An Amateur Radio publication for the Microwave enthusiast

MICROWAVE NEWSLETTER

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Lambda House, Cranborne Road, Potters Bar, Hertfordshire EN6 3JE

FROM THE EDITOR

2004 – JUNE

This is an historic issue of the Newsletter. Almost a quarter of a century after it first appeared as a single A4 activity list sheet in the Spring of 1980, the RSGB Microwave Newsletter ceases to exist as of this June 2004 edition. As its editor since 1985, I would like to place on record my gratitude to all who have supported this publication over the years, to you the readers and to the staff at RSGB HQ who have turned my draft copy into the little booklet with which several hundred of you have become very familiar over the years.

However, we "rise from the ashes" in a new format next month as **Scatterpoint**, the official newsletter of the UK Microwave Group. At the time of writing this editorial, many readers have already sent in the form that appeared in last month's edition, announcing their intention of joining the UKuG. If you have not yet sent in yours then please do so because from July you will only receive Scatterpoint if you are a member of UKuG.

A couple of readers feel the two levels of UKuG subscription is not a fair system and that , in the words of one reader, those who subscribe to the printed Scatterpoint will be subsidising those who pay the lower amount and get the emailed newsletter. In fact nothing could be further from the truth! Please regard the basic £6 subscription to the UKuG as just that, a fee to join the group. It automatically entitles everyone to receive the emailed (PDF) newsletter. However if you wish to receive a printed newsletter then that will cost you another £6 (in the UK). The basic £6 subscription is to help the UKuG carry out its role as the "voice of UK Microwavers" and provide you all with a number of useful and exciting facilities. The UKuG committee are determined to give you value for money in the coming years so please support us in our endeavours!

So, it's "goodbye" for now but "hello again" in late July or early August.

73 from Peter, G3PHO

In this issue ...

News, views and articles for this newsletter are always welcome. Please send them to G3PHO (preferably by email) to the address shown below. 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.

G3PHO: Peter Day ++44 0114 2816701

G3PHO: Email: microwaves@blueyonder.co.uk

G3PHO, Peter Day,
146 Springvale Road,
Sheffield, S6 3NU, UK

DDS Source Kitset

From: Andy, G4JNT
[actalbot@southsurf.com]

I am going to be putting together a design for an AD9852 Direct Digital Synthesizer module, which will be made available as a kit, initially in small numbers. The AD9852 device is a generation on from the AD9850/51 devices used by a number of amateurs recently, and that was basis of my design published a few years ago in RadCom.

This newer chip can clock up to 250MHz (300M with care, and over this if you are prepared to really cook it) making it possible to directly generate over 100MHz. Frequency resolution is improved to microHz accuracies, and the chip contains an internal PLL multiplier that can be programmed to multiply from 4 to 24. There are a host of other facilities on the chip that we probably won't need (eg. automatic chirp generation, amplitude shaping, phase ramping). Have a look at the data sheet, this can be downloaded from:

www.analog.com

The module will include a PIC controller implementing a plain ASCII command set on a serial interface, which will be simpler to drive than the one for the AD9850 was. The DDS chip itself is an 80 pin Quad package with 0.6mm pin spacing, so is a bit tricky to solder on (although microwave constructors should find it a lot less of a problem than other constructors!) So will investigate if having these mounted by the PCB manufacturer will be cost effective. Costs still to be investigated but watch this space …

LATE FLASH!

I am now the proud (!) owner of 15 AD9852ASQ DDS chips - these are the ones with a metallic base for operation to 300MHz clock frequency. Am now about to put the finishing touches to a development PCB and some PIC firmware to drive it.

If anyone wants a bare chip to put on their own PCB, please contact me directly- the price will be 'around' £23, but as the owner of the VAT number who had to order them for me hasn't yet had any additional VAT/Customs fees sent to him (and doesn't know if they even will) I can't guarantee that price just yet.

After a quick look at Newbury Electronics PCB Train web site / price calculator (www.pcbtrain.com) **the board price will be in the region of £15 each for 10 off**, then there will be the PIC so I may be looking in the £50 region for a short kit of the specialist bits. It is not worth getting Newbury to mount the chips, having just the one IC per board fitted is not cost effective. It's not too difficult soldering on the 0.6mm pitch IC pins by hand - especially for those who have built modern amateur microwave circuitry.

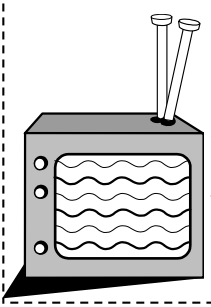
I've used this DDS device before, but with a larger PIC and with parallel programming for top speed. For the development / general purpose module I was thinking of a simple PIC based interface that accepts ASCII / RS232 characters to set the device registers after a minimum of setting up, and save the values in non-volatile memory for boot up next time. This will keep things simple and offer maximum versatility with a single reproducible PIC firmware.

73 from Andy G4JNT

SURFACE MOUNT COMPONENT OFFER

G4NNS has some surplus of Surface Mount Components due to the generosity of another Andover microwaver. The list of available components is available in downloadable .rtf format from **http://myweb.tiscali.co.uk/g4nns/SMDList.html** along with instructions as to how to get your hands on the components.

LORAL RELAYS: 2@ LORAL FSCM 99899 types.
These are 1 pole, six way SMA microwave Relays. **Price £25 each or £45 the pair.**
Contact: Maurice, G0FVE (Amesbury).
Telephone: 01980 625947



ATV MICROWAVE REPEATERS

from: Murray Niman, G6JYB [mjniman@iee.org]

The following notice has recently appeared on the RMC website:

A number of 13cm and 10GHz repeaters were cleared for operation on 30th April 2004.
GB3BH: 13cm TV at Watford on Hertfordshire
GB3KM: 13cm TV (dual input) Co.Durham
GB3LX: 10GHz TV Lincoln
G**B3RV:** 10GHz Brighton, East Sussex (Digital & Analog TV)

The Microwave ATV network is got quite a number of installations around the UK.

Experimental 10GHz beacon

From: Andy Talbot [actalbot@southsurf.com]

I have an experimental beacon transmission currently running from home **(IO90IV58)** on **10368.90518MHz**. (+/- 10Hz) This uses the high stability new driver that will be used on GB3SCX when tests are completed. ERP is about 2 Watts. This version has moved on from the DDS based design in February's Newsletter in that, instead of prescaling and comparing, I now use the VCXO to clock the DDS direct which then generates 10MHz to compared with the reference and fed back. This was mentioned at the end of the article as an afterthought and has the advantage that, if the reference signal is lost, the VCXO just free runs at its centre frequency and the DDS doesn't crash from having no clock input … and obscure prescalar chips don't have to be found.

As an experiment, I have added an RTTY message as well as the usual CW ident - if successful the RTTY will be included on the GB3SCX transmission. The RTTY is generated by reprogramming the DDS between Mark and Space frequencies.

All reports of reception are welcomed to actalbot@southsurf.com and/or actalbot@dstl.gov.uk

The format for the RTTY transmission is not exactly the same as that used on HF. I have used a wide frequency shift - 850Hz and keying at 50 Baud rather than the usual 45 baud. The wide frequency shift is more suitable for scattered and Doppler shifted signals such as those on microwaves. Also, with a 13Hz setting resolution (at 10GHz) the accuracy needed for lower frequency shifts is not going to be sufficient.

The keying sequence currently in use is : Callsign (at12 WPM), Locator (at 20WPM), 5 seconds of carrier, RTTY message (which takes about 8 seconds) then 30 seconds of carrier before the sequence repeats. The sequence to be used on GB3SCX will probably be similar to this.

50 bauds was adopted because the Multi PSK RTTY settings would only allow 850 Hz shift at 50 baud, not 45, and it is 10% faster. MMTTY and TrueTTY allow all usual combinations of shift and bauds rate. The keying polarity is such that the 'rest' or Mark frequency is the nominal carrier, and the RTTY Space keys 850Hz HIGHER … whether this is reverse or normal I don't know. MMTTY and MULTIPSK needs the keying polarity to be set to normal, TrueTTY has to be set to reverse, so even the authors don't seem to know! If you get garbled copy, try switching the keying polarity on your software.

The reason for choosing RTTY rather than a more advanced data scheme is because there are a lot of public domain programmes for the Soundcard that can cope with most flavours of shift and baud rate. Furthermore, a low data rate wide shift is probably one of the most optimum data modes for this band.

The RTTY receiving programmes I recommend are MMTTY, MultiPSK and TrueRTTY. MMTTY and MultiPSK are free, TrueTTY is shareware and requests payment of a $39 registration fee to gain full facilities. However, it is useable from immediate download. All can be found by searching on these names and MultiPSK will be reviewed in the Data colum in June's RadCom

The keyer module for this is a new PIC firmware I have just written and is also still being tested. It is broadly based, in concept, on the G0IAY keyer published in the Newsletter some years ago. Unlike other beacons keyers to be seen in widespread use, the mesage in this design can be reprogrammed simply by plugging in a 1200 baud RS232 connection from any serial terminal. The whole PIC does not have to be reprogrammed just to change the message. In this latest design both CW message, delays, and the RTTY mesage can be changed time and time again and are stored in non-volatile memory.. Furthermore, it is also the only one (I think) where the CW speed can be changed during the transmission, eg. for a slow callsign ident, and faster location information.

Andy G4JNT

VERSATILE TRANSVERTER INTERFACE FOR THE FT817

~ by Peter Day, G3PHO

The FT817 is a deservedly popular transceiver, used by thousands of QRP enthusiasts around the world and immediately recognised by the amateur microwaver as a modern replacement for the ageing IC202 or FT290 "prime movers" of yesteryear.

I've used a couple of IC202 transceivers (one an S model) for over fifteen years and have been very pleased with their performance as a microwave IF, except for one feature … the poor frequency display of ten kHz per dial division. In the past few years, my microwave transverters have been improved so much, with features such as hi-stability OCXOs, that their frequency stability and resetting accuracy now exceeds that of much of my old VHF gear. Hence I thought it was about time I treated all the transverters to a more modern IF transceiver. In late March 2004 I purchased a new FT817 and was immediately impressed at how Yaesu could pack so much into so little!

My 3.4, 5.7, 10 and 24GHz transverters are designed around DB6NT transverters, constructed from Michael's excellent kitsets and driven by 120 milliwatts of 144MHz from an IC202S. My 23cm old DEM transverter is driven at 10 watts input by an aged TS700A, while my recently acquired 47GHz gear, bought from a "retired millimetre man", requires an FT290 at 3 watts. Apart from the 23cm transverter which uses a separate PTT line, all the others require a switching voltage on the coax connecting the IF transceiver to the microwave transverter. The 47GHz transverter send/receive is controlled by a positive voltage on TX while the others are switched by a positive voltage on RX. A look through my (almost complete) collection of Microwave Update Proceedings found a couple of relevant articles in the 2002 edition … one by Paul Wade, W1GHZ **(1)** and the other by UK expatriate Dave Robinson, WW2R. Dave's article **(2)** provided me with the solution to the problem of switching the transverters no matter what the configuration (IC202S or FT290).

The final outcome was the unit shown in the photographs … a versatile and switchable interface between the FT817 and the microwave transverters. This little unit allows the FT817 to directly replace either IC202 or FT290 type transceivers **with no modifications at all** required to the microwave transceivers. A facility to adjust the RF input to the transverters is also included, as well as a near foolproof protection circuit for those who have been known to get the 12V DC input leads the wrong way round … a potentially disasterous event when out /portable!

Apart from a little mechanical ingenuity, most of this article relies entirely on other people's work. My thanks go to Dave, WW2R, for the basic circuitry.

The Design:

The interface module is connected to the +12 volt DC input supply (eg a battery if operating portable). If the supply is connected reversed polarity then Relay 1 does not go over and you will have to reverse the supply leads for correct operation. The correct state is shown by the red LED. Over the years I have found this relay protection just about "idiot proof" and I now have no fear of damaging my precious microwave gear through lack of care when hooking up supplies. The few

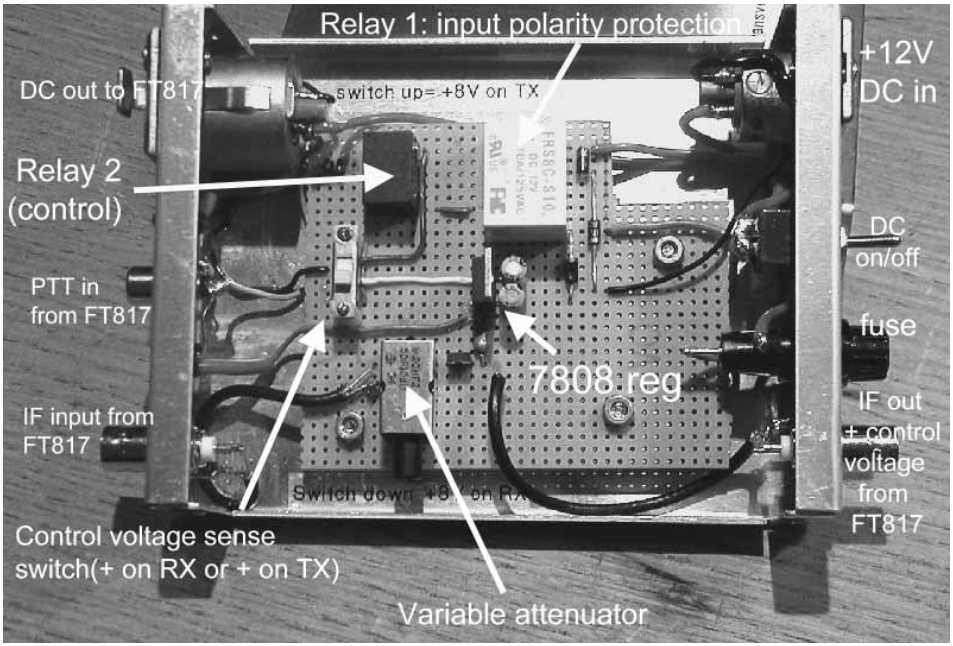
extra milliamps drawn by the relay is a small price to pay for piece of mind …. and please don't tell me that you have **never** connected a supply the wrong way round!

The FT817 power lead is connected to the fused 12V output socket on the interface, while the FT817's BNC VHF antenna connector is connected via a short length of coax to the socket marked '500mW RF input'. The FT817 power output is reduced to 0.5W by means of the transceiver's menu. A coax cable of any convenient length then connects the interface to the microwave transverter. My own system uses a 15 foot length of 50 ohm double screened lead here, the variable attenuator in the interface being adjusted to give 120mW at the far end of this cable.To obtain full send/receive control of the transverter by the FT817 PTT line, an 8 pin mini DIN plug is wired up to take a short, thin coaxial lead from the transceiver's ACC socket (pin 2) to the PTT phono socket on the interface. When the microphone PTT button is pressed or the morse key activated, pin 2 ('TX ground') of the ACC socket of the FT817 is grounded to pin 3 and in turn completes the ground connection of the coil of Relay 2 in the interface. This applies 12V to the 7808 regulator IC. Depending on the configuration of the slider switch in the interface, a +8VDC control voltage will be applied to the IF output line on either RX or TX.

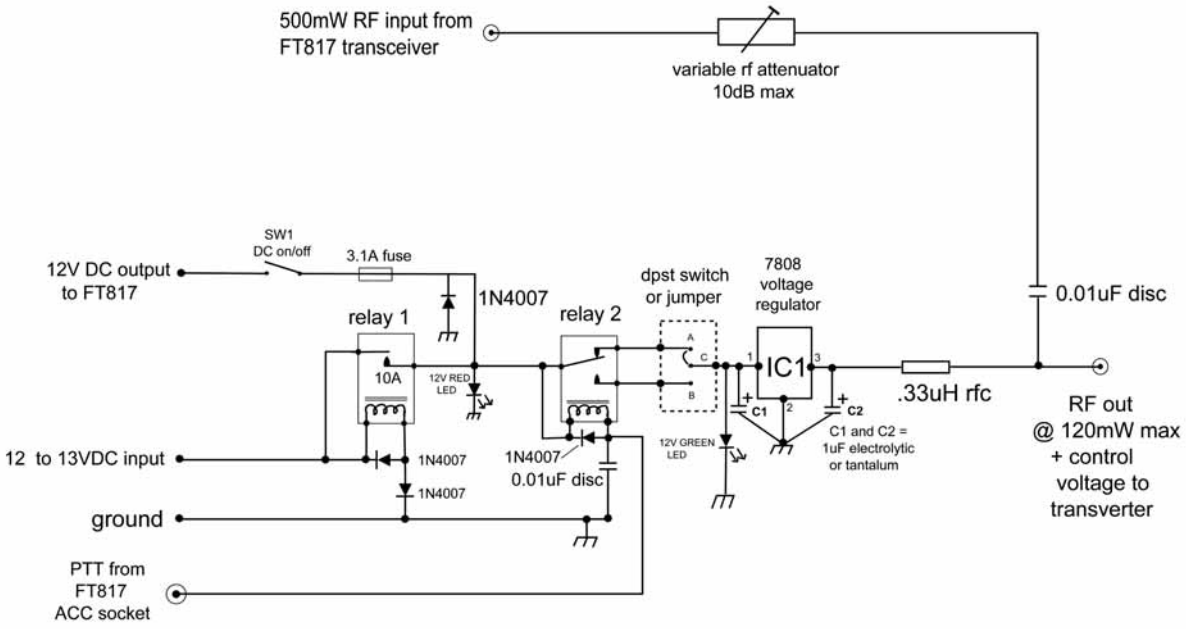
Construction:

There's nothing special about this module. One off units like this don't need a purpose made PCB unless you like your gear to look fancy! The enclosure is a small aluminium box I had in the "come handy drawer" and I used some perforated board that has strips of copper foil on one side (called "Veroboard" in the UK) for the circuitry. The board should be populated with the various components and tested before it is put into the small aluminium enclosure, as shown in the photographs. The box is drilled at both front and rear aprons to take the various connectors and switches, making sure that all I/O leads to the FT817 go to one apron and the outputs to the microwave transceiver to the other.

The photograph below shows the component layout.



FT817 /Microwave Transverter Interface



Peter Day,G3PHO, April 2004

The finished product:

The complete interface is a little smaller than the FT817. If a larger enclosure were used, extra DC and IF output sockets could be fitted, enabling use with several transverters at the same time.

After completing this project I realised it would have been more useful to have the control voltage sense switch on the front apron of the enclosure rather than inside the box!

COMPONENTS:

The component values are marked on the schematic but a few extra points are added below ….

The variable attenuator:

I already had a few of these nice little pc mounting variables in my junk box. Although they do not provide a constant input and output impedance (and therefore not a good VSWR for the FT817), they are very convenient. A fixed resistive attenuator (T or Pi type) can easily be substituted and calculated from the values of input and output required.

I decided not to switch out the attenuator when receiving as my transverters have more than adequate RX gain in reserve to overcome the 6dB or so of attenuation in the IF line. This is probably the case for most systems.

Relay 1:

This is for polarity reversal protection. Any 12V DC type will do here so long as the contacts can handle a few amps. I used one rated at 10A. To reduce overall load on portable batteries choose one with low coil current.

Relay 2:

This is the main control relay. I used a miniature 12VDC type with 1 amp contacts.

With both relays, don't forget to put 1N4001, or similar diodes, across the coils to prevent "back EMF" effects.

RF choke: A small axial lead 0.33uH type

8 Pin mini-DIN connector (male) :

This is needed for connecting the interface to the ACC socket on the rear of the FT817. Make sure that the inner of the thin coax lead goes to **pin 2** and the shield to **pin 3** of the male connector. Use the pin numbers on the connector itself to absolutely sure you have the correct pins. Wrap some insulation over nearby pins, one of which, **pin 1**, carries +13.8V from the FT817. Short this to ground at your peril! Refer to the FT817 manual diagram. On the ACC socket pin 2 is named "TX ground" and pin 3 "ground". **Do not use the PTT pin on the DATA socket.**

Control Voltage Sense Switch:

A small slider switched was mounted on three pins that are soldered through the perf board. Pin 1 of the 7808 regulator is connected to the slider. In the schematic, pins A and C are connected by the switch to simulate IC202 control switching while pins C and B provide FT290 type switching. This switch could be mounted on the front panel for ease of use.

Internal IF coax lead:

I used a short length of RG174 here, taking care to minimise the exposed sections of inner conductor at the attenuator and the BNC connectors.

Summary:

The interface worked first time and has been used with excellent results in the May and June 5.7/10GHz cumulatives and millimetre band contests. One added advantage of using the FT817 is that if 'KYR' is selected by pressing key F on the front panel, the C function switch below the main dial puts the FT817 into beacon mode, sending a steady stream of dots or dashes according to your tastes (provided a morse key is plugged in).

After over a decade of using IC202s to make hundreds of microwave contacts you get quite used to using antiquated gear. Only now do I feel I'm in real control of frequency setting. I got quite a "buzz" from a report by G3LRP that I was only 100Hz out on 24GHz when I called him on 24048.100MHz. I can live with that considering I do not yet have GPS locked oscillators!

References:

1. **Bias Tee for Remote Transverter Control - Paul Wade, W1GHZ: Microwave Update Proceedings 2002**
2. **Interface circuits for the FT817 - Dave Robinson, WW2R (G4FRE): Microwave Update Proceedings2002 and also RSGB Microwave Newsletter April 2002**

MORE BEACON NEWS

Update for German Beacon DB0GW

DB0GW in Duisburg is now QRV on 10GHZ:
10368.850MHz 0.1W o/p to a Slotted-Waveguide 9dB Omni
24GHz and 5.7 GHz are 80% finished.
73 from Rolf, DL4JK, **[rolf.kueppers@uni-duisburg.de]**

GB3SC# Mast raised

From: g4jnt [actalbot@southsurf.com]
Sent: 29 May 2004

The GB3SC# beacon mast has now been raised to its full height to clear the trees in the south-easterly direction.The source for GB3SCX has now been replaced with a phase locked unit using a reference oscillator from the old Decca Navigator chain. When I checked the frequency off air just now, it is 21Hz high of nominal, at 10368.905021MHz.The plain carrier gap period in the keying has been extended to 30 seconds to allow more meaningful recordings in narrow bandwidths. An RTTY message has been included, sent after the callsign sequence at 850Hz shift, 50 baud.

Andy G4JNT [actalbot@southsurf.com]
Sent: 29 May 2004

GB3SEE Beacon - Reigate

The GB3SEE beacon is again operational from 16.00hrs 21st May 2004. ERP is around 2 Watts from a 200mW source. The received signal in Winchester (G8ACE) is back to or slightly better than before its problems set in a while back. Denis, G0OLX, Beacon Keeper, will be interested in your reports,

email: denis@procom-pescot.co.uk

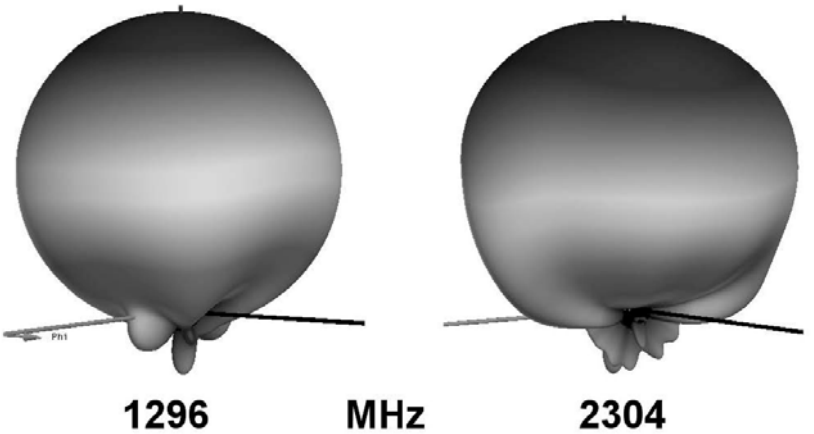
Analysis of the G3LTF Dual Band Feed for 23cm and 13cm

Paul Wade W1GHZ ©2004 w1ghz@arrl.net

In the March 2004 edition of the RSGB Microwave Newsletter, G3LTF described **(1)** a dual band feed for the 23 cm and 13 cm bands. The feed is a combination of two proven designs: an EIA dual-dipole feed for 23 cm, with a cylindrical waveguide horn, or "coffee-can," feed for 13 cm. The dipoles are backed with a 1λ diameter GP (ground plane); the cylinder fits in a hole in the center of the GP, so that the GP acts as a flange at the aperture of the cylinder. Each dipole is fed with a stripline balun arrangement from a remote power divider, and the cylindrical waveguide is excited by a probe.

Taken separately, each feed is known to work well; radiation patterns and calculated dish efficiency may be found in the W1GHZ Microwave Antenna Book — Online **(2)**. What remains to be seen is how well the combination works. Is the dual band feed as good as the individual feeds, or are there unexpected interactions that spoil the performance?

Figure 1



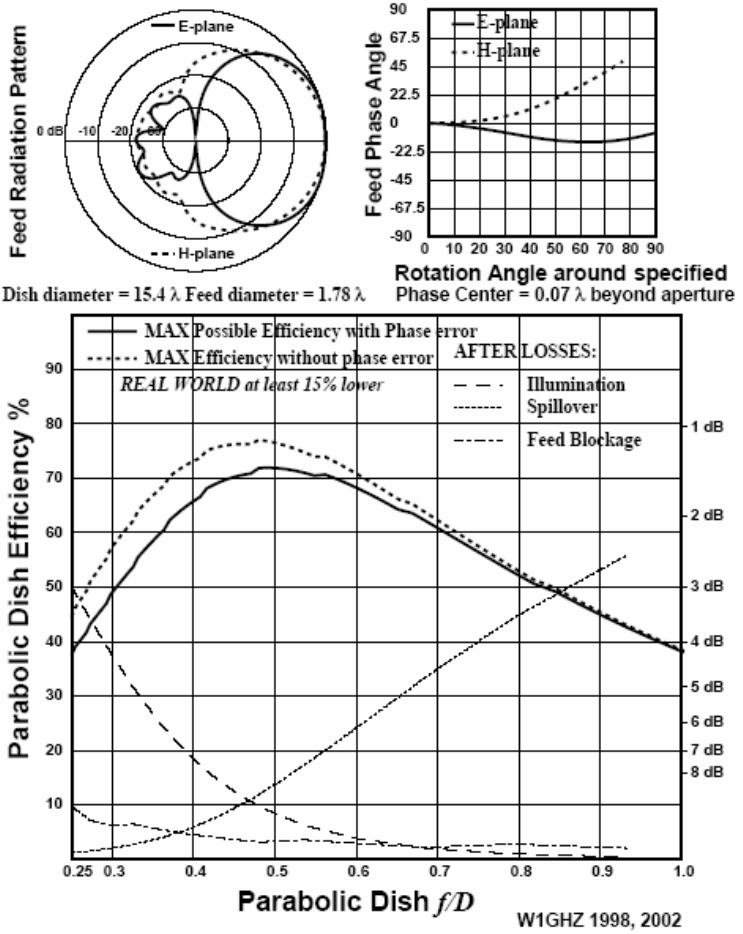
The radiation patterns were calculated using Ansoft **HFSS** software **(3)** and plotted in 3D in Figure 1. Performance as a dish feed was estimated using my **PHASEPAT** software **(2).** The calculated dish efficiency at 2304 MHz is very good, as shown in Figure 2. Best ***f/D*** **is around 0.5, just** right for the two-meter diameter dish at G3LTF. The phase center is 0.07λ beyond the aperture of the cylindrical horn, or about 9 mm above the GP. Since the phase center is most critical at the higher frequency, the 1296 MHz dish efficiency in Figure 3 is calculated at the same phase center (best

phase center at 1296 MHz would be 0.14λ above the GP). Efficiency is also very good, with only a tiny phase error due to the phase center compromise. Best f/D is again around 0.5, so this is a good feed on both bands for the G3LTF dish.

Since the two dipoles for 23 cm are fed separately, it is important to keep them in phase, by using a good power splitter and identical cables. Figure 4 illustrates the radiation pattern resulting from feeding the dipoles 180º out of phase — the beam splits into two lobes with a null in the center.

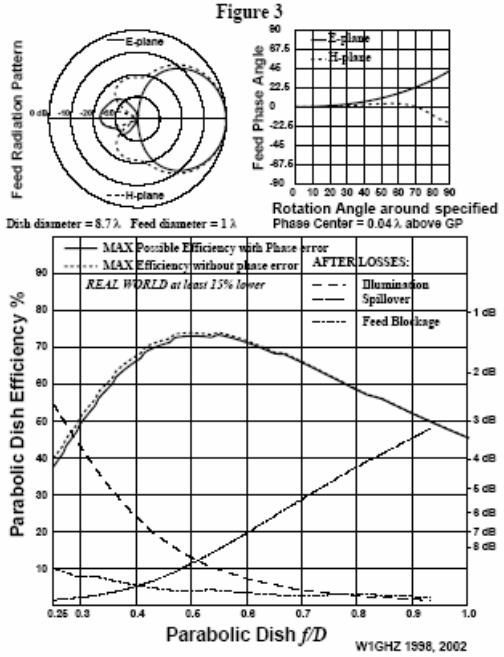
G3LTF L&S Dual Band Feed at 2304 MHz

Figure 2



G3LTF L&S Dual Band Feed at 1296 MHz, 13cm Phase Center

Figure 3



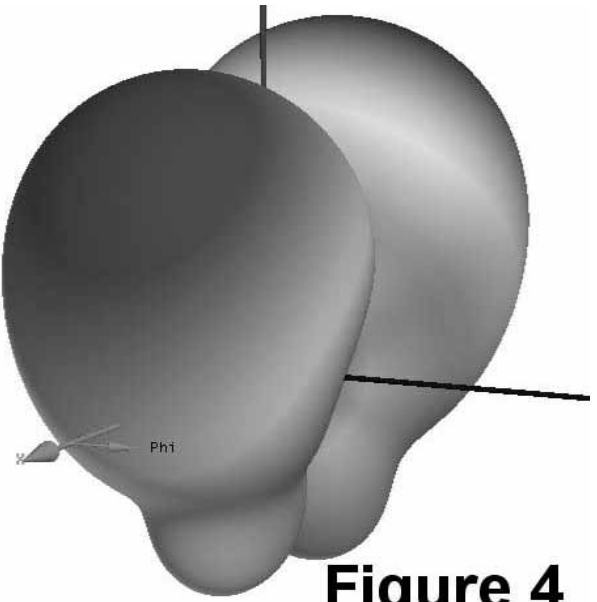


Figure 4

Isolation is always a problem with multi-band feeds. The 13cm cylindrical waveguide is beyond cutoff at 23cm, so isolation at 23cm is better than 30 dB. At the higher frequency, there is nothing to isolate the two feed except spacing, so the isolation at 13cm is on the order of 20 dB. At any reasonable power level, additional protection will be necessary.

References:

1. Peter Blair, G3LTF, "A Dual Dish Feed for 23cm and 13cm," *RSGB Microwave Newsletter*, March 2004, pp. 7-8.
2. www.w1ghz.org
3. www.ansoft.com

Moonbounce ....nah! Venus bounce (E.V.E) is the way to go!

From: Freddy de Guchteneire [on6ug@amsat.org]:

Amsat-DL EME activity from Bochum 10 GHz

The Amsat-DL activity over the weekend of 12/13 June was severely hampered by the weather and the work time table for the commissioning of the Bochum 20m dish (see below for more details).

Because of this, we where unable to have a long EME activity on 10GHz. This activity was organized by Amsat-DL and DB6NT in close cooperation with the IUZ-Bochum to enable radio amateurs to have some excellent EME signals and have the opportunity to test their equipment and possibly have some first hand experience with EME. EME activity is closely related with Interplanetary communications and Amsat-DL is preparing for an Interplanetary mission in 2007-2009.

We recognize the importance of this and decided to repeat this activity on 10GHz the next weekend, June 19 and 20. During this weekend we will reduce the work on the Bochum dish and give priority to EME activity.

Details:
call: DK0SB (clubstation Sternwarte Bochum) JO30
Antenna: 20m dish
Polarisation: Linear vertical and circular RHCP (TX)
Power: 50W (200W)
Modes : CW SSB JT65 FREQ : 10368.100 MHz TX

Short report on the activities of June 12/13, 2004:
We had some severe thunder storms and heavy rain in Bochum. Saturday was the worst. Besides this we had a mechanical technical problem and the noise measurements we had to do where difficult with the water on the dome. Our own EME signals where very good and we made some excellent recordings in CW, SSB and even in FM ! Some QSO where made. We thank everybody for their patience. **In order to prepare for possible Venus reflection test we did successfully detect Venus noise on Sunday afternoon**. However we are not sure if we can do the Venus reflection tests within the short time available (abt 2 weeks) If not, this work is not lost and to be seen as preparation for 2006 EVE.

73 from Freddy ON6UG

DID YOU KNOW ?.....

Dave Robinson, G4FRE/WW2R now has RSGB Microwave awards for 1296, 2304, 3456, 5760 10GHz and 24GHz from both sides of the Atlantic… this must be a "first!

4ft Andrew dish … FREE!

Andrew FP4F-15E dish 1.224m diameter, 1.3m gross, free to good home. The nameplate says "DISH Type 105251-1 4' F.P. REFL. ASSY.". It's substantially made, 2.3mm thick and indestructible. Good to 24 GHz at least. Just take it away, please! If you don't, it's going to dish heaven … in strips! 73 de James [Cambridge]. Email me at: **g3ruh@jrmiller.demon.co.uk**

PRELIMINARY NOTICE OF A MICROWAVE EVENT..

Crawley Microwave Round Table
Sunday 26th September 2004

Sixty one UK microwavers attended the UKuG Microwave Round Table meeting at RAL this April. The venue, kindly provided by Rutherford Appleton Laboratories, South West of Oxford and organised by Dr.Mike Willis, G0MJW and others at the establishment, has been the scene of many a good meeting in the past.

One of the attendees was Dave Bowman, G0MRF, a well-known UK amateur who operates from lightwaves down to VLF. He had just returned from the highly successful 3B9C Rodrigues Island Dxpedition which some of you may have contacted on many or all of the HF bands.

Every UK Microwave meeting has a Bring 'n Buy or Swap meet. RAL is no exception … the tables were laden with microwave "goodies", including some very nice millimetric stuff.

Much of the fun of these meetings is socialising with other amateur microwavers. We found John, G8ACE discussing his latest high stability oscillator and multiplier designs with Andy, G4JNT. Andy is himself quite an exponent of oscillator stability so when these two get together you can be certain they are discussing how many parts in "10 to the whatever" their latest brainchild is capable of!

John, G8ACE, brought along his latest creation ... a 47GHz beacon using the latest G8ACE OCXO oscillator, phase locked to a 5MHz reference by a variation of the CT1DMK CPLD PLL circuit. The multiplier is John's latest x24, for which he can provide kitsets, followed by three further stages (x5, x2, x2) for a total multiplication factor of 480. With this sort of multiplication a 1Hz shift at the basic crystal frequency means almost half a kHz at 47GHz! That calls for some real attention to stability techniques!

RAL is memorable for its cuisine! This year, in spite of the restaurant being short staffed that day, we were not disappointed. An excellent lunch at a most reasonable cost was provided.

There were three lectures at the meeting: Peter, G3PHO, described how he built a portable DB6NT/Ionica PA system for 3.4GHz. David, G6GXK had a captive audience when he went through various methods of achieving high frequency stability and accuracy. Allan, G8LSD also enthralled the audience with his talk and demonstration of his lightwave equipment. The sound of the Beatles, transmitted at the frequency of light, was quite amazing ... in fact John Lennon would have written a song about it had he seen this talk! Allan is co-holder of the UK lightwave record.

So there you have it .. another excellent meeting of UK microwavers. Our thanks go to all who had anything to do with the organisation of the event, especially to Mike Willis, G0MJW and the rest of the staff at RAL.

If you haven't yet attended a UK Microwave Round Table meeting then treat yourself this November!

SOS SOS SOS

Please note that my 10GHz Beacon, running from Blackhill in central Scotland IO85BU is temporarily QRT. Keying failed after more than 10 years continuous service. That fault has been fixed but the system will be getting an overhaul before it goes back. With that in mind, I would like to replace the PA which expired for the second time about 2 years ago and was bypassed. I need a solid state PA with between 250mW and 1W output continuous rating (I have about 25mW drive). Has anyone got any such device surplus to requirements for a reasonable price please?

Mark GM4ISM www.dclight.co.uk

From: Brian W Flynn,GM8BJF
[Brian.Flynn@ee.ed.ac.uk] comes a report on his group's 3cm and 23cm activity during the RSGB UHF/ Microwave contest held over the first weekend of May……

We went out as the Lothians Radio Society using the Club callsign GM3HAM/P to at site near Gatehouse-of-Fleet (IO74VW) which we have used in the past for VHF. It 's a good site that has the amenities of the village close by. On 3cm activity started slowly but we eventually worked 3 stations. Our first one was GM4DIJ/P, across the bay at the Isle of Whithorn. This gave us reassurance the the gear was working. The next contact was with G4MAP/P in IO92GB. Looking at the path involved, we were fairly astonished - although the first 100 miles at our end were over a sea path. GD0EMG/P was more difficult - although the Isle of Man was visible, he was located on the other side of the island with a great deal of high ground on the path. After several abortive attempts, we decided to make one more try with both stations beaming at the Lake District Mountains and almost immediately made contact - showing the effectiveness of using reflection over an obstructed path.

The gear was my HB transverter based on WDG modules, running 1 Watt to a 80 cm dish. We also had 23cm running 200W to 4 x 55 element F9FT Yagis and managed 30 contacts. The weather was very pleasant and everyone enjoyed the weekend and went away having learned a lot and gained a great deal of enthusiasm. We WILL return !

73 from Brian GM8BJF

MAY 10 & 5.7GHz CUMULATIVE REPORTS

From: PaulJ.Marsh M0EYT/P [pjmarsh@compuserve.com]

The first 10GHz cumulative of 2004 went fairly well, with the 10GHz system previously being given a test run during the May UHF contest. The weather at Bell Hill(IO80UU) was extremely hot and sunny which made the contest much more pleasurable. Tony G3PFM operated the 2m station for the talkback. G3PHO was the best DX of the day at 397.4Km. The usual path to F6DKW didn't go but we have worked many times before from the site - only a short burst of DKW's dots were heard, probably due to aircraft reflections. Conditions to the East seemed a little poor as did propagation generally. We worked 24 stations with only G4RQI/P getting away.

The 10GHz system should have its ~1dB NF LNA fitted and operational by the time of the next cumulative. The LO is being modified to include a JNT stabilised PSU as per the last news letter article. In fact the G8ACE OCXO seems to be performing nicely - it's been powered up since about May 2003 but may need some attention as it's drawing about 90mA and is in a well insulated enclosure. The frequency stability however, remains excellent and will only be improved with the addition of the JNT GPS locking circuitry.

From: Bob Reeves G8VOI [bobg8voi@reeves59.freeserve.co.uk]

Conditions were generally very poor, especially to the south / south-east. I really struggled to work Maurice F6DKW. There was some strange scattering of some signals, the strangest when working Mike G0JMI (only a 19km, but very obstructed path). Normally I would have to beam down from Butser Hill but this time we both found a patch at quite a high elevation in a clear sky and were able to swap easy 58 SSB reports as opposed to 539 / 219 in the 10GHz Trophy a couple of weeks earlier. I ended up the daywith the following tally:
5.7GHz - worked 12, best DX G3PHO/P at 375km
10GHz - worked 24, best DX as above.
I either worked on one or both bands, or heard on 144MHz, all but 6 of the stations known to be on, a very good turnout... let's hope for similar or better for the rest of the year. In the 10GHz Trophy contest I only worked 12 stations, the best DX being GD0EMG at 430km.

From: Allan Wyatt, G8LSD <allan@r-type.org>

For the May Cumulative, the visibility at Chanctonbury was as good as I have ever seen it. The Isle of Wight was clear in the distance at some 65km, and all round visibility was very good indeed. The heat of the day brought some haze but then the cloud built up and we were not too hot in the mobile shack. The 10GHz conditions were variable but most of the stations called were contacted on microwave. The notable exceptions were to the north east over to PA and ON. This general direction fires into the ring of trees on Chanctonbury Hill and only goes under exceptional conditions. The day yielded 11 squares, 26 contacts with three over 300 km. Best DX was to G3PHO at 387 km closely followed by F6DPH at 379 km. Thanks to all for a most enjoyable day.

From: Brian Coleman, G4NNS,[brian-coleman@tiscali.co.uk]

Conditions were disappointing for the first session of the

10GHz and 5.7GHz cumulative although activity was good. Paths to the east were much better than to the west. I only managed a one way with Ralph G4ALY on 10GHz whist this path normally goes 90% on our regular Monday evening skeds (20:00 local 10368.125). Sometimes 144.175MHz talkback was cluttered. Perhaps it is time to suggest a code of practice. Here is my two pennyworth :

1) Keep calls to a maximum of 2 x 2 eg cq microwaves x 2 Callsign x 2.

2) Leave a gap of at least (say 30 seconds) before repeating a cq call - someone else may have been politely waiting for their turn - if no one answers your call leave time for them to see if you get a reply and put out a call too - don't assume that no one else wants to use the calling frequency.

3) Move off the calling frequency as quickly as possible.

4) Remember that others might be hearing things you can't and persistent calling or chatting may be causing qrm and loss of contacts.

From: Peter Blakeborough, G3PYB ([peter@papine.demon.co.uk]

I ventured out early on the May cumulative day to find Maurice, F6DKW, on from Paris but he was weak on 3cm. I worked F1PYR later on both 6and 3cm but signals were still down on normal. Signals to the North poor all day but the shorter distance to the Midlands gave a number of contacts and Doug GW3ATM was the usual consistent signal. The path to Paris improved after 5pm. My best distance was F1DPI at 411Km and then G3PHO at 388km. Sam, G4DDK, was much stronger than normal to the NE. I worked 32 stations across both bands and was busy most of the day. I heard 10 to 12 more call signs that I did not work ... a good day out with good weather. "Mr Plod" called in and said there was a person of Turkish looking origin on the hill. After a short conversation, we agreed my East Yorkshire back ground could not stretch to Eastern Mediterranean looks!

Peter, G3PHO/P (Blakey Ridge, North York Moors, IO94MI73) had a mixed May Cumulative day. Almost everything from IO94 is DX, with the South Coast at around 385km and north France at over 500km. Conditions, even on 2metres, were very poor and only six stations were in the 3cm log after two hours. It was a shock to receive G8LSD's serial number of 013 to my 006 !! Where were all those stations? Normally-certain paths did not work (eg to G3PYB/P in IO90LU) while others were abnormally weak. Things picked up after lunch though and got rather interesting. F1PYR/P (JN19CS) at 621km was worked with relative ease on 5.7GHz cw but nothing was heard of him on 10GHz in spite of him getting a few dots of my signal via aircraft reflection. Other F stations were also copying me at the same time though I didn't know it !

5.7GHz provided me with 11 contacts, F1PYR/P being best DX and included PA5DD for another DX contact.

10GHz produced a final tally of 22 stations with G8LSD/P (IO90TV) and M0EYT(IO80UU) as best DX and included a one way (my 3cm, his 2m) with PA0WWM.

It was great to hear some new callsigns on the bands … **G0EWN/P,** Gordon, was active from the Peak District with his newly built DB6NT 10GHz transverter, while Dave, **G4RQI/P**, activated IO93PV on the Yorkshire Wolds to good effect with similar gear.

From: Paul Gaskin, G8AYY, [p.gaskin@tiscali.co.uk]: I operated /P from Merryton Low (IO93AD) but only worked G3UKV/P, G4BRK and G8JVM on 10GHz SSB. Unfortunately I was not very well organised and only had a short operating time. I heard a lot of microwave talk back activity on 144MHz however. At the home I have reorganised the 1.3 GHz set up to make it easier to operate. An RF feedback problem with TX/RX changeover was cured by putting in a proper DC ground return between the FT290 and the control logic board. The key socket on the FT290 was used to provide a DC ground!

From: Ralph Bird, G4ALY IO70VL, [Ralph.Bird@btinternet.com]

Due to the Dartmoor "filtering system", the 3/6cm 23rd May contest here was pretty poor, in fact the worst result of any contest I have taken part in in the last 3 years! I had only 9 contacts on 3cm of which two were one way plus six on 6cm. Best Dx on 3cm was G3LRP 398km. There were a further 21 stations contacted on 2m but failed on the higher bands. Activity since then has been poor as conditions restricted most paths from here. Exceptions were GW3ATM 3cm (on rain scatter) G1JRU, G0JMI 3cm 31st May. F6APE 24th May and 29th May on 6cm.

The **French contest** on 5/6 June was lively on 2m/70cm but hard to find microwave contacts F6APE and F1PYR on 6cm. F5SGT/P. F6APE, F6DKW, F6BQX, F6CCT, F8DBF on 23cm. F5SGT/P on 13cm. On 8th June G0UHY (IO80FJ) if you need that square on 23cm. F6DKW 55 both ways with QSB on 23cm. On the 9th June I worked F6FHP at 700km, G3XDY, F6DKW ssb 59+/59+ on 23cm and 52 to 55 both ways in ssb on 3cm. F1PYR on 479km, G3XDY on 13cm. Monday evening activities: G4NNS, G4LDR are regularly worked 3/6cm, plus G1JRU, (G1JRU/P after the 24GHz contest on 6th, on 3cm.) **The usual aircraft scatter skeds with G3LRP** continue (every evening) on 3cm and failure is extremely rare. During the French contest, the reason it was difficult to pick off the microwave stations because there were 5 or 6 big portable stations which were difficult to work round from here. Most of the other stations were frequency hopping to work them. When they were audible (beaming my way) they were calling the big boys and it was their freq. so could not get contact with them to qsy. I think on that day I could have worked quite a few more shf boys.

June 24/47GHz CUMULATIVE REPORTS
The millimetre contests have been poorly supported this year and it is to be hoped that the final session in September sees many more operators on the band at last. At the moment there are not enough to justify the event being called a contest!

From: Mike, G0JMI,[mike.karen1@tesco.net]
Sunday, 6th June, went well from Lane End (IO91JA) with Del G1JRU. We worked the three stations on Walbury Hill (IO91GI) on 24GHZ: G8BKE/P, G3PYB/P and G4LDR/P all at 5/9. Del also worked Ralph G4ALY in IO70VL on 10GHz.

I also took my wideband 10GHz with me to look for GB3OIW (is it still there etc…). Unfortunately this was obstructed from Lane End by trees but I heard GB3SCX at Bell Hill, using the wideband gear on 10GHz, which was interesting!

Peter, G3PHO/P, had his usual day of "roving" around the Peak District, starting off at Alport (IO93FB44) to work both G3LRP (IO93HO) and G3UKV/P (IO82NN) on 24GHz . An attempt to work G8VZT/P (IO82NN) on 47GHz failed over the 103 km path. However, at Peter's second location Merryton Low, IO93AD74, the 47GHz worked fine to G8VZT for a QRB in excess of 90km. G3s UKV/P and LRP were worked again on 24GHz.

G3PYB/P, G8BKE/P and G4LDR/P all activated Walbury Hill, IO1GI for the mm-band contest. These "three musketeers" all worked the lads at IO91JA (see earlier report) but nothing was heard of Northern stations (G3PHO/P,G3UKV/P, G8VZT and G3LRP).

That's all the news for this month. See all of you next time in Scatterpoint! 73 from Peter, G3PHO

G3JMB MEMORIAL TROPHY

We are delighted to announce a new operating trophy. Due to the kindness of Jack's family and a desire to remember him as a devoted 10GHz low power microwaver, **this trophy will be presented to the leading operator in the Restricted Section of the annual 10GHz Cumulatives**. By the time you read this the trophy may have already been commissioned. It will not be inscribed each year with the winner's callsign but individual certificates will be awarded in lieu.

Our thanks go to Jack's family, including Margaret his wife and his son-in-law G8LSD who have made this possible.

So all you "one watters"on 10GHz go to it … who will be the first recipient of the trophy?

OE9PMJ ~ SILENT KEY

From Erich, OE9ERC ….

I have to convey the sad news that on June 7th, 2004, Peter OE9PMJ lost the struggle for his life. He had been hospitalized for the last 2 weeks as a consequence of a prostate carcinoma which unfortunately had been detected too late for effective treatment. A number of ham friends have been with him during these last days and I am sure he enjoyed being surrounded by hams until the very end. Until very recently he had been active on the moon using his OE9XXI call !

Peter has been known worldwide not only for his EME activities but also for a number of technical innovations like microwave filters, antenna designs, transverters, easy to build dishes and many more.
His technical articles have been translated and published in a number of languages (Japanese, English, Russian, French just to name a few).

He joined the Austrian Amateur Radio Society in 1977/78 and built one of the first repeaters, located high up in the alpine mountains. In the following years he dominated the VHF/UHF contests in Austria before he conquered the "ham summit", EME. His ham career culminated when he achieved DXCC #1 on 1296MHz (23cm band) !

He has been an Elmer to a number of other hams, so it is not by chance that there are a good number of active EME stations within the small Austrian ham population.

Being a self educated person who always took technical challenges as an opportunity to expand his knowledge, at age 46 he started evening school to become officially an engineer. Just when his engineering consulting service started to take off he learned about his deadly disease. The doctors predicted him 4-6 weeks to live but finally his strong will bought him more than a year. He had so many projects he wanted to finish.....

The priest said with enough time left he surely would have finished becoming a medical doctor - like anything in his life he took his disease as an opportunity to learn all and everything about prostate carcinoma, his strong will to overcome it puzzled many doctors.

Peter we will miss you !

Condolences should be addressed to: OE9YTV,Reinhilde, his XYL under the following address: reinhilde.riml@aon.at

73 de Erich, OE9ERC