sup>2</sup> insulated wire was cut to exactly 1467mm. The overall length of the antenna assembly is 1975mm. This indicates a velocity factor of about .81 compared to a normal 5/4 wave 146 Mhz antenna. See calculation below:

$$(300/146 \times 5/4 \times .95) \times .81 = 1976\text{mm}$$



**Figure 1**

Now that we have all our parts, lets begin assembly by cutting back the insulation of the coax and the TV twin lead. We will need to cut back the coax to expose the center conductor as well as part of the braid. It is a good idea to lightly thin the braid with solder to prevent any strands from shorting out to the center conductor. Solder the center conductor to

one end of the twin lead and solder the braid to the other end of the twin lead as in Figure 1. Notice the braid of the coax is soldered to the shorter part of the twin lead which is left open. This serves as our matching system which adds capacitance to our antenna to offset the inductive component of the antenna. Trim the twin lead to 510mm and solder about 1525mm of 1mm<sup>2</sup> stranded wire to the twin lead as in Figure 1. The insulation should not be removed except as necessary for soldering.

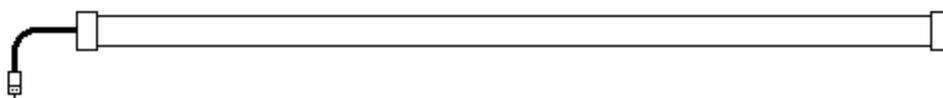
Prepare the 6mm hardwood dowel by joining two 1200mm or 1500mm lengths together. The ends can be joined by crimping a 25mm length of 8mm aluminum tubing or using a good quality wood glue. Now attach the coax, twin lead and wire assembly to the 6mm dowel using tie wraps about every 75mm. Pull the twin lead and wire to keep it as straight as possible. Before attaching the PL259 connector to the coax, drill a hole in one of the PVC end caps and slide it over the coax to prepare for permanent mounting in the PVC. Now attach the PL259 connector as well as any other connectors needed to check SWR. Cut back the open end of the twin lead to about 16 inches as in Figure 1.

Now we are ready for final tuning. Slide the antenna, dowel assembly inside the 20mm PVC first. All SWR readings must be taken with the antenna, dowel assembly inside the PVC tubing or the antenna will appear electrically shorter than necessary. Check SWR on both the top and bottom edge of the band. If the SWR is higher at 147.995 Mhz than at 144.005 Mhz then the antenna is too long and should be shortened. Cut off no more than 6mm at a time of the 1mm<sup>2</sup> wire. Also, trim the open end of the twin lead by no more than 3mm at a time to further lower SWR. Remember the twin lead is simply a matching system which changes impedance and has no real effect on the electrical length of the antenna. The final lengths of the 1mm<sup>2</sup> wire and twin lead should very closely resemble those listed in Figure 1. The prototype antenna achieved SWR readings of less than 1.2 to 1 across the entire 2 meter band. Remember to keep the antenna away from metal objects when checking SWR.

After the antenna is properly tuned, trim the antenna dowel assembly to about 2130mm. Leave a few inches of coax attached to the bottom of the dowel so that the mast will be away from the twin lead portion of the antenna when mounted. Trim the PVC tubing to about 2185mm and cement the top end cap. Double check SWR before cementing the bottom end cap. After SWR has been double checked, slide the antenna, dowel assembly into the PVC and cement the bottom end cap. If desired, styrofoam spacers may be used to get a very snug fit. Waterproof the bottom end cap where the coax leaves the antenna. When completed, the antenna should resemble Figure 2.

When mounting the antenna, use a PL259 female to female coupler. Do not use RG58/U for the entire feed line because it is too lossy. Use good quality RG8/U or similar coax for the feedline. Of course, do not forget to waterproof the female to female coupler. Mount to any mast using standard TV antenna clamps at the bottom of the antenna and keep it high and away from other metal objects for best performance and lowest SWR.

**Completed 5/4 Wave Antenna**



**Figure 2**

Although not actually measured, this antenna should give at least 6 dB gain if mounted high enough. Remember, the small diameter of the radiating element has no effect on the radiation resistance. The only real benefit with using a large diameter radiating element is durability and slightly improved bandwidth. This antenna should give many years of reliable performance for a fraction of the cost of a commercial antenna.

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### **Reminder re ICASA licences**

ICASA will be generating the renewal notices in the first week of December, and plans sending them out middle of December. The unchanged licence fee of R27 has to be paid before 31 January 2010. Rumour has it that it will be increased to R125pa in the near future.

If you do not receive a renewal notice, please check with Peter, ZS5PHL, ICASA - Dbn branch. Chances are good that they do not have your correct postal details. Hopefully it will not be due to non payment of your license for this last year, because then quite a bit more work will be required to get it reinstated. Please visit [http://www.sarl.org.za/forum/topic.asp?TOPIC\\_ID=4680](http://www.sarl.org.za/forum/topic.asp?TOPIC_ID=4680) for more detailed information.

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If you have any useful articles for this newsletter, please email them to [zs5ml@marc.org.za](mailto:zs5ml@marc.org.za) for publication. Any articles of interest to Amateur Radio, both technical and non technical, will be well received

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**Ham Bulletin Readers**

- 06 December - ZS5ML
- 13 December - ZS5BGV
- 20 December - ZS5CID
- 27 December - ZS5PJ

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**Tailpiece:** (an old one, found on the SARL forum)

Dear Sir

I am writing in response to your request for additional information for block number 3 of the accident reporting form. I put "poor planning" as the cause of my accident. You said in your letter that I should explain more fully and I trust the following detail will be sufficient.

I am an amateur radio operator and on the day of the accident, I was working alone on the top section of my new 80 foot tower. When I had completed my work, I discovered that I had, over the course of several trips up the tower, brought up about 300 pounds of tools and spare hardware. Rather than carry the now unneeded tools and material down by hand, I decided to lower the items down in a small barrel by using a pulley, which fortunately was attached to the gin pole at the top of the tower.

Securing the rope at ground level, I went to the top of the tower and loaded the tools and material into the barrel. Then I went back to the ground and untied the rope, holding it tightly to insure a slow decent of the 300 pounds of tools. You will note in block number 11 of the accident reporting form, that I weigh only 155 pounds.

Due to my surprise of being jerked off the ground so suddenly, I lost my presence of mind and forgot to let go of the rope. Needless to say, I proceeded at a rather rapid rate of speed up the side of the tower. In the vicinity of the 40 foot level, I met the barrel coming down. This explains my fractured skull and broken collarbone.

Slowed only slightly, I continued my rapid ascent, not stopping until the fingers of my right hand were two knuckles deep into the pulley. Fortunately, by this time, I had regained my presence of mind and was able to hold onto the rope in spite of my pain.

At approximately the same time, however, the barrel of tools hit the ground and the bottom fell out of the barrel. Devoid of the weight of the tools, the barrel now weighed approximately 20 pounds. I refer you again to my weight in block number 11. As you might imagine, I began a rapid descent down the side of the tower.

In the vicinity of the 40 foot level, I met the barrel coming up. This accounts for the two fractured ankles and the lacerations of my legs and lower body. The encounter with the barrel slowed me enough to lessen my injuries when I fell onto the pile of tools and fortunately, only three vertebrae were cracked.

I am sorry to report, however, that as I lay there on the tools, in pain, unable to stand and watching the empty barrel 80 feet above me... I again lost my presence of mind. I let go of the rope.

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