



Founded 1969

# T.D.A.R.S.

Telford & District Amateur Radio Society

## News Letter

G3ZME G6ZME

Issue 216 Date Feb.2006

Dawley Bank Community Centre, Bank Road, Dawley, Telford, Shropshire. TF4 2AZ

# Forthcoming programme

- Feb 15 Club Project—Product Recall (!). Bring it along—finished or un-built.
- Feb 22 “Climbing K2” - Mike’s (G3JKX) Elecraft K2 Project in the flesh.
- March 1 Open Evening / OTA / Committee
- March 8 Stan Brown G4LU. Talk & slides Not to be missed...
- March 15 Main Construction Competition. Bring something .....Anything!
- March 22 Microwaves Now! Talk and equipment view by Martyn G3UKV
- March 29 TDARS Annual General Meeting
- April 5 New Committee Meeting + OTA + Open Evening
- April 12 Club Contesting and Portable Activities . Coming along ?
- April 19 Using the club’s Antenna Analysers & such-like. Committee presentation
- April 26 All About Digital Radio Mondiale (DRM) Talk by Richard M1RKH
- May 3 First-in-the-Month: On Air, Committee & Open Evening.
- May 10 Social Evening (outside, hopefully) incl new Club Tent Erection

**CLUB MEETINGS EVERY WEDNESDAY AT Bank Road Community Centre,  
Bank Road, Dawley Bank. Rooms available from 7:30 pm.  
ALL WELCOME. COME AND MEET EVERYONE !**

**For Foundation & Intermediate training, contact Mike G3JKX tel: 01952 299677,  
mjstreetg3jkk@aol.com). Advanced course contact Eric M0KZB tel: 01743 240286,  
e.arkinstall@virgin.net)**

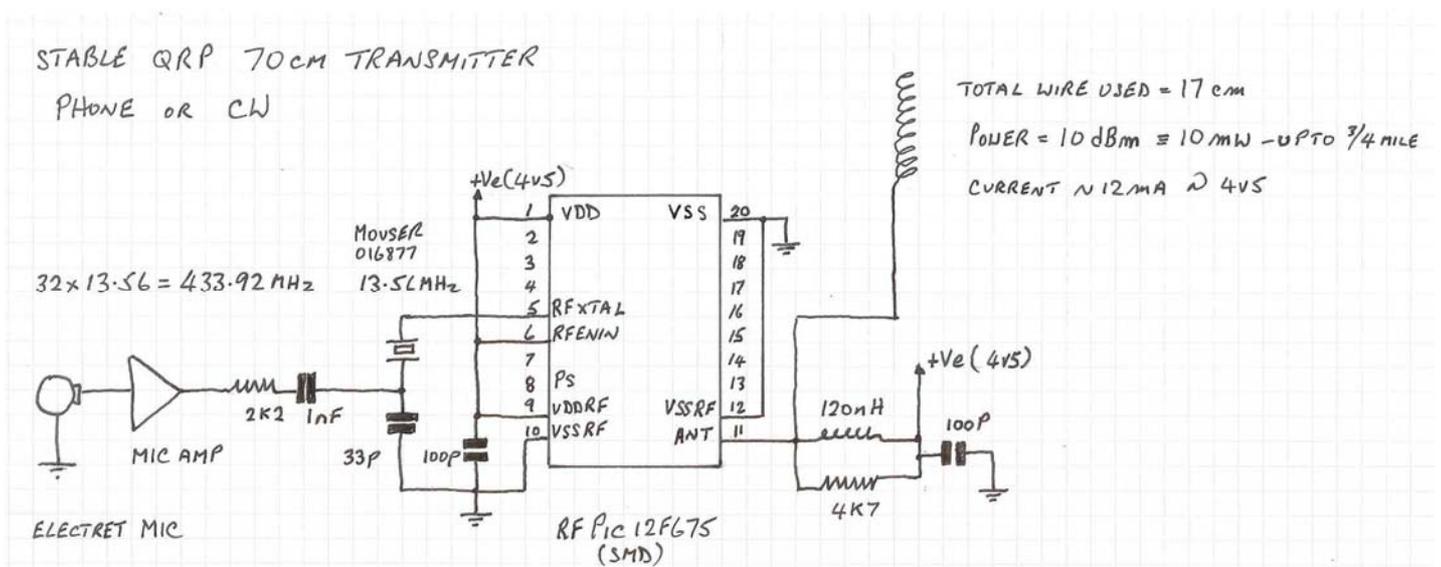


## 70cm – 434Mhz QRP FM / CW transmitter

The heart of the transmitter is the Microchip rPIC12F675F. This is an SMD IC that is 7x7mm and has 20 pins so each pin is only 26thou from its neighbour. The IC is actually 2 chips in one, it is a full blown PIC reprogrammable microcontroller and a 10mw transmitter (it also has a 10MHz crystal built into the package).

The diagram shows it being used as an FM(FSK) transmitter – this is achieved by pulling the 13.56MHz crystal via the microphone amplifier. The capacitor between the two is used to control the deviation. As well as phone it can be used as a CW transmitter. To achieve this, the frequency is not changed but the RF is switched on and off via the RFENIN pin of the PIC. I was impressed by how far 10mW would go. Living where I do it is difficult to find a piece of flat land, but I could hear the CW using a 13cm helically wound antenna from my house to the Hay Golf Club some  $\frac{3}{4}$  of a mile away. The only slight problem that I had was finding the 13.65MHz crystal. In the end I had to buy it from Mouser in Texas so I bought 10 at a cost of £1.359 ea including P&P.

**Richard GOVXG**



Editor's Postscript: This is the impressive PCB item that Richard brought along recently to the Club, and could become a new Club Project, possibly next Autumn.

Richard is currently investigating a receive equivalent that may use similar technology. However, probably a bit soon to throw out your Japanese Handheld just yet.

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**REMINDER: Paid up Members are welcome to borrow almost any item of Club Equipment, so long as it is returned the following week and the usual "signing out" process is followed strictly. That's a privilege of TDARS Membership. If you can't return it on time, please find someone else who can, or don't borrow it that week!**

# Ephemera: Club News

▣ **The Club Project** (Low voltage PSU protection circuit) has been a little troublesome. The mod mentioned last time still does not seem to isolate a piece of equipment in EVERY situation; a chattering relay may still result on over-voltage. So, one further mod that simply MUST work is to place the relay contacts on the *output* from the module. The only drawback then is that any excess voltage will still hit the module itself, so it may suffer damage. However, this possible loss is likely to be negligible compared to the damage that could have been caused to the attached equipment. In any case, a *sudden* increase in supply voltage, say from 13.8 to 20 volts (as distinct from slowly winding up the volts from a variable PSU) will almost certainly open the relay in the original Mk 2 version! As a result of these minor hiccups, which seem to have beset some more than others, Mick (G0VXJ) has requested that he may leave the room when the next Club Project is proposed !! (See page 3, Mick....)

G3ZME

T.D.A.R.S.

G6ZME

▣ Rather disappointed to find that the Leicester (Donington Park) Radio Rally has been brought forward to September 8-9 this year, without warning:—that's the Fri/Sat following our Telford Rally at Shrewsbury's West Midlands Showground (Sept.3rd). It will obviously be top item on the agenda at the TARRG (Rally Group)'s next meeting in February. Watch this space. Is this *really* the age of communication?

▣ **50 MHz Trophy Results** are now on the RSGB vhfcc web site. As predicted a few weeks after the event last June from N Ireland (GI3Z/P), we came fifth. 277 QSOs, worth 226136 points. 119 multipliers. Total score 26,910,184. The top dogs (Northern Lights from Is of Man, of course) won with almost 92 million points. They had 4 separate antenna set-ups - 11 ele, plus 2X6 ele, plus 2X7 ele, plus 2X7 elements. Jeepers! Anyway, easily *our* best score EVER, and we gave many European stations their first GI.

▣ **The new GB3TF box** came on air at midday on 6th January, using the N.Z. equipment, which is ex-PMR (don't ask!). Whilst it worked perfectly for days at Jim's house, it started playing-up (of course) at HQ. Eventually this was tracked down (pun intended) to numerous microscopic cracks on the logic board PCB copper tracks (a bit of over-enthusiastic etching back in 1992 which had finally come to roost!). With a bit more tweaking and a different logic board, things settled down. However, the signal strength seemed a bit down. Further tests and checks resulted in all 5 antenna filters (3 X receive, 2 X transmit) being removed with no detrimental effects and more output. This is a great tribute to the design of the TX/RX by Tetra, considering the aerials are only about 12ft apart, and transmit frequency 1.6MHz offset from receive. Still down in signal strength, however. SWR check on transmit revealed more than 2.5:1—ouch! Further visit by Mike 'NKC and Martyn 'UKV revealed all, as water flowed out of the disconnected TX antenna outside. Put up temporary dual band co-linear, and output shot up by about 20dB. It can now even be heard in Donnington.....



## **Getting Up On Three Bands by Richard M1RKH**

A long time ago I made the decision to get up on VHF, UHF and 23cm for SSB. I decided this primarily as I had already got a Carolina Windom up on HF that was working reasonably well and did not really have the space for any kind of HF beams. I must say now that from the point of “deciding to get up on...” to actually “getting up on...” probably had the gestation period of an elephant from the point of idea insemination.

The problems of getting up on a band are not always straightforward, and much of the knowledge and pointers needed end up being coiled up in people’s heads. This kind of knowledge comes with experience so if you want to do this kind of thing properly you have to talk to various people to get those snippets of information, there’s not really a single place you can go to to ask your “how do I ?” questions. These notes highlight some of the requirements and shortfalls in equipment you may encounter.

The operating bands were chosen, the primary modulation modes decided, now to get things in the air. The primary difficulty was getting a pole in location that could be dropped for maintenance.

I decided to get these erected on the same side of my house as my shack, trying to keep coax runs short. I also wanted a pole that could be dropped down. So two Wythall rallies ago I spoke to Barenco, and in the back of his van he had one of those “we don’t sell many of these” brackets. Dropping the pole down at the side of my house means I have to drop it down parallel to the wall, rather than dropping it away from the wall, which would be the most common way. The bracket I purchased was a good heavy duty affair with a tilting plate allowing the pole to be dropped. Currently dropped with a cunning arrangement of ropes at both ends to support the weights of the poles and the antennas on the end. One rope looped though the bracket at the house apex and one tied to the end of the pole. I ditched the nylon lock nuts in favour of standard nuts to allow quick fitting and removal. Poles are hard to come by in decent lengths, I opted for 2” aluminium 5ft poles with pole joiners, ideally longer single runs of poles would be better but that kind of pole isn’t easily obtained.

The antennas used are a 23 ele for 23cm and two ZL specials for 2m and 70cm (not mentioning the manufacturers, for reasons that become apparent later). The 23cm aerial does take a lot of construction, as each element is held above the beam by a plastic spacer, and most of the elements, though short are of different lengths. Once constructed it does seem sturdy enough. One thing to be aware of is that this antenna is made to work in both the Amateur voice bands and the TV bands. As such element position is different for both and needs adjusting.

For 2m and 70cm the antennas are constructed less soundly. Each has a radiating element that is basically a folded dipole and then various directing elements. These were constructed and straightened and we did some preliminary tests with an ATU, (sorry Mike I mean an AMU). It was clear from initial tests without any tuning that both resonated way off band producing completely the wrong impedance at the operating frequency. Some measurements were taken and it soon became clear that the directors’ dimensions in both cases were a few inches out from where you would expect them to be. We suspect (yes I say we because by this time, I had gathered a lot of momentum and Martyn was involved as well – never under estimate the time needed!) they were designed for operation in some commercial band and modified for this one.

The 2m is adjusted with a stub of coax, you just trim a bit off until you get a good match in the middle of 2m. For 70cm there is an adjusting capacitor to tune up for the band. It’s worth pointing out that this is not really tuning the antenna in any way, just matching the impedances, so from

an electrical point of view it isn't as efficient as it could be. Everything on these antennas comes into plastic cups, so the tuning stub, coax run etc all need to have the plastic cups sealed with self amalgamating tape, and then taped over with pvc tape. We were trying to make things fairly weatherproof. One thing that I have in my garden is a local geography that manages to funnel the wind from the brow of the hill behind my house in a northward direction, no matter what direction the rest of Telford gets its wind from. The alleys between each of our houses gets an increase in wind pressure, so things need securing pretty well (a case in point: I had a 2m collinear up, secured really well, but over 4 years the connectors underneath and the central joint managed to unscrew themselves).

Now to put them somewhere where they can radiate. On top of the aluminium poles I put a small rotator, one of the cheapest ones you see in W&S etc. on top of this was a 4ft steel pole. The antennas are attached to this, 2m at the bottom through the centre of the boom, 70cm attached from the end of the boom and 23cm at the top held off from the top of the boom so it is not affected by the boom at all. Alignment is done to make sure that when it goes up it will be pointing North.

Coax used for the 2 & 70 was RG213, from looking at it, you can see that this suppliers (Farnell) coax did not have a very dense braid at all!. For 23cm I purchased some Ecoflex 10 (expensive L ), and the specific N types for this cable. This cable came from Diode Comms and is low loss at 23cm, has a braid and copper foil outer and solid dielectric. Luckily it is still as flexible as RG213. Connectors were put on, self amalgamating tape and pvc tape applied. Things are getting close now, two years preparation is culminating in two days J.

Three holes had previously been drilled into the shack to get these and the rotator cable through. With a bit of a squeeze every thing made it through the holes. First up is the other N type for the 23cm, plug it into the ICOM 910 (which has had the 23cm unit added) and listen up. The Stoke repeater was coming through, point North to Martyn, we exchanged a few signal reports, maybe a bit low, same with Dave Hall, maybe a bit low. Luckily the club has a Revex SWR meter, very easy to use piece of kit, and also works to 23cm. Uh-oh, SWR of 4, but I thought everything had been checked. Working back out of the shack. Starting at the rig N type, then dropping the antenna down. Check the yagi, all elements in place and assembled in the correct order. Only one thing left, take off the pvc tape and self amalgamating tape from the N type. I think that the cable had managed to pull itself loose back out of the N type, probably because the sets of washers and spacers needed to be in a different order (Maplin didn't give an assembly picture, all N types seem to be similar but slightly different). Rearrange and re tighten and with the antenna pointing to ground an SWR of 2. Not bad. Now to re-seal and hoist back up. Bish bash bosh, Stoke comes through so loud I have to turn the volume down and I can just about pick up Martlesham. I think the job is complete (just two days after the lift on 23cm, doh). Luckily enough there are just enough people active on this band to have some local activity, and as we have found elsewhere, activity begets activity, so hopefully Telford will have a new lease of activity on this band and anyway I got my first microwave station on air.

(Ed: By rotating this page, you can see it in raised or lowered orientation—easy !!)





