



Mid Sussex Amateur Radio Society  
NEWSLETTER  
March/April 2009

# Mid Sussex Matters



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## FROM THE PRESIDENT'S CORNER

Another month gone by and still the cycle refuses to show an upturn. There is muttering on the bands that we're never going to see good conditions again and Amateur Radio will be confined to repeaters, computers and D Star, but don't you believe it. The good times will return and every band will be full of stations waiting to work you.

In the meantime, spruce up your antennas and make sure that the rest of your station is working properly. It's all too easy to assume that just because it's all in a box and you think that it worked last time out, that it'll work when you really want to use it again.

The good signs are the number of newly licensed amateurs joining the Society and the keenness they express to get on the air. Help them all you can - you were newly licensed once yourself.

On my part, I'm still making antennas out of the junk box for myself, and will make one for you if you ask me. Remember, you don't need thousands of pounds to get on the air and enjoy yourselves, and half the fun is trying to do it for nothing and being surprised when it all works for you.

Keep listening, and get onto one or two of MSARS nets when you can.

**Ken Gibson G3WYN**

### ***On the Cover....***

The new Mid Sussex Matters editorial team: Luke Milburn 2E0ZLM and Eric Willox M0BKX

## ***From the Chair***

Nearly into April and still no meaningful sunspot activity! But all is not gloom and doom - MSARS has some very positive high spots to remember, in particular Phil Godbolds (G4UDU) excellent lecture on contesting in January and Don Fields (G3XTT) enthralling talk in February about his DXexpeditioning experiences.

This will be the last edition of Mid Sussex Matters that Bob Clinton (G0BUX) will be editing. Bob has fulfilled the role of Editor for the past two years and is going to be a very hard act to follow and I would like to thank Bob very much indeed, on your behalf, for all of his excellent work in producing what is, by any standards, a splendid house magazine.

In future, the Editorship will be a joint effort by Eric Willox M0BKC and Luke Milburn 2E0ZLM and, knowing them both, I am sure that they will maintain the very high standards that have been set by Bob, although I have to caution that they will only be able to do this if they are provided with sufficient good copy from you - the members. So PLEASE do write short accounts of your radio interests and activities and help Eric and Luke to produce the magazine regularly. I really must thank both Eric and Luke very much for being prepared to take on this very important job for the Society. You will find a photo of the new editorial team on the cover of this edition.

I also want to thank Jacqui Moore 2E0FQV very much for finding the charming photo of our late member Richard Sharman G4YCN and having it framed and mounted as a present to Janet, Richard's widow, on behalf of MSARS. Jacqui and Mike Pollock visited Janet Sharman at her home recently and presented her with the picture of Richard and some flowers on behalf of us all. Janet was delighted with these gifts and a photo of her with them will be found on page 11.

Finally, please may I thank the Committee for all that they do on behalf of the society and for their support to me personally.

**Gavin Keegan G6DGK**

# Editorial

As most readers will already know, this is my last issue as editor of Mid Sussex Matters. It was almost exactly two years ago that I volunteered to take on the job and since then I have produced 20 issues. Or I should say, WE have produced 20 issues because I could never have done the job on my own. During this period I have worked with three Chairmen and one President and each one has been prompt and conscientious in getting his regular contributions to me. Thank you Kim, Russell, Gavin and Ken, for your continuous support. I have felt that the newsletter has maintained a high standard of grammar, spelling, punctuation and accuracy – this is primarily because of the efforts of the proofreaders, Roger Ferrand G7VBR and my XYL Brenda Hopkin. Although filling 16 pages sometimes seemed like a struggle, there always seemed to be just enough articles, owing the literary skills of a large number of contributors. I won't try to list everyone who wrote an article but I do want to mention Chris Saunders G4ZCS who could always be counted on for his excellent series of relevant and well-written technical articles. But everyone in the club helped, with ideas, suggestions, articles and most of all, encouragement and support.

It has been an honour to have been given the responsibility for the newsletter of a radio society with as long and rich a tradition as MSARS, but I feel that the time has come for me to turn over the job to others. There are a number of things that I want to get done before the relentless march of years overtakes me completely, but, more important, I think that the newsletter will benefit from a fresh set of fingers at the keyboard. As many of you know, Eric Willox M0BKX and Luke Milburn 2E0ZLM are taking over as joint editors. I am sure that all of you will give them the same level of help and support that you have given me.

I am leaving as editor but I am not leaving MSARS. I will see you at meetings and outside events and talk to you on the air – more often, I hope, than I have in the past. And who knows – I may even some evening see some of you at the fox's lair, without having to open the brown envelope.

**Bob Clinton GØBUX**

## External Events News

The club meeting on Friday 20 March included a lively discussion of external events, with emphasis on Mills Weekend (9-10 May) and VHF NFD (4-5 July).

Our traditional site for Mills Weekend has been Jill Mill at Clayton but we have not been able to operate there for the past two years because of repairs to the windmill. This year the administrators of the mill are happy for us to operate there but the station would have to be dismantled on Saturday evening and re-erected on Sunday morning. An alternative is Shermanbury Place, the QTH of William Greenwell M3VRE who has kindly offered the site for the event. The tentative conclusion reached at the meeting was to operate VHF for one day at Jill Mill and HF on both days at Shermanbury. So that the External Events Team can reach a final decision please email your views to Kim Newland G7AIE at [kim.newland@o2.co.uk](mailto:kim.newland@o2.co.uk).



G7AIE demonstrates HF operation to an attentive audience at the 13 March meeting.

For more details on the possibilities for Mills Weekend, see Kim's article on page 10.

We have had a request from Worthing & District Amateur Radio Club to join us for VHF NFD. It was agreed in principle that they would become honorary members of MSARS for the weekend, be under MSARS rules and decisions and count towards any totals we may achieve with our callsign. WDARC have offered to repay our hospitality by inviting MSARS to join them for the HF SSB weekend in late September. Their station is at High-down, just west of Worthing on the A259.

To help the club get ready for this year's events Kim and Rob Ashman 2E0RJA held a hands-on familiarization session at the meeting on 13 March, concentrating on the HF rigs the club will deploy for events.

## **CONNECTIONS BETWEEN MODERN TRANSCEIVERS AND VALVE LINEAR AMPLIFIERS**

One of the problems with the manufacturers of today's state of the art HF equipment is they imagine that having created their latest super model, everyone is going to rush out and replace all their existing gear and purchase a completely new line up of transceiver, linear amp and auto ATU complete with all the necessary interconnecting cables.

Well, of course not all of us do that but rather, after much soul searching, splash out on the latest transceiver, bring it home and put it on the air as soon as possible. The next step is to link it to our valved linear amplifier that has been giving excellent service for years, with the cables that worked for the old transceiver and press the mike switch. This could be an expensive mistake, indicated by the magic smoke that keeps our equipment alive leaking out of the back of the new transceiver with a costly repair bill to follow.

The reason for this is that manufacturers imagine that no one will be using old fashioned valved linears and will have replaced them with modern solid state models. Many "old fashioned" linears have amplifier control relay circuits that require a high current to operate them, whilst modern linears have more modest requirements and the switching transistor in the matching transceiver is designed to suit. It might not however sink the current demanded by that big warm box of yours over in the corner and once you find out it might be too late!

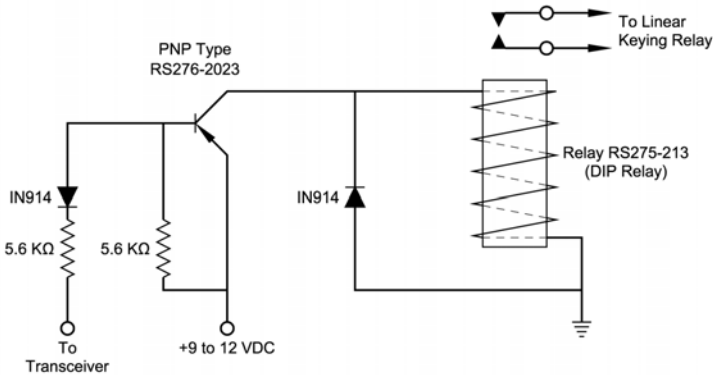
This conflict arose when I needed to connect my new Yaesu FT-950 to my (2 year old) valved linear and realized that I might have a problem. After some discussion with the engineers at the emporium involved I persuaded them to make me up a special interconnecting lead incorporating a mechanical relay that would carry the current involved and this is now coping well.

David Littlewood W1GN, a member of my 15m net, was impressed by my praise of my new 950, and rather than upgrade his old transceiver, traded it in for a 950. He had a trick up his sleeve though and made up a circuit which he had used before to overcome the problem described above.

Here then is a copy of the circuit, neatly drawn up by Tom Haylock M0ZSA from a sketch by David, from which you will see that a few standard parts might well save you an expensive repair in the future.

There have been four amateurs involved in bringing this solution to you but there is always a solution to any problem that you might encounter in amateur radio. So if you are not sure that what you are about to do is going to work, talk to another MSARS member about it first.

**W1GN Linear Keying Circuit :**  
**Designed by W1QWJ (SK)**  
**In use since 1988**



**NOTES:**

- I Use a 9V Battery
- RS = Radio Shack Part Numbers
- I use a PNP Type 2N 3094
- Ground or "O" Volts from transceiver causes PNP "xistor" to conduct and thus activate the dip relay, uses dry contacts rated at about 1Amp.

**Ken Gibson G3WYN**

*The W1GN interface is well within the construction capabilities of most hams, but if you would prefer an off-the-shelf alternative, have a look at the Ameritron ARB-704, available from Waters & Stanton for just under £70. I have been using one for a year to connect my reasonably modern solid-state Icom 706 to my ancient Drake L-4B linear. No smoke so far.*

**Bob Clinton G0BUX**

# Microphones and PTT systems

In preparing my series of articles on radios, I realised that there is a gap between the information provided in operator's manuals and the systems actually engineered by some manufacturers of radios. For speech communication (this article does not specifically cover CW or data modes), a radio needs two operator inputs: first a source of audio and second a transmit command.

## Audio input

The microphone element can be found in four possible configurations, the fist mic, the desk top mic, the head set and the built-in mic. All perform the same function: collecting sound energy and converting it to an electrical signal for passing on to the input circuits of the transmitter section of the radio. The elements tend to be one of three general types: the old carbon pile type, the modern dynamic type and the electret type.

Generally there are few problems matching microphones to radios, but there can occasionally be some, so never assume that because the badge on the mic matches that on the radio all is well.

In looking at the audio response figures for both microphones and radios the audio bandwidth will be somewhere between 0 Hz and 20 KHz. For normal SSB use a response between 300 and 2600 Hz is adequate. If you are experimenting with higher quality modes then a studio mic with a response of 30 to 20,000 Hz will be needed. A check of the response curve graphs of the mic and the radio might help, if they are published. These will help when setting up menu choices for speech quality on transmit.

## The PTT function

PTT, short for "Push to Talk", is the command to the radio to transmit. Most systems require only a switch connecting a PTT wire to a ground wire, but there can be complications.

First I will deal briefly with the VOX function. This is a marvellous aid in certain circumstances, and replaces the PTT function altogether. It operates on the principle that the mic is live all the time and, if the volume of what it hears rises above a set level, the circuitry assumes that the operator wants to transmit and turns the radio to transmit. All other PTT functions rely on a switch somewhere. The fist mic has one built in which is usually is on the side, (photo 1). The inbuilt mic relies on a button somewhere on the body



of the radio. Even large base stations usually have a PTT button somewhere on the front panel. The head set (photo 2) does not have a PTT switch and therefore relies on a switch somewhere else.

I use a range of switches depending on what I want at the time. These are shown in photo 3. The foot switch comes in “momentary” or “latching”; I prefer the momentary one. Then there is the weather man’s push button, in which the switch is set into the end of a hand held wand. My favourite is the lever switch. This example is from a NATO head set system used by fighter airmen and was originally designed to be strapped to the knee pad of a flight suit. It uses a spring loaded magnet passing over a sealed magnetic sensitive reed switch, and is probably the best of all for reliability.



### Complications and problems

Some common problems are:

Leaving the VOX level too low, so that any noise in the room sets the radio to transmit (listen for dogs barking and phone bells ringing on 20 Metres).

Not checking the voltage on PTT lines. This may happen when using an older linear amplifier, where the PTT line is connected from the radio to the amp as well as to the microphone. Some old amps use high voltage on the PTT lines, risking damage to the radio or the operator. It is always worth checking the manuals and double checking with a meter to see if the PTT line is “LIVE” and, if so, what open circuit voltage might be present.

*(Continued on page 10)*

## **MILLS ON THE AIR**

Further to my talk on Friday 20 March, here is a run-down of the ideas floating about regarding Mills weekend.

Firstly, we have been invited back to Jack and Jill Mills. Also, we are invited back to Shermanbury Water Mill. So what do we do? In an ideal world we could simply operate from both sites and have jolly good fun doing it. However, this is the real world and there are always obstacles in the way, namely the number of volunteers we get for any event that the society puts on. When I started writing this article I had only three people come forward so, needless to say, the idea of operating from both sites had gone straight out of the window.

Or had it? Another idea was that we operate over the weekend on HF from Shermanbury; we can leave the aerals up and all the kit can be left on site along with a night watchman. We can then operate from J&J either Saturday or Sunday on VHF; as we know, this is a very good VHF site requiring very little equipment up on the hill for the day. As I'm sure many of you will remember one of the main problems with J&J was we had to remove all kit over night and re-assemble it the next day. In addition, the area which we operated from has become smaller and smaller over the years (because of the rare flowers/grass/weeds). At Shermanbury we are more or less our own boss.

But, after a slow start, we now have eleven volunteers, so we will be able to operate from both sites (although only at J&J on the Sunday). My thanks to all of those who have volunteered. More is always better so if you are able to turn out for the event, please email me at [kim.newland@o2.co.uk](mailto:kim.newland@o2.co.uk).

**Kim Newland G7AIE**

*(Continued from page 9)*

### **Conclusions**

There are probably as many combinations of microphone, radio and PTT switch as there are amateurs using them. The choice of combination is yours and should be considered carefully before purchasing any expensive item.

**Chris Saunders G4ZCS**

## Presentation to Janet Sharman



In the last issue we reported the loss of our friend Richard Sharman G4YCN. Earlier this month Jacqui Moore 2E0FQV and Mike Pollock G8KMP visited Richard's widow Janet to present her with a bouquet and a framed picture of Richard which Jacqui had produced.

## MFJ-4416 Battery Booster

A few days after my article on battery accessories appeared in the November/December issue, the MFJ-4416 battery booster that I had ordered was delivered. I have been using it almost since the day it arrived and I can now give you a first hand report.

The most concise report I can provide is “it works”. That is, it delivers a constant voltage despite declining voltage from the battery to which it is attached. What that output voltage is is determined by the setting of an internal potentiometer. I have just left it at the factory default setting of 13.8



volts. Another factory setting is the minimum input voltage which is set to 10 volts, and I have also elected to stay with that one too. Other options are 9 and 11 volts.

There are two different ways to connect the input battery and the output load. My preferred method is to use the Anderson PowerPole connectors, but if you don't use these connectors there are pairs of binding posts available.

The booster installed in the boot. It's upside down to shorten the output cable run.

the circuit board, there is only one control on the unit: an Enable/Disable push switch. When in the Enable position the unit will provide the selected output voltage constantly. If the button is out – i.e., in the Disable position, the unit will only boost when it senses RF from a transmitter – a point I will come on to in a minute. This button has caused the only difficulties I have had with the booster. On a couple of occasions passing gremlins put it in the Disable position and my D710 started complaining about insufficient voltage. Fortunately Enable is the pushed in position so a piece of tape has solved the problem.

Apart from the voltage adjustment pot and some jumpers on

I would think the RF sense feature would be of little value to most users, and for me it is of none. There is an SO-239 jack on one side of the case to which a sample of the RF output of a transmitter may be attached. The idea is that the output voltage will only be boosted when the transmitter being supplied is keyed. But since I have two different transmitters in the car, and

want to power other equipment as well, I don't expect to use this feature.

In my previous article I said that there was a cost to boosting and I have now been able to measure the cost of the "free lunch". The documentation states that the efficiency of a booster set for 13.8 volt output is 90 – 92%. What this means in useful terms is that with no load, the booster draws about 40 ma in Enabled mode and 20 ma in Disabled mode. Not a huge cost, but given enough time it could flatten your battery. While doing this test I also used a variable DC power supply to confirm that I could still get 13.8 volts out with as little as about 10.5 volts in.

I have my booster mounted in the boot of the car since I use it with auxiliary batteries carried in that compartment. The booster will emit a warning tone when the input voltage drops to the minimum value, but since it is in the boot, I can't hear it. I can't yet decide if this is an advantage or disadvantage.

**Bob Clinton G0BUX**

## **RSGB Club Calls 160M Contest 2008**

Members may recall that MSARS entered a team of three for this contest towards the end of 2008, using our cherished callsign of G5RV.

I hope that you will all be pleased to hear that we came 52<sup>nd</sup> out of a total entry of 94 entries and earned 736 points. Unfortunately, we were only credited with 43 contacts whereas we claimed 51. Overall, Bob Clinton, Mike Pollock and I feel that we acquitted ourselves and MSARS quite well for a first attempt.

**Gavin Keegan G6DGK**

## Mid Sussex Happenings

27 Mar	Surplus Equipment Sale (U)
3 Apr	Radio Night (D)
10 Apr	No meeting (Good Friday)
17 Apr	Radio Night and Table top Sale (D)
24 Apr	Fox Hunt
1 May	Short Talk by Gavin and a birthday drink (D)
9-10 May	Mills Weekend
8 May	Radio Night (D)
4-5 July	VHF NFD
5-6 Sep	SSB NFD

Meetings are held on Friday evenings starting 7:45 at Cyprus Hall, Cyprus Road, Burgess Hill. West Sussex, unless otherwise noted. U=upstairs, D=Downstairs

**Visitors are always Welcome**

### CLUB NET TIMES

**Join in if you can. All times are UK CLOCK times.**

<b>Sunday</b>	<b>08:00</b>	<b>3.74MHz ± QRM</b>
<b>Sunday</b>	<b>11:00</b>	<b>S14 (145.350MHz)</b>
<b>Sunday</b>	<b>20.00</b>	<b>HY Net 433.125Mhz</b>
<b>Wednesday</b>	<b>20:00</b>	<b>S14 (145.350MHz)</b>
<b>Weekdays</b>	<b>13:30</b>	<b>21.330MHz. Work the USA</b>
<b>Tuesday</b>	<b>20:30</b>	<b>3.725 MHz ± QRM SCARF</b>

### Deadline

The deadline for items for the May issue of Mid Sussex Matters is

**15 April 2009**

## *Membership Renewal Reminder*

The Society Constitution says that subscriptions must be paid no later than 31 March each year, so if you haven't paid yours for 2009 yet, it is not too late to do so. Subscriptions are still £35 (£25 conc.) this year. Please contact Mike Pollock G8KMP for a renewal membership form. E-mail address is: [mike.g8kmp@virgin.net](mailto:mike.g8kmp@virgin.net) or you can write to him at: 25 Meadow Lane, Burgess Hill, West Sussex RH15 9HZ

## **Members' Adverts**

In order to make room in my shack I am selling my Drake vintage equipment.

Items included are:

L-4B Linear Amplifier  
MN-2000 Antenna Tuner  
R-4C Receiver  
T-4X Transmitter  
MS-4 Speaker

Everything is clean and in working order with the exception of the T-4X which is complete but needs some work to get it on the air. Manuals are provided for all items.

Based on recent eBay selling prices and the current rate of exchange I believe a reasonable price for the lot is £1,050. However before listing this equipment on eBay I am offering it to MSARS members for £950. I will include an extra 3-500Z for the L-4B and a Shure 444 microphone in the package. Free delivery in the Southeast of England.

Offers for individual items will be considered but I would prefer to sell all items as a package.

Email your interest to [rhclinton@tiscali.co.uk](mailto:rhclinton@tiscali.co.uk)

Bob Clinton G0BUX

## Mid Sussex Amateur Radio Society

President	Ken Gibson	G3WYN	01444 412420
Vice President	Mike Pollock	G8KMP	01444 244953
Chairman	Gavin Keegan	G6DGK	01825 722045
Vice Chairman	Alan Cragg	G8YKV	01273 844511
Secretary	Mark Tickner	M3XHZ	
Treasurer	Stella Rogers	SWL	01273 844511
Programme Secretary	Sue Davis	G6YPY	01273 845103
Shack Manager	Alan Cragg	G8YKV	01273 844511
Committee	Rob Ashman	2E0RJA	01444 232129
Committee	Jacqui Moore	2E0FQV	
Committee	Phil Brown	M5BTB	01444 235826
Licence Holders	Chris Cook (G1ZMS, G3ZMS) Gavin Keegan (G5RV)		
Examiners of Accounts	Roger Ferrand G7VBR, Tony Finch G3XQM		
Reserve Examiners	Mike Munday G1TDL, Chris Saunders G4ZCS		

**Club Web Site: [www.msars.org.uk](http://www.msars.org.uk)**

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### **Newsletter**

Contributions are invited from all club members. The cut off date is the 15th of the month prior to publication.

**Address all contributions to the editors:-**

**Luke Milburn 2E0ZLM and Eric Willox M0BKX**

**Email: [m.s.matters@btinternet.com](mailto:m.s.matters@btinternet.com)**

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**7-9 Newhouse Business Centre**

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**Tel: 01293 851053**

**Email: [mike.webb@printedword.co.uk](mailto:mike.webb@printedword.co.uk)**

**FAX: 01293 851900**