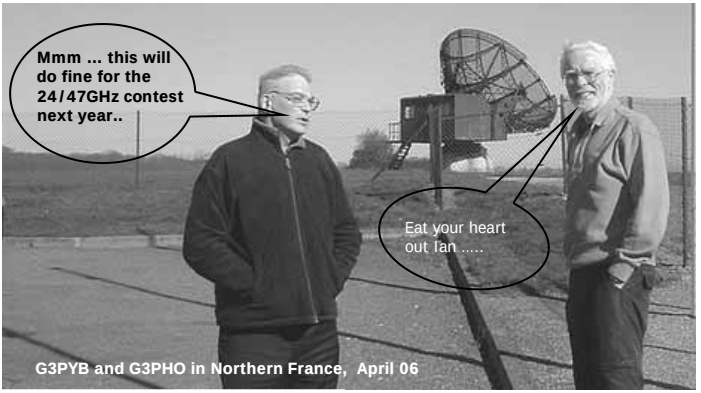
An Amateur Radio publication for the Microwave Enthusiast

scatterpoint

Formerly the RSGB Microwave Newsletter and now published by the UK Microwave Group

2006 April



G3PYB and G3PHO in Northern France, April 06

In this issue ...

- ***Latest News ...***

- **Ultra Wideband given the go ahead on 3.4GHz**
- **L'Entente Cordiale cemented by four UK microwavers!**
- **Space Probe Voyager heard by German amateurs ... and it's 98 times further away than the Earth is from the Sun!**
- **There is no April Fool article in this issue ... honest!**

MANY THANKS TO ALL OUR CONTRIBUTORS THIS MONTH ... WITHOUT YOU THERE WOULD BE NO SCATTERPOINT!

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From the Editor's Desk

Many thanks to all our contributors this month for a good selection of articles and news. The Activity News column is still in the doldrums with very little UK activity being reported. We can only assume that you will all burst forth onto the bands when Spring comes (if it ever does!). The articles by G0EWN and G4DDK on home station operation and backyard EME in this issue show what can be done with modest outlay in seemingly unsuitable locations.

The Microwave Round Table at RAL, just as you receive this issue, promises to be very well attended indeed. Apart from the usual excellent talks, there will be a most important discussion taking place in the on UK Beacons. UKuG's Committee has been very busy recently with beacon matters and some important decisions need to be made about the kind of beacons we would wish to hear in the future, as well as how we can improve the ones we already have. Please attend this discussion if you come to RAL.

Finally, due to the hard work of our enterprising secretary Ian, G8KQW and Murray, G6JYB, we now have a smart looking UKuG lapel badge! These will be on sale at RAL and thereafter via post. More details will appear in the next Scatterpoint.

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News, views and articles for this newsletter are always welcome. Please send them to G3PHO (preferably by email) to the address shown lower left. The closing date is the Friday at the end of the first full week of the month if you want your material to be published in the next issue.

A warm welcome to the following new members of the UK Microwave Group ...

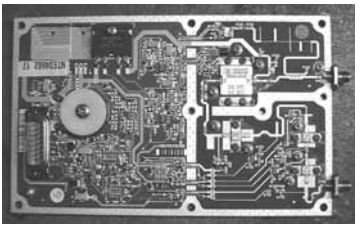
The following microwave enthusiasts have recently joined us ..

Roger	M0ROJ
Sean	M1ECY
Steve Reed	G? / M?

We hope they will gain much pleasure out their membership

SUBSCRIPTION ENQUIRIES SHOULD BE SENT TO THE UKuG GROUP SECRETARY AT THE ADDRESS SHOWN AT THE TOP OF THIS PAGE

3.4GHZ (Ionica) PAs for sale.



15 watts out with no mods. I have just four remaining units. Price £10 each plus postage. Email me, Andy G8VLL, at:

ark@freenet.co.uk

WG20 Flanges for Sale

From: John Klewer N6AX <n6ax@speakeasy.net>

I have available a large quantity of silver-plated brass flanges in *WR42* UG-595/U (WG-20) 18 to 26.5 GHz cover flange for the 24GHz ham band.

These are clean, ready to solder brass flanges in excellent condition for your K-band projects.

The waveguide fits into this flange and buts up against the inside of the flange so you do not have waveguide exposed at the flange interface.

Price is $5.00 per flange plus shipping.

Shipping costs will be dependent on quantity purchased. Most orders will ship by Priority mail within the CONUS for $4.20. Most international orders will ship by Global Priority mail for $5.25

OFCOM and RSGB SPECTRUM FORUM NEWS ..

from Murray, G6JYB

CEPT has released a final decision permitting UWB in the 6-9.5GHz band and a further consultation for it in the 3.4-4.8GHz area

The 'high' band decision is largely in line with a joint UKuG/RSGB/Amsat-UK submission at Christmas last year.

Further info is on: **www.ero.dk , www.microwavers.org** and **http://www.rsgb-spectrumforum.org.uk/microwaves.htm**

At the very least, the 5.7 and 10GHz amateur bands look fairly safe from this particular threat. It will be interesting to see what impact we get at 3.4GHz (along with the Radar and WiMAX community) where the bulk of the UWB chipsets are aimed at present.

Hard on the heels of the hi-band UWB decision, comes the new CEPT consultation on permitting UWB to use 3.4-4.8GHz, ie including the Amateur 3.4GHz band.

Comments to the above are invited from CEPT administrations and any other interested parties not later than 29 May 2006 and should be forwarded to the European Radiocommunications Office preferably by e-mail to **Mr Fatih Yurdal <yurdal@ero.dk >**

See http://www.ero.dk/consultation?frames

24GHz SRR is another CEPT item from a few weeks ago in mid-March. It's from half way down the page at:

http://www.ero.dk/consultation?frames=1

"The regulatory affairs working group at its meeting in Luxembourg, February 2006, provisionally approved the texts of the following new draft ECC Reports for Public Consultation:

Draft new ECC Report 85 on guidance for '24 GHz Short Range Radar (SRR) enforcement'

Comments to the above Reports are invited from CEPT administrations and any other interested parties not later than 14 May 2006 and should be forwarded to the European Radiocommunications Office preferably by e-mail to Mr Adriaan Brinkerink brinkerink@ero.dk "

The report is overly concerned with Radio Astronomy (eg in 2a) and ignores potential interference to other services inc Primary Users such as EESS and ourselves.

73 from Murray, G6JYB

UK BEACONS

…. the case for a co-ordinated review and update

Application problems:

Anyone who has ever built an amateur microwave beacon and has applied (in some cases successfully !) to install it at the site of their choice will be fully aware of the trials and tribulations that can be involved waiting for permission to go ahead. Some people say it's worse than waiting at the altar … you just don't know when it will arrive! In recent years, the beacon application process and the resultant response to applications has been unsatisfactory to say the least. There are many reasons for this, some going back over a decade, but abolition of the RSGB Microwave Committee in 2003, followed by the change over of the Radio Authority to Ofcom certainly left their mark! We know of at least one amateur who has waited four years for his application to be considered, only to find it had "got lost" in the changeover! Other similar stories have been heard from time to time.

The **good news** is that the UK Microwave Group, working with RSGB's Spectrum Forum and the RSGB Microwave Beacon Co-ordinator is, as you read this, carrying out a major revision of all UK Microwave beacon data and liaising with Ofcom to ensure a much more rapid processing of beacon applications. The bulk, if not all, of the work involved has fallen on the shoulders of our ever-willing UKuG members Murray Niman , G6JYB and Graham Murchie, G4FSG.

The new amateur regime at Ofcom is settling down and is proving to be helpful. An early result is that some 24.192 to 24.048GHz frequency change applications have now been 'found' and we hope to progress them shortly. We would support the remaining few to follow suit in this band.

Beacon lists .. the quest for accuracy:

The first job undertaken was to gather as much accurate data on our present UK microwave beacons as possible. Beacon lists kept by G3PHO, GM4OGI, IARU and others have been checked and doubled checked and, at the time of writing this column, a definitive list has been drawn up. This list will be ongoing and always in a state of flux as new information is being received. Murray and Graham have done their very best to make certain that the list is the most up-to-date available. Information relating to beacon keepers, site access, frequencies and power outputs have been revised and double checked. If you are a beacon keeper, the chances are that you have already been approached by UKuG's "B - Men" (Like the G-Men of 1930s USA !) for these details.

UKuG's aim is to provide both RSGB and Ofcom with beacon information worthy of the 21st century. The latter demands this by it's very nature as the controlling authority and RSGB are obliged to provide it … hence both organisations' close work with UKuG in this instance.

The revised UK Beacon list will appear on **www.microwavers.org** which will be getting a new beacons reference area including the maps. One advantage of the UK-only listings is that it has vividly demonstrated the local shortage of beacons on various bands. Hopefully this will encourage some of you to build microwave beacons in areas where there are none at present.... ie NE and NW England, Scotland, North Wales and Northern Ireland.

Our intent is to provide much more information to current and potentially new enthusiasts as well as to aid planning of where to put in new systems.

Keepers who have webpages describing their beacon should forward the URL so we can integrate the links into the new online information we intend to provide.

Day-to-day news and the European info will continue to reside on G3PHO's website, **www.g3pho.org.uk** and in Scatterpoint.

Already you, the reader, can see some of the fruits of the work recently put in …. visit the

UKuG website at **http://www.microwavers.org** where, thanks to G6JYB's expertise, you can now enjoy **interactive beacon maps**, band by band, using either Google satellite pictures or scaleable maps to show the exact location and surrounding area of all our UK microwave beacons. By the time you read this, a downloadable, up-to-date, **UK beacon list in Microsoft Excel spreadsheet format** should also be available **at www.microwavers.org**. This is in addition to the present European beacon list on G3PHO'S website. The spreadsheet is much more versatile than a webpage. For example you can arrange the list to suit your own purposes by using the "Sort" routine provided by Excel. It's dead easy to rearrange it in LOCATOR order to give a geographical list, or in order of frequency for example. Extra information is now provided such as an accurate National Grid Reference location as well as beacon keeper contact information. You will now have no excuse for failing to send in SWL reports to the beacon keepers!

Application protocols:

Alongside the update of this data, UKuG has also been looking at the beacon application procedures and much progress has been made. UKuG will be collaborating on a major revision of the RSGB Guide to Beacon Licensing and the current Application form (which dates back to the Gunn Diode days!). When details are this are finalised they will be published in Scatterpoint. It should not be too long before you can confidently expect your beacon application to have been approved (or disapproved !) in a matter of weeks, rather than many months, or even years, as at present.

Better and more useful beacons:

Many readers will be aware of the excellent series of microwave beacons that transmit from Bell Hill in Dorset, IO80UU. They are the work of the Southern Group of microwavers that includes G4JNT, G8BKE, M0EYT, G0NZO, G8ACE and others. Andy, G4JNT, has recently been developing an advanced beacon architecture that could form the template for all future UK microwave beacons.

The UK Microwave Group Committee is now seriously considering the setting up of a workgroup to be responsible for co-ordinating beacon building across the UK, helping individual beacon builders with their project, possibly in the form of some ready made modules such as OCXOs, PIC keyers, software, etc. The aim is NOT to build the actual beacon for him but to enable a potential builder to fast track his project to the point where he can confidently submit his application to Ofcom within his planned time frame.

A key aim of this UKuG initiative will be to improve frequency accuracy and consistency. This will enhance each beacon's worth for both amateur and other users. We wish to work in such a way that microwave beacons will be welcomed, not objected to, by others, especially in the shared bands.

Obviously the initiative will need financial support. The UK Microwave Group intends to allocate supportive funds and/or hardware to bona fide beacon projects. Each project will be treated on merit. Support will not be given to projects that are merely just pipe dreams at present!

Criteria for such support is yet to be finalised and the common beacon architecture idea is yet to be discussed at UKuG membership level. By the time you read this, we will be within a few days of the RAL Microwave Round Table. It will be there that members will be given the chance to voice their opinions and thoughts on the subject. If you can't attend RAL then please send in your views and ideas to the Chairman of UKuG (address on page 2 of this issue).

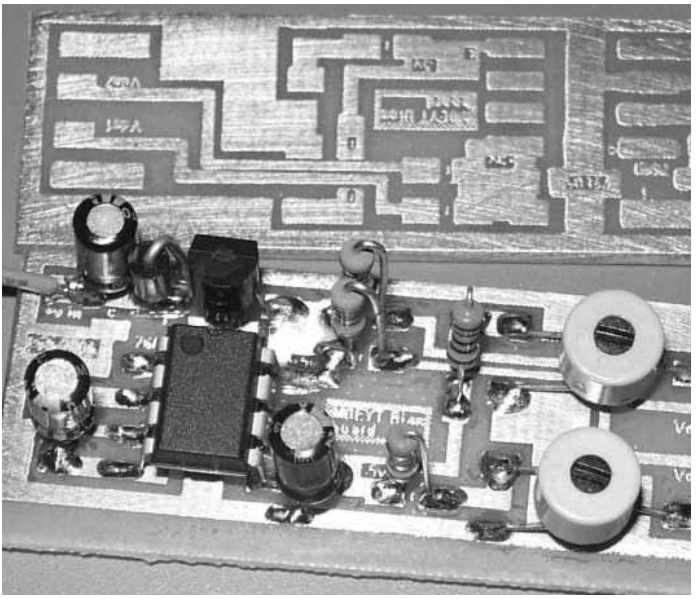
The next few years should, if we all pull together and encourage beacon building, not only raise the status of amateur microwaves in the UK but should see increased amateur operating activity. Beacons encourage people to build gear to hear them! Those of you used to having beacons within range, and/or having suitable test gear as a substitute, may not realise how difficult it is to motivate oneself to get onto the microwave bands when there's nothing to listen to!

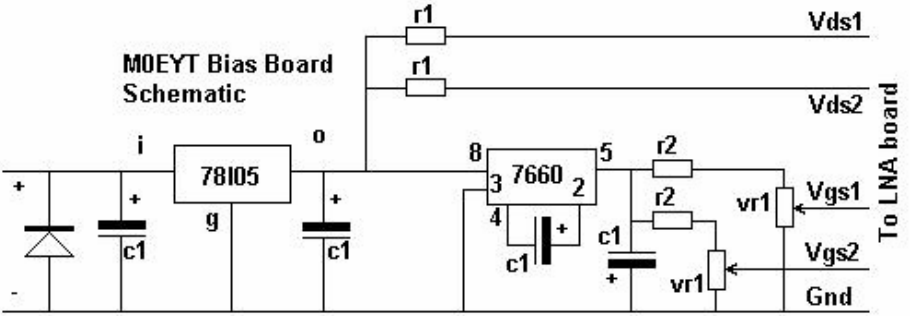
The UKuG Committee is looking forward to hearing from you.

GaAsFET preamp bias board..

by Paul Marsh, M0EYT

This is a simple bias board using an ICL7660, designed to support 2 GaAsFETs. I needed to find a suitable power supply for use with the surplus LNA boards that are sold by www.rfmicrowave.it. It's designed to run from 7 to 24 volts and provide an adjustable negative supply as well as a 'select on test' positive supply.

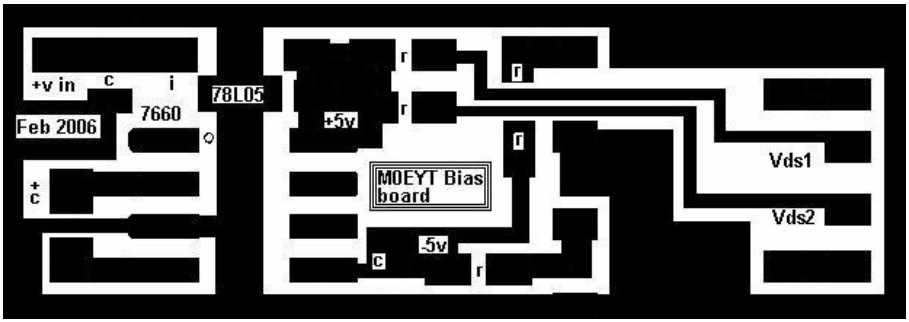




The component values for the bias board are as follows:

C1 – Electrolytic 10uF 25v
R1 – 150 or 200 ohm (150 ohm)
R2 – 4.7 to 10K (10k)
VR1 – 5 to 20K (10k)

The diode is for reverse polarity protection, a 1N4001 or similar is fine.
ICs 78L05 and ICL7660 are cheaply obtainable from Maplin Electronics.



The artwork is available from **http://pjm.dyndns.org/pcbs/biasboard.jpg** .... it's at 300dpi and will result in a print that is 5.3 cm X 1.8 cm. I tend to print off and etch 5 at a time.

More on LNB polarplexers

In reply to G1HDQ 's email (see last month's Scatterpoint) about using dual output LNBs modified for polarplexer use, although I haven't tried this particular mode, I do use dual output LNBs for my narrowband transverter. They are quite handy if you disable the puck LO and feed an external 10dBm stable LO into the splitter that feeds the two front ends. In my case, this is at 10080MHz - just a smidgeon away from the 10000 MHz original (OK, it's an 8 year old LNB....), so the splitter needs no bodging. I use one front end, unmodified (save for some sticky foam over the image filter, just to bring it down into the band), and the other I turn the front-end GaAsFETs round (well just the first one, to act as a buffer) with more sticky foam on it's image filter too. This seems to work quite well but, with the low IF used (280 MHz), the LNB IF hi-pass filter has to be doctored a bit. This is not a problem though if something above 800 MHz is used. On transmit, a decent waveguide filter ensures that the LO leakage and image are kept 50 - 60 dB down ... a very cheap solution, if you like tinkering. It just needs an equally cheap method of amplifying the TX up to a few watts but that I haven't found yet!

Bernie Wright G4HJW

8.4GHz DSN receiver

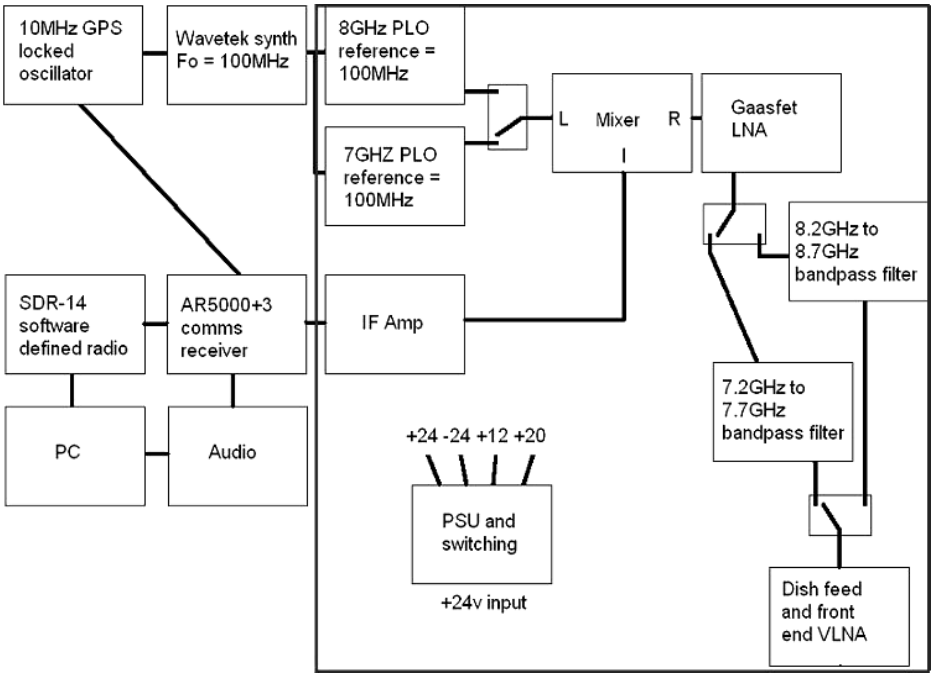
by Paul Marsh, M0EYT

As many people who attended the Martlesham microwave meeting back in November 2005 saw, James G3RUH and Freddy ON6UG gave an amazing demonstration of the reception of deep space probes, which are on their way to various planets. At the time, the Venus Express spacecraft was 750,000 miles away but the best DX came from the Mars Reconnaissance Orbiter at 27,000,000 miles .... not bad DX!

After having seen the demo and chatting with James and Freddy, it was clear to me that I needed to build a receiver and hear this stuff for myself. This article gives the technical details of what I did in order to hear the signals.

Following the demo, I managed to pick up some very useful items from the 'flea market' at Martlesham, including a phase locked oscillator that originally ran on 7997MHz – this would be used as the 8GHz LO. I found some other components that were useful, and also managed to scrounge a mixer and some isolators off local amateurs.

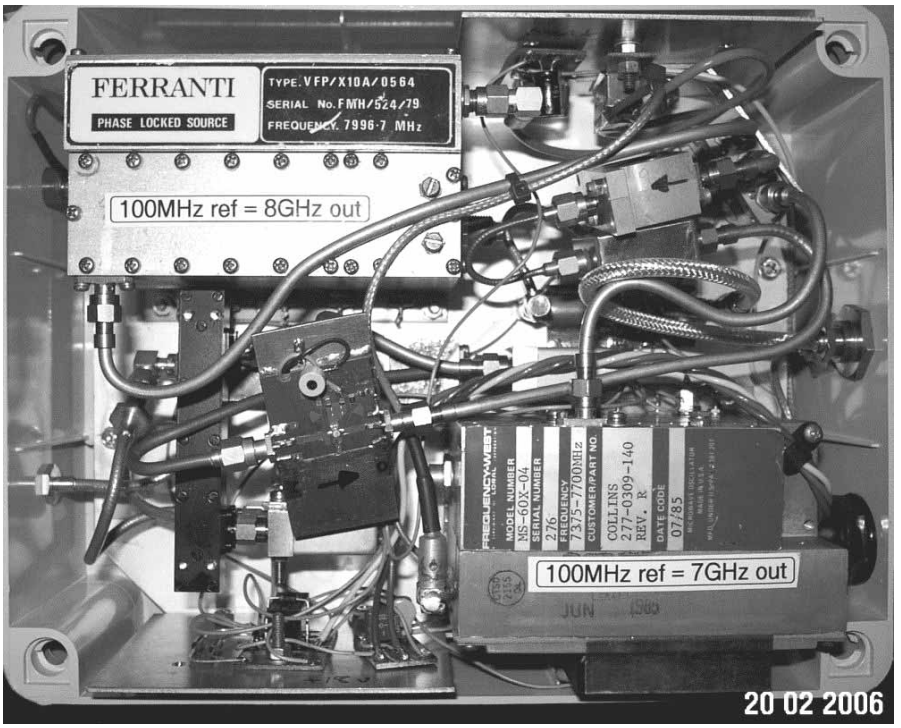
The diagram below shows the final iteration of the down converter, after about 10 experimental builds:



The 10MHz reference oscillator is the G4JNT simple GPSDO that was published a while back in the 'Microwave Newsletter'. This feeds an eBay Wavetek synthesiser that in turn feeds an accu-

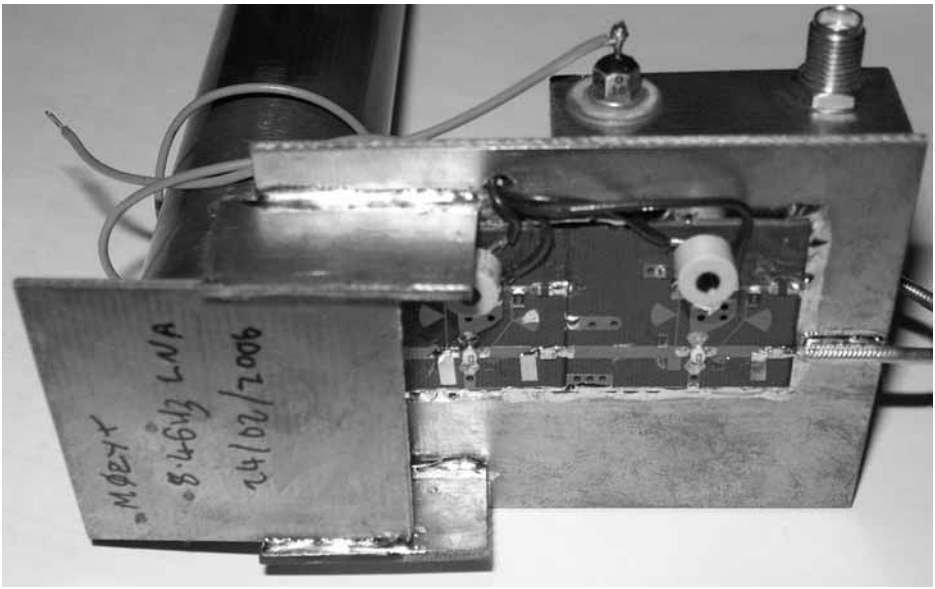
rate 100MHz reference signal to the down converter which is mounted behind the dish or directly at the feed in the case of the FRARS 3.7m dish. In the 'final' design of the converter, it was decided to also include a 7GHz LO to allow system checks to be made on signals from geostationary satellites. This was for two reasons 1) to verify the az/el calibration of the dish and 2) to perform an RF end-to-end checkout and to help with optimisation of the dish feed point.

Switching in the relevant LO also switches in band pass filters for the band in question – for 7GHz LO there is a 7.2 to 7.8GHz filter, whilst for 8GHz LO there is a 8.3 to 8.8GHz filter. The down converter runs from +24V and has remote switching to allow the band to be changed on the fly.



The picture above shows the final build of the down converter including the switched band pass filters – a further single stage GaAsFET preamp was added after the filters / SMA relays to increase the signal a little before it hits the mixer. After the mixer, a MAR-6 special is used as a broadband IF amplifier.

At the front end, a dual stage LNA is used, this was built around the sat-TV LNA boards sold by **www.rfmicrowave.it** from Italy, and costing around £2 per board, for which you get four GaAsFET preamplifiers. The GaAsFETs are NE32584s and with two the LNA gives around 25dB gain and 'should' give less that 1dB NF. The LNA is directly coupled into B&Q 28mm waveguide (i.e a copper waterpipe ...editor) and a scalar ring had been constructed to match the feed to the dish (see the photo on the next page).



The LNA and down converter have been tried on two dishes, with great success. Firstly the 1m offset here at M0EYT was used to DX the MRO and VEX. The first VEX signals were copied with the space craft at a touch over 4 million miles and the last copied signals from MRO were with the space craft at 69,593,573 miles.

The second dish we tried was the FRARS 3.7m EME dish – this allowed some better DX. Firstly the LNA / feed position was peaked using a CW carrier from a geostationary satellite – it was possible to get a quieting FM signal in 15 KHz of bandwidth. Addition of the scalar made an amazing improvement, with a fully quieting 110KHz wide FM bandwidth! The signals from MRO, this time at 120,594,960 miles from Earth were a good copy in SSB bandwidth, and could be tuned by ear with no problems. But, the best DX of the day was with the ESA's Rosetta space craft at 242,730,000 miles – not bad at all.

The next step is to try and DX the 'New Horizons Pluto Charon' mission which will take 10 odd years to arrive at its destination – hopefully amateur technology can keep up and allow us to hear signals from space craft.

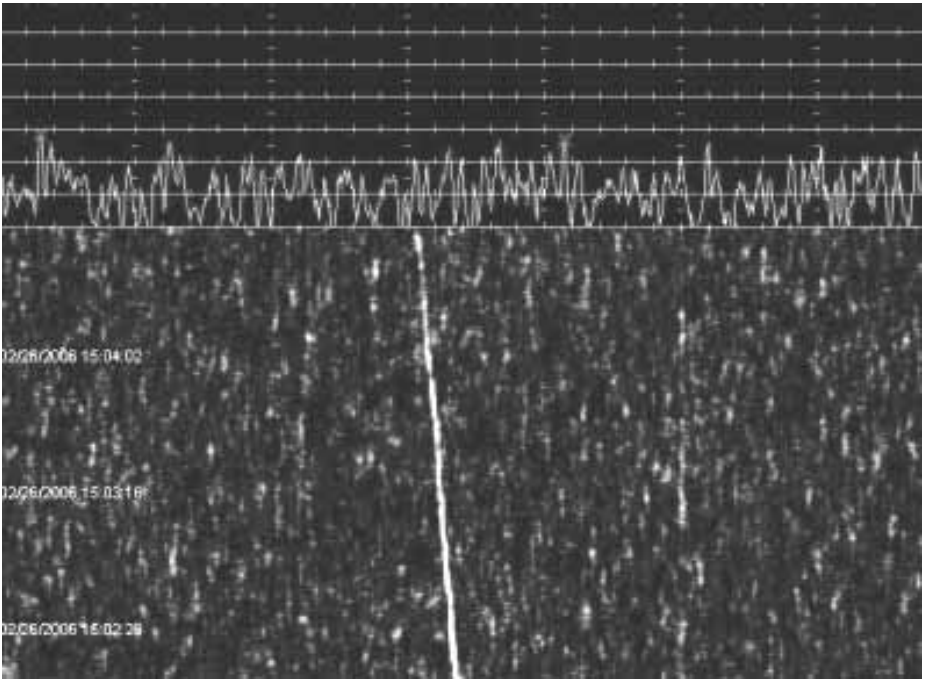
Incidentally, we have created a yahoo group for discussion of Amateur-DSN topics – its online at **http://groups.yahoo.com/group/amateur-DSN/** . If you already are a member of the UK Microwave Group, joining this one will be easy!

73 Paul M0EYT

(see also the photograph opposite)

Editor's comments .... readers will surely join with me in congratulating Paul on a most enterprising project. Apart from the German amateurs (which include DB6NT and ON6UG) using the Bochum dish, we have heard of only Paul and Charlie, G3WDG, doing anything like this space DX reception over here in the UK and Western Europe.

Aren't microwaves fantastic fun!



Rosetta in the FFT! – peaking around 18dB in 1Hz

Handy PCB tip …

For those who use photo-sensitised FR4 board from Farnell/RS, but who would like the same in a microwave dielectric, keep your eyes open this coming year. I have had a couple of batches of board (one Rogers 4003, the other Taconic RF-35) sensitised and black plastic filmed by Mega at Linton - they supply the FR4 board to one or both Farnell and RS, and are now proposing to offer a microwave dielectric also. I would have thought there would be a big enough market for 0.8mm board, say, for them to make it worthwhile just in the amateur radio sector alone.

Bernie Wright G4HJW

Silent Key

It is with much regret that we sorry report the death of **Maurice, G0FVE** from Amesbury. UKuG extends its sincere condolences to Maurice's family and friends.

STOP PRESS! GOOD NEWS FOR SATELLITE USERS

It has transpired that the allocations table included as an insert to the BR68 contains two errors - 78 to 79GHz **IS** allocated to the Amateur Satellite Service on a secondary basis but 122.250 to 123GHz is only allocated to the Amateur Service (on a secondary basis).

I will get the bandplans changed on the websites.

73 from Colin, G3PSM
RSGB Spectrum Forum

“Quatres Anglais” at Seigy 2006

Photo by G4ALY

Seigy 2006 (or “Cj” 2006 as they seem to prefer down the Cher et Loire region) took place this year over the first weekend of April. Four of us, G3PYB, G8ACE, G4ALY and myself (G3PHO) decided to make the effort to meet all those French microwavers we had worked on the bands over past years. Ralph, G4ALY, had been to the event in 2005. This time he travelled independently as he was part of a big 60th surprise birthday party for André, F1PYR (but that’s another story!) while the rest of us travelled down in G3PYB’s car from Le Havre, after taking the overnight cross Channel ferry from Portsmouth. The superb new motorway from Le Havre to Tours was a delight to drive on, with very little traffic, so the 400km journey was speedily done.

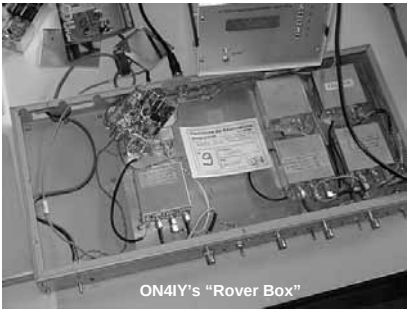
CJ is a VHF to Microwave meeting, held once a year at Seigy, a small village to the S.E of Tours. The village green and meeting hall are pressed into service for the weekend to provide a day and a half of fleamarketing, lectures and socialising. Two nearby hotels provided two evenings of excellent wining an dining until the midnight hour! Hundreds of French amateurs come from all parts of the country for this most popular event. This year there were also visitors from Switzerland, Belgium, UK, German and Italy, as well as a few expatriate Gs now living in France.


Fleamarket at Seigy

The French microwavers had a special meeting of “Hyper” during the Saturday afternoon, during which “les Anglais” were very warmly welcomed (in French of course!). Meeting the French microwavers was a particular delight for the writer. It was great to meet Eric, F1GHB, Herve, F5HRY, André F1PYR and Maurice, F6DKW after having 5.7GHz or 10GHz QSOs with them from across the Channel. André had been of special assistance to us

as he had prebooked our hotel and Friday night dinner and had driven Ralph, G4ALY down from Paris. Many thanks indeed André!

The social aspects of CJ were immediately apparent. Everyone was very friendly and much more general chit chat took place than we seem to get at our UK Microwave Round Tables, so much so that it's possible we may give a little more time to it at Martlesham and RAL from now on! Facilities such as test gear were not at the Martlesham and RAL level however but, nevertheless, there was a large pile of equipment left for test at the noise figure measurement table in the main hall!


ON4IY's "Rover Box"

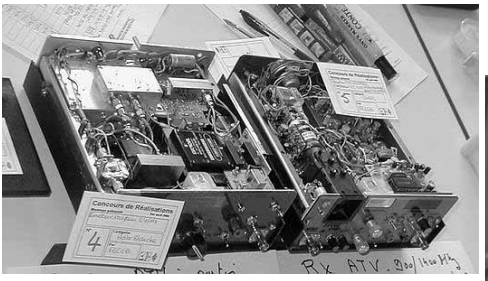
A "Concours de réalisations" (equipment construction competition) attracted a sizeable number of excellent examples of home-made microwave and VHF gear, including the "Rover Box" by Christophe, ON4IY **(see photo right).** This is an LCD display of GPS information such as: Date, UTC time, Maidenhead grid square, Odd/even minute indication (very useful for weak signal or airplane scatter work), Validity of GPS data , number of sats used for fix, height in meters above Mean Sea Level, HDOP - will indirectly reflect 10MHz quality, warning on display if HDOP threshold exceeded or validity lost, Sun azimuth and elevation.

On the Sunday, we decided to drive to the Normandy coast for a look at the D Day landing beaches and to check out a few possible microwave locations in case we decide to invade those shores again next year! Arromanches looked ideal but would we be allowed to set up our portable stations on the lookout above the town? Only time may tell!

Many thanks to all our French friends for a wonderful welcome and a most enjoyable weekend. ... and also for the free bottle of special CJ white wine, bottled just for the event ... every one gets one when they register at the door ! **73 from Peter, G3PHO**


F6AJW G3PHO F1PYR F6DKW


Ralph, G4ALY



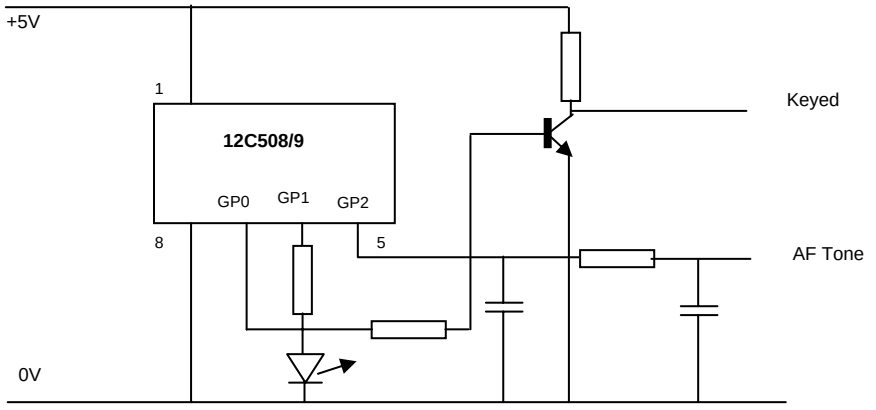
Above: F6CJD's excellent 24GHz transceiver (left) and ATV Receiver (right) entered in the construction competition

Below: F6APE (left) receives the French microwave contest trophy from F1GHB

Many thanks to G4ALY and G8ACE for some of these photos

A SIMPLE PIC BEACON KEYER

Circuit from Dave, G4HUP and software from Andy, G4JNT



Note – GP0 and GP1 connections can be reversed to give opposite keying phase

PIC KEYER Source code / hex code and a description are now on G4JNT's web site in the software section. See BCNKEYER.ZIP at: **www.scrbg.org/g4jnt/5**

Is this the first amateur laser beacon?

Simple optical beacon experiment in San Diego ...

We have installed a simple LED optical beacon on San Miguel Mt. in San Diego. The beacon is a Luxeon 1W red LED with 15 Degree (30 deg total) integrated lens. It is powered by a square wave at about 700Hz and has an identification of N6IZW once each minute.

At 8 miles the beacon was visible through a 7X20 mm rifle scope mounted on my K3PGP type receiver with 4" glass lens. The tone was barely detectable by ear as there are several lights on the same mountain generating huge quantities of 60 Hz and harmonics. Using Spectrum Lab SW on my laptop, the tone was readily observed and disappeared during the identification period. The tone strength was only slightly stronger than the 720Hz harmonics (12th harmonic of 60 Hz, probably due to receiver overload) of the other lights on the hill. The frequency response of the receiver currently extends down to a few tens of Hertz so is very much affected by 60/120Hz lights. Adding a good high pass filter to the front end should make the beacon much easier to copy. Thanks goes to Greg, K6QPV for putting the beacon up on the hill and setting it up with a control link to turn it on & off.

From: Kerry Banke <kbanke@qualcomm.com>-

Experiences with a Home station
G0EWN IO93FK 230asl

As with so much in life, it's often better to get on with it, making the best of what you have, rather than hankering after the ultimate. For the first 18 months of my 'microwave career' (I became active on the microwave bands in April 2004) I concentrated on portable operation, first with 3cm, then 6cm followed by 24GHz. The upside of portable operation is you get to choose your site; the downside is that you are normally back at home and not on the bands when they are open!

My first experience of a microwave tropo opening came in December 2004 when the whole VHF, UHF and SHF spectrum came to life. The only permanent antenna here was for 2m and after working strings of stations into the KO series of square locators, I decided to set the 3cm portable rig up to fire out of an upstairs bedroom window. The result was 5 DX stations worked, best DX at 750kms or so with OZ1CTZ. All these were worked with QRP, a barefoot DB6NT transceiver). The bug for home operating had bitten!

However there were problems with establishing a home station ... I live in a conservation area, a roof mounted dish would have to survive very strong winter winds and only one system per band, designed for portable operation, was available. The list went on. Fortunately, I visited Peter, G3LRP who lives some 30km or so away to the North of me. Peter works successfully on a number of bands, including the now famous series of daily skeds with Ralph G4ALY. All this **without** a permanent antenna system; Peter points his antennas out of his large, opening, shack window ... no problems with planning, wind loading or maintenance.

The final link which persuaded me to try and establish a home capability was listening to John G4EAT's inspirational talk about his 24GHz home station experiences at Martlesham last November (2005). Clearly things happen for home stations, especially if the site is halfway decent. G4JNT's software showed my home location would be almost as good as some of the portable sites I had used especially out to the Continent. That clinched it. What evolved is clearly a compromise but, as with G3LRP, it works. A short mast was fastened just outside the attic bedroom window to support equipment; it's a fairly easy matter to change between bands, feeds and even dishes. With the dish mounted just outside the window, I have a clear horizon for some 90 degrees or so covering the Continent between OZ to eastern France (**see photo above**). Other directions are heavily obstructed

Results so far

3cm Squares worked so far:
IO 91 G8DKK
IO93 G3LRP, G3PHO
JO01 G4EAT,G8APZ
JO02 G4DDK, G3XDY,G4BAO,G4HJW

JO03 G3PHO/P
JO22 PA0EHG, PA0EZ, PA5DD
JO31 PA0BAT, DJ5BV
JO45 OZ1FF
JO46 OZ1CTZ

Many of the above stations have been worked on numerous occasions. Indeed, G4EAT, G4DDK and G3XDY are all workable under seemingly any conditions via forward troposcatter; all are roughly 240km or so away typical signal strengths are RS52 to 54 on 3cm.

Beacons Heard

GB3MLE (normally the only beacon to be heard, via reflection), ON0RUG JO11, DB0JK JO30, DB0GHZ JO34, DB0CV IO54, GB3MHX JO02, PI7EHG, OZ4SHF JO65 (current ODX at 920km)

24GHZ

JO01 G4EAT is my best DX at **241km** from home on this band. John and I tried a number of times prior to our successful contact. When the path finally' went' John was absolutely end stopping on 3cm—the path behaved like line-of-sight. The 3cm dish and feed were taken down and replaced by the 24GHz transverter with half a watt to 45cm Procomm dish (10 minutes to change band/dish). John's signal was found straight away at 59 just a few hundred Hz from where I expected him on the dial. (Another advantage of home operation—I was able to feed the transverter directly from a Racal VHF synthesiser so no offset, which often happens due to thermal effects when out portable!) This opening, whilst good, was nothing special, leading to the conclusion that with the higher powers now available the current UK tropo record of 395km will be exceeded in the next few years.

I'm just in the process of re-boxing my 6cm gear to accommodate a 5W amplifier and hope to give that band an airing shortly. I'm looking forwards to working lots of you in the coming year either from home or portable.

Best wishes from Gordon, G0EWN

GOT PROBLEMS WITH YOUR ISP AND THE SCATTERPOINT EMAIL PDF ATTACHMENT?

I can recommend the **Google Gmail** service for this. If anyone would like one FOC then if they drop me a line I'll gladly send them an invite.

The service can be accessed via a web browser or a normal email client such as Thunderbird or Outlook Express.

73 from Nick G4IRX <nick@nowindows.net>

READ THIS BEFORE SOMEWHERE?

From time to time, you'll find items in Scatterpoint that may have been previously posted on various microwave reflectors, including UKuG's own one, before the Scatterpoint publication date. The reason we sometimes do this is that many Scatterpoint readers do not subscribe to the internet reflectors and we feel they should get the benefit of any informative "technical gems" that have appeared there as casual postings. We also feel that a permanent record such as Scatterpoint is a more suitable archive for such information, otherwise it merely gets lost in people's email mailboxes! Occasionally we do use the stuff as fillers when you folks fail to send us anything else to publish!

BACK YARD EME... from G4DDK

In case anyone thinks I've given up microwaves I thought I'd mention what I've been doing recently.

I have been fascinated by moonbounce ever since I can remember but previous QTHs have forestalled me installing an effective antenna. Once we moved to Falkenham much of the restriction was removed.

I bought a small (2.3m) TVRO dish at a London trade exhibition and installed in on a concrete pad at the rear of my garden shed.

Using the dish with a 1.3GHz 200W output DB6NT SSPA and a 0.3dB (ish) NF preamp I can see my echos 90% of the time using Spectran, and hear them about 5% of the time.

Using this system I have worked 15 stations on CW and 2 (uniquely) using JT65C and that includes Dave Robinson, WW2R/G4FRE in Dallas! The smallest station I have successfully worked is SM5LE who was using a 2.2m diameter dish with 250W on JT65C.

Before the April Dubus EME contest I decided I would like to try listening off the moon on 13cm, so I borrowed G3LQR's rectangular septum polariser feed, built yet another WD5AGO 13cm pre-amp (~0.6dB nf) and using my home brew transverter was able to listen to F2TU, OE9ERC, OH2AHX and OK2CA as well as several others I couldn't identify. F2TU persuaded me to connect my 20W terrestrial amplifier to the antenna and try with him. This was unsuccessful but the following day (9th April 2006) I connected up the 50W driver from my much bigger, but unfinished, SSPA and again called Philippe. This time he responded with Os, which is all copied. I then arranged a sked with OE9ERC and again successfully worked him with O/O reports! Next I had a sked with Peter, G3LTF, who, although managing to copy his own callsign and my O report to him, was unable to complete because he couldn't copy my callsign fully.

I think that a 2.3m dish with just 50W constitutes real 'backyard' EME and should not only encourage others to try, but it is also clear from my measurements of sun noise, etc. that the same 13cm system is capable of at least another 2 to 3dB performance improvement.

73 de Sam, G4DDK

Following on from Sam's most interesting report above we'd like to hear from anyone who took part in the 10GHz EME test from Bochum, Germany over the first weekend of April this year. While your scribe was wining at dining in Seigy, DB6NT and his group were transmitting on the big dish at Bochum. According to Chris, G8BKE, several UK operators heard them on their own terrestrial systems. It would be most interesting to find out just how small a system one could use to receive the EME from Bochum.

Contest Plans

One or two of you have already decided where you will be going this year for some of the contests. Ian, G8KQW sends us his 24/47GHz schedule:

G3FYX and G8KQW will be operating 24 & 47GHz as follows:

Brown Clee	IO82QL	- 7th May
Ventnor IOW	IO90JO	- 9th July
Mynydd Maen	IO81LQ	- 10th September
Cleeve Common	IO81XV	- 8th October

G3PHO/P and G3PYB/P will be on the North York Moors (IO94MI) for the June 6cm and 3cm cumulatives and the former will also be reactivating IO72 (Rhiw Mt) on 6 and 3cm sometime this summer.

G0EWN/P has plans to operate from JO03 on 24GHz soon.

Some of you may not be aware of the contest activity bulletin that is emailed during the week leading up to each UKuG contest. If you want to be on the mailing llist for this please contact the

Scatterpoint editor who also publishes the bulletin.

French Activity Days

Hello UKuG,
I am please to inform you of the dates for the 2006 series of French activity days :

29 & 30 of April
20 & 21 of May
17 & 18 of June
29 & 30 of July
19 & 20 of August
23 & 24 of September
28 & 29 of October

For all these Week Ends, activity on 23 cm and up will begin on Saturday 17 PM to 23 PM French local time and then on Sunday 06 AM to 17 PM French local time
Best 73 Eric, F1GHB

ACTIVITY REPORTS

To say that these are thin on the ground is an understatement! Just what have you all been doing this winter? Anyway we have a short report from **Keith, GW3TKH, Cardiff** on the **March All Band Activity Day**:
Sunday was cold and very windy here, so I decided to stay at home! I worked:
G3FYX on 23cm.
G4NNS on 6cm (57/56) & 3cm.
GW3PPF on 6cm & 23cm.
Activity on 2m talkback was low. The only others I heard were: G0MJW/P & G4PBP.
The lack of activity did allow me to get on with the 13cm transverter, which now receives and produces power! Hopefully I'll have it in a usable state and an antenna erected by the 23rd April. **73 Keith, GW3TKH**

24GHz in NEW ZEALAND

Steve, ZL1TPH, furnishes a little more information and an impressive audio file (which we can't print of course!) regarding the successful 24GHz national record reported in Scatterpoint earlier this year:

Thank you for your reply in regards to my contact with **Ted ZL2IP** at 221km on 24GHz here in New Zealand. Ted was only running 500mW, as you heard on the audio wav file. I have only 1.2 watts.

Ted sent me this picture of Mt Taranaki (otherwise known as Mt Egmont in the North Island). It was taken from his home QTH which is at 420m asl. For the record contact he was only a little way up that big mountain at 962 km.

Ted also comments:
You can just see the roof of the visitor centre where I was as a white horizontal line on the right just above the near tree line. So that is 962m. The top is 2510m.....You can just make out the translator tower as a dark vertical line, at about 1500m I think.

73 from Steve ZL1TPH

DXPEDITION TO IRELAND

From Rainer, DF6NA, we hear of his expedition to SE Ireland for the May Region1 VHF to uWave Contest. This offers UK operators an excellent opportunity to work IO62 square on most microwave bands. For more details, visit their special website at:

www.ei5hn.vhf-dx.net

Space probe VOYAGER 1 successfully received

On March 31st, 2006 an AMSAT-DL /IUZ team received the American space probe VOYAGER 1 with the 20 m antenna in Bochum. The distance was 14.7 billion km. This is a new record for AMSAT-DL and IUZ Bochum. The received signal was clearly identified through means of Doppler shift and position in the sky. The receive frequency was exactly measured and compared with the information provided by NASA.

This distance equals approximately 98 times the distance between Earth and Sun. VOYAGER 1 is the most distant object ever built by mankind. This again proves the superior performance of the Bochum antenna. Most probably this is the first time Voyager 1 has been received by radio amateurs.

VOYAGER 1 was launched on 5. September 1977 by NASA. It transmitted the first close-up pictures of Jupiter and Saturn. In 2004 VOYAGER 1 passed the Termination Shock Region, where the solar wind mixes with interstellar gas. VOYAGER 1 today is still active, measuring the interstellar magnetic field.

The following radio amateurs were involved:

Freddy de Guchteneire, ON6UG
James Miller, G3RUH
Hartmut Paesler, DL1YDD
Achim Vollhardt, DH2VA/HB9DUN

Special thanks to Thilo Elsner, DJ5YM of the IUZ Bochum, Roger Ludwig of Jet Propulsion Laboratory (JPL), Pasadena USA and the Deep Space Network Tracking Station in Madrid, Spain for their cooperation.

For more information please visit:

http://voyager.jpl.nasa.gov
http://www.amsat-dl.org/cms, (under "News")

CUE FOR A PHOTO CAPTION COMPETITION ?

Study the photograph on the left and think of a suitable caption. It appears to be a photo of a mobile phone company's airport shop in the USA.

Remember this is NOT an April Fool quiz!

(Thanks Kent, WA5VJB, for the photo)

JUPITER GPS MODULES ...

some useful information from Andy G4JNT

I've just received the following email from TDC in Basingstoke who I recommended as a source of GPS modules in the RadCom article.
I haven't used the Pico module, but would be interested in hearing from anyone who has...

It's nice to know there are some radio amateurs at that company.

Andy G4JNT (www.scrbg.org/g4jnt/)

-----Original Message-----
From: Simon Taylor [mailto:simon@tdc.co.uk]
Sent: 28 March 2006
To: ACTALBOT@mail.dstl.gov.uk
Subject: GPS clock

Dear Mr Talbot,

I have read with interest your article using the Jupiter T and, as product manager for TDC, write to thank your for the link.

Unfortunately, the Jupiter timing products are now obsolete, and only a few remain. We are trying to get a few more Jupiter T's but we also have the Pico T which is identical in performance, function, chipset etc (and is also obsolete), but has a different PCB connector, being a smaller module.

We have some of these in stock, We've got a price of £59.00 plus £6 carriage (to UK addresses) + VAT. (£76.38 all inclusive).

I will put up a page with the datasheets for both devices and a link to email an enquiry for the product to one of our sales desk people, Will Sandys, who can deal with any enquiries.

Regards, Simon Taylor, G1NTX

Date: Wed, 15 Mar 2006
Subject: RE: [ukmicrowaves] Jupiter GPS

I've now added the PIC source code used for GB3VHF to the web site below: go to the software download page.

The file GB3VHF05.ASM includes code for reading the binary data from a Motorola Oncore GPS module to get the time and satellite status (location is buried in the middle of the data string too). Some models of Jupiter T default to this format too.

Sorry, Atmel AVR users ... But the source code should be transferable one way or another, and the data format of the GPS output string is there !

Andy G4JNT

From: Talbot Andrew <actalbot@mail.dstl.gov.uk>

Subject: RE: [ukmicrowaves] GPS Signal Aquisition

As there appears to be a lot of interest in this subject, I've now posted the PIC source code for the 5MHz beacons as well as that for GB3VHF. This one contains routines for reading NMEA data and extracting time and status information from the $GPRMC string.

Andy G4JNT

www.scrbg.org/g4jnt/ <http://www.scrbg.org/g4jnt/>

PAST COPIES OF SCATTERPOINT NOW AVAILABLE ONLINE!

As a follow on from the announcement made on this page in last month's Scatterpoint, the Committee has decided to make available, **to anyone in the public domain**, all copies of Scatterpoint printed during 2004. At the end of this year all the 2005 issues will also be added to the free archive. In this way UKuG members will not be penalised as their current year's issues will remain their privilege. To enable an easy-to-use archive download system we have acquired **www.scatterpoint.org** as the URL. Just go there and follow the links!