



An Amateur Radio publication for the Microwave enthusiast

# MICROWAVE NEWSLETTER

Published by the Radio Society of Great Britain and edited by G3PHO and G8AGN.

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

## FROM THE EDITOR

2001 – JANUARY

Another year gone by and here we are in 2001, the year of the well known film of the same name! Ten years ago I was all excited about just getting on 10GHz narrowband with 'QRO' for those days, 200 milliwatts! Today I'm equally excited at the thought of having 800 milliwatts on 24GHz, the result of some excellent little amplifiers coming in from the USA. Times change and ten years has seen some remarkable developments in amateur microwaves. Who would have dreamed of a 10GHz world record of over 2000km, amateurs making narrowband contacts at 145GHz, or frequency accuracy and stability at 76GHz of the same order as 30MHz? All these and more are here, now!

There are so many things to do in amateur microwaves that one wonders why some of our fraternity are rarely heard or have even given up altogether. Certainly, the increasing pressures of family life and work have played a part but, speaking as one who has 'been there and got the T-shirt' in a big way, I never once lost interest in the microwave hobby. Somehow, even in the midst of 80 hour working weeks, it was possible to find time to do a little microwaving.

This year, let's all try to reverse the trends of the past two or three last years which have seen a 50% fall in contest log entries, a marked decline in home station operating and a general lethargy setting in which could lose us many of



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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 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 0114 2816701  
G8AGN: Barry Chambers 0114 2304202



G3PHO: Email: g3pho@geocities.com  
or p.day@virgin.net  
G8AGN: Email: b.chambers@sheffield.ac.uk



G3PHO, Peter Day,  
146 Springvale Road,

**SUBSCRIPTION ENQUIRIES & RENEWALS  
SHOULD BE SENT TO RSGB HEADQUARTERS  
AT THE ADDRESS SHOWN AT THE TOP OF THIS  
PAGE AND NOT TO THE EDITOR ..**

## GREMLINS!

### A Universal Multiplier (Oct. 2000)

In translating F6BVA's article on page 11 of the October 2000 Newsletter, the editor omitted the following line:

*'The filter pipecaps are then drilled and tapped to take M2.5 tuning screws and locknuts.'*

This line should be inserted at the end of the seventh paragraph in the article.

## UK GOES QRO ON 24GHz !

British 24GHz enthusiasts were given a 10dB boost this month when a quantity of high gain, state-of-the-art PA modules became available through the good nature of Will Jensby, W0EOM. After some feverish e-mail correspondence between Will and G3PHO, some two dozen modules were shipped across to the UK and should, by the time you read this, be installed in the equipment of more than twenty UK operators.

The modules are only 2.25 inches long, in WG21 equivalent, and produce around 28/29dBm output with some 40dB gain. This means a "barefoot" DB6NT mixer would need throttling back to drive this beauty to around 800mW output ... that is some 10dB up on what most UK operators have been running up to the present time.

With power levels now approaching 1 watt on 24GHz, it is time some serious operating was done on the band! It is to be hoped that these PAs will lead to a massive increase in 24GHz activity. Now is the time to explore some of those elusive paths that have not worked until now... Thanks Will Jensby! See y'all on 24Gigs!

## NEWS FROM THE SAN BERNARDINO MICROWAVE SOCIETY, CALIFORNIA

### New Technical Articles on SBMS Web Pages

Hello Microwavers!

We have added two new articles by Kerry Banke, N6I ZW, to the San Diego Technical Article Section of the SBMS Web Pages.

- #1 "The San Diego Microwave Group 1296 Transverter"
- #2 "A Low Cost Noise Source for VHF through 10 GHz Based on Qualcomm Surplus Material"

Both articles include photos and figures.

The URL is:

<http://www.ham-radio.com/sbms/sd/>

Please take a look!

## WANTED

**G4XUM** is looking for a length of WR90/WG16 flexible waveguide. About 2 to 3 foot would be enough (with standard straight flanges)

Please contact Martin **G4XUM**, QTHR, or email at: [g4xum@qsl.net](mailto:g4xum@qsl.net)

## FOR SALE

**G3AAJ** has a 90cm aluminium dish, fibreglass coated, complete with 13cm preamp/antenna tripod fitted to the apex. The dish was last used by G3CDK on UOSAT 11 and for a 2.4GHz contact between Wanstead and Wallington using an FT736R at both ends. Price £30 but prefer buyer collect. Contact Ron Broadbent, [g3aaj@cs.com](mailto:g3aaj@cs.com) or QTHR.



## AMERICANS BREAK WORLD 145GHz RECORD

From Brian Justin, WA1ZMS comes this excellent news...

**On Jan 1st, 2001 at 23:22z, W2SZ/4 worked WA4RTS/4 on 145GHz over a distance of 61 kilometres.** W2SZ/4 was operated by WA1ZMS from FM07fm (37-31-4N 79-30-40W). WA4RTS/4 was located in FM08ia (38-2-57N 79-18-37W)

The distance calculated based on actual lat/long is 61.6km. The distance calculated based on centres of the 6 digit grids is 59.7km.

The weather at the time of the QSO was 15F an 60% RH at the FM07fm end. No weather data was taken for the FM08ia end but the temp was around 25F. The atmospheric losses were calculated to be around .27dB/km.

Equipment used was the same gear that set the former North American record on Nov. 6th, 2000. (see Nov. Dec 2000 Microwave Newsletter) Some changes to the feed system of one dish gave the extra signal margin needed to extend the record to the 61km mark. The addition of Rubidium standards to each station also helped by practically eliminating any frequency error.

As with the last North American record, the team believe they have reached the 0dB S/N limit of one station, so further DX will require much work on the stations themselves.

Brian Justin, WA1ZMS left his audio recording gear at home, so no wave files are available for the Internet. Pete, W4WWQ and John, N4QWF helped during this rather cold rover effort and photos taken by Pete of a test QSO earlier in the day as well as photos from FM07fm are available at:

<http://albums.photopoint.com/j/AlbumIndex?u=995403&a=10714084>

73, Brian Justin, WA1ZMS

EDITOR COMMENTS ... Congratulations to all concerned, Brian, on a very fine achievement. Good luck with your future exploits on 145GHz (and higher?)

That's the lot for this month ... let's have a lot more input next month please! Oh, and by the way ... don't forget to switch on the transmitter this week ... you never know who's listening!

GB3MHX yesterday. First I was getting MHX on aircraft but later it was audible all the time and someone over there was calling CQ on the key. It's still as shame that they do not press the mic key. I suppose their argument is I should learn cw! The Reigate 10GHz beacon continues to follow the same temperature/frequency track as the graph I sent you last year. During the Nov/Dec rainy season it spent much of its time on top of MHX just for annoyance. It finally got to .850 with the snow and frost but today its back down at .837 with the overnight weather change. Cleeve Common is excellent! I can hear it over 90 degrees in heavy rain. Wolverhampton I get on raincatter OK. Taunton we suspect has a power problem .. no longer heard here. Likewise Bushey and Chelmsford have not been heard in a long time. I think stability is an issue here as Bushey wanders and additionally it has a no output state in its keying cycle, which is no help at all.

**Tim, G3KEU** (Swindon) and **Peter, G3LRP** (Near Wakefield, IO93HO) continue their daily sked contacts on 10GHz. They have found recent winter conditions very poor but nevertheless something is always heard and 99% of the time a contact is made. These contacts take place around 0815 local time on 10368.100MHz. **Paul, G0HNW** (Holthirch, W. Yorkshire) often joins in. Skeds such as these show what can be done on 3cm. G3LRP's 60cm dish is pointed out of an upstairs window each morning and Paul has what most would consider an "impossible" QTH ... yet they both regularly work Swindon and beyond! **Peter, G3PHO**, (IO93GJ) blessed with an even poorer location than Paul, very occasionally tries a reflect path with G3LRP. Although the direct path is only around 25km or so, it is unworkable. Fortunately both stations can "see" a common PMR tower south of G3LRP and east of G3PHO ... that does the trick and produces good ssb signals. If you are in a seemingly impossible situation then try reflected paths... they often work fine.

**Paul, G0HNW, Dave, G0IVA, Martin, G7MRF and Dave, M0VZT (formerly G8VZT and M5AFG)** are in the midst of building equipment for the 76GHz band ... watch out the Southern Group! They also

**YEAR 2000  
10GHz OPERATING LADDER  
Updated to 31 December 2000**

<b>CALLSIGN</b>	<b>Stns Wkd</b>	<b>Best Dx</b>	<b>Points Score</b>
<b>G4BRK</b>	61	635	2348
<b>G3PHO/(P)</b>	65.5	449	1782
<b>G4ZXO/P</b>	59	492	1759
<b>G3XDY</b>	46	595	1659
<b>G3FYX/(P)</b>	49	521	1547
<b>G4LDR</b>	49	444	1318
<b>G6UAJ/(P)</b>	37	389	872
<b>F1VBW</b>		21.5	589
767			
<b>G3JMY</b>	34	331	682
<b>G8BKE/P</b>	13	278	219
<b>G4KNZ/P</b>	12	263	191
<b>G4DDK</b>	6	268	97
<b>BAND:</b>		10GHz	
<b>SCORING STATIONS:</b>		12	
<b>AVERAGE DX :</b>		437	
<b>AVERAGE CALLS WKD:</b>		37.8	

These scores are calculated according to the algorithm used to score the multiband Microwave League Tables. They are **not** based on scores obtained by multiplying the

planning to work the 47GHz path between Galloway and Snowdon.. over 200 kilometres. Unfortunately the weather this winter has

**Our thanks ....**

**To all who have submitted articles and activity reports for this issue. We still have a couple more in the pipeline ready for next month but after that it's back to square one!**

**This Newsletter depends on constant reader input so please write/email/phone or even call in on us with your contribution!**

**WANT A STABLE OSCILLATOR?**

... then look no further! **John Hazell, G8ACE**, has developed a very stable 100MHz OCXO (Oven Controlled Crystal Oscillator) suitable for multiplication up to the highest microwave frequencies in use in the UK. He had a few kits available at the GCHQ Microwave Round Table last September and the editor was fortunate to obtain one. It was easily put together in an evening, plus an extra 24 hours for some adhesive to dry.

The kit came complete with all components except for an enclosure, the crystal and Tronser trimmer. The latter can be substituted with any good quality ceramic or glass tubular type (the writer used a JFD component).

The oscillator uses a good quality crystal, preferably rated at 50 to 60 degrees C, in an efficient oven controlled arrangement. A 35mm square plate of 3mm thick aluminium heatsink is heated by a TIP31A transistor whose power is controlled by a bead thermistor and associated circuitry. The whole thing is surface mounted on one side of a 35mm square pcb, glued to the heatsink.

John has paid particular attention to phase noise performance and achieves a lower than usual level by using of a cascode output amplifier (rather than the more common MMIC used in German designs) and a low noise voltage regulator, an LP2951. An output of around 5mW is

easily obtained on the common microwave starter frequencies around 100MHz.

The writer's oscillator module is mounted "floating" in a small aluminium box and insulated with thick layers of polystyrene.

It is important to obtain a crystal whose temperature characteristics suit this type of circuit. Good quality 60 degrees C types are available from Eisch in Germany but the writer initially used a standard QuartzLab 106.5MHz crystal which was to hand in the "junk box". Results, even with this crystal, are very good indeed. After first switch on, the oscillator drifted some 12.5kHz at its 10224MHz multiplied frequency (125Hz at 106.5MHz. Since that time (some two weeks of continuous operation) it has moved HF by 1.6kHz at 10GHz ... not bad! Remember that this is with the "wrong" type of crystal. One cut for the operating temperature should work much better.

It is felt that this sort of stability is highly satisfactory for the typical kind of portable 10GHz operations carried out by UK operators and, as soon as the four week "soak" test is over, the oscillator module will be built into the newly-built 3cm DB6NT-based transverter!

You can see the oscillator and its constructional details at John's website:

[www.microwaves.mcmail.com/](http://www.microwaves.mcmail.com/)

**Peter, G3PHO**

**S.O.S**

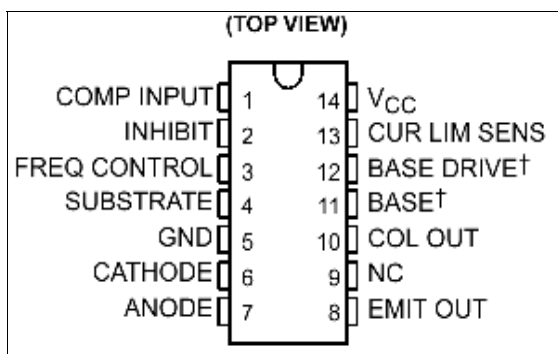
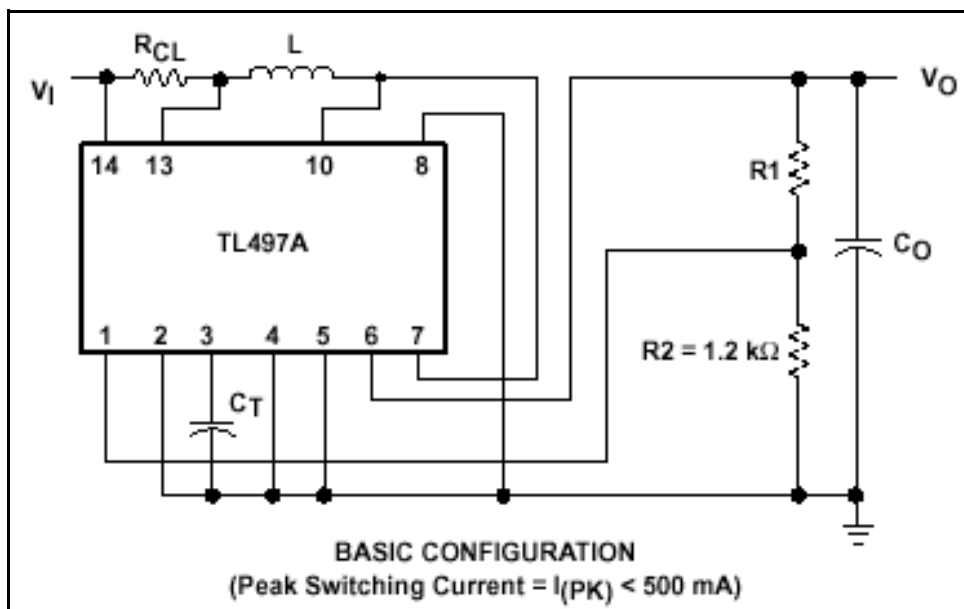
Many years ago, in Ham Radio Today, there was a circuit to add cw vox to the IC202 (saves having to put the cw switch up then key; you just key and off it goes). Does any reader have a copy of this article? Mine is lost after 4 house moves! Dave, G4FRE (email: robinda@nortelnetworks.com)

# A Switching Regulator for Light Duty Applications

~ by John Hazell, G8ACE

There was a recent need to provide a regulated 12v dc supply from a 12v battery. Using a standard 78L regulator there would be insufficient supply voltage available for regulation. The solution adopted was to use a TL497 switching regulator to provide a higher supply voltage. Whilst this regulator can provide a regulated output directly, in the particular application the output was set to 15v to feed a 78L regulator. This is a 14 pin IC and includes an on board rectifier diode. The total component count for the voltage booster is therefore quite small.

The TL497 IC (available cheaply from Farnell) can be used as a stepup, step down or inverting supply circuit.



# ACTIVITY NEWS FROM THE WORLD ABOVE 1000MHZ

There are few activity reports to hand this month, the usual winter 'doldrums' having set in. Neither have we noticed any long distance openings on the microwave bands so far this winter. Of course there has been some good rainscatter from time to time on 10GHz but it seems years since we all enjoyed a decent tropo opening to the Continent.

Your scribe, G3PHO, has been upgrading his equipment by building up a DB6NT 10GHz transverter kit. This should be shortly rehoused in a portable system using the existing 1 and 5 watts PAs employed last year. The DB6NT 5.7GHz system is also getting a boost by being fitted with a 10 watt solid state PA, bought for the princely sum of \$60 at Microwave Update 2000! You'll have read about the 800mW 24GHz Pas on page 2. Yes, we have one of those also! 2001 looks set to be a most interesting year for G3PHO/P. I hope to travel a little further afield this year. I already plan to be on the Isle of Wight for the May 10GHz Cumulative, followed by Rhiw Mountain (IO72PT) in NW Wales, for the June event. After that we may very well try the Mull of Galloway and certainly the North York Moors (IO94 square). Weather and Mr. G. Brown permitting, operations from even further afield could take place. I am anxious to activate new squares on 5.7GHz for anyone.... Please let me know what you want.

Neil, G4BRK, (Near Swindon) emails the following report and an update for the league Table: I am quite pleased with the scores on 3cm (made with <1W in use all year) and 23/13 (first full year on these bands). Must do better on 24 and 3.4GHz this year!

John, G3XDY (Suffolk) also updates his scores but has found activity and conditions on 23cm and 3cm quite mediocre over the winter.

Neil, G4LDR (Wiltshire) has had antenna problems, as his email describes ... I'm still not back on the bands following the

storms at the end of October. I was in Canada walking in the Rockies (in relatively warm and bright sunshine) whilst my antenna system was being bent by the 80 mile an hour winds. The problem I have is, that as the dish turns, the elevation changes. I had intended to sort things

out over Christmas but I need a day or two of fine weather to take everything off the tower and try and straighten the tower head unit. Perhaps we will get a good day or two before the spring contests start when the weather is fine and I am at home.

From Ted, G3JMY (Bristol) comes this email:

I was interested to see you had inserted my 10 GHz system picture in the Nov/Dec newsletter. It was complete with the leaky WG flange which caused me trouble back in 1999. Since drying it out and cleaning and polishing, resealing completely with silicone it has behaved perfectly. Even the heavy rains have not upset it, for which I am very thankful.

I was all ready to send in my cumulative entry when I discovered I had missed the deadline, which was a disappointment. My final score was 105,651 (best 4 - 8127 and 13 squares worked), in the open section. I will keep the rules nearby next year! I think the reason for few entries was, like me, many did not realise their entries had to be in within a few weeks of the last event. (*it's all written in the rules Ted! ...editor*)

Peter Blair, G3LTF emails some EME news.. I worked four stations on 13cm, cross band 2320/2304 MHz, in the eme contest which ran over 2 weekends in Oct/ Nov ... ZS6AXT, HB9SV, OE9ERC and OZ4MM. My equipment is a 6m dish, 50W at the feed and a 0.46dB preamp. On 23cm I worked 55 stations. All in all I was operational on 4 bands!

John, G8ACE (Winchester) emailed some 10GHz news just at the start of the year ... 2000 went out with some scatter toward

run between \$40-50. (Flying from SF to SJ is not recommended. The flight is only about 10-15 minutes, but you have to get on/off and through terminals, etc.)

### Key Events:

- Thursday, Sept 27: Surplus Tour
- Friday, Sept 28: Conference
- Saturday, Sept 29: Conference
- Sunday, Sept 30: Antenna Measurements

### Other Activities

In addition to ham activities, we are tentatively planning some extra activities for family members. Most attractions can be reached in less than 1 hour. We would like to hear your interests. We will include a final list of activities at a later date.

Some examples:

- Paramount's Great America Theme Park
- Winchester Mystery House
- Tech Museum of Innovation
- Santa Cruz Beach Boardwalk
- Gilroy Outlet Mall
- Children's Discovery Museum
- Monterey Bay Aquarium
- San Francisco
- Napa Wine Country (2 hours drive)

### SURPLUS

There are a number of surplus houses within a 10 mile radius of Sunnyvale. Maps will be provided for those interested. Local hosts may be available, make your plans early.

### Papers and Presentations

It's never too early or late to start asking for papers! If you would like to present a paper at Microwave Update 2001, please contact us.

We will provide a list of papers/speakers as it is available.

### Contact Information

**Chairmen:** Will Jensby, W0EOM/6 (w0eom@aol.com) and  
Jim Moss, N9JIM/6 (n9jim@aol.com)

**Visit:** "The 50MHz and Up Group" website at <http://www.qsl.net/50up>

**Microwave Update 2000 - G3PHO's retrospective:**

### DESIGN EQUATIONS

- $I_{(PK)} = 2 I_O \max \left[ \frac{V_O}{V_I} \right]$

- $L (\mu H) = \frac{V_I}{I_{(PK)}} t_{on} (\mu s)$

Choose L (50 to 500  $\mu H$ ), calculate  $t_{on}$  (25 to 150  $\mu s$ )

- $C_T (pF) = 12 t_{on} (\mu s)$

- $R1 = (V_O - 1.2) k\Omega$

- $R_{CL} = \frac{0.5 V}{I_{(PK)}} \left[ \frac{V_I}{V_O} I_{(PK)} + I_O \right]$

- $C_O (\mu F) = t_{on} (\mu s) \frac{V_{ripple (PK)}}{V_O}$

Editor's comments ....

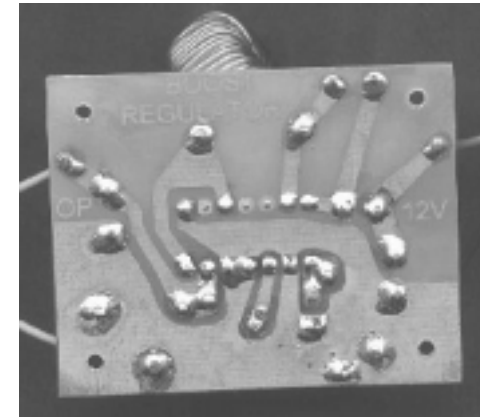
This design can be used for microwave change-over relay supplies as it can easily supply the 24V or so required by the ubiquitous Transco and Dynatech types.

The following component values on a prototype produced an output of 24.2V, for a minimum of input 8.5V, thus giving an enormous amount of headroom for a flagging 12V battery!

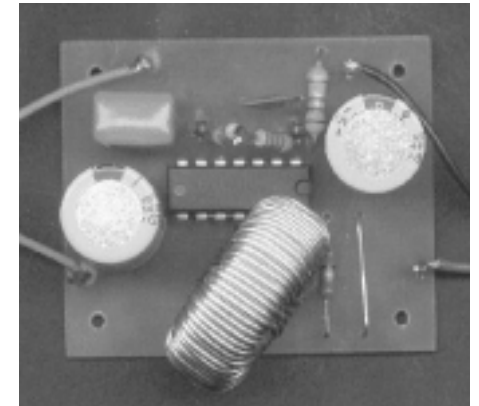
**R1: 1K2, R2: 23K (made up of 10K and 13K in series) CT: 4n7, CO: 0.33uF. 470uF electrolytics were fixed across input and output supplies.**

According to the data sheet, the device is good for 500mA maximum but the higher the voltage out the lower the available current. However the 24V supply should be good for several hundred mA, more than enough for a relay supply.

The TL497A is a versatile chip and can be used in a step up, step down or inverting supply circuit. Remember that it is switching at 50kHz or so and thus will require careful filtering and



Above and below: the printed circuit board used in the prototype



The TL497A switching regulator is a cheap alternative to the LM2577T described in the Microwave Newsletter some time ago, especially when no more than a few hundred milliamps of output current are required. For supplies in excess of 0.5A, the LM2577T is to be recommended.

Full data info on TL497A can be found at: <http://focus.ti.com/docs/prod/folders/print/tl497a.html>

## Instability Problems in a WDG002 module

- some notes by Paul Gaskin, G8AYY

During much of last year I had been disappointed with the performance of the WDG002 10GHz receiver module that forms part of my 3cm transverter. Rather than fit a preamplifier, I decided to minimise the length of UT-141 between the coaxial c/o relay and the SMA/WG16 transition. The WDG002 was mounted directly on the relay via an SMA coupler. This caused the instability problems described below!

Previous instability in this LNA had been cured with the GOMRF modification I described in the April 1996 Microwave Newsletter. The problem now was that the narrow bandwidth of the SMA probe transition was causing an off-resonance mismatch to the LNA, resulting in out of band oscillation. This may be the cause of instability in other people's LNAs! The cure was to replace the SMA transition with a Marconi N/WG16 T-bar type. This has a much greater bandwidth.

I had to hand a Marconi (Sanders) N-type/WG16 T-bar transition, NATO Stock No. 5985-99-521-4655. They sometimes appear at rallies and fleamarkets. A gold-plated N plug (Sealectro part no. 57-007-9073-31) was used already fitted to an N to SMA plug cable link in UT-141. These links are also often found surplus at rallies.

At last it seems I have finally cured the problem!

## Results of the October 2000 24 / 47GHz Contest

Callsign	Locator	24GHz	47GHz	Total
G8IFT/P	IO82QI	493	156	649
G3PHO/P	IO93EI, FK, FB, AD	531	-	531
GW3UKV/P	IO83KA69	321	150	471
G7MRF/P	IO93AD	217	188	405
G3ZTR/P	IO93PV	185	-	185

### Adjudicator's comments:

G3PHO seems to be the only one to make use of the rover scheme and does quite well as a result. Does every (any) one else know about it?

Andy G4JNT

### Editor's Comments:

Where are the logs of all the others who were active that day?

The "rover" scheme or rule was put into the millimetre band contests to encourage portable operators to change sites during the day and work new paths. Full details are in the contest rules. With the present state of equipment on these bands one fixed location for a whole day does not produce a many contacts. "Rovering" spices up the activity and presents a whole new challenge to the operator. In the USA this is treated with much enthusiasm and expertise. Try it sometime!

## Make the Pilgrimage this Year!

Microwave Update is the main event of the amateur microwave calendar. OK, it's in the USA but that should not stop you going! Below are the details of this year's Update, published in the sincere hope that some, if not many, Newsletter readers will make the effort to attend. If you have any intention going so then please contact the Newsletter Editor ... we might be able to arrange, among ourselves, an economical way of getting there! Let's have a large UK contingent there this year. You'll be very welcome!

## Microwave Update 2001

Sponsored by: The 50MHz and Up Group of Northern California  
September 27 through 30, 2001

**Where:** Four Points Hotel, 1250 Lakeside Drive Sunnyvale, California 94085-4010, USA

**Reservations:** call toll free USA 1-800-325-3535 or  
see [www.fourpointssvl.com/reserv.html](http://www.fourpointssvl.com/reserv.html)

The Four Points Sunnyvale (formerly the Hilton Sunnyvale) will be providing accommodations and rooms for this event. This is a 375 room full service hotel with a restaurant, lounge, pool, fitness room, etc. It is centrally located in the Silicon Valley near Highway 101 and Lawrence Expressway. Complimentary shuttle to the San Jose International Airport is provided.

We will have full use of the conference centre on Friday and Saturday. A package rate of \$237 for Thursday, Friday, and Saturday is available. The Wednesday night rate is \$289. We have blocked rooms under the key code "Microwave Update".

This is a very busy area. The entire Silicon Valley sells out every Tuesday and Wednesday night at rates from \$150 to \$300. For those arriving Wednesday, we will have recommendations for more affordable places on Wednesday night. Those driving in may want to stay just out of town on Wednesday night.

### Travel Info:

**San Jose Airport** is 10 minutes from the hotel and a free shuttle for hotel guests is available.

**San Francisco Airport** is about 40 minutes from the hotel. This is the main airport for international travel and usually has cheaper flights. However, taxi fare or shuttle fares

## PULLOUT SUPPLEMENT

# MICROWAVE CONTEST RULES 2001

These rules are final and binding for 2001. Any previously listed rules should be ignored.  
Please note the important changes to the RSGB 10GHz Trophy rules.  
The following contests are scheduled for 2001:

- 10GHz Cumulatives (6 contest days with 4 to count for scoring purposes)
- 10GHz Trophy (see below for important changes to this contest)
- Millimetre Bands Contest: 24GHz and up (4 separate events - not cumulative)
- All Bands Contests (3 separate events - not cumulative)
- In addition there are 5 non-competitive activity days (see above)

The full contest programme and rules are also published in the October 2000 issue of the RSGB's RadCom and is also available on the Internet at: <http://www.g3pho.free-online.co.uk/>

Since the rules were published in RadCom there has been a change of Contest Adjudicator. G4KNZ has now taken over from G4JNT.

## GENERAL RULES (applicable to all events):

- All the contests run from 0900 to 2100GMT on a Sunday.
- Except for the 10GHz Trophy, the Contests are open to all comers (you do not have to be an RSGB member). 10GHz Trophy contestants must be members of RSGB if they wish to submit logs.
- Contestants are expected to enter in the true spirit of the event and to strictly adhere to any equipment or power restrictions that apply to the particular contest.
- Contacts are scored on the basis of 1 point per kilometre for full, two way microwave contacts and at half points for one-way (ie crossband) contacts. The G4JNT Contest Software is recommended for use in the final scoring process.
- Contest exchanges on the microwave bands consist of **RS(T) + serial number** (starting at 001). In addition the six (or eight) figure **QTH LOCATOR** must be exchanged either via the microwave band or on the talkback frequency. Where the LOCATOR is not known, a full six figure National Grid Reference (UK only) must be provided. **In multiband contests, the serial number will start at 001 for each band** (i.e. a common sequence across the bands is **NOT** to be used).
- Operators may enter as home station or portable (either mixed or separately).
- Except where indicated, the VHFCC general rules as published in the RSGB Contest Handbook also apply.
- Contestants are asked to make sure their entries have been scored correctly and that all relevant bonus points and multipliers have been claimed. The adjudicator will not do this for you!
- All entries **must** be prefaced with an appropriate summary/cover sheet (either an RSGB VHF-UHF type or a personal one) showing: Title of contest, name(s) of operator(s), location(s) of station, section entered, callsign used, band score(s), multipliers or bonus points, final claimed score. The sheet should also detail equipment used, particularly the power output, antenna and receiver for both the microwave band and the talkback. This is very important if the logs are entered in one of the restricted sections. Where the contest has a "rover" facility, it is essential that each location used is clearly stated.
- Where Locator squares and/or countries are used as multipliers for bonus points, a summary list of the squares and countries worked must be attached to the contest cover (summary) sheet. This list should include the callsign and date of the first contact for each square/country.
- Log entries may be submitted directly on paper, using standard RSGB VHF Contest sheets or self-prepared contest sheets or on a 3.5 inch diskette (IBM PC format), the latter preferably using the G4JNT Contest Software.
- In the light of problems experienced in recent years with email entries going astray, it is highly recommended that a paper log is also sent to G4KNZ either as a backup or as the main entry.
- ALL LOGS (INCLUDING THOSE FOR THE 10GHz TROPHY CONTEST) SHOULD BE SENT TO THE CONTEST ADJUDICATOR, Steve Davies, G4KNZ, WITHIN 16 DAYS OF THE END OF THE

1. The General Rules (see above) apply to this contest.
2. **Three All Bands Contests** will be held, each a "stand alone" event.
3. Each band will be scored separately and band leaders will receive certificates. The overall contest winner will be the operator with the highest normalised scores for the whole band range 1.3 to 47GHz.
4. The raw claimed scores will be "normalised" to a maximum score of 1000 and then ranked.
5. There are **no bonus points**. The normalisation of scores takes care of differences in activity and "difficulty" from band to band.
6. **"Rover" contacts may be made on 24 and 47GHz** only (see 10GHz Contest Rules for a definition of this).
7. There are no separate sections for low power, wideband, etc.
8. Logs should therefore only include the exchange of information outlined in the General Rules.
9. One-way and crossband contacts score half points.
10. **If the 10GHz logs are to be also entered in the 10GHz Cumulative Contest they will need to be rescored for that contest in the light of the Cumulative Contest rules (see earlier).**
11. The completed logs and summary/cover sheets should be sent to **arrive at the adjudicator no later than: Tuesday, 10th July 2001 (for the June contest)**,

## RSGB MICROWAVE COMMITTEE

### MICROWAVE CONTEST PROGRAMME 2001

(All events are scheduled for Sundays 0900-2100GMT unless otherwise stated)

This list also includes other contests having microwave sections: The May RSGB 432MHz and Up contest, the IARU VHF/UHF/SHF October contest, the Autumn RSGB 1.2/2.3GHz Cumulatives (held 2000-2230 local time), the RSGB Fixed 1.2/2.3GHz Contests held in April and September and the RSGB 1.2/2.3GHz Trophies held in October. These contests are NOT organised by the Microwave Committee and the rules for them only can be found in RadCom 2000-October. *They are shown in italics in the list below....*

Please note: The RSGB 10GHz Trophy Contest will not be a one-off event this year. The Trophy will be awarded to the leading RSGB member in the 10GHz Cumulative Contest. As a result, there will not be a one day contest in May for the Trophy.

JAN	28	All Bands Activity Day - non competitive	Last Sunday of month
FEB	25	All Bands Activity Day - non competitive	Last Sunday of month
MAR	25	All Bands Activity Day - non competitive	Last Sunday of month
APR	8	<i>RSGB 1.2/2.3GHz Fixed Contests(1700-2100GMT)</i>	<i>2nd Sunday of month</i>
APR	15	Millimetre Bands Contest (24GHz and up)	3rd Sunday of month
MAY	5/6	<i>RSGB 432 - 248GHz Contest (1400-1400GMT)</i>	<i>1st weekend of month</i>
MAY	27	1st 10GHz Cumulative Contest	Last Sunday of month
JUNE	10	Millimetre Bands Contest (24GHz and up)	2nd Sunday of month
JUNE	24	All Microwave Band Contest (incl. 2nd 10GHz Cumulative)	Last Sunday of month
JULY	7/8	<i>RSGB VHF NFD (Includes 1.2GHz)</i>	<i>1st weekend of month</i>
JULY	29	3rd 10GHz Cumulative	Last Sunday of month
AUG	12	All Microwave Bands Contest	2nd Sunday of month
AUG	26	4th 10GHz Cumulative	Last Sunday of month
SEPT	9	Millimetre Bands Contest (24GHz and up)	2nd Sunday of month
SEPT	9	<i>RSGB 1.2/2.3GHz fixed contest (1800-2200)</i>	<i>2nd Sunday of month</i>
SEPT	23	5th 10GHz Cumulative	4th Sunday of month
OCT	6	<i>RSGB 1.2/2.3GHz Trophies (1400-2200)</i>	
OCT	6/7	<i>RSGB and IARU VHF/UHF/SHF CONTESTS (1400-1400)</i>	
OCT	7	All Microwave Band Contest (incl. 6th 10GHz Cumulative)	2nd Sunday of month
OCT	11/26	<i>RSGB 1.2/2.3GHz Cumulatives (2000-2230 local)</i>	
OCT	21	Millimetre Bands Contest (24GHz and up)	4th Sunday of month
NOV	5/20	<i>RSGB 1.2/2.3GHz Cumulatives (2000-2230 local)</i>	
NOV	25	All Bands Activity Day -non competitive	Last Sunday of month
DEC	5	<i>RSGB 1.2/2.3GHz Cumulatives (2000-2230 local)</i>	

CONTEST. Late entries will be acknowledged but not used in the final ranking. G4KNZ's address is presently as shown below but may change during 2001. Details will be notified in the RSGB Microwave Newsletter and on the Internet.

S. J. Davies, G4KNZ, 14 Herondale, Birch Hill, BRACKNELL, Berks., RG12 7ZT  
E-mail: steve.davies@nokia.com

LOGS FOR THE 10GHZ TROPHY CONTEST will be forwarded by G4KNZ to the RSGB VHF Contest Committee once they have been adjudicated for the 10GHz Cumulatives. It is important to label the top of your cover sheet with "+ 10GHZ TROPHY". Remember that you must be a member of RSGB to make this entry.

- Appropriate Certificates will be awarded to overall contest winners and individual section leaders . Additional Certificates of Merit may be awarded at the discretion of the RSGB Microwave Committee. With these, as with the logs, the adjudicator's decision is final.

## RULES FOR THE 10GHZ CUMULATIVES:

1. The general rules shown above apply.
2. Six, monthly events are available from May to October inclusive. Two of these events (*June and October*) are also part of the ALL BANDS CONTESTS (see below) and their scores can be used in both contests.
3. Any four of the six events may be used for final scoring purposes. Logs for ALL events entered must be submitted.
4. Contestants may submit logs for any one of the following sections:
  - Open
  - Restricted
  - Wideband

There is no separate section for portable stations. However, the Restricted and Wideband sections offer much scope for portable work.

The sections have individual restrictions as follows:

- **Open:** No power or antenna restrictions (other than those laid down in the Amateur Licence) on either 10GHz or on the talkback band.
- **Restricted:** 10GHz transmit output not to exceed 1.0 watts to the antenna. No power restrictions on the talkback band. No antenna restrictions on either band.
- **Wideband:** 100 milliwatts maximum transmit power to the antenna. Modulation bandwidth to exceed 50kHz. This section includes wideband modes such as FM (voice), MCW, ATV and DATA

For both the Restricted and Wideband sections contestants are free to use the "Rover" concept of portable operation. This allows the location of the station to be moved as many times as desired and by a minimum of 16 linear kilometres, at any time during the contest period. From each new location, stations worked from any of the previous locations during the event may be worked again, both stations involved in the contact gaining points. The serial number however will not revert to 001 each time a move is made but will carry on consecutively from the previous contact.

The "Rover" concept is to encourage lightweight, low power portable activity. Details of the equipment used for this type of operation should be included on the log summary/cover sheet.

The "Rover" concept is NOT applicable to the Open section.

5. **Scoring** - as detailed in the General Rules (i.e 1 point per km). In addition the following **BONUS** points will also apply:

**LOCATOR SQUARE MULTIPLIER: (applicable to all sections):**

- The final, total kilometre score for the best four cumulative sessions will be multiplied by the total number of different Locator Squares ("grids"), for example IO92, IO81, etc) contacted over the entire cumulative (ie up to the six events maximum). To claim this bonus it is therefore essential to submit logs for all events entered, not just the best four. Please include a separate check list of the squares worked with your cover sheet.

**WIDEBAND BONUS: (applicable to all contacts in which a wideband mode forms at least one half of the microwave contact):**

- Two-way wideband contacts *multiply the distance points by 2*
- Wideband to non-wideband contacts *multiply the distance points by 1.5*
- One-way contacts score half the points a full contact would have made, including the multiplier. The wideband bonus applies to both sides of the contact. Therefore a narrowband operator working a

widebander would also *multiply the score for that contact by 1.5*

- NOTE: Wideband stations do NOT multiply the Locator Square Bonus as well!

It is appreciated that operators who use computer contest log software will not yet have the facility to automatically include the wideband bonus in their logs. For the moment, the bonus will have to be added manually to the final score as calculated by the G4JNT software, for example. All bonus carrying contacts should be clearly marked as such.

6. Logs should be sent to the adjudicator, G4KNZ, to arrive no later than **Tuesday, 23th October 2001.**

## RULES FOR THE 10GHZ TROPHY CONTEST

Important notice:

At the time of these rules going to press, this contest is under discussion at committee level. The rules below are subject to final decisions being made by the RSGB Microwave Committee and the RSGB VHF Contest Committee. A final announcement will be made in RadCom and the RSGB Microwave Newsletter during the early part of 2001.

1. The contest will run in parallel with the 10GHz Cumulative Contests, the winning station being the leading RSGB member (or members if a group entry) in the cumulatives held between May and October..
2. General rules shown above, General RSGB Rules (See Radcom Oct 2000) and the 10GHz Cumulative Rules (see above) will apply.
3. There is one section only - Open
4. **Only paid-up members of the RSGB are eligible to enter this contest.**
5. **If you wish to enter your 10GHz Cumulative logs for the Trophy please mark the cover sheet accordingly, otherwise it will not be forwarded to the RSGB VHF Contest Committee.**
4. Awards: The 10GHz Trophy will be awarded to the leading RSGB member (or members if a group entry) in the 10GHz Cumulatives.
5. Logs: These should be posted to arrive at the adjudicator, G4KNZ, **no later than Tuesday, 23th October 2001.**

## RULES FOR THE MILLIMETRE BANDS CONTESTS

1. The rules are identical for each of the millimetre bands: **24GHz, 47GHz, 76GHz and higher.**
2. These band contests are "stand alone" events and will be scored as such. However, as an incentive to millimetre wave activity, an award will also be made to the operator with the highest combined 24GHz scores, a further one to the operator with the highest combined 47GHz scores and likewise to the operator with the highest combined 76GHz scores, and above, over the four sessions. These awards will be in addition to the band leaders in each event.
3. The General Rules apply (see above)
4. Sections: One section only (Open) on each band. There will be **FOUR contests for each band** held over the summer season.
5. Scoring: Each contact will be scored on a 1 point per km basis.
  - Crossband and one-way contacts score half points.
  - The "rover" concept is applicable to both bands (see 10GHz Cumulative rules above) as it has been in previous years for the 24GHz contests
  - There are no bonus points for wideband contacts, unlike the 10GHz contests.

6. Logs should be sent to the adjudicator **to arrive no later that the following dates:**

**Tuesday, 1st May 2001 for the first Millimetre Band Contest**  
**Tuesday, 26th June 2001 for the second Millimetre Band Contest**  
**Tuesday, 26th September 2001 for the third Millimetre Band Contest**  
**Tuesday, 6th November 2001 for the fourth Millimetre Band Contest**

## RULES FOR THE ALL BAND MICROWAVE CONTESTS