An Amateur Radio publication for the Microwave Enthusiast

scatterpoint

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

2006 OCTOBER

Budding new microwavers gather at the highly successful FRAS Beginners' Workshop held last month at Wimborne, Dorset (see inside for details)

In this issue ...

Latest News ...

- **FRARS beginner's Workshop a great success**
- **Martlesham Round Table website open for registration**
- **Slovaks make their first lightwave contacts**

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

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From the Editor's Desk

This edition comes to you just a couple of weeks before the premier UK Microwave event of the year, the Martlesham Round Table. We have been recently sounding out your views on topics such as the contest programme and your thoughts about UKuG in general through (a) two polls on the UKuG Internet reflector and (b) by the member's Survey form included with last month's edition. If you haven't yet sent in your survey to the Group Secretary then please do so as soon as you can.

There are still some vacancies on the UKuG Committee and we urge members to consider themselves for these positions. We now have two ordinary committee members positions to fill as a result of our colleagues G6GXK and G4HUP recently standing down. We thank them very much indeed for all they have done for us in the past and hope they will be able to find time, in the not so distant future, to engage in committee work for us once again. If you feel that you can fill these positions then contact the Secretary immediately with your name and the name and callsign (if any) of a seconder, who **must** be a UKuG member. Failing that, you can submit your name (and that of the seconder) at the AGM at Martlesham on Sunday, 12 November.

Last, but not least, we must all congratulate the FRARS team for the excellent Beginners' Workshop they put on at the end of last month. Already, emails from its attendees have been coming in, praising the event and its organisers very highly. Well done FRARS!

73 from Peter, G3PHO — Editor

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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 that month's issue.

NEXT MONTH'S SCATTERPOINT

will be our usual issue spanning both November and December.

It should appear in your mailbox sometime in early December so don't panic if you don't receive before then end of next month!

The one after that will be the January 2007 edition.

Scatterpoint appears ten times a year, the bi-monthly issues being July/August and November/ December

HAVE YOU RENEWED YOUR UKuG SUBSCRIPTION YET? YOU CAN CHECK THE RENEWAL DATE ON YOUR ENVELOPE ADDRESS LABEL IF YOU RECEIVE A PRINTED SCATTERPOINT. THE DATE IS ON THE LOWER RIGHT CORNER OF THE LABEL. IF YOU STILL DON'T KNOW YOUR RENEWAL DATE PLEASE EMAIL THE SECRETARY, G8KQW, AS SOON AS POSSIBLE!

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

UK Microwave Group Beginners'Workshops ....

FLIGHT REFUELLING AMATEUR RADIO SOCIETY

30 September 2006

The second of the UKuG Workshops for Beginners took place at the club headquarters of the Flight Refuelling Amateur Radio Society at Wimborne in Dorset. The venue is ideally placed to serve those radio amateurs in the South Coast region who have ideas of taking up microwaves. The whole day event had been carefully organised by a team of FRARS members, led by Paul Marsh, M0EYT, who is also a member of the UK Microwave Group Committee. The workshop consisted of a series of presentations on basic microwave topics and a demonstration of working equipment. Andy, G4JNT, Carl G6NLC, John G0API and Paul, M0EYT, were the presenters. The following report was received by the Scatterpoint editor just a few hours after the workshop had finished, since Paul was so excited about its success! Read on and see what you could also achieve in your region to encourage "new blood" into this stimulating area of Amateur Radio. The UK Microwave Group will give you lots of support in the form of exemplar presentations, information CDs, plus literature and advice from those who have already " been there, done it and got the T shirt" !

The next Workshop will be held on Saturday, 11 November 2006, at the Martlesham Microwave Round Table, while the Telford and District A.R.S are seriously thinking about holding a similar event during Spring 2007. The Sheffield Amateur Radio Club is planning to repeat its May 2006 workshop (the first of the UKuG series) next May. If you are interested in helping, or know anyone who might like to attend these events, then contact the Scatterpoint editor who will put you in touch with the appropriate workshop organisers.

From Paul Marsh here is a short report on the uWave workshop held at FRARS ....

We had 24 people turn up for the event, along with Andy JNT, Carl G6NLC, John G0API and me to do the 'teaching'.

The run down of the presentations was: Introduction to uWaves. based on Peter G3PHO's Sheffield presentation. Following that was a pitch by Andy and John on Simple Gunn Diode TXs and uWave antennas. I demonstrated my 2 component (Gunn cavity with a 4 ohm speaker in series!) 10GHz WBFM tx with some speech being transmitted across the room.

We had a break for lunch, then a short demonstration of WBFM across the field. Andy, G4JNT gave a demo of SSB 10GHz with just open waveguide to John API a few km away.

Following that we had a presentation by Andy on the importance of beacons and why we need them, mostly based on the material he wrote for Radcom. I wrapped up the day with some slides again based on Peter's presentation, on 'how to find more info' and 'the UKuG'. We closed at about 16:15.

There is a photo of the people at the event at: **http://www.uhf-satcom.com/ukug.jpg** I'm off shot as I took the picture! *(see front page of this issue ...editor)*

All of the complimentary copies of Scatterpoint went, as did about 20 UKuG membership forms, I'll follow up with a 'thank you' email to the attendees in a few days and remind them to fill in the membership form!

All in all I think it was most productive and should certainly result in some microwave activity! We have videoed the talks and this will be edited along with clips from the Power Point presentations, then encoded and burnt to CD. Once this is done, I'll provide a copy for UKuG archives.

See you all at Martlesham! Regards from Paul, M0EYT.

Universal Control Board

by Ian Melvile G4EZP and Keith Naylor G4FUF

Introduction

Two years ago I started the winter project of upgrading my 10GHz portable system. For sometime I had planned to incorporate a modern 10W solid state power amplifier and low noise figure pre-amplifier into the system. Over the years, plenty of control boards had already been knocked up. However, times have changed and spare time now was at a premium. A search through a wide range of commercial suppliers failed to identify a control board capable of the switching combinations I required or the sequencing feature for a High Power Amplifier. After discussing the requirements with local members of the microwave community, it quickly became apparent that the lack of a suitable control board and sequencer design for use in high power microwave transverter systems was a common problem. In many cases this was preventing people getting their gear "on the road". Surprisingly, some of those consulted even had such a requirement for immediate use in a project.

After some gentle arm twisting (and a few suitable beverages) myself (G4EZP) and Keith (G4FUF) were persuaded to design and produce a control board integrating all the required supplies and sequencing for controlling a microwave transverter system. The Universal Control Board (UCB) is the result.

Using our own experiences and input from fellow members of the microwave community, the requirements were defined for the initial UCB-01 design. This PCB was available in limited quantity prior to the Adastral Park Microwave Round Table in November 2005. Currently, there are some 20 of the original UCB-01's in use in a variety of applications, primarily in microwave transverter systems and VHF/UHF amplifiers.

Over the following months, suggestions and improvements were incorporated into the UCB-01 design culminating in the final UCB-02, the design and development of which is the subject of the remainder of the article.

Overview

The Universal Control Board (UCB) is a general purpose interface PCB that simplifies the integration and control of a wide range of transverters, LNAs, HPAs and coaxial/waveguide changeover relays within a system. The UCB responds to PTT control inputs and generates sequenced TX and RX control timing and switching functions combined with a range of antenna changeover functions.

Readily available HPAs continue get bigger. The UCB-02 is an updated module providing increased current handling capability, additional mirrored control outputs and a number of minor refinements to the TX and RX control signals. UCB-02 is compatible with UCB-01.

As with its predecessor, special attention has been taken to ensure compatibility with the relevant control signals required by most of the currently available products such as from Kuhne Electronics (DB6NT), Down East Microwave and from G3WDG and DK2AM.

All electrical interconnections to the UCB are provided using a combination of terminal blocks for high current connections and polarised friction lock 0.1" KK style header connectors, thus dispensing with the need for any soldering. Connectors are grouped by function, the same switching signals and supplies appearing on several different connectors. This grouping permits most external modules to be configured and connected via a single connector. This configuration permits rapid swapping out of failed components in the field should the event arise.

Although the minimal UCB configuration is mechanically self-contained, for sustained high power operation at maximum currents the UCB requires an external heat sink or a suitable thermal interface. With this in mind, all the components requiring a thermal interface/heat sink are

located on one side of the module. The UCB is provided with four isolated M3 mounting holes.

The Universal Control Board, UCB-02 is designed with the following features.

- Operation from a single nominal +12V DC Input Supply including reverse polarity and over-current protection. (Typically 11V-16V max)
- 20A sequenced switched high current +12V transmit (+12V_HPA) output supply
- 1A high voltage (+HV) switched supply configurable over the range 15 to 32V.
- 1A low voltage (+LV) switched supply configurable over the range 2.5 to 10V.
- PTT control from an external source via a DC signal level on the I.F. RF connector or from discrete hardwired PTT inputs. Jumper configurable to match all known transceiver types.
- Sequenced 2A 12V supply on transmit (+12VTX).
- Sequenced 2A 12V supply on receive (+12VRX).
- Sequenced voltage outputs for control of antenna relay/waveguide switches.
- Sequenced 0v/GND outputs for control of conventional antenna relay changeover.
- Sequenced transmit logic outputs.
- Sequenced receive logic outputs.
- User selectable switched output voltages configured via jumper settings
- User selectable timing delays configured via jumper settings.
- LED status outputs for TX and RX. Together with on board LED indicators for TX, RX and HPA active.

Description

Reference should be made to the schematic diagrams. Note, as with most CAD schematic capture tools, a net/node name appearing in the schematic is implicitly connected to all nets/nodes with that same name. Consequently, an explicit interconnection may not necessarily be shown.

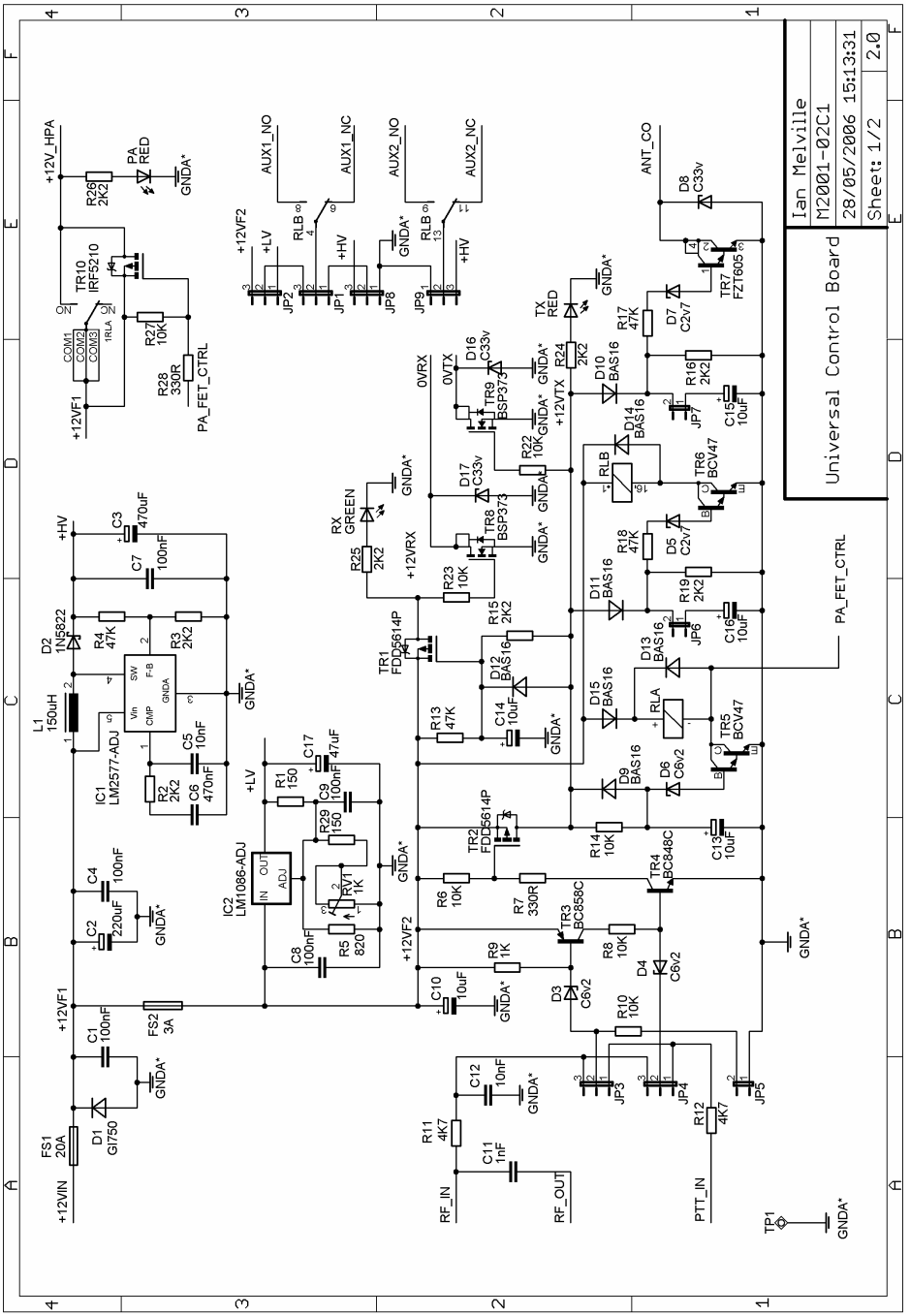
Input Circuit and Protection

The UCB is designed to operate from a nominal 12VDC supply and is protected against reverse polarity by a shunt diode D1 and fuse FS1 at the PCB input. Under reverse polarity, D1 is rated to effectively open FS1 up to its maximum rating. FS1 also provides elementary protection for short circuits on the HPA supply output and module as a whole. The low current supplies are independently fused by secondary fuse FS2. Both FS1 and FS2 used in the UCB design are ATO auto blade fuses in PCB mounted holders, this was important to allow for easy field replacement.

The maximum current rating of the UCB is primarily limited by the block connectors together with the choice of series pass MOSFET to a maximum of 25A. However, the user should select the appropriate value for FS1 consistent with the maximum current requirements of the HPA. The value of the low current supplies fuse FS2 should be determined by calculating the worse case sum of currents required by the +LV supply, the +12VF2 and the +12VTX and +12VRX outputs. The maximum rating for FS2 should not exceed 4A.

The PCB design allows for the +12VDC supply return (0V/GNDA) to be isolated from the PCB mounting points. Where required, a secure chassis ground may be connected to the PCB ground-planes at designated point TP1.

The UCB design provides for a range of fixed, sequenced and non-sequenced, switched voltage supplies and ground outputs derived and referenced to the nominal 12VDC input supply rails.


Universal Control Board
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Sheet: 1/2
2.0
+12V_HPA
PA RED
R26 2K2
TR10 IRF5210
R27 10K
R28 330R
PA_FET_CTRL
+12VF1
+12VF2
+LV
+HV
AUX1_NO
AUX1_NC
AUX2_NO
AUX2_NC
JP1
JP2
JP8
JP9
RLB
ANT_CO
D8 C33v
TR7 FZT605
TX RED
R17 47K
D7 C2v7
R16 2K2
C15 10uF
JP7
D14 BAS16
D10 BAS16
D16 C33v
TR9 BSP373
R22 10K
R24 2K2
0VTX
+12VTX
0VRX
+12VRX
RX GREEN
R25 2K2
D17 C33v
TR8 BSP373
R23 10K
TR6 BCV47
R18 47K
D5 C2v7
R19 2K2
C16 10uF
JP6
D11 BAS16
D13 BAS16
D15 BAS16
D12 BAS16
R15 2K2
R13 47K
C14 10uF
TR1 FDD5614P
TR2 FDD5614P
RLA
TR5 BCV47
D9 BAS16
D6 C6v2
R14 10K
C13 10uF
TR4 BC848C
TR3 BC858C
R6 10K
R7 330R
R8 10K
R9 1K
D4 C6v2
D3 C6v2
R10 10K
C10 10uF
JP3
JP4
JP5
R12 4K7
R11 4K7
C12 10nF
C11 1nF
RF_IN
RF_OUT
PTT_IN
TP1
L1 150uH
IC1 LM2577-ADJ
D2 1N5822
R4 47K
R3 2K2
C3 470uF
C7 100nF
C5 10nF
C6 470nF
R2 2K2
C4 100nF
C2 220uF
IC2 LM1086-ADJ
C17 47uF
C9 100nF
R1 150
R29 150
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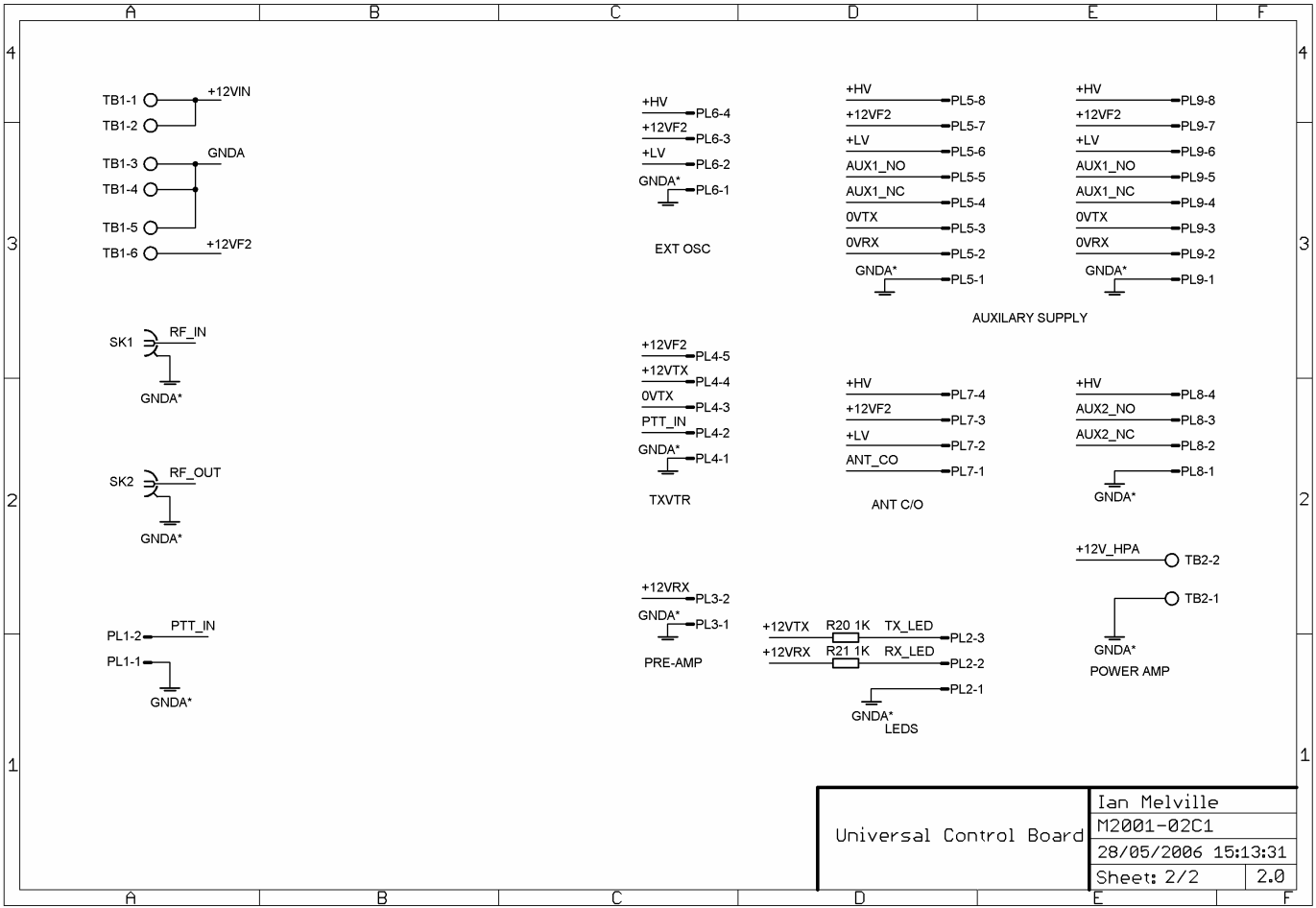
+12VIN
D1 GI750
C1 100nF
FS2 3A
GNDA*


TB1-1
TB1-2
+12VIN
TB1-3
TB1-4
TB1-5
GNDA
TB1-6
+12VF2
SK1
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GNDA*
SK2
RF_OUT
GNDA*
PL1-2
PL1-1
PTT_IN
GNDA*
+HV
+12VF2
+LV
GNDA*
PL6-4
PL6-3
PL6-2
PL6-1
EXT OSC
+12VF2
+12VTX
0VTX
PTT_IN
GNDA*
PL4-5
PL4-4
PL4-3
PL4-2
PL4-1
TXVTR
+12VRX
GNDA*
PL3-2
PL3-1
PRE-AMP
+HV
+12VF2
+LV
AUX1_NO
AUX1_NC
0VTX
0VRX
GNDA*
PL5-8
PL5-7
PL5-6
PL5-5
PL5-4
PL5-3
PL5-2
PL5-1
+HV
+12VF2
+LV
AUX1_NO
AUX1_NC
0VTX
0VRX
GNDA*
PL9-8
PL9-7
PL9-6
PL9-5
PL9-4
PL9-3
PL9-2
PL9-1
AUXILARY SUPPLY
+HV
+12VF2
+LV
ANT_CO
PL7-4
PL7-3
PL7-2
PL7-1
ANT C/O
+12VTX
+12VRX
R20 1K
R21 1K
TX_LED
RX_LED
PL2-3
PL2-2
PL2-1
GNDA*
LEDS
+HV
AUX2_NO
AUX2_NC
GNDA*
PL8-4
PL8-3
PL8-2
PL8-1
+12V_HPA
TB2-2
TB2-1
GNDA*
POWER AMP
Universal Control Board
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HPA Switching

The UCB provides a nominal +12V switched supply, +12V_HPA, which is capable of providing up to 20A for powering an HPA. The +12V_HPA output is switched by high power MOSFET TR10.

The majority of HPAs that do provide TX/RX switching use a low level control input activating the amplifier bias while the main high current DC supply remains connected. Over the years a number of cautionary tales may have been heard where stations with HF set-ups have suffered catastrophic failures due to the low level switching on mast mounted systems being latched on. Frankly, it remains wise to remove the high current supply completely on RX.

The recommended P-Channel MOSFET IRF5210 has an Rds of <0.06Ω, resulting in a nominal power dissipation of ~24W at a 20A load current. This level of device dissipation requires a thermal heat-sink/interface, typically ~1.2°C/W assuming say a maximum temperature rise of 30°C.

The design and PCB layout also provides the same +12V_HPA switching function using a high current auto relay. However, as you might be aware most 12V high current component parts in this category are rapidly becoming obsolete as car manufacturers switch to 42V power systems.

The sequencing for this supply can be set to provide a receive-to-transmit switching delay (typically 100-200msec). The release time has a maximum transmit off delay of 1msec with respect to the PTT reference signal. If the relay option is chosen rather than the MOSFET then the receive-to-transmit delay time will be increased by typically 30-40msec due to the armature mechanics as will the release time, typically 6-8msec. This delay timing is a simple but robust combination of a CR circuit and threshold switch where the delay is set by a single resistor R14. The value is determined from a look up table provided in the full documentation, a nominal 10KΩ being sufficient for most applications.

Although the UCB design is expected to carry high DC currents, copper resistance is finite and voltage drops will naturally occur. For field operation these can sometimes be important when considering additional voltage drops in power leads to batteries for example.

Based on the selected MOSFET switch at 20A output load current and a 25A ATO fuse, the worse case voltage drop measured between the +12V input supply and the +12V_HPA output is ~1.6VDC.

Problems may generally only arise in mast mounted applications where sometimes the real additive voltage drop in the power cables may be overlooked. Sometimes this can be overcome by increasing the remote input supply voltage or actually mounting the PSU at the masthead. Where lower output currents may be required, TR10 may be substituted for a device with a lower current rating. The only practical reason for this change is device cost. Note that selecting a lower current device will inevitably result in a higher Rds.

Non-Switched Supplies

The non-switched output, +12VF2, is derived directly from the power-input circuit after FS2. The +12VF2 supply is intended to supply an external oscillator, oscillator multiplier, oven or any modules requiring the 12VDC input supply with basic over-current protection. The maximum continuous output current at +12VF2 should be limited to 2A.

The UCB also provides a high voltage supply, +HV, capable of providing up to 1A. This supply is generated from a self-regulating voltage boost converter I.C. incorporating input over-current and output short circuit protection. The +HV supply is capable of providing output voltages up to 32V, typically it would be set at 26-28VDC for use with wave-guide/coaxial changeover relays. The output voltage is set with two fixed resistors R3, R4.

The low voltage supply, +LV, is designed to supply 2.5-10V at up to 1A and is provided by a low drop out (LDO) linear regulator IC2. The +LV supply output voltage can be set either via a multi-turn potentiometer or it may be fixed by selection of two resistors R1 and R5. The user may decide which method is required. If the potentiometer solution is selected then R5 is omitted, conversely if the output is fixed then only R1 and R5 are required. This supply can be used for low voltage relays/switches or running TCXOs. If low drop out is not a consideration then IC2 can be substituted with an LM317.

Switched Supplies

The UCB design provides a range of sequenced output supplies for use with external drivers, amplifiers, bypass or antenna relays.

The switched supplies +12VTX and +12VRX are capable of supplying up to 2A on transmit and receive respectively. The +12VTX supply switching is immediate with no delay with respect to the PTT reference signal. The +12VRX supply switching incorporates a small delay of ~10msec to permit a margin when going from transmit to the receive state. This feature is in line with some commercial LNA requirements.

At 2A load current, the measured voltage drop from the +12V input supply to either of the +12VTX or +12VRX switched outputs is typically <0.25VDC with the specified devices at TR1 and TR2.

Outputs AUX1_NO and AUX1_NC are relay switched outputs and by jumper configuration can provide different combinations of the +LV, +12VF2, +HV supplies or GNDA. These outputs are intended for control of antenna switching and may incorporate the optional hang time on either TX or RX by formulating the relay switching as either low side or high side. Note that, in each case, normal diode protection is expected across the relay coil(s).

PTT Switching Control

The UCB transmit-receive switching sequence is controlled by the PTT reference signal and the source of the PTT reference input is user selectable via jumpers that determine both the source and polarity of the PTT signal.

The PTT reference can be selected to sense the DC state present on the RF Input at connector SK1 or from an external DC voltage or ground at terminal PTT_IN on connector PL1 or PL4. Polarity selection is provided for all possible combinations of ground (GND), positive (+V) and open-circuit (HI-Z) PTT potentials from both input sources.

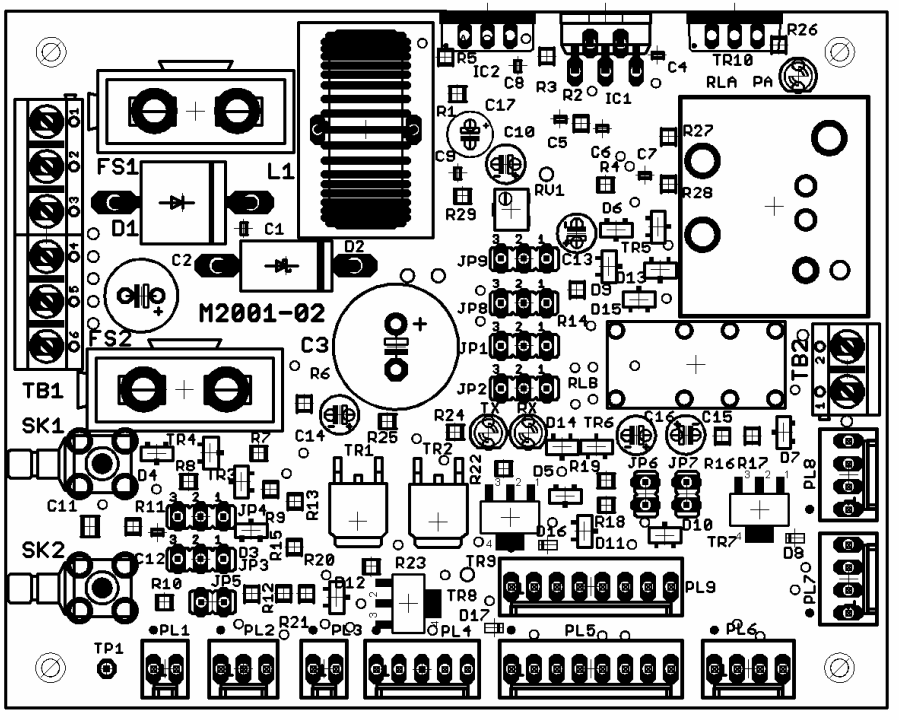
When sensing the DC voltage on the incoming I.F. RF signal source, the signal from the driver tranceiver should be applied to SK1 and the DC blocked output from SK2 is then available to drive the TX I.F. input of the transverter/amplifier. If the PTT is derived by this means it should be remembered that the use of any inline external attenuation between the driver and the UCB will alter the final DC levels present at the UCB. Measurement of the final DC level should be made to determine that PTT operation is not compromised.

The maximum RF level rated at SK1 with SK2 correctly terminated in 50Ω is 10W. The module will tolerate up to 25W if capacitor C11 is replaced with an ATC100 or ACCU-P style capacitor. The current PCB layout can accommodate SMA, SMB or SMC PCB mount connectors at SK1 and SK2.

Output Switching

The UCB provides a range of sequenced output control signals for use with external driver amplifiers, transmit bypass relays and antenna switching. Open-collector output ANT_CO is specifically provided to control heavy-duty antenna change over relay/switches in combination with the +LV, +12VF2 and +HV output supplies. The ANT_CO signal goes active low immediately with the PTT going to the transmit state but incorporates a delay on returning high to the receive state. The delay on ANT_CO switching inactive is selectable via a jumper. The ANT_CO output is intended for conventional relay operation, i.e. the TX state is when the relay is energized and provides a maximum rated current of 0.5A. The maximum terminal voltage presented should be <32VDC. Antenna C/O may also be provided by combination of the following switched outputs in conjunction with the various supply rails available. Together these accommodate all the known types of relay/switches available.

The 0VRX output provides a GND on receive and is an inverse logic open drain output derived from the +12VRX supply with identical timing characteristics. This may be used as one of the control signals to many of the 4-port SMA or waveguide relays currently available or to switch an external driver amplifier or transverter requiring a ground to receive/mute control signal. Conversely, the 0VTX output provides a GND on transmit and is an inverse logic open drain output derived from the +12VTX supply with identical timing characteristics. **[Continued on page 12]**


M2001-02
FS1
FS2
L1
D1
D2
C1
C2
C3
TB1
TB2
SK1
SK2
IC1
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TR10
RLA
PA
TP1
PL1
PL2
PL3
PL4
PL5
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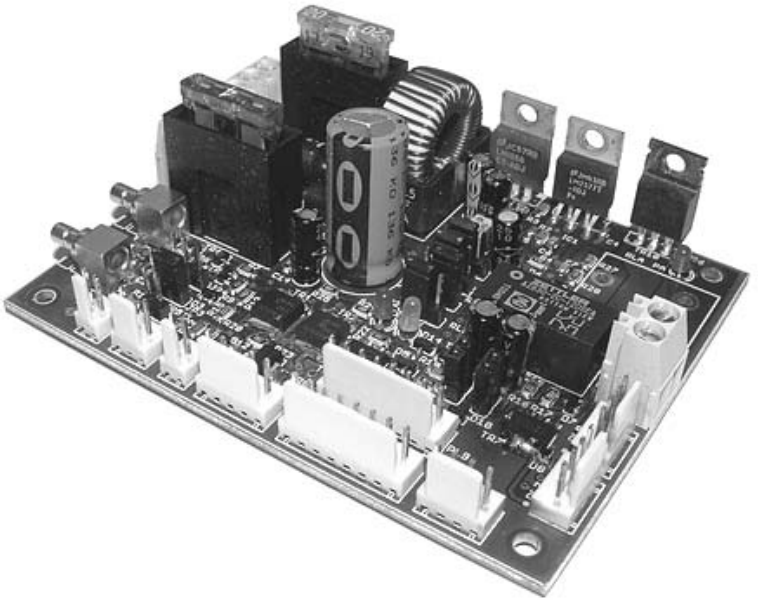


COMPONENT LIST : UNIVERSAL CONTROL BOARD

Circuit Reference	Value	Description
C11	1nF	Capacitor Ceramic SMD 1206 50V X7R
C5,C12	10nF	Capacitor Ceramic SMD 0805 50V X7R
C1,C4,C7,C8, C9	100nF	Capacitor Ceramic SMD 0805 50V X7R
C6	470nF	Capacitor Ceramic SMD 0805 16V X7R
C10,C13,C14,C15,C16	10uF	Capacitor Electrolytic 10uF 25V
C17	47uF	Capacitor Electrolytic 47uF 25V
C2	220uF	Capacitor Electrolytic 220uF 25V 85C
C3	470uF	Capacitor Electrolytic 470uF 50V 85C
D1	TS750	Diode Silcon 6A 50V
D2	1N5822	Diode Schottky 3A 100V
D3,D4,D6 BZX84 250mW	C6V2	Diode Zener SMD SOT23 6.2V
D5,D7	BZX84 C2V7	Diode Zener SMD SOT23 2.7V 250mW
D9,D10,D11,D12,D13,D14,D15	BAS16	Diode Silicon SMD SOT23
D8, D16, D17 BZX284 C33	Diode Zener SMD SOD110 33v 400mW	
FS1,FS2	PCB ATO	Fuse Holder
IC1	LM2577	I.C. Switching Regulator 3A Adjustable
IC2	LM1086	I.C. Low Drop Out Regulator 1.5A Adjustable
JP1,JP2,JP3,JP4,JP8, JP9	JP2E	Header 0.1" Pitch 1-Row 3-Way 3A
JP5,JP6,JP7	JP1E	Header 0.1" Pitch 1-Row 2-Way 3A
L1	150uH	Power Inductor 150uH 2A
PA, TX	LED 3mm RED	
RX	LED 3mm GREEN	
PL1,PL3	Header PCB Style KK 0.1"" Pitch 2-Way	
PL2	Header PCB Style KK 0.1"" Pitch 3-Way	
PL6,PL7,PL8	Header PCB Style KK 0.1"" Pitch 4-Way	
PL4	Header PCB Style KK 0.1"" Pitch 5-Way	
PL5, PL9	Header PCB Style KK 0.1"" Pitch 8-Way	
R1	150R	Resistor SMD 1206 1% 0.25W
R3	2K2	Resistor SMD 1206 1% 0.25W
R4	47K	Resistor SMD 1206 1% 0.25W
R5	820R	Resistor SMD 1206 1% 0.25W
R14	22K	Resistor SMD 1206 1% 0.25W
R16	2K2	Resistor SMD 1206 1% 0.25W
R19	2K2	Resistor SMD 1206 1% 0.25W
R7, R28	330R	Resistor SMD 1206 1% 0.25W
R9,R20,R21	1K0	Resistor SMD 1206 1% 0.25W
R2,R15,R24,R25,R26	2K2	Resistor SMD 1206 1% 0.25W
R11,R12	4K7	Resistor SMD 1206 1% 0.25W
R6,R8,R10, R22,R23,R27	10K	Resistor SMD 1206 1% 0.25W
R13,R17,R18	47K	Resistor SMD 1206 1% 0.25W
R29	150R	Resistor SMD 1206 1% 0.25W
RV1	1K	Trimmer 5-Turn SMD
RLA		Relay PCB SPCO 12VDC 30A (Option A)
RLB		Relay PCB DPCO 12VDC 2A
SK1,SK2		Connector PCB SMB 90-deg Jack
TB1,TB2		Terminal Block PCB 2-Way 24A
TR1,TR2	FDD5614	MOSFET P-Channel D-Pak
TR3	BC858	Transistor PNP SMD SOT23 TBC858C
TR4	BC848	Transistor NPN SMD SOT23 BC848C
TR5,TR6	BCV47	Transistor Darlington NPN SMD SOT23
TR8, TR9	BSP373	MOSFET N-Channel SMD SOT223
TR7	FZT605	Transistor NPN Darlington SMD SOT223
TR10	IRF5210	MOSFET P-Channel TO220 (Option B)

This may be used as one of the control signals to many of the 4-port SMA or wave-guide relays currently available or to switch an external driver amplifier or transverter requiring a ground to transmit control signal.

The maximum rated switched current by 0VRX or 0VTX is 0.5A and maximum terminal voltage presented of <32VDC, note that the outputs are transient clamped at ~33V.
To ascertain UCB operation on-board LED indicators for transmit, receive and the switched +12V_HPA supply status may be fitted. In addition external status outputs are provided for TX and RX indicators with provision for optional on-board ballast resistors.

Finale

Special thanks go to Robin, G8APZ and Brian, G4NNS, for valuable feedback and continuing support in the project.

Availability

The UCB-02 PCB is manufactured from a 100mm x 80mm x 1.6mm glass-fibre FR4 double sided, PTH gold-flashed PCB. It uses a combination of both SMD and through-hole leaded components that are available from several electronic component suppliers both in the UK and worldwide. The entire assembly and all specified components are RoHS compliant.

Although the UCB design is intended for home construction without need for special tools or test equipment, the assembler should have basic experience in the handling and soldering of SMD components.

Not everyone who is interested in the module may require the complete functionality or want to populate an entire PCB. Primarily, the UCB-02 is available as an unpopulated PCB. The UCB is also available as a kit. However, fully assembled and tested UCB-02 modules can also be provided upon request.

The basic UCB-02 PCB is available for **£16-50** including a CD containing all documentation, component specification libraries, assembly drawings and part-lists.

The UCB-02 module kit is available at **£92-00** and includes:-

- UCB-02 double sided, PTH, gold flashed PCB
- All components and connectors (SMB RF connectors)
- A full set of mating friction lock connectors and socket inserts
- Heat-sink mounting hardware for TO220 devices
- CD containing all documentation, component specifications library, assembly drawings and part-lists.

Fully assembled and tested UCB-02's come with all mating connector parts and mounting hardware together with the CD and are available at: **£122-00**.

All prices include delivery within the UK. For delivery outside the UK or for further enquiries and information please mail: **ucb@micronet-uk.com** and visit **www.micronet-uk.com/ucb**

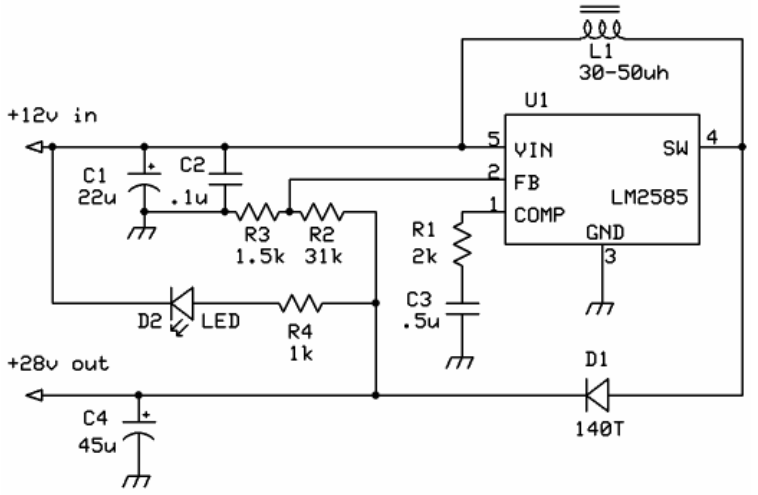
NOTE TO MARTLESHAM ATTENDEES

A limited number (20) of the PCBs and associated CD documentation will be available at the Martlesham Microwave Round Table. Look for Ian, PA4ZP, who will be pleased to supply you….. but be quick or you may miss out!

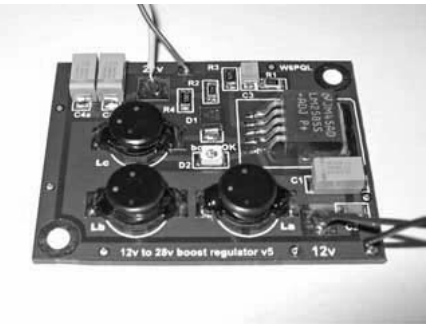
12-28 Volts DC to DC Converter Relay Supply

... by W6PQL

... from a note in the San Bernardino Microwave Society (California., USA) October 2006 newsletter



Chuck, N6EQ, had some of these boards at one of the SBMS meetings some time back. Check out the web site **www.w6pql.com** for full details.



This boost regulator is for those times when you have a 28v relay but want to use it with a 12v source. The circuit is built around the National Semiconductor LM2585, and uses the energy stored in an inductor to boost the 12v to 28. Output voltage can be varied by adjusting the ratio of resistor values on the feedback pin. The circuit does its switching around 100kHz but generates no noise if SMD components are used.

Output is good for about half an amp continuous, enough to power two or three large microwave relays.

The board measures 1.5"x2". It is important to note at least these three cautions before powering up the board:

- A short-circuit on the output will kill U1 and D1. Always use a 1 ohm 5w resistor, or a 2.5A fast fuse on the 12v input lead.
- Do not omit the LED (D2); It provides a visual indicator of a properly operating boost condition,but more importantly, it also provides a minimum load for the output, preventing an output "spike" which will otherwise appear when the load is disconnected abruptly.
- Keep the ratio of r2 and r3 to 22 or less to keep the output voltage within the ratings of C4 (C4 on my board is rated at 35wvdc). This ratio plus 1, multiplied times 1.25v, determines the output voltage.

Attenuator Checker

This spreadsheet calculates the value that would be measured with an ohm-meter on an unknown 50 ohm attenuator un loaded.

		Pi Attenuator network		Ohm-meter measurement Pi attenuator network		T Attenuator network		Ohm-meter measurement T Attenuator network	
Att'n in dB	V ratio	Rshunt	Rseries	Shunt Res	Series Res	Rseries	Rshunt	Shunt Res	Series Res
1	0.89	869.55	5.77	436.21	5.75	2.88	433.34	436.21	5.75
2	0.79	436.21	11.61	220.97	11.46	5.73	215.24	220.97	11.46
3	0.71	292.40	17.61	150.48	17.10	8.55	141.93	150.48	17.10
4	0.63	220.97	23.85	116.14	22.63	11.31	104.83	116.14	22.63
5	0.56	178.49	30.40	96.25	28.01	14.01	82.24	96.25	28.01
6	0.50	150.48	37.35	83.54	33.23	16.61	66.93	83.54	33.23
7	0.45	130.73	44.80	74.93	38.25	19.12	55.80	74.93	38.25
8	0.40	116.14	52.84	68.83	43.05	21.53	47.31	68.83	43.05
9	0.35	104.99	61.59	64.40	47.62	23.81	40.59	64.40	47.62
10	0.32	96.25	71.15	61.11	51.95	25.97	35.14	61.11	51.95
11	0.28	89.24	81.66	58.63	56.03	28.01	30.62	58.63	56.03
12	0.25	83.54	93.25	56.73	59.85	29.92	26.81	56.73	59.85
13	0.22	78.84	106.07	55.28	63.42	31.71	23.57	55.28	63.42
14	0.20	74.93	120.31	54.15	66.73	33.37	20.78	54.15	66.73
15	0.18	71.63	136.14	53.27	69.80	34.90	18.36	53.27	69.80
16	0.16	68.83	153.78	52.58	72.64	36.32	16.26	52.58	72.64
17	0.14	66.45	173.46	52.04	75.25	37.62	14.41	52.04	75.25
18	0.13	64.40	195.43	51.61	77.64	38.82	12.79	51.61	77.64
19	0.11	62.64	220.01	51.27	79.82	39.91	11.36	51.27	79.82
20	0.10	61.11	247.50	51.01	81.82	40.91	10.10	51.01	81.82
21	0.09	59.78	278.28	50.80	83.63	41.82	8.98	50.80	83.63
22	0.08	58.63	312.75	50.63	85.28	42.64	7.99	50.63	85.28
23	0.07	57.62	351.36	50.50	86.78	43.39	7.12	50.50	86.78
24	0.06	56.73	394.65	50.40	88.13	44.06	6.33	50.40	88.13
25	0.06	55.96	443.16	50.32	89.35	44.68	5.64	50.32	89.35
26	0.05	55.28	497.56	50.25	90.45	45.23	5.02	50.25	90.45
27	0.04	54.68	558.56	50.20	91.45	45.72	4.48	50.20	91.45
28	0.04	54.15	626.98	50.16	92.34	46.17	3.99	50.16	92.34
29	0.04	53.68	703.71	50.13	93.15	46.57	3.55	50.13	93.15
30	0.03	53.27	789.78	50.10	93.87	46.93	3.17	50.10	93.87

USEFUL ATTENUATOR REFERENCE SPREADSHEET

… by Alan Melia, G3NYK

Hi all. Have you ever had to check out a suspect attenuator, or an unmarked one, or find out what the strange marking on an SMD pad means.? You can put an ohm-meter end to end and end to ground (unloaded) and measure some values and then spend a while finding a table of component values and pushing buttons on a calculator.

I have had reason to do this 3 times in the last week and got fed up the last time and thrashed up a crude but simple spreadsheet (see page 14) that tabulates the ohm-meter readings for "Pi-section" and "T- section" 50 ohm attenuators. I have seen lots of fancy attenuator component programs but not with this useful addition.

For those of you who bought the detector pcb at Crawley the "14" on the input pad means 14dB !! If you would find it useful, you can also download the spreadsheet from:

http://www.alan.melia.btinternet.co.uk/download/Attenor.xls

73 from Alan

CONTESTING IN STYLE

FRARS contest group entered the RSGB UHF and Up contest, over the weekend 7/8 October 2006. Paul M0EYT, Julian G3YGF and Jules G0NZO, operated from Bell Hill (IO80UV) on 4 microwaves bands, plus 144MHz ssb talkback.

Equipment used:
23cm - Box of 4x37ele yagis, mast head transverter/PA delivering 40W at the feed. Mounted on a single 24ft pole.
13cms- 1m mesh dish, mast head transverter/PA delivering 70W at the feed. Co-mounted on the 23cms mast.
6cm - 1.8m dish, mounted on the club trailer at a feed height of approx 10ft. Mast head transverter/PA delivering 20W at the feed.
3cm - Co-mounted feed on the 1.8m dish. Mast head transverter/PA delivering 13W to the feed.
2m - 9ele yagi on a 25ft mast. Masthead preamp and Icom 910 delivering 100W at the shack.
Due to lack of manpower and equipment, they decided not to operate 70cm or 9cm.

The photos below shows their impressive portable station antenna system.

For further details and more photos please visit the FRAR website (from which we gratefully acknowledge the information above and these photos):

http://www.frars.org.uk/cgi-bin/render.pl?pageid=1316

M0EYT/P

M0EYT/P

ACTIVITY NEWS FROM THE WORLD ABOVE 1000MHz

Photo by Alun, G4WGE

Just to show the RSGB VHFCC do remember microwaves! The photo above shows John Wood, G4EAT, receiving the RSGB 10GHz Trophy at the recent HF Convention from Mr President. The 10GHz Trophy is presented by the VHFCC (30-300MHz) at the HFC (3-30MHz) ..... something just doesn't seem quite right there! **73 from Alun,G4WGE**

EME REPORTS

From Howard, G4CCH, comes a correction to the low power on 23cm item, in last month's Activity News: "The QRP QSO was with PY2MJ not PY2MU. Guilherme was using a 2m dish with a horizontally polarized feed and 20W. As I was using circular polarization (the standard for 23cm EME) there was an additional 3dB loss due to polarisation mismatch. You can find out more on my website: http://www.g4cch.com/data/log/newsofmy.html

Best 73, from Howard, G4CCH

From: Chris Bartram <chris@chris-bartram.co.uk>

It was fascinating to have 10GHz EME contests on two subsequent weekends - The first close to perigee with the Moon at medium declination, and the other with the Moon approaching apogee at high declination.

I was only able to operate for a few hours in the ARI contest, after getting home from a wedding at 2.30am on the morning of 10 September and I suspect that I missed a lot of the activity.

However I had easy QSOs with F6KSX, 465JTA, WA7CJO, and HB9SV. I also heard IK2RTI with a good signal, but I think he went QRT as I came on. Echoes were good and I heard my ssb echoes again. I finally got to bed at about 6am!

I'd looked forward to the ARRL contest, but it was **very** hard going on 3cm. Close to apogee, signals were weaker and there was also quite a lot more spectral decorrelation than usual. I could hear my echoes all the time, although they were weaker than the previous weekend. During the first pass ofthe Moon I was only able to work IQ4DF 529/529 and WA7CJO 559/579. I took the focus box off of the dish after the first pass and it checked-out properly on the bench.

The second pass was even worse! I heard OH2AXH and HB9BHU with what would normally be workable signals, and I had had a nice 539/519 QSO with RW1AW, (actually I could have given Alex a much better report than 519, but I'd based it on a minute or so when the dish drifted off of the Moon and didn't want to change it) but, even after an hour's trying, I failed to work DL0EF!

They were a strong signal (549) with their 10m dish and ~20W, but were clearly having problems copying me. Sun and Moon noise were both normal when I looked just after I finished trying with them.

I know other people had similarly disappointing results, and it has led me to question the wisdom of moving the microwave leg of the ARRL contest to a high path-loss weekend. After a bit of experience on 10GHz, it seems that unlike the lower frequency bands, 10GHz and probably the higher frequency bands are particularly effected by path loss. I have a hypothesis that when signals decorrelate to the extent of becoming audibly noise-like, the ear is quite poor at detecting them, and there's some form of threshold effect which can make signals sound as though they vary more like 6dB than 2dB over the lunar cycle. Do any experts in pschyco-accoustics read Scatterpoint? **Vy 73 de Chris GW4DGU**

TERRESTRIAL MICROWAVES

Over the past month or so, one or two of our readers have sent in reports which, due to lck of space, didn't make these pages, so we'll try to make it up this time! Here's one from the backlog:

Activity report from Peter, G3PYB/P: The **24/47GHz contest on the 9th July** was preceded, on the Saturday the 8th, by a 76GHz tune-up for G3FYX who came to Lane End , IO90JA, near Winchester through the kind effort of his temporary chauffer for the day, G8KQW. After much adjustment, the FYX 76GHz rig was performing well and G3PYB had two contacts on 76GHz for the log from Butser. Signals were big despite the high temperature and humidity.

The 24/47GHz contest next day started with very difficult weather, low cloud and wind so strong the tripods haD to be fixed down securely. G3PYB started at A site near Mercury and worked G8KQW and G3FYX on the Isle of Wight and others on 24GHz and Good signal strengths were seen on 24GHz. No 76GHz was worked that day due the heavy wind on the IoW Ventor site. G3PYB relocated to Near Butser and was joined by G0JMI/P who, with some assistance with frequency spotting on 47GHz, work the IoW stations at approxi-

mately 40Km for his first and best 47GHz contact.

In all 8 contacts on 24GHz were made and 3 on 47GHz ... a difficult day with all manner of difficulties pointing the dishes, and keeping them on beam due to the wind. Improving the dish illumination also means narrower beam widths and all the station worked have improved their dish performance over the last year.

It was a cooler day, for a change, for the **5.7/10GHz** contests on the 23 July at Portsdown Hill and it brought me some 22 contactson 3cm. F6DKW in Paris and G3PHO/P (IO93PW) in the East Riding of Yorkshire were the longer contacts. I had 9 contacts on 5.7GHz, with G3PHO/P being the longest path. It was good to hear some stations back on the air with G3ZTR/P in Yorkshire and G3WIE in Southampton ... a pleasant day out at 24 deg C but conditions were a little down at times but with many stations to work.

From: Keith GW3TKH. September 5.7/10GHz Cumulative: I left home in rain which cleared as I headed east. Cefn y Galchen, *(aka the Blorenge..ed*) in IO81LS, was dry but in mist, the distant horizon appearing at about 1330! Beacons heard: GB3CCX, 599++. GB3SCX, 579. GB3KBQ, just audible. GB3SCC, 599+. No other beacons were heard.

I made 11 QSOs on 3cm and 5 on 6cm. Signals were very strong on both bands and, unusually, all were worked on ssb. At one point in the afternoon, 2m was so busy with uWave talkback it was difficult to find somewhere to operate. Best dx was G4EAT, JO01HR at 253 km. The batteries failed at 1630, so I was home in time for supper. Thanks to all, Keith.

From Mike, G0JMI/P: Activity report for the 24GHz and 47GHz Contest for Sunday 10th September 2006: I activated Verely Hill, Picket Post, New Forest, Hants (IO90DU), and, along with Del G1JRU/P, worked G8KQW/P and G3FYX/P(both at IO90AP) on both millimetric bands. I was very pleased to work them with my home-brew mixer and 18 inch dish as it can only be giving out a few micro-watts! The path length was less than the one we did during the July 2006 24/47GHz contest (43km) but 30km is still quite respectable for my QRP system.

Del , G1JRU, was operating on 24GHz only SSB and also worked Ian G8KQW/P and Roy G3FYX/P as well. Del also worked Bob G8VOI/P at 5/1 and Chris G8BKE/P at 5/9 at Butser Hill (IO90MX) , however I did not manage to hear either station because my Rx is a bit deaf on 24GHz (a winter project is to include an Rx pre-amp!).

I managed to be around to operate for the **September 10GHz contest,** which was good having been unavailable for several of the 10GHz Contests throughout 2006. From my home QTH (Alton, Hants, IO91MD), I managed to work the following stations mainly using SSB: G8KQW, G4NNS, G8ACE, G4LDR, G4EAT, G4ZXO/P, G4WYJ/P, G4WGE/P and G3YGF, with G4EAT being the best DX for me at 128km. Obviously, other stations worked far more contacts that me but from this QTH this represents a personal best.

The set up here is a Flyswatter at 25 feet, 18 inch dish and peak power of 10w.

Steve G1MPW/P and Dave G6KIE/P worked from JO03 for the **September 10GHz** Cumulative contest. They managed to work 15 stations in all with the best DX being 250Km to Ditchling Beacon. Steve tried taking the laptop and 3G card to try out KST for the first time - two G contacts were made entirely with KST and it generated a lot of interest from F and ON . Sadly none of the continental stations had 144MHz talkback so about an hour and a half was spent trying to work them - without success . The PC had to go in the car with towels draped over the windows to get it dark enough to see the LCD screen - and the car was about 30 feet from the 10GHz gear. Much running to and fro resulted in zero points and a vow to stick to 2m next time (although that was playing up as well - got reports that sounded like it was FM-ing - maybe the battery couldn't cope with running the 100W linear or maybe it was caused by talking too near the mike in an effort to overcome the wind noise !)

Steve says he can see the advantages in using KST at a home station but isn't so sure it's a good idea , for him at least , when /P. None the less it was a great way to finish the season - time to start planning the next one now!

From Harold, G3UYM/P: For the **September 24/47GHz contest,** I decided on a change from my usual /p site at Therfield and instead activated **IO92NP** in Leicestershire. There was thick fog all the way up there and I had difficulty in finding the site, Robin - a - Tiptoe Hill, NGR SK774043. Access to the hill top is very difficult in a small car. Fortunately the weather was dry and so I was able to negotiate the steep incline to the top. It was a bit 'hairy' coming back down though! I had four contacts on 24GHz :-G3PHO/P IO93FB [64Km], G8VZT/P IO93AD[91Km], G0EWN/P in IO93CH [96Km] a very obstructed path and G3ZME/P IO82WN [84Km] I tried, unsuccessfully, the 144km path to John G4EAT in JO01HR. It was an interesting day out from a new site and the weather was excellent.

Neil, G4BRK (IO91) reports on the September **10/5.7GHz Cumulative contest**:
Conditions weren't too good - no DX worked. In fact I didn't manage to find any French /P stations and the only DX attempted were F6DKW and ON4IY - both with no result. There were very few on in the north of England. Apart from that had quite a good time working a number of the regulars.

It was nice to have the 2m antenna back - it is more efficient than KST for setting things up when signals are reasonable. Still, I couldn't hear G1MPW/P on 2m, yet had a nice and easy 3cm contact on SSB. Best was G4ALY at 219km, closely followed by G3PHO/P. My final tally was 24 contacts, not bad considering I was away from the shack for the afternoon and early evening. 73, Neil G4BRK

Robin, G8APZ (JO01) writes: I've been in IN95 through July, August, and half of September with a break in early August to reactivate GB2LD in IN79. This year I also took 6cm and 3cm and made a few QSOs on those bands. I was heard on 3cm (in the noise) by G4EAT at 428Km, and by F6DKW at 555Km and I ran daily tests with G8KQW and G4EAT, but no QSO resulted. I also tried with a number of F stations on 3cm, all of them over 500Km, to no avail!

These were the stations I worked:
6cm - G4ALY(90km) G0RRJ (302km) sent 51 but QSO incomplete, F1GHB/p(21 km). **3cm** - G4ALY(90km), F9OE(195km), G4NNS(294km), G0RRJ(302km),F1GHB/p (210km). I subsequently found a wire had come off inside the DB6NT transverter on 6cm (dry joint?), which affected the receive performance somewhat!

Bob, G3GNR/P (IO80) is back on 10GHz after some year's absence. Welcome back Bob! Here's his report on the **September 10GHz Cumulative**: The best we did from our /P site on Dartmoor,was G4EAT and F1GHB which was nice, not having worked Eric for years! Our log: G4ZXO/p, G4WYJ/p, G4WGE/p,F1GHB/p, G0UHY, G4EAT, G8KQW, G4MAP, G3FYX, G4ALY, G3YGF, G6MLX/p, G4UVZ, G4NNS, G4ZME/p, G4PBP. (17 in all). We were very pleased with 500mW to a 45cm dish.

The Anatomy of a Tropo Lift

Nick, GM4OGI (IO85) sends us the following notes taken from jottings in his **propagation logbook for Wednesday/ Thursday 20/21** September 2006. They make very interesting reading! It's obvious that Nick is fortunate enough to have a

good location for microwave contacts across the North Sea. East Anglia can no longer claim to be a microwave paradise… go North of the border folks!

Nick's report begins: With all the talk about 'the future of microwaves' we must not lose sight of the fact that contacts with distances of 1200km are becoming quite common on all microwave bands across Europe particularly with increased activity from the Baltic States and Russia.

I paid more attention to the 1345km contact on 23cm and the 1132km contact on 3cm than 9cm. The 9cm was so stable and easy it felt 'routine'... All in all quite a surprise to have such an opening when the local weather was sobad with a southerly 'breeze' and rain. Here's my log:

Wednesday 20th September: saw the first 'stiff breeze' of the autumn. The southern wind was particularly warm and increasingly humid. No unusual condition being noted. Antennas fixed to point into the wind all day.
Thursday 21st September:
02.20utc - Wind particularly strong. One of the satellite dishes had beenripped off its mounting so spent a while retrieving the bits that were left.
02.40utc - 03.30utc - Checked beacons on 23cm. Surprised to hear GB3IOW at good strength. First time via tropo. Checked for French beacons and HB9EME but found nothing. Checked UK beacons and only found GB3IOW and GB3USK audible. The latter being considerable weaker than the former. Parked antennas.
17.55utc - Noted that SM6AFV in JO67 was hearing GB3EDN on 23cm. Checked for Scandinavian beacons on 23cm but found none. Wind still strong from the South but subsiding
18.03utc - Exchanged 539/569 signals on 23cm with SM6AFV. Contacts with SM7GEPand SM6EAN followed directly after.
18.20utc - 23cm beacon search....none found. Nil 3cm contacts result from attempts with the West Coast SMs
18.40utc - after a prompt from SM7GEP try 3.4GHz. Surprised to swap 519/539 reports. Optimising the dish bearing brought the signal to 559.
18.47utc - completed with SM7GEP on 3cm with signals 569/519. My first contact with the 1w PA.
18.51utc -Hear SK6MHI/B on 3cm - nothing on 23cm from the JO57 beacons or from OZ1UHF on 9cm. SM6 stations now quite weak
19.15utc - 9cm session with GM0UHC - ironing out system bugs from his new kit.
21.00utc -Return to dx mode. SM6 stations very weak on 23cm. Nil beacons heard.
21.17utc -Work SM1NJC on Gotland for a new square on 23cm. QRB 1345km,
exchange 539/569 signals quite stable
21.38utc - Work SM7LCB on 23cm 519/519 weak but stable. Nil on 3cm.
Feeling quite pleased with the 1345km contact I returned to the chat on ON4KST where G3XDY reported that my 9cm contact with SM7GEP might be a UK record. OZ2M's calculator reports that the distance is 1136km (WGS 84) or 1132km (standard model). **The following day Matej, OK1TEH informs me that the 9cm contact with SM7GEP is a European record!**

Equipment summary:
1296MHz: 67 element yagi at 10m, 140w=20
3400MHz: 1m dish (0.25f/D) dipole/splashplate feed...on a tripod in the garden, 45watts
10368MHz: 80cm mesh dish at 8m, 1watt

Regards to all Nick - GM4OGI Loc: IO85DX04

OCTOBER UKuG MILLIMETRE BANDS CONTEST

This contest was arranged to run in parallel for some of the time with the **IARU Region 1 432 and Up contest**. A small number of UK contest groups were out, some with all bands to at least 24GHz and the South Birminham Group up to 47GHz, courtesy of the UKuG Secretary, G8KQW/P, who provided the millimetre band equipment this time.

For change, the bulk of the activity for the contest was North of latitude 52 degrees North! In addition to the contest groups, we understand the following solo operators were active for the UKuG Sunday 24/47GHz contest:

24GHz: G3ZME/P & G8VZT/P (Roving between Hope Mountain and the Wrekin), G7MRF/P (Merryton Low Triangle), G3UYM/P (Broadway), G3PHO/P (Merryton Low IO93AD and Alport Height IO93FB), G0EWN/P (Alport Height), G4EAT (Home station JO01HR), M1CRO/P (JO01GN), G8ACE (IO91IB), G4LDR (IO91EC), G8KQW/P (Brown Clee IO82QL), G0JMI/P (IO91CL)

47GHz: G0EWN/P, G3PHO/P, G8KQW/P, G0JMI/P

Several reports on this contest have been received but will be held over until next month.

For now, best 73 to all readers and good microwaving, from Peter, G3PHO, Editor

Slovaks See the Light!

On Sunday 17th September, 2006 at 17:30 UTC what is probably the first optical (lightwave) amateur contact in Slovakia was made between OM2ZZ and OM3KII.

The range was 3650 meters. The contact was made via the modulated red light.

OM2ZZ
Location - JN88OA
RX system - 90mm lens, focus 240mm, oboR RX design
TX system - Laser diode 3mW, 670nm (447THz)

OM3KII
Location - JN88PA
RX system - 74mm objective, focus 300mm, oboR RX design
TX system - Laser diode 3mW, 650nm (461THz)

For more information (technical notes, photos, audio, etc) you can go to the following webpage:
www.foton.sk

AUGUST 2006 LOWBAND CONTEST RESULTS

Overall results table:

	1.3	2.3	3.4	Total
G3PHO/P	1000	0	1000	2000
G4EAT	759	1000	0	1759
G8VOI	303	449	658	1410
G8AIM	221	133	204	558
GM4CXM	382	0	0	382
G0UPU	83	0	120	203

Individual Band Scores:

1.3GHz	Best DX	Located	Distance	QSOs	Score
G3PHO/P	F1PYR/P	JN19BC	530	19	4363
G4EAT	G4ALY	IO70VL	366	13	3313
GM4CXM	G8DKK	IO91VX	518	4	1666
G8VOI	G3PHO/P	IO93AD	250	11	1321
G8AIM	G4ALY	IO70VL	275	8	964
G0UPU	G3LRP	IO93HO	185	3	361

2.3GHz	Best DX	Located	Distance	QSOs	Score
G4EAT	G4ALY	IO70VL	366	10	2278
G8VOI	G4ALY	IO70VL	235	8	1022
G8AIM	G8VOI/P	IO90MX	154	3	303

3.4GHz	Best DX	Located	Distance	QSOs	Score
G3PHO/P	G4ALY	IO70VL	333	8	1461
G8VOI	G3PHO/P	IO93AD	250	7	961
G8AIM	G8VOI/P	IO90MX	154	3	298
G0UPU	G3PHO/P	IO93AD	130	2	176

AUGUST 2006 LOWBAND CONTEST RESULTS

Adjudicator's comments:

There were only 6 entries, 1 portable and 5 fixed stations, similar to June, and about half as many as received in the April event.

Conditions were generally reported as not very good, with few contacts outside the UK, the exception being Peter G3PHO/P, who managed to work as far as JN19.

Peter G3PHO/P, operating from Merryton Low Triangle, **IO93AD51,** was the **leader on both 1.3 and 3.4GHz, and the overall winner**. Peter was running 18W to a 35 element Tonna on 23cm, and 12W to a 1.2m prime focus dish on 9cm.

John G4EAT (JO01HR) was band leader on 2.3GHz, and overall runner-up. John was running 10W to a 60cm offset fed dish on 13cm.

Again, thanks to those who sent in entries. There were obviously many more participants who did not send in an entry; any comments from those of you who did not would be most welcome, as we set the 2007 calendar and rules.

Regards, Steve Davies G4KNZ.

FREE DISH...

I am in the process of having a garden clearout and I have an unfinished project, a 1.2 meter dish (see photos) which is no longer required

I don't want any thing for it and would be willing to give it to any microwaver who can make use of it and be willing to take it off my hands.

The base/stand is not included as this forms part of a Sky system which is still under construction, hence the reason for the need for space in my small court yard garden.

There are some arrangements that could be made for delivery from down here in Devon, to even as far as Brian G4NNS, as I have family in the Andover area.

Nick G6GFO

Email: nick.atrill@blueyonder.co.uk

Tel: 01752 782424 Home (Plymouth, Devon)
or 07985 807405 Mobile

24GHz PA WANTED (500mW or more)

I am looking for a suitable PA for my home station system, so if you know of a source or anyone that may have one sitting in the cupboard, I would be pleased to hear!

Roger G4BEL
Email: rogertaylor@towercomms.freeserve.co.uk

MARTLESHAM MICROWAVE ROUND TABLE

11-12 November 2006

The programme of lectures and other activities for this event can now be found on the UK Microwave Group website at:

www.microwavers.org

There will be talks on both the Saturday afternoon and on Sunday, plus an antenna test range, a fleamarket, the usual test gear facilities and the UKuG AGM.

At the time of writing this there were still rooms available at the Holiday Inn, Ipswich (the new hotel chosen for this event) for an overnight stay but by the time you read this they may be all booked so check.

If you can only come on Sunday you will still need to register for the Round Table meeting itself. You can do this online, following the link from the UKuG website (see above).