SURREY RADIO CONTACT CLUB

OCTOBER 2005 – No: 757

CLUB NET	1.905 MHz	Sunday **9:30am**
CLUB NET	144.325 MHz	Friday 8:30pm
CLUB NET	145.500 MHz and Down	Thursday 7.00pm

CLUB Internet WEB Site:
http://www.g3src.org.uk

Hon. Sec. Ray Howell/s G4FFY
9 Aultone Way
SUTTON
Surrey SM1 3LD
(020) 8644 7589
E-Mail: secretary@g3src.org.uk

MONTHLY MEETINGS 1ST AND 3RD MONDAYS 7.45 FOR 8pm
Normally AT THE T.S. TERRA NOVA, 34 THE WALDRONS, SOUTH CROYDON, CR0 4AZ

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"A" MEETING 3rd Oct 2005 Autumn SURPLUS EQUIPMENT SALE
"B" MEETING 17th Oct 2005 FIX-IT, ADVICE, CHIN-WAG, CLUB STATION **+ "MOVE-IT-ON"**

Chairman	G4XAT Gareth Evans	020-8462 2837
Vice-Chairman	G4WAY Roger Holyoake	020-8689 7089
Treasurer, Liaison & Equipment	G4DDY Maurice Fagg	020-8669 1480
Secretary, Membership & Communications	G4FFY Ray Howells	020-8644 7589
VHF Co-ordinator (Co-Opted)	G8IYS John Simkins	020-8657 0454
Publicity & HF Co-ordinator	M1MRS Robert Shepperley	020-8687 0811
Club Meetings	G4FDN Pat McGuinness	020-8643 0491
Members	G3RJW Graham Marshall	020-8669 8722
	G8TB Bernie Wynn	020-8660 7517

Dear Members & Friends

Hello and welcome to October 2005 newsletter and I start with the news that your scribe has been given a date for the Prostate surgery of 18th October. It is planned that I will be admitted to Vernon Ward, St. Georges, Tooting, on Monday 17th October, operation on the Tuesday, and sent home on the Saturday. I then will be convalescing for some 8-weeks and probably won't be fully functioning until the new-year.

Right to business - the SRCC meetings this month start with the "A" meeting on Monday 3rd October when we welcome Bernie G8TB and Maurice G4DDY as your auctioneers for the Autumn Surplus Equipment Sale; with the "B" meeting on Monday 17th October.

NEXT "A" MEETING: Monday 3rd Oct 2005
Autumn Surplus Equipment Sale

We hope there will be a good turnout for this **Autumn Sale**, when members can bring along items for sale and also items to be donated to the club. It is very helpful, as in the past, for sellers to be in the clubroom well before 8 o'clock, and no boxes of "rubbish" please. All members and visitors they have brought along must sign the attendance book and all must be conversant with the rules.

Note that the club accepts no responsibility for goods sold at this private sale, and the purchasers buy on the understanding that they are capable of determining the usability, fitness for purpose and SAFETY of goods obtained. The following also applies:

1. Only SRCC members are permitted to sell.
2. All items not donated must be marked with the name or Callsign of vendor, brief description and details of any reserve price.
3. Bids should be in steps of 5p up to £1 and 25p thereafter.
4. Visitors are welcome but must be introduced by a member who is responsible for informing them of the rules.
5. All members and VISITORS must sign the attendance book.
6. Sellers will not be paid until all buyers have settled up.
7. The club levies 15% on all transactions.
8. Please try and arrive early to allow start by 8 o' c.
9. *PLEASE KEEP THE DOORWAY CLEAR FOR FIRE PRECAUTIONS.*
10. Meeting room now has a NO-SMOKING policy - thank you for adhering to this.

It has been mention that this may well be your last chance to save some regular items from the "skip" – good homes are being sought!!

NEXT "B" MEETING: Monday 17th Oct 2005
FIX-IT, Advice, Chin-Wag & "MOVE-IT-ON"

The "B" meeting on Monday 17th Oct is the regular "Fix-It" and advice evening with the extra twist. If you have a radio item or anything else that you just wish to clear out then bring it along - you never know it may be just what another member is looking for!

The Fix-It section has proved very interesting and successful so please bring along that item that has been giving you grief - the collective heads at the meeting usually come up with something.

LAST "A" MEETING: Monday 1st August Defence of the UK from Enemy Bombers – John Downs – Part2: RADAR Development

Development of Radar:

Radar was initially called Radio Direction Finding (RDF) and John Downs highlighted how close we came to being almost totally defenceless in 1939.

Scientists had been experimenting with the properties of electro-magnetic power for some time with experiments in England, France, Russia, America and Germany. A leading scientist in England called Robert Watson-Watt had noticed that aircraft caused some interference when he was carrying out tests on the effects of electro-magnetic transmissions on the Ionosphere and has written as such to a number of committees. However the decision to investigate these facts further came through the back door.

Over the years many suggestions had been made for the destruction of enemy aircraft including:

- A steel curtain suspended from barrage balloons tethered at 35,000 feet,
- The firing of steel spiders webs in front of approaching aircraft,
- The dropping of bombs that were suspended on parachutes in front of the enemy formation

These suggestions may seem laughable to us now but they were possibly feasible at that time as aircraft speeds were so slow. We should remember that in just a few years time a scientist would be asking us to believe that he could bounce bombs on water.

One recurring proposal for an anti-aircraft weapon was for the use of concentrated, high energy transmissions – in other words the Death ray. In the 1920s the Air Ministry was inundated with claims from inventors that they could kill rabbits as short distances but they wouldn't reveal any details.

The Ministry managed to defer these proposals by offering a £1000 reward for the inventor who could demonstrate killing a sheep at 1000 yards. It was reported that the mortality rate of sheep was not affected by this offer.

The conclusion reached was that the Death Ray project was quite impracticable, but suggestions that re-radiation of electro-magnetic waves might be used to detect aircraft. A demonstration was called by Wimperis of the Ministry for prior to funds being forthcoming. On 26th February 1935 at 9.45am in a field near the village of Weedon, not far from Daventry, a simple receiver aerial was setup by Watson-Watt and his team, and they awaited the arrival of a Heyford Bomber which was to fly over the BBC Transmitter and then towards London. The aircraft was tracked for only a maximum distance of 8-miles, but given the primitive nature of the equipment used this was a small triumph.

On 13th Apr 1935 the Treasury approved £12,300 to establish a research facility at Orfordness which later moved to Bawdsey in Suffolk – the place considered to be the home of Radar.

Fighter Control:

Whilst the development of the early warning device was proceeding, during air defence exercises in the 1920s it became apparent that unless some control of the fighters could be devised, the defence against bombers still left a lot to be desired.

Early signs were not good, on some night raids the bombers were ordered to leave their navigation lights on ostensibly for flight safety reasons and in bad weather no flights took place at all. If the fighters were on patrol above cloud and the bombers flew below cloud nothing could be done. In fact in the Air Defence exercise of 1934, even though the routes and targets of the bombers were known in advance over half reached their target without opposition.

So what about communications, during WW1 it was almost impossible to communicate with aircraft from the ground. By 1932 Radio Telephones were fitted but of doubtful reliability with a range of only 35 miles ground to air and 5 miles air to air.

However direction finding was possible which gave the bearing of the fighter from the receiving station when a transmission took place from the aircraft - useful in adverse weather.

In March 1936 it was decided that HF DF stations should be situated at all sector airfields for homing purposes, the combined information from 2 or 3 of these stations could give a fix. In August 1936 training exercises were carried out at Biggin Hill in which the combination of simulated radar information and real fighter fixing was used to practice controlled interception of enemy raids. Precise interception was not sought, only to put the fighters 5 miles ahead of the raid and then keep a good lookout.

This required complex formulas and a specialist navigation officer was attached to bomber command. Several interceptions wee lost whilst the formula was being calculated and eventually frustrated sector controllers simply measured the angles by eye. It became clear the promptness was more important than accuracy.

The pieces were slotting together and by the spring of 1937 providing the positions of bombers could be provided at one minute intervals and correct to 2 miles, it was possible to direct fighters to within 3 miles of bombing raids.

Initially to obtain a fix the fighter had to press his transmit button for a period, but later a system was devised for one aircraft in a section to transmit for 15secs in a minute by setting up a connection from the aircraft clock to the transmitter. This system was known as Pip Squeak and was used throughout the Battle of Britain and beyond.

Radar Arrives:

Throughout 1936 the development of radar was continued at Bawdsey under the control of Robert Watson-Watt. The program went from the research to development stage with the decision to build a chain of sites around the south coast. The first station was operational at Bawdsey in May 1937, followed by Dover in the July. Five more stations were opened by July 1938 and 54 by July 1940 and by the September 76 stations were operational completing the chain.

As the threat of war rumbled on, the Air Defence system was put on continuous watch from 7th April 1939 and exercises continued to fine tune the whole system. In fact it wasn't until the last Air Defence exercise in summer of 1939 that the powers that be felt that they had a working system.

Radar operators training was an issue as the estimated number required kept increasing as the number of stations became operational – from 450 in Nov 1938 to 1,200 in Apr 1939. All initial training was at Bawdsey on a course that lasted 6-weeks.

It was suggested that women could be employed and two secretaries from Bawdsey were selected as guinea pigs. This idea proved very successful and in the summer of 1939 a group of some of the earliest recruits for the WAAF were sent to Bawdsey for training. The first WAAF watch crew went operational in Oct 1939.

The Germans were showing great interest in these new structures that were going up around our coasts and the Lufthansa flights into Croydon were frequently diverted from their normal routes to investigate. Just weeks before the start of war they sent a Zeppelin which was packed with electronic equipment. This flew up and down the coast being tracked by the Radar it had come to investigate, but they had made a miscalculation on the frequency to monitor and put the towers down as some radio equipment.

Next month I'll conclude this series with some of the early equipment that was used and some of the experiences had by John. Once again I thank John for the use of his talk notes allowing me to write the above.

LAST "A" MEETING: Monday 5th Sep 2005 PICs (Peripheral Interface Controllers) – Gareth G4XAT

At the last "A" meeting held on 5th September we welcomed our Chairman Gareth G4XAT for a talk on PICs but in fact became PICAXE – more below. Gareth has kindly given me his slides from the talk which I use below to write-up his presentation. So . . .

"It must be ten years since I first noticed a 'new' chip appearing in the popular electronics magazines – Everyday Practical Electronics and Elektor Magazine. It seemed to do a lot with very little, so I started researching what it could do….

Sink and source 25ma per pin – up to 13 input/output pins on an 18 pin chip. 6.5 volts Vmax – ideal for battery power, 4xAA's

CMOS technology with an ability to "sleep" and draw less than 1microamp

Fairly simple instruction set (35 commands, it's a computer)

Happy to execute 1 million instructions per second!!!

THE FUTURE HAD ARRIVED!!! Peripheral Interface Controllers were here!!

But, there was a problem….whilst I could understand roughly what the commands did and how they worked, I never was any good at machine code, briefly tried in the days of the BBC 'B' so little progress was made.

Around that time we had a pupil who won the 'Young Electronic Designer of the Year' award with an electronic version of an outdoor distress beacon (six blasts on a whistle) with an added 'strobe' feature. We received a phone call from an Industrialist who wanted to check his "idea" didn't clash with our "idea", since he was holding a patent on his "idea".

We got talking and I mentioned these new chips to him – PICs as they were known. "If you ever need any help with them, give me a call" he said!! So, after some thought, he received a phone call…… asked if he could help us by writing small pieces of code that did specific things like time 1 second, 1 minute, flash an LED, make a noise via a piezo element etc. My technician at the time, Peter Friend, was computer literate and came along to help.

After some four hours, we had working code for a four channel, 1-255 minute touch activated timer with sound and light (Bleeps on start-up and flashes every second, with a tune at the end)

Peter turned out to be a natural at machine code and quickly learnt what to do. I designed the hardware, talked about it with him and away he went, writing the code.

Meanwhile, PICs became ever more prevalent and companies and magazines published and developed stuff to help use these versatile devices…..not least a company called Revolution Education……..

Over my years in education I have often provided staff training for 'Electronics in Design Technology', popularising my approach to interesting yet simple to build, cost-effective "pupil proof" circuits – several have been built at construction evenings!

In 2002 I spotted a local course about the PICAXE family run by Revolution Education and that was the start….

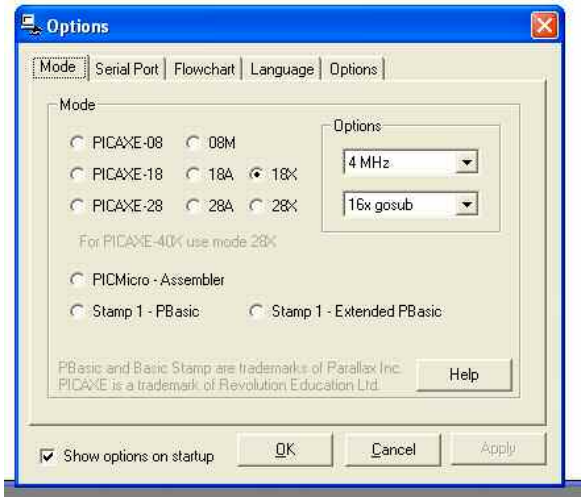
So what is PICAXE??

Using "flash" based eeprom PICS (electrically erasable and programmable) and a resident piece of interpreting code called a 'bootstrap'; control programs are written in a dialect of Basic. This 'code' is then up-loaded to the PIC and once the upload process is completed it runs your 'programme' until the power is removed.

There are some very minor drawbacks however…..

- code space is taken up by the bootstrap programme
- because the PIC is interpreting your basic, it takes longer to run the code, limiting its speed to around 10,000 instructions per second (compared to 1,000,000 in native mode)
- a small number of functions are no longer available, notably the 'wake up from sleep on port change' which allows the PIC to sleep for months at sub-uamp current consumption.
- but it is easy to write, understand, visualise, change, expand, modify, explain, try, apply, design and play!!
- and you can even use a flow chart to create your masterpiece which can be simulated at will to check the programme flow!!

Now let's look at the family of chips….



…and there is a 40 pin monster available too….

As time has moved on so has the technology – the range of flash based PICs has increased and so has the programme memory space. As an example, Joshua built his GCSE project around an 18x part, wrote about 400 lines of code and still only half filled the chip!!

He got an A* for his GCSE by the way…….

An Infrared capability has been added (Sony R5 commands, all 128 of them) as has the ability to play Nokia monophonic ring tones, 1,000's of which are available on the web for free!!

Some also supports I2C and serial comms at slow speeds (up to 9,600) and as such form the basis of our data loggers that our cars use.

In Industry these tiny powerhouses have formed the basis of many products and with outstanding code protection many manufacturers don't even bother scratching off the type numbers.

Roger, G8HDP, has used PICs for many years and although I have a negligible understanding of machine code, he works with it extensively.

Through his contacts with Microchip (manufacturers of the PIC family, see www.microchip.com) he has been able to 'extract' some rather nice goodies for native PIC work with a couple of items donated to next years construction contest for the project that makes best use of a PIC (or PICAXE) in the entered project.

Although they are slow (as indeed they are compared to GHz 32 bit PCs), there is a limit to the processing power required to send Morse, control a switching sequence, analyse battery capacity etc. etc. etc. and you often end up wasting time in simple delay loops……

The PICAXE software is FREE by simply registering your email and NO you don't get spammed to death from it – not even information about updates!!

The PICAXE chips are no dearer than buying them from Farnell or Rapid Electronics

If you buy their 'programmer' (£30 and NOT required to programme normal PICAXE chips) it will allow you to disassemble their basic code into assembler alongside the original code so that you can see how it is done and so perhaps teach yourself proper assembler??

Have a go, it's addictive!! Start at www.picaxe.co.uk and download the editor. There is an active forum that quickly answers most questions linked to from their website."

CHAIRMAN THOUGHT of the MONTH – October 2005

"Well it seems ages since the summer holiday, now just a fond memory away. Whatever the weather this year it led to a bumper hop harvest which pretty much took a whole weekend to pick, even with the help of young son Reuben. On the flying front Joshua and Reuben have been making good use of the large sports hall at Trinity and have perfected the art of indoor aerobatics. Joshua was asked to do a flying display at a school assembly last week,

I normally manage to skulk these events but I just had to see this. On the theme of 'what did you achieve this summer' Joshua's demonstration, confined to a small piece of airspace where the front three rows would normally have been, produced a huge 'buzz' and loops and rolls brought even louder gasps of anticipation. Well worth watching!!

Due to sheer pressure of work I have enrolled 8 of my students on the Bromley and District Amateur Radio Society foundation course, the effort to organise and tutor this eluding me. I, and I am sure they too, will be very grateful to Bromley for giving up their time for the future of the hobby.

On the Greenpower racing front we had our first racing incident (in 1,200 miles racing!!) at Bedford Autodrome on the 18th September which took us out of the race after a great first four hours - at this point we were 9 laps up on the nearest car – about 5 miles. It was no-ones fault, we decided this having watched some convenient video, despite the shot being from a long way away and being a bit shaky, it was just a bit tight for the three cars and the one in the middle flinched! Having watched three highly paid drivers do a similar thing last Sunday in the first 100 yard straight of the Brazilian GP, taking with their accident several £100,000 of car, I don't think we did badly, at least our was on a tight bend!

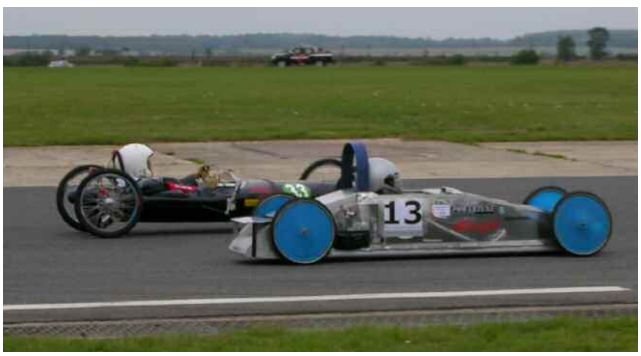
Repairs are under way, the rear right hand wheel, suspension upright and sundry bolts well and truly mangled. Our data logging provided some interesting G figures as the circuit was all anticlockwise bends with two being particularly tight. Our right rear tyres go from 'new to bald' in this race whilst one or two had bald-patch blow-outs due to the extreme wear. We peaked at 0.56 sideways G, slightly less than the 0.6 G we record at Goodwood chicane exit, probably because we are usually going about 5 mph faster at Goodwood.

We are still seeking aerodynamic testing on our car and after playing with a disco smoke machine (by parking the car into wind and playing smoke over the car) decided to add a rear wing, not for down force but to help shed a vortex that we saw developing. It looked good but the circuit wasn't really fast enough to see if it helped. The national final is at Goodwood circuit near Chichester on the 16th October, free admission and the second largest event held there, being surpassed only by the Goodwood Revival. You may be surprised by what can be achieved on 1/3 of a hp wheelchair motor!! 75 cars will be slogging it out and we are qualified #2 on the grid. I'll be the nervous one then……6 hours is a long time!! Apart from a top three placing we are hoping to break the 'platinum' 180 mile barrier. Time, and the weather, will tell.

After a very radio/useful junk free period at our local boot fair I picked up another Pace PRD800 satellite receiver last Sunday, this model being one of the better units to convert to amateur use – cost, a mere £1, how times change.

Our October 'junk' sale is upon us, so bring out your wallets, evict the albino moths and bid on a bargain! As usual, I shall no doubt go home with more that I arrived with but then who knows what bargains are to be had? See you at the sale!!

Gareth G4XAT"



TSR-2 puts another lap on a competitor before our early exit. The new rear wing (with anti-rattle 'gaffer tape' braces) can be seen. Speed at this point is about 30 mph. *Photo: Reuben Evans*

THE CALENDAR SECTION

SRCC and Local Club Meeting Dates:

3rd Oct	**Autumn Surplus Equipment Sale**
7th Oct	Crystal Palace: G3FZL Memorial Lecture – My Adventures on Top Band with Martin G4FKK @ All Saints Church Parish Rooms, Beulah Hill. 7:30 for 8pm. Bob G3OOU 01737 552170 (Meetings 1st and 3rd Fridays) http://members.aol.com/rfcburns
10th Oct	CATS – Kinesiology with Dr Sally Prestwich – Meetings normally held @ St. Swithun's Church Hall, Grovelands Rd, Purley 8pm 2nd Monday's. Contact: Dave G8VXB on 020-8546 5445 dyoung@photo-scan.com
11th Oct	Dorking & District Radio Society – Meetings 2nd & 4th Tuesdays @ Friends Meeting House, Butterhill South Street, Dorking – opp. Spotted Dog. Details: John G3AEZ on 01306 631 236
14th Oct	W&DARS – Project Building & Club on Air @ St. Andrew's Church Hall, Herbert Road, Wimbledon – 7.30 for 8pm 2nd & last Friday's Details: Jim M0CON on 020-8874 7456 http://www.wadars.thersgb.net
18th Oct	Bromley & District - Meetings on 3rd Tuesday's @ Victory Social Club, Kechill Gardens, Hayes – 7.30 for 8. Alan G0TLK 020-8777 0420 www.bdars.org.uk
20th Oct	Sutton & Cheam RS – RSGB Q&A Evening with Paul Berkeley M0CJX. Meetings @ Vice Presidents Lounge, Sutton United Football Club, Gander Green Lane, Sutton – 7.30 for 8pm. Sec: John G0BWV 020-8644 9945 www.scrs.org.uk
17th Oct	**Fix-It, Advice, Chin-Wag, Move-It-On**
Oct	Crawley ARC – Main Meeting TBA @ Hut 18, Tilgate Forest Recreational Centre, Tilgate Forest, Crawley – 7.30pm. Sec: Keith G8KZZ 01403 257788 www.carc.org.uk
25th Oct	Dorking & District Radio Society –Meetings 2nd & 4th Tuesdays @ Friends Meeting House, Butterhill South Street, Dorking – opp. Spotted Dog. Details: John G3AEZ on 01306 631 236
26th Oct	Mitcham & District ARS (Meetings normally last Wednesday of each month) @ ATC Headquarters, Commonside West, Mitcham. Sec: Mike Knott G0WCR 020-8764 4716
28th Oct	W&DARS – AGM @ St. Andrew's Church Hall, Herbert Road, Wimbledon – 7.30 for 8pm 2nd & last Friday's Details: Jim M0CON on 020-8874 7456 http://www.wadars.thersgb.net
7th Nov	**Converting Computing PSU to Amateur Use with G4FDN**
5th Dec	**Hybrid powered vehicles and vehicle battery systems with Peter G4WPB**

SRCC Meetings indicated in **BOLD** with venue of Terra Nova unless otherwise stated.

Rally Calendar, etc:

30/9-1st Oct	**Leicester Amateur Radio Show**
7th – 9th Oct	**RSGB HFC2005 –** Gatwick Worth Hotel
15th/16th Oct	**Jamboree on the Air**
30th Oct	**CATS Bazaar**
13th Nov	**West London Radio and Electronics Show** – Kempton Park – Feature Event: "Train the Trainers"

SIGNING OFF:

That's it for this month. See you all at the Sale on Monday 3rd Oct (my last meeting before my operation). **STOP PRESS:** ***Sale will have some special treats for high power Linear constructors.***

Ray G4FFY

73 and 88 Posted: 30th Sep 2005