Vol. 31

DUBUS

C 11159
2. Quartal

2 / 2002

EME Conference Prague 2002

Entirely Devoted to VHF/UHF and Microwaves

PROCOM
DENMARK

MCW 3000

Mikrowellen-Wattmeter

- Einfache, schnelle und genaue Leistungsmessung.
- Extreme Bandbreite.
- Großer Dynamikbereich von 70 dB.
- Hochempfindlich – mißt ab ÷50 dBm (10 Nanowatt).
- Bereich: ÷50 dBm bis +20 dBm. (10 Nanowatt bis 100 Milliwatt).
- Frequenzbereich: 100 kHz bis 18 GHz mit Standardmeßkopf PRO-18G und bis 50 GHz mit Zusatzmeßkopf.
- Mit den meisten Typen von Dioden-Meßköpfen einsetzbar.
- Unzählige Einsatzbereiche bei der Leistungsmessung.
- Hohe Genauigkeit: < ± 1 dB mit PRO-18G Standardmeßkopf (÷40 dBm bis +20 dBm) [HP 33330B-, C-, D- oder E-Typ Meßköpfe können ohne Nachstellung verwendet werden].
- Ausgang für Koordinatenschreiber oder Scope. (1 V/10 dB).
- Der Dynamikbereich läßt sich mittels externer Dämpfungsglieder oder Richtkoppler erweitern.
- 9-12 VDC-Versorgung.
- MEßKOPF TYP PRO-18G WIRD MITGELIEFERT.

NEUHEIT

Eisch-Kafka-Electronic GmbH
Abt-Ulrich-Str. 16 * D-89079 Ulm * Tel: 0049 (0)7305 23208 * FAX 23306
e-mail: eisch-electronic@t-online.de **www.eisch-electronic.com**

Inhalt / Content 2/02

Title: The participants of the Prague EME Conference in August 2002.
A report and more pictures will follow in the next DUBUS issue.

Redaktion / Editoral Staff

Technical Reports / Team of authors	Ian White, G3SEK, 52 Abingdon Rd, Drayton, Abingdon, Oxon, OX14 4HP email: G3SEK@ifwteck.co.uk Michael Kuhne, DB6NT, Scheibenacker 3, D-95180 Berg, Germany email: kuhne.db6nt@t-online.de
Microwave Europe	Simon Lewis, GM4PLM, Creoch Farm, Ochiltree Ayrshire, KA18 2QH, Scotland, U.K. gm4plm@emn.org.u.k. simon@creoch.freeserve.co.uk
Microwave USA	Kent Britain, WA5VJB, 1626 Vineyyard Rd., Grand Prairie, TX 75052, USA email: wa5vjb@flash.net
EME-News:	Bernd Wilde, DL7APV, Nordhoferstr. 8, D-16833 Nordhof, Germany email: DL7APV@t-online.de – DM2BHG, Heinz Borde, Heinz.Borde@t-online.de
Tropo Reports	Tom Doelle, DG3FK, Neuer Trieb 10, D-61206 Woellstadt, Germany email: DG3FK@darc.de
6m-News, FAI Reports, New Products, Beacon List	Joachim Kraft, DL8HCZ, Gruetzmuehlenweg 23, D-22339 Hamburg email: info@DUBUS.de
Aurora Reports	Stefan Heck, LA0BY, Hildsvej 5, N-1349 Rykkinn, Norway email: la0by@qsl.net stef-he@online.no
Meteor-Scatter Reports, Es-Reports, Top List	Norbert Goettsche, DL8LAQ, Tulpenweg 3, D-24568 Kaltenkirchen email: DL8LAQ@GMX.de
News & Comments	Klaus Tiedemann, DL4EBY, Halskestr. 35, D-12167 Berlin, Germany email: tklaus@snafu.de

Impressum

Das DUBUS-Magazin ist eine zweispachige Zeitschrift (Englisch/Deutsch) für Amateurfunk auf VHF/UHF und Mikrowellenbändern. Sie wird von ehrenamtlich arbeitenden Funkamateuren zusammengestellt.

DUBUS is the bilingual (English/German) written magazine for Ham-Radio on VHF/UHF and Microwaves. The content is compiled by non profit working ham editors.

Das DUBUS Magazin erscheint vierteljährlich im März, Juni, September und Dezember.
Der Abonnementspreis – inklusive Versandkosten - beträgt 20,- Euro für Deutschland und Europa. Die Bestellung erfolgt durch Überweisung des Betrags auf das Postbankkonto (s.u.). Das Abo verlängert sich nicht automatisch. Der Betrag enthält 7% gesetzliche MwSt.

DUBUS-Magazine is published quarterly in March, June, September and December.
For a 1-year-subscription (Europe) please transfer Euro 20,- to our account or contact your national representative (see page 5). Rate for overseas air mail is 25,- Euro or 25,- USD.

Herausgeber / Publisher
DUBUS Verlag, Grützmühlenweg 23, D-22339 Hamburg, Germany

Geschäftsführer / Manager
Joachim Kraft, DL8HCZ, Grützmühlenweg 23, D-22339 Hamburg, Germany
email: info@DUBUS.de
Tel./FAX: ++49 40 538 31 86

Abo-Verwaltung / Circulation:
Norbert Goettsche, DL8LAQ, Tulpenweg 3, D-24568 Kaltenkirchen, Germany.
Phone: ++49 4191 959913
email: DL8LAQ@GMX.de

Abo-Konto / Subcr.-Account
POSTBANK HAMBURG
Konto / Acc-Nr. 266292202
BLZ 20010020
SWIFT PBNKDEFF200

DUBUS ISSN 1438-3705

For latest information please check the

DUBUS Web page

www.DUBUS.org

Redaktionsschluss für die nächste Ausgabe: 20.10.2002

Deadline for the next issue: October 20th 2002

DUBUS Distributoren
International DUBUS Representatives

Austria	Reinhilde Riml, OE9YTV, Marktstr. 35, A-6971 Hard, Austia. email: riml@aon.at
Australia	Doug McArthur, VK3UM, Tikaluna, 26 Old Murrindindi Rd., Glenburn, Victoria 3717. email: tikaluna@ycs.com.au
Belgium	InfoRad c/o Jan Galicia ON6JG, Oude Gendarmeriestratt 62, B-2220 Heist-op-den-Berg. email: inforad@pandora.be
Bulgaria	Christo Mintchev, LZ1DP, Ul Boruigrad 8 AP 10, 6004 Stara Zagora email: lz1dp@stz.orbitel.bg
Czech Republik	GES Electronics, OK1FM, Sady S. Kvetna, 30112 Plzen, Tel: 019-7373111 email: ges@ges.cz
Denmark	Gert Rahbek-Udengaard, OZ1FKZ, Virringvej 60, Virring, DK-8660 Skanderborg Tel.: 0045 8657 2660, email: oz1fkz@fritid.tele.dk
Eire	Albert E. Latham, EI6AS, 226 the Rise, Belgard Heights Tallaght Dublin 24 email: alby@esatclear.ie
France	Patrick Magnin, F6HYE, Marcorens, F-74140 Ballaison Tel: 0450941914, email: f6hye@ref-union.org
Finland	Jukka Hietaranta, OH1FF, Insinrinkatu 48 A 28, SF-33720 Tampere Fax: 0424 9999 234, email: Jukka.Hietaranta@elektrobit.fi
Italy	Tony Fumagalli, I2FUM, Via Masia 34, I-22100 Como Tel: 031571537, email: elcosrl@tin.it
Japan	Ryuichiro Nagaoka, JA3MKS, 15-18-704, 2 chome, Higashi-izumioka, Toyonaka-shi, Osaka, 561-0864 Japan, Tel/Fax: +81-6-6850-1890, E-mail: mks@x.age.ne.jp
Netherlands	Veron Verkoop Bureau, P.O. Box 1166, NL-6801 BD Arnhem email: veroncb@worldonline.nl
Norway	Anders Thorrud, LA8LF, Jerpeveien 20, N-3030 Drammen email: LA8LF@qsl.net
Portugal	Antonio Filipe S. Ferreira, CT1DDW, Pousada do Forno, 1 E.F., Pascoal, P-3510 Abravezes, email: filipeferreira@net.sapo.pt
Poland	Andrezj Wlodarczyk, SP1JX, P.O. Box 67, 76-270 Ustka
Romania	Folea Ion, YO5TE, P.O.Box 168, RO-3400, Cluj 1 email: yo5te@yo5kai.codec.ro
Russia	Sergej Joutiaev, RW3BP, P.O. Box 462, 111555 Moscow, email: rw3bp@co.ru
R.S.A.	John Sygo, ZS6JON, P.O. Box 66, 1752 Paardekral, Tel: 0119540437, email: johnsygo@pop.fast.co.za
Spain	J.R. Daglio Accunzi, EA2LU, Manual Irribarren 2-5 D, E-31006 Pamplona email: ea2lu@eresmas.net ea2lu@telefonica.net
Serbia	Nemethy Istvan, YU7EW, Branka Radicevica 63, YU-23217 Aleksandrovo email: yu7ew@yo2kjo.ampr.org
Slovenia	Miha Habic, S51FB, Vodnikova 8, SI-1000 Lubljana email: Miha.Habic@pub.mo-rs.si
Sweden	Anders Pettersson, SM7ECM, Hökvägen 111, S-24562 Hjärup email: Anders.Pettersson@sonyericsson.com
Switzerland	Ferdinand Stämpfli, HB9MIO, Bachtelen 3, CH-3308 Grafenried stagra@bluewin.ch
Ukraine	Sergej Lysenko, UR5LX, Zolochev Reg., Iwaschki, Kharkov Obl, Ukr. 312211 email: ur5lx@kharkov.ukrtel.net
United Kingdom	Roger Blackwell, G4PMK, 5 Tollgate Road, Culham, Nr. Abingdon, Oxon OX14 4NL email: dubus@marsport.demon.co.uk
USA	Kyle Britain, KB5UBE, 1626 Vineyard Road, Grand Prairie, TX 75052 email: dubususa@hotmail.com
Other Countries	Contact DUBUS Verlag. Subscription Rates: Europe: 20.00 EURO; Overseas Air Mail: 25.00 EURO (USD 25.00)

Editorial

Liebe DUBUS-Leser!

Ich möchte mich an dieser Stelle ausdrücklich für das verspätete Erscheinen der DUBUS Ausgabe 2/2002 entschuldigen.
Leider ist es im Sommer dieses Jahres zu bedauerlichen Ereignissen gekommen: Der Gesundheitszustand des langjährigen Chefredakteurs Rainer Bertelsmeier, DJ9BV, verschlechterte sich so stark, dass er das DUBUS Heft 2, mit dem er gerade begonnen hatte, nicht weiter fertig stellen konnte.
Ende August erhielt ich dann einen Teil des Rohmaterials und begann das vorliegende Heft 2 zusammenzustellen und zu layouten.
Leider kann Rainer, DJ9BV, auch in Zukunft der DUBUS nicht mehr zur Verfügung stehen. Damit öffnet sich natürlich für die DUBUS eine Lücke, die nicht zu schliessen ist. Rainer hat den technischen Teil der DUBUS seit der Ausgabe 4/1988 durchgehend betreut und mit seinen eigenen Artikeln besonders über Yagi-Antennen und Vorverstärker den Stand der Technik mit bestimmt. Ausserdem hat er alleine das komplette Layout des Heftes erstellt.
In der heutigen Zeit ist es praktisch unmöglich, einen Nachfolger zu finden, der ein solch umfangreiches Pensum an Arbeit in seiner Freizeit schultern möchte.
Ich selbst werde in Zukunft nur zusätzlich den Teil des Layoutens übernehmen können.
Anstatt eines einzigen Redakteurs für technische Artikel habe ich Ende August vorgeschlagen, ein Team von Autoren zu bilden, das regelmäßig technische Artikel für die DUBUS schreibt. Ich bedanke mich bei Ian White, G3SEK, und Michael Kuhne, DB6NT, die als erste spontan zusagten.
Ich würde mich freuen, wenn sich weitere ehemalige und neue Autoren angesprochen fühlen würden, sich der Gruppe der DUBUS Technik-Autoren ebenfalls anzuschliessen. Nähere Details hierzu können bei mir erfragt werden.
Ich werde mich bemühen, die DUBUS in Zukunft weiter interessant zu gestalten. Auf jeden Fall werden wir ab sofort wieder pünktlich erscheinen.
In der kommenden Ausgabe 3/2002 werden wir eine große Leserumfrage zum Inhalt und zur Zukunft des DUBUS-Magazins durchführen.
Ich möchte Rainer, an dieser Stelle -auch im Namen aller VHF/UHF/SHF-Funkamateure- ganz herzlich danken für alles, was er in den 13 Jahren geleistet hat!

Dear DUBUS Reader!

I apologize for being so late with this issue No. 2/2002. In July the health status from our chief editor Rainer Bertelsmeier, DJ9BV, suddenly got really worse. He had just started with the work for this issue, and at the end of August I took over the complete work of editing.
Unfortunately Rainer will not be able to do any work for DUBUS in the future. This causes a big hole for DUBUS, because it will be almost impossible to substitute for Rainer. He has been the technical editor for DUBUS since issue 4/1988, and he also wrote many articles. His articles about yagis and preamps have set the state of the art. Also Rainer made the complete layout of each DUBUS issue.
Nowadays it is impossible to find any one person who could do all this work in their own rare free time. Myself I will do all the layout work in the future, but instead of having a single technical editor I have suggested to build a team of technical editors and authors for DUBUS. I have to thank Ian White, G3SEK, and Michael Kuhne, DB6NT; who spontaneously were the first to say yes to this proposal. I would be happy if other of the previous DUBUS authors - and new ones, of course - would join this group. For details please contact me.
I will do my very best to make DUBUS continue to be an interesting magazine, and I promise that DUBUS will come regularly again from now!
In the coming issue No. 3/2002 we will make a big poll about the content and future of DUBUS.

Finally, I want to say a strong thank you - and also in the name of all VHF/UHF/SHF amateurs - to Rainer, DJ9BV, for all his outstanding work for us during the past 13 years!

vy 73, Joachim (Joe), DL8HCZ / CT1HZE
email: info@DUBUS.de

Because I have serious disease I am forced to resign from the job of the editor-in-chief of the DUBUS magazine. I regret this step but I have no other chance. I want to express my thanks to all people who contributed to the DUBUS either as readers or as writers over the past 13 years.

Wegen einer ernsten Erkrankung bin ich gezwungen meine Funktion als Chefredakteur der DUBUS aufzugeben. Ich möchte mich bei allen Lesern und Verfassern von Artikeln bedanken, dass Sie die DUBUS entweder mit Interesse gelesen oder mit Artikeln lesenswert gemacht haben.
Ich hoffe, dass dieses Interesse auch meinen Nachfolgern entgegen gebracht wird.

Rainer, DJ9BV

10GHz-DX via Regenscatter

von Dieter Vollhardt, DL3NQ

Zur Weinheimer UKW-Tagung 2000 stellte OM Dieter (DL3NQ) die dritte Auflage seiner 10-GHz-Informationen vor. Dieses Werk ist das zur Zeit umfassendste und interessanteste, was es über den DX-Betrieb auf 3cm gibt. Wir möchten uns bei DL3NQ für die Möglichkeit bedanken, diese Informationen hier zu veröffentlichen.

Vorgeschichte

Seit 50 Jahren ist aus den Anfängen der Radartechnik bekannt, daß Regenschauer im X-Band deutliche Echos produzieren und seit ca. 30 Jahren gehört Wetterradar zum Handwerkszeug der Meteorologen und Flugpiloten. In den Jahren der aufkeimenden Aktivität im 3cm-Band (1977-82) erlaubten die Gunnplexer mit ihrer geringen Leistung und Empfindlichkeit sowie der verwendeten Breitband-FM entsprechende Beobachtungen nicht. Die nachfolgende Gerätegeneration, die etwa ab 1980 den Übergang zu SSB brachte und sich allmählich über 100 Milliwatt hinauf arbeitete, war im Wesentlichen auf Portabelbetrieb und quasi-optische Sichtverbindungen fixiert. Als "Reflektoren" wurden ebenfalls topographische "Hindernisse", wie Gebäude, Industrieschlote und natürliche Bergwände benutzt, so vor allem in den Alpen. Im Zuge des "Aufrüstens" auf 10dB höhere HF-Leistungen und darüber, wurden dort auch die ersten Reflexionen an Gewittern beobachtet oder vermutet. HB9AMH/MIN haben das z.B. in einer Verbindung mit HB9RG 1987 festgestellt und darüber berichtet (1). Auch DF7FJ machte um diese Zeit bei seinen ersten Transalpin-Verbindungen vom Südschwarzwald aus mit diversen italienischen Stationen entsprechende Erfahrungen, wenngleich die großen Entfernungen zu den Refexionszentren deren direkte Beobachtung nicht erlaubten.

Im August 1988 hatte er zweifellos über "Wolkenscatter" gearbeitet und in der "CQ-DL" (2) über den charakteristischen "Aurora-Sound" berichtet. Gleiches gilt auch für OE8MI, der im Juli 91 von seinem Home-QTH im Tal bei Villach (JN66tn) über eine aufziehende Gewitterfront mittels Scatter italienische Stationen jenseits der Berge arbeiten konnte (3). In DL hat DK3UC schon im Winter 1989/90, vor allem aber dann bis Ende 1990 in über 100 Tests mit DJ5BV und HB9RG (272 bzw. 582km) den Zusammenhang zwischen guten 3cm-Signalen und regnerischem Wetter immer wieder beobachtet und im Februar 1991 in Dorsten darüber berichtet (4). DJ5BV hat auf der Weinheimer UKW-Tagung 1991 in seinem Vortrag ebenfalls auf die beachtlichen Signalanstiege durch Regengebiete (möglichst in der Mitte der Funkstrecke) ausdrücklich hingewiesen. Diese Zusammenhänge sind auch aus der Auswertung einer Sked-Linie zwischen LX1DU (JN29XM) und DL9SH (JN49DN), die von Oktober 1991 bis Februar 1992 jeweils um 0900 und 2000 UT gefahren wurde und an der der Verfasser (JN49IN) öfters teilnahm (bzw. sie tagsüber mit zusätzlichen Tests anläßlich besonderer Wetterbedingungen ergänzte), klar zu ersehen. (Abb. 1)

Anscheinend blieben alle diese Hinweise bei alten und neuen 3cm-Stationen weithin unbeachtet. Während der Conteste tauchten zwar immer neue Calls auf, aber die Zahl der OMs, die auch dazwischen qrv sind, hat nur wenig zugenommen. Feststationen, die in der Lage sind, ihren Spiegel auch vertikal anzuheben, kann man an einer Hand abzählen. Hier gibt es allerdings einen Zusammenhang: Wer seine 3cm-Station in einer Top-Lage betreiben kann, sieht keinen Anlaß, seine Spiegel in der Vertikalen anzuheben und wer nicht in dieser glücklichen Lage ist, richtet sich schon bei der Planung der Hardware darauf ein, 3 bis 6 mal im Jahr einen Portabelstabdort in Toplage aufzusuchen, wobei ein 10m hoher Hügel an der Küste durchaus schon eine Toplage sein kann...
Der Verfasser sieht hier ein großes DX-Potential

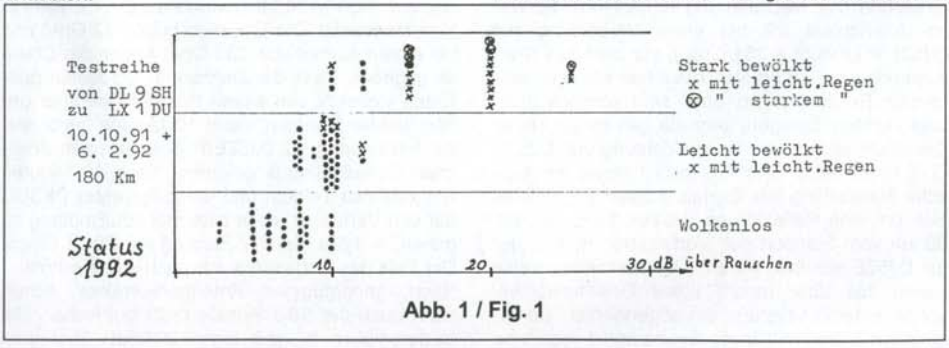


Abb. 1 / Fig. 1

ungenutzt brach liegen und möchte versuchen, möglichst viele 10-GHz-OPs zu animieren, die individuellen Möglichkeiten auszuloten. Er selbst hat seit 1982 einen 1,6m-Parabolspiegel mit Multibanderreger im Einsatz, den er um 90 Grad anheben kann. Über ihn wurden von 1984 bis 1992 alle 3cm-SSB/CW-Verbindungen abgewickelt und 1989 erstmals Scattersignale von HB9RG (5 Grad Elevation) beobachtet. Diese Trasse über 260km ist topographisch schwierig und typisch für sie ist, daß bei wolkenlosem Himmel und kühler Luft nicht die Spur eines Signals durchkommt (auch nicht mit 20 Watt, 36 dBD und 1.2 dB NF). Sobald auch nur leichte Bewölkung (gleich welcher Art) aufkommt, werden die ersten Zeichen der Gegenstation hörbar und bei einem Gewitter (auf halber Strecke) wurden die CW-Zeichen aus der Schweiz mit bis zu 30dB über dem Rauschen gemessen.

Als Ergebnis der fremden und der eigenen Beobachtungen formulierte der Verfasser Ende 1991den Slogan: „Das 3cm-Band ist ein Schlechtwetter-Band!" Die Erfahrungen der folgenden Jahre bestätigten das eindrucksvoll. An dieser Stelle sei kurz über den Begriff "DX" auf SHF-Bändern philosophiert. Für den Verfasser hat eine Station auf SHF dann "DX-Charakter", wenn sie sich in einer Entfernung, oder einem - topographisch bedingt- schwer erreichbaren Gebiet befindet, wo sie nur unter aussergewöhnlichen Ausbreitungsverhältnissen gearbeitet werden kann. Dazu zählen dann also nicht nur QTHs in Entfernungen von mehr als 300 km, sondern eben auch Standorte, die vielleicht nur 50 km entfernt sind, aber in einem anderen Gebirgstal liegen, oder hinter des Nachbars Ahornbaum, oder in Richtung des Berges, an dessen Hang das QTH des Verfassers angesiedelt ist. Diese Lage, die nur 38% 0-Grad-Horizont bietet und für die restlichen 62% eine Elevation von 5 bis 20 Grad erfordert, war Anlass, im Laufe von 30 Jahren unzählige Landmarken (die zum Teil bis zu einer Entfernung von 120 km identifizierbar sind) von 144 MHz bis 24 GHz auf nutzbare Reflexionen zu untersuchen (zur Nachahmung empfohlen). So war im Juli-Kontest 92 bei einer Verbindung mit DJ5ZE/P (J040fh = 351 Grad), die über 324 Grad zustande kam, sofort klar, dass hier keine terrestrischen Reflektoren im Spiel sein konnten (trotz waagrechtem Spiegel), denn da gab es gar keine! Die Rückmeldung der Spiegelrichtung von DJ5ZE (275 Grad bei 3 Grad Elevation) sowie der typische Auroraklang des Signals zeigten an, dass es sich um eine Reflexion an Wolken handelte, die, 90 km vom Standort des Verfassers entfernt, nur für DJ5ZE sichtbar waren. Überraschenderweise waren das aber (noch) keine Gewitterwolken, sondern deren Vorstufe, ein sogenannter "Cumulonimbus". Bei mittlerem Scatteranteil war eine SSB-Verbindung möglich mit nur 120 mW und 60 cm-Spiegel. Ein weiterer ungewöhnlicher Kontakt in CW kam nach einem Hinweis von DB2VY am 20.11.92 mit DJ2DY bei Neunkirchen (JN39oi) zustande, der hinter einem Hang gelegen, durch das geschlossene Küchenfenster mit 300 mW, 60 cm-Spiegel und 6 Grad Elevation arbeitete. Das Wetter: tiefhängende Regenwolken. Ende April 93 konnte der Verfasser nach langen Vorarbeiten endlich die verbesserte 3cm-Station (rechtzeitig zum Mai-Kontest) in Betrieb nehmen:
Antenne: 121cm Vollspiegel mit Rundhohlleiter zentral gespeist und mit Visier versehen. Gewinn = 36 dBD, Max. Elevation = 18 Grad, TX = TWT mit 18 W im Erreger, RX = LNA, Fsyst.= 1,8 dB. Empfangsseitig betrug die Verbesserung des Signal/Rausch-Abstands 15 dB gegenüber der alten Anlage. Leider musste der neue Spiegel aber 6m niedriger montiert werden, sodass der 0-Grad-Horizont jetzt auf 28% zurück gegangen ist und alle Grossfelder nördlich des 50. Breitengrades nicht mehr direkt, sondern nur noch über Wolkenreflexionen erreicht werden können. Grund für Frust? Nein! Vielmehr eine anspornende Herausforderung... 30 Minuten vor Beginn des Mai-Kontests 93 ging ein kurzes Gewitter nieder, aber bald klarte es wieder auf, während die dunklen Wolken sich im Rhein-Main-Gebiet ballten und entluden. Eine entsprechende, zeitlich versetzte, Front zog über Belgien ostwärts. Über diese Gewitterzone machten am späten Nachmittag des 01.05.93 zahlreiche Kontestteilnehmer zum 1. Mal Bekanntschaft mit Scattersignalen. Zwischen 1700 und 2100 UT wurden nördlich der Mainlinie über 50 Verbindungen via Regenscatter getätigt, von der englischen Ostküste bis zur Weser (genau im toten Winkel des Verfassers). Der konnte am 02.05. dennoch ein Erfolgserlebnis verbuchen. Ab 1500 UT war keine unbekannte 3cm-Aktivität mehr zu entdecken, dafür aber ein wachsender Cumulus, der zusehends zu einem Cumulonimbus auswuchs. Gegen 1510 UT musste er dann etwa 6000 - 8000 m hoch sein und der Parabolspiegel wurde mittels Visier auf das obere Viertel gerichtet und auf 10368,100 MHz wurde die CW-Schleife in Marsch gesetzt. Die Elevation betrug 12 Grad und bei einem Azimut von 330 Grad schien die Chance gegeben, dass die Zeichen im Nordosten oder Osten vielleicht von einem Kontestteilnehmer gehört werden könnten, denn 10 Monate zuvor war die Verbindung zu DJ5ZE/P ja über einen ähnlichen Cumulonimbus gelaufen. Nach 10 Minuten klingelte das Telefon und ein aufgeregter DK3UC bat den Verfasser, doch bitte mal auf Empfang zu gehen, er höre die CW-Zeichen mit S9 (!) Bingo! Der Puls des Verfassers war auch etwas erhöht.... Nach geringfügiger Antennenkorrektur waren dann auch die SSB-Signale recht gut lesbar. Die beiderseitigen Signale lagen 20-25dB über dem

Rauschen und die Verbindung hätte sicherlich auch mit 200mW getätigt werden können. Der Azimuthvergleich zeigte später, dass es sich um eine Art Schrägreflexion handelte, mit jeweils 22.5 Grad Einfalls- und Ausfallswinkel. Das Reflexionszentrum lag etwa über JN49FS. Dies war eine Art Schlüsselerlebnis für zukünftige Versuche.
In den darauffolgenden Wochen hat der Verfasser erreichbare Bücher über Meteorologie und radarmeteorologie studiert und danach regelmäßig den Himmel abgesucht nach Wetterfronten, Gewitterzellen und Cumulonimben. Leider waren diese im Juli dünn gesät, aber 4 Gewitter konnten dennoch genutzt werden. Am 20.7.1993 entschloß sich der Verfasser dann kurzfristig, die Möglichkeiten dieser Betriebsart auf der Weinheimer UKW-Tagung einem größeren Kreis zugänglich zu machen. Von da an wurden Bandaufnahmen der Signale mitgeschnitten und Wolkenbilder gesammelt.
In der nachfolgenden Tabelle sind die Scatterkontakte des Jahres 1992/1993 aufgelistet.

Technische Stationsparameter

Für erste Versuche genügt eine Stationsausrüstung, die bei Portabelbetrieb häufig anzutreffen ist:
a) Ein RX mit einer Eingangsstufe, deren Rauschzahl nicht grösser als 3dB sein sollte.
b) Ein TX der wenigstens 0,3 Watt an die Antenne bringt.
c) Eine Parabolantenne mit wenigstens 48cm Durchmesser.
Jetzt müssen Sie heraus finden, ob Sie von Ihrem Home-QTH aus eine (oder mehrere) 3cm-Baken hören können. Falls nicht, können Sie versuchen, einen anderen OM zu finden, der schon auf 3cm qrv ist und notfalls "Bake" spielen kann. Er sollte ca 20-100 km entfernt sein (und nicht gerade hinter einem Bergrücken sitzen). Die weiteren Versuche werden sehr erleichtert, wenn Sie mit ihm eine Querverbindung verabreden können (die nicht abreisst, wenn Sie Ihren Spiegel drehen), notfalls per 600 Ohm. Wählen Sie für erste RS-Versuche einen regnerischen Tag. Stellen Sie den RX auf

Date	UT	Call	RST	dB	Az/El	RST	Loc	Az/El	Ant/TX	RPL	Clouds
5.7.92	0926	DJ5ZE/p	43	9	324/1	56	JO49fh	275/5	60/0.12	JO30vi	Cumulonimb.
2.11.92	2015	DJ2DY	529	6	258/0.5	549	JN39oi	80/6	60/0.3	JN39vx	Stratus /rain
2.5.93	1324	DF0OG	55	25	330/12	59	JO41pu	195/07	1/25	JN49fs	Cumulonimb.
6.1993	2130	HB9RG	57	30	183/3	59	JN47HF	2/0	120/17	JN48gu	Thunderstorm
4.7.93	1358	HB9RG	32	9	253/1	59	JN47HF	344/0	120/17	JN39uj	Thunderstorm (not visible)
4.7.93	1430	DK9MN	-	-	192/0.5	56	JN58tc	260/1-		JN47br	Thunderstorm (not visible)
16.7.93	1908	DK9MN	44	18	168/5	59	JN58tc	290/1	80/0.7	JN48gs	Cumulonimb.
18.7.93	2027	DK3UC	54	20	347/18	54	JO42wk	196/07	1/25	JN49io	Thunderstorm
22.7.93	1855	DH1SBJ	56	31	155/4.5	57	JN48nv	342/1	60/20	JN49ki	Thunderstorm
25.7.93	1115	LX1DU	57	33	269/0	59	JN29xm	89/	130/8-		Altocumulus
26.7.93	1942	DK0NA	32	6	281/6.6	53	JO50TI	251/0	60/5	JN49cp	Rain showers
30.7.93	1605	DK4GD	55	10	182/3-		JN47gw	270/20	100/7	JN47fx	Thunderstorm (short)
30.7.93	1645	DL3YEE	539	5	347/18	559	JO42	180/0	48/0.25	JN49io	Thunderstorm (short)
8.8.93	2015	DJ1RV	59	10	160/8-		JO40fe	175/0	90/25	JN49	Cumulus strg.

RPL = Reflection Point Locator

Tab.: DL3NQ`s (JN49) QSOs via Rainscatter on 10GHz in 1992/1993
Conclusion: 10 GHz is a "bad weather band"

Welche praktischen Tips kann der Verfasser für RS-Betrieb geben? Die Antwort lautet: Für den Anfang brauchen Sie nur 3 Dinge.
1.) Hamspirit 2.) Eine 3cm-Station 3.) Eine "Scatterwolke" und etwas spezielle Betriebstechnik.
Für Punkt 1 müssen Sie selbst sorgen. Zum 2. und 3. Punkt können einige Hinweise hilfreich sein.

ein Bakensignal ein und drehen Sie langsam Ihren Spiegel. Irgendwann werden Sie bemerken, dass ein vorher klares Signal rauh, bzw. auf einem Seitenband verrauscht klingt. Durch (evtl. gegenseitiges) Optimieren der Antenne(n) auf diesen Effekt können Sie leicht die Richtung des Reflexionszentrums ermitteln und u.U. auch mehrere andere Reflexionszentren finden. Sie haben jetzt schon

ein passives Wetterradar! Wenn Sie Geschmack an der Sache gefunden haben und diese Technik für "Weitverbindungen" im 3cm-Band via RS nutzen wollen, ohne immer erst einen höher gelegenen Portabelstandort aufsuchen zu müssen, sollten Sie prüfen, was an Ihrer 3cm-Station verbessert werden könnte (oder müsste). Dazu einige Hinweise: Sie brauchen eine gewisse Frequenz-Treffsicherheit. Es ist nicht allzu schwierig, z.B. von DCF77 eine genaue Frequenz abzuleiten, mit der man den Grundoszillator eines Frequenzzählers synchronisieren kann. Bei DK2DB ist hierzu ein kleiner Bausatz bzw. Platine erhältlich. Notfalls genügt es auch, einen mittels Poti ziehbaren 18 Mhz-Quarzoszillator (bzw. 24/48/72 MHz) mit DCF77 zu vergleichen, seine Frequenz zu vervielfachen und die Oberwelle auf 10368,000 MHz zu kontrollieren. 5 kHz Treffsicherheit geht für den Anfang, 1kHz ist natürlich besser. Für DSP-Versuche (mit Signalen die 15 dB unter dem Rauschen liegen) braucht man allerdings eine reproduzierbare Genauigkeit von 100 Hz. Das ist aber dann schon etwas für ausgekochte Spezialisten. Sie sollten es nicht bei einem 48er Parabol belassen. Ein 60er bringt 1.25, ein 80er sogar 2.2 dB mehr... Ferner sollten Sie nicht auf eine ausreichend reproduzierbare Spiegeleinstellmöglichkeit verzichten. Das bedeutet, dass Sie einen Azimut-Rotor haben sollten, der eine Reproduzierbarkeit von mindestens 80:Spiegelradius (in Grad) erreicht, also für einen 80cm-Spiegel: +/-2 Grad. Dazu braucht man nicht unbedingt einen Rotor der 3000-DM-Klasse, aber ein normaler KW-Antennenrotor kann das in der Regel ohne ein "Tune-up" nicht. Durch Eliminierung unnötig grosser mechanischer Toleranzen sowie Einführung einer mechanischen Drehmoment-Vorspannung am drehbaren Antennenstandrohr und einer elektronischen Nachlaufsteuerung konnte der Verfasser einen "einfachen" Rotor auf eine Reproduzierbarkeit von +/-0,5 Grad trimmen! Für die Elevation stellt sich das gleiche Problem nochmal, allerdings kommt man -je nach Lage- in der Regel mit 10 bis 20 Grad Anstellwinkel aus. Der Verfasser hat 18 Grad mit einer M8x1 Gewindestange aus Edelstahl plus einem 24V-DC-Motor mit Untersetzungsgetriebe (Flohmarkt Weinheim: DM 10.-) realisiert, der mittlerweile seit über 6 Jahren seinen Dienst tut. Dazu ist dann noch eine Elevationswinkelanzeige zweckmässig, die man mit einem Neigungsmesser oder einem Poti oder auch mit Gabellichtschranken herstellen kann. Dieser Aufwand ist eine Überlegung wert: Um Scatterzentren in ca. 7000m Höhe und 90 km Entfernung richtig zu erfassen, ist schon ein Elevationswinkel von 4 Grad nötig. Ein gut ausgeleuchteter 60cm-Spiegel hat da aber bereits einen Diagrammabfall von 20 dB! In den kalten Monaten liegen Nimbostratuswolken u.U. 4000m niedriger, sodass der gleiche Spiegel diese in der selben Entfernung mit 2,3 Grad Elevation sieht. Aber da hat er dann auch schon 7 dB Gewinnabfall. Ein Spiegel mit 0 Grad Elevation fest montiert, verliert also deutlich an Effektivität! Anmerkung: Es ist wenig bekannt, dass es auch bei reinem Tropobetrieb zweckmässig ist, die Strahlungskeule der Antenne immer etwas über den jeweiligen Sichthorizont anzuheben. Empfohlener Richtwert: 40% der Halbwertsbreite des Vertikaldiagramms! Diese Überlegungen sollen eventuelle Verbesserungsmöglichkeiten aufzeigen und Fehlplanungen bei Neubauten vermeiden helfen. Keinesfalls ist es aber so, dass mit 0 Grad Elevation RS-Verbindungen unmöglich wären.

Um den Richtstrahl auf einen gewünschten Punkt ausrichten zu können (z.B. auf die Sonne oder den Horizont, muss man zusätzlich zur Positionssteuerung noch ein Zielvisier am Spiegel haben und da auch durchschauen Können, damit Azimut- und Elevationsanzeigen kalibriert werden können. Der Verfasser hat dazu an seinem 1.2m - Spiegel ein 20cm langes Rohr, welches 20mm Durchmesser hat und an beiden Enden mit Drahtkreuzen (0.5 mm - Draht) versehen wurde, seitlich am Spiegelrand befestigt. Anmerkung: Spiegel steht auf dem Balkon! Die technischen Daten der für die Anfangsversuche in vorangegangenen Teil unterstellten "Portabelstation" sind natürlich nicht zeitgemäss! Für RS-Betrieb sollten Sie eine Vorstufe haben mit einer Rauschzahl unter 1dB, die zusammen mit dem Koax- (oder Hohlleiter-) Umschaltrelais möglichst nahe an der Antenne sitzt. Die Verstärkung der Vorstufe sollte etwa 10dB über der Dämpfung des Kabels von Antenne zum Shack liegen. Entsprechendes gilt für den Output: Mit 5 Watt am Antennenrelais sind Sie heutzutage fast überall dabei!

Theoretische Grundlagen

Die Theorie besagt, dass Reflexion und Streuung von Energie im elektrischen Wellenfeld auftritt, wenn sich im "durchstrahlten Medium" die Dielektrizitätskonstante auf kurze Entfernung ändert. Wassertröpfchen erfüllen diese Voraussetzungen recht gut, denn sie stellen dielektrische Kügelchen dar, deren Durchmesser < 1/20 Wellenlänge ist. Umfangreiche Forschungen nach dem 2. Weltkrieg haben ergeben, dass neben ihrer Dichte vor allem ihre Grösse ausschlaggebend ist für das Rückstreumass und dass grundsätzliche Überlegungen von Mie (1908) sowie Rayleigh (1871) in einem bestimmten Bereich anwendbar sind. Fazit: Das Rückstreumass eines Gebietes, in dem sich Wassertröpfchen mit einem Durchmesser von 0,001 mm bis 0,5 mm befinden, ist proportional: mit:

$$F \times N \times D^6 \times f^4$$

F = projizierte Fläche des Gebiets
N = Anzahl der Tröpfchen pro Volumeneinheit
D = Durchmesser der Tröpfchen im Gebiet
f = In das Gebiet eingestrahlte Frequenz

Wenn also 1000 Tröpfchen mit dem Radius 0,005 mm koagulieren und so ein neues Tröpfchen mit dem Radius 0,05 mm bilden, dann gibt es zwar 1000 kleine Reflektoren weniger, aber dafür einen Neuen, der 1 millionfach stärker rückstreut! Würden das alle im Gebiet befindlichen Tröpfchen gleichzeitig tun, würde dessen "Scatterleistung" also schlagartig um 30 dB zunehmen! So läuft das zwar nicht ab, aber es lässt sich leicht einsehen, warum man einen Landregen schwächer "hört", als einen Regenschauer und wieso die Scatterechos von aktiven Quellwolken manchmal binnen 20 Minuten um mehrere Zehnerpotenzen ansteigen können. Gemäß Abb. 2 kondensiert nämlich die aufsteigende, feuchtegesättigte Warmluft infolge der adiabatischen Abkühlung zu kleinsten Tröpfchen, die nach und nach wachsen, schliesslich zu fallen beginnen, jedoch von dem stärker werdenden Sog erneut mit nach oben gerissen werden, immerfort mit anderen koagulieren und so weiter:..... Ein "ECHOTURM" bildet sich! Nähert sich der Durchmesser der Wassertröpfchen 0,5mm, dann wird in obiger Näherungsformel die 6. Potenz des Durchmessers immer schneller kleiner, so dass ab ca 8mm Durchmesser das Rückstreumass nicht mehr weiter wächst.
Radarbilder zeigen, dass sich die aktiven Scatterzentren etwa in der Mitte der jungen Schlote in einer Höhe von ca 3500m zuerst bilden, um dann schnell nach oben -aber auch nach unten- zu wachsen. Mächtige Schlote können bis zur Tropopause aufsteigen und sie sogar durchstossen wie schon erwähnt. Deren Höhe kann ab Juni 10....12 km erreichen, ab Herbst dagegen bis auf 5 km absinken. Nach dem Überschreiten der weit tiefer liegenden Nullgradgrenze gehen die nach oben wirbelnden Tropfen zunächst in einen "unterkühlten" Zustand über und gefrieren dann schliesslich zu Eiskörnern. Werden sie aus dem Schlot herausgeschleudert, oder lassen die Auftriebskräfte nach, fallen sie zurück und schmelzen meistens, bevor sie den Erdboden erreichen. Geraten sie aber mehrfach in nachfolgende Schlote, in denen sie wieder nach oben gerissen werden und dabei weiter wachsen, dann droht Hagelschlag. Umgekehrt kann es in der Anfangsphase der Bildung von Wärmegewittern vorkommen, dass die angesaugte feuchte Warmluft zunehmend in trockenere übergeht und die fallenden Tröpfchen wieder verdunsten ehe sie den Bodenerreichen, d.h. es kommt nicht zum "Abregnen", sondern die Quellwolke löst sich langsam wieder auf. Eis hat etwas andere Scattereigenschaften als Wasser. Bis zu einer Grösse von 10mm verhalten sich Eiskugeln ähnlich wie Wassertropfen, allerdings mit etwa 10 dB schlechterer Rückstreuung. Das ändert sich, wenn sie weiter wachsen. Ab 20 mm sind sie so gut wie gleich grosse Wassertropfen, aber ab 50 mm Durchmesser scattern sie etwa 20 mal stärker als jene, - solange sie "trocken" sind - Sobald sie aber angetaut sind, d.h. von einem Wasserfilm umgeben, verhalten sie sich auch wie Wassertropfen.

Forschungen haben ferner ergeben, dass trockene Eiskugeln nicht wie ein Kugelstrahler scattern, sondern mit zunehmender Grösse "fokussieren", d.h. die Energie vorzugsweise in die Einfallsrichtung zurückstrahlen! Auch grosse Wassertropfen führen im Schlot ein Eigenleben, da sie durch die Auftriebskräfte verformt werden und dann eher kleinen Plättchen ähneln. Der Verfasser hat sich schon oft gefragt, ob derartige Phänomene die Ursache für häufig zu beobachtende "Vorzugsrichtungen" für Reflexionen an grossen Scatterzentren sein können. Leider ist diese Frage auch jetzt noch nicht geklärt, obwohl die "Dichte" der bei Scatterereignissen auf dem Band befindlichen Stationen sich seit 1994 verachtfacht hat! Schliesslich ist noch auf die 4. Potenz hinzuweisen, mit der die Frequenz im obigen Produkt eingeht, denn daraus folgt, dass auf 24 GHz das Rückstreumass um rund 14 dB grösser ist als auf 10 GHz, sodass trotz der hohen Wasserdampf-Dämpfung auch im 1,2-cm-Band Scatterverbindungen durchaus möglich sind. Schrägscatter mit Knickwinkeln von 20 - 40 Grad bieten wahrscheinlich die besten Chancen, da dabei der Funkstrahl am ehesten wieder aus dem dämpfenden Medium austritt. Ein gutes Beispiel ist die RS-Verbindung zwischen OE5VRL und DL6NCI im Juni 1998 über 281 km mit einem Knickwinkel von ca 19 Grad.

Der Gewitterturm eines Cumulonimbus besteht natürlich nicht nur aus einem, sondern aus einer Vielzahl von Auf-/ Ab-Wind-Schloten die auch "Echozellen" genannt werden. Ihre einzelne Lebensdaür beträgt nur ca. 20 Minuten, es werden aber fortwährend neue gebildet (begleitet von heftigen, inneren elektrischen Entladungen). Die Gesamtlebensdauer eines Cumulonimbus kann -je nach Grösse- zwischen 40 und 120 Minuten liegen. Besonders mächtige Exemplare können selbst die Tropopause bei max. 12000 m erreichen und die Aufwinde der Schlote stossen dann mit grosser Energie in die stabile "Stratosphäre" hinein. Die Turbulenz in diesen Türmen ist enorm, daher wird auch von den grössten Verkehrsflugzeugen ihr Durchfliegen gern vermieden

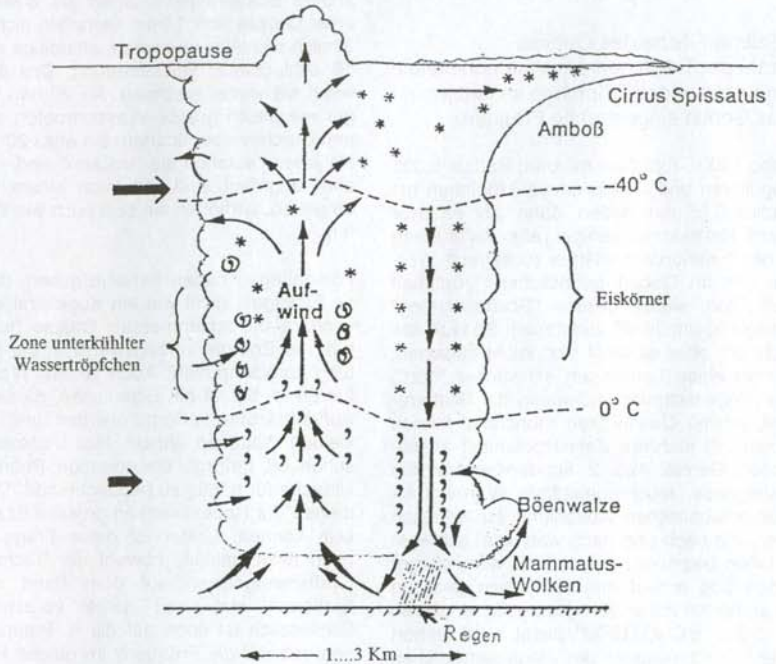


Abb. 2 / Fig. 2: Schema of a Cumulonimbus system
Schematische Darstellung der Abläufe in einem voll ausgebildeten Cumulonimbus

Leistungsbilanzvergleich mit einem kommerziellen Wetterradar

Die Tatsache, dass Regenscatterverbindungen über mehr als 300km mit 100mW im 60cm-Spiegel keine Seltenheit sind, ruft immer wieder ungläubiges Erstaunen hervor. Das hängt nicht zuletzt damit zusammen, dass "Wetterradar" gedanklich sofort mit "Magnetron" und "zig-KW-Power" verbunden wird. Dabei bleibt völlig ausser acht, dass der Radar-Sender seine Leistung nur für Mikrosekunden ausstrahlt und dass der (an gleicher Antenne arbeitende) Empfänger vergleichsweise "taub" ist, u.a. wegen seiner notwendigen grossen ZF-Bandbreite. Machen wir also einen Vergleich: Die typischen Werte eines 3,2cm-Wetterradargerätes für max. 300km Reichweite lagen 1970 bei 100kW Pulsleistung mit einer Pulsbreite von 2 Mikrosekunden und einer Pulsperiode von 4 Millisekunden. Der Antennengewinn beträgt dabei 39dBi (x2 für Senden und Empfangen) und die Empfindlichkeit des Radar-RX wird mit 0,1 Picowatt angegeben (-130dBW).

Die Dauerstrichleistung des Radars liegt damit bei 50 Watt bzw. 17dBW. Die Abbildung des Regenechos hat also 225dB gekostet. Darin enthalten sind die beiden "Streckendämpfungen" (hin & rück) sowie die Reflexionsdämpfung des Scatterzentrums. Nun machen wir diese Rechnung mit unseren Amateurmitteln: HF-Leistung Station A: 100mW/-10,0 dBW, Antennengewinn Station A (60cm-Spiegel) 34,0 dBi, Antennengewinn Station B (90cm-Spiegel) 36,8 dBi, Relaisverluste - 0,8 dB Streckendämpfung (s.o.) -225,0 dB. Bei Station B kommt also das Signal mit -165,0 dBW am LNA an. Ein Widerstand erzeugt bei 293 Grad Kelvin und 2,5 kHz Bandbreite eine Rauschleistung von -170dBW. Dasselbe liefert der Spiegel, wenn er die warme Erde "sieht". Angenommen der LNA hat eine Rauschzahl von 1,5dB, so liegt das Rückscattersignal von Station A bei Station B etwa 3,5dB über dem Rauschen (SSB-Bandbreite) und kann somit locker aufgenommen werden. Ab 2 Grad Elevation kommt dazu noch der Bonus des zurückgehenden Erdrauschens. Es ist also kein

Wunder, dass wir mit unseren Mitteln über Scatterzentren Verbindungen herstellen können.

Scatterarten

Man kann drei Scatterarten definieren, die fliessend inneinander übergehen und vom Ein- und Austrittswinkel der reflektierten Strahlung abhängen.

Vorscatter (Forwardscatter) auf 3cm ist eng verwandt mit Troposcatter. Bei dieser Wellenlänge streuen aber nicht mehr nur die Irregularitäten der Troposphäre, sondern auch schon feinste Wassertröpfchen in feuchten Schichten. Bei relativ geringer Abweichung von der "direkten" Richtung (+/- 20 Grd) liegt daher oft eine Art Mischausbreitung vor. Es eignen sich dafür alle Schichtwolken-Formen, die mit etwas Feuchtigkeit beladen sind, also: Stratus, Altostralus und Stratocumulus, sowie die vorwiegend in den kälteren Monaten auftretenden konturlosen, grauen Wolkenmassen der Nimbostratus-Gruppe. Die Signale sind häufig mit schnellem QSB (5-15 dB) behaftet, sind aber kaum diffus, d.h. sie haben keinen, oder wenig "Scattersound", solange auf der Strecke keine konkreten Niederschläge fallen.
Kommen auf der Strecke allmählich leichte Regenfälle ins Spiel, wird aus dem "Misch-Vorwärtsscatter"- bei nachlassendem QSB - immer mehr ein echter "Regen-Vorwärtsscatter", wobei SSB u.U. einen rauheren Klang annimmt, bzw. rauschbehaftet wird, aber noch immer einwandfrei lesbar bleibt. Spannend wird es, wenn in der heissen Jahreszeit die gewitterträchtigen Cumulushaufen auftreten und vor allem, wenn sich diese zu Cumulonimbustürmen auswachsen (s. hierzu den vorletzten Abschnitt)! Wenn es gelingt, mit einer anderen Station über den "Kopf" eines mächtigen Cumulonimbus-Turms in ca 10000m Höhe Kontakt aufzunehmen, ist es möglich, ca 750 km zu überbrücken, - mit leichter troposphärischer Unterstützung auf der "heissen Seite" der Strecke sogar an die 900 km! Das ergibt sich aus der Erdkrümmung, sowie aus der für Mitteleuropa typischen Maximalhöhe dieser Quellwolken-Türme, die zum kälteren Halbjahr hin immer seltener und kleiner werden, während das Auftreten von dichten Wolkenmassen in niedrigeren Höhen zunimmt. Beides hat zur Folge, dass die mögliche Maximaldistanz allmählich bis auf 40% zurück geht.

Schrägscatter

Schrägscatter ordnet der Verfasser nach 7-jährigem Erfahrungsstand bei einem Knickwinkel von 20...90 Grad ein. Dieser Winkel stellt die Differenz dar zwischen Eintrittsvektor und Austrittsvektor am scatternden Medium und resultiert vor allem aus den Azimutwerten der beidseitigen Richtantennen. Bis ca. 30 Grad bleibt SSB gut lesbar, dann sinkt die Silbenverständlichkeit schnell, sodass man ab 40 Grad Knickwinkel nur noch mit viel Phantasie das gesprochene Wort rekonstruieren kann. Dies hängt auch etwas von der Feldstärke des ankommenden Signals ab. Mit 20 dB über dem Rauschen geht einiges, was bei 10 dB nicht mehr geht! In solchen Situationen kann allerdings ein sehr langsames und akzentuiertes Sprechen, mit vielen Wiederholungen, manche SSB-Verbindung noch retten. Ab 50 Grad

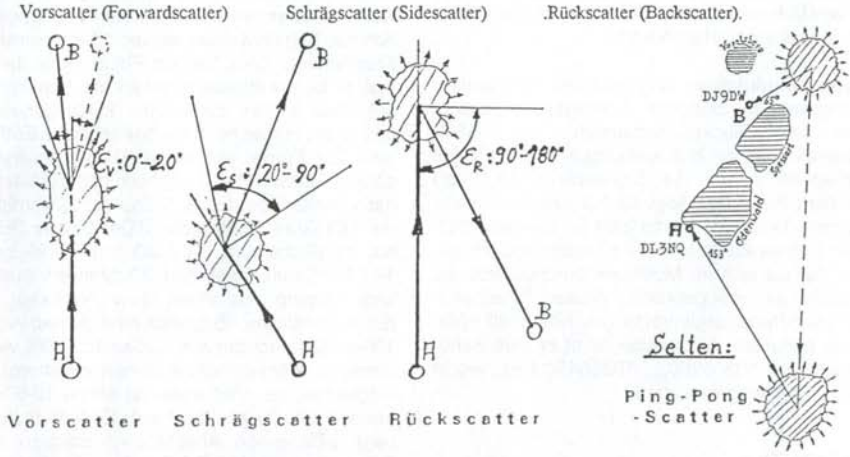


Abb. 3 / Fig. 3: Scatterarten – Types of Scatter

geht dann nur noch CW bzw. FM. Die in diesem Bereich maximal überbrückbaren Entfernungen betragen ca. 700 bis 500 km mit abnehmender Tendenz im kälteren Halbjahr.

Rückscatter
Rückscatter mit Knickwinkeln zwischen 90 Grad und 130 Grad ist für SSB-Betrieb genauso unbrauchbar, wie Schrägscatter zwischen 50 Grad und 90 Grad. Oberhalb 130 Grd scheinen die Phasenverzerrungen bei SSB-Betrieb allmählich wieder etwas abzunehmen, aber zu einer gut verständlichen SSB-Übertragung kommt es nicht mehr, es sei denn, man kann (bzw. muss) mit einem sehr grossen Elevationswinkel arbeiten (>15 Grad)! Hinweise aus der Ausbreitungsforschung besagen, dass die "Qualität" einer SSB-Übertragung von dem "Kohärenzgrad" der rückgestreuten Signalkomponenten abhängt - und dass dieser z.B. nach einer Reflexion an einem Echoturm nicht besonders gut sein kann, leuchtet angesichts der dort ablaufenden Vorgänge ein. Es lebe CW! Die maximal überbrückbaren Distanzen betragen hier nur noch ca. 500 bis 300 km je nach Jahreszeit.

Ping-Pong-Scatter
Ping-Pong-Scatter ist eine Rarität, aber vom Verfasser in den letzten 5 Jahren mehrfach beobachtet worden. Das jüngste Ereignis dieser Art trat im Juni-Contest am 5.6.1999 auf. Es wurde allerdings erst einige Tage später als solches erkannt, als sich im Gespräch mit der Gegenstation (DJ9DW) herausstellte, dass sein Parabol zum Zeitpunkt der Verbindung nicht auf das von mir benutzte Reflexionszentrum im Raum Heilbronn gerichtet war, sondern um ca. 100 Grad "daneben" auf ein anderes, westlich von Fulda, über das er seinerseits mein Signal am stärksten hörte!

Frequenzmodulation Während mit steigendem Knickwinkel im höheren Schrägscatterbereich, sowie im Rückscatterbereich die SSB-Verständlichkeit auf Null zurückgeht, bleibt FM gut übertragbar, sofern die Signalstärke 15...20dB über dem Rauschen liegt (auf 3 kHz-Bandbreite bezogen). Diese Modulationsart ist unempfindlich gegen Schwankungen von Amplitude und Phase, daher hat sie sich im Mobilfunk durchgesetzt. Es ist allerdings unangebracht, diesen "Breitbandfunk" im Schmalbandbereich um 10368100 +/-50 kHz zu benutzen. Akzeptabel ist er in dem Bandsegment von 10368350.... 10368450 kHz, wie in DUBUS 3/97 vorgeschlagen.!

Nützliche Tips zum Einsteigen in die "Scatter-Praxis"

Regenscatter: Wie haufig? Wann? Wie lange?

Erfreulicherweise hat sich herausgestellt, dass nicht nur im Sommer, sondern auch in den kühleren Monaten Scatter viel häufiger auftreten als man noch 1993 glaubte. Selbst im Winter gibt es immer wieder mal RS-Tage, denn nicht nur Wassertröpfchen und Eiskügelchen scattern, sondern auch Schneekristalle (allerdings mit schlechterem Wirkungsgrad). Der Verfasser hat in den letzten sieben Jahren jeweils 6-8 grössere RS-"Happenings" miterlebt und im Grossraum "Mittel-Europa" (das etwa den Grossfeldern JN+JO entspricht) vom 1. Januar bis 31. Dezember 1998 199 Scattertage registriert.

Das Auftreten von besonders guten Regen- (bzw. Schnee-)-scatterbedingungen ist zu erwarten:

- Beim Aufeinandertreffen von Kalt- und Warmfronten.

- Bei mehr oder weniger lokalen Wärmegewittern infolge starker Sonneneinstrahlung auf feuchte Luftmassen.

- In Zusammenhang mit mächtigen Schichtwolkenmassen, die Regen oder Schnee heranschaffen.

Quellwolkentürme (Cumulonimben) mit ihren 8...12 km hoch aufschiessenden blumenkohlartigen Wolkenmassen treten nur in den Monaten der hochstehenden Sonne auf, da nur dann die zuvor notwendige "Aufheizung" der Luft möglich ist. Man kann mit ihnen vor allem in den Monaten Mai bis September rechnen. In dieser Zeit sind also die Chancen für die Überbrückung grösserer Entfernungen besonders gut. Vor allem wenn aufgrund topographischer Gegebenheiten mittels Schräg- oder Rückscatter um Hindernisse "herum" gearbeitet werden muss. Ab Spätsommer werden die relativ kurzlebigen Quellwolkentürme allmählich kleiner und seltener, dafür treten häufiger ausgedehnte Schichtwolkenmassen (Nimbostratus) in Erscheinung. Dies hat zur Folge, dass die maximal zu beobachtenden Höhen der Scatterzentren auf etwa 4000m bis 2000m zurückgehen, aber das reicht immer noch für beträchtliche Entfernungen. Zur Frage, wie lange RS-Bedingungen andauern, antwortet das Logbuch des Verfassers: Je nach Wetterlage, bis zu 9 Stunden, (allerdings bei nur 180 Grad Sichtbereich). Der Cluster DB0MDX hat im Grossraum JN / JO am 4.6.99 und am 14.8.99 Scatter während 12 Stunden ausgewiesen! Fronten aus West- bzw. Nordwest haben durchschnittliche Zuggeschwindigkeiten von 60-100km/Std, Fronten aus Südwest ca 30% weniger. Einzelne Wärmegewitter ziehen meist wesentlich langsamer, der Verfasser hat schon 10-50km/Std beobachtet. Daraus lässt sich für jede individuelle Lage eine grobe Abschätzung machen, wieviel Zeit ein bestimmtes "Sichtfenster" hergeben kann. Je näher und schneller ein Scatter, desto kürzer seine Sichtbarkeit! Dem Verfasser ist schon mehr

als eine Verbindung zu früh im Rauschen versickert, weil die Signale hinter Nachbars Baum verschwanden..

Wie findet man Scatterzentren?
Man kann das Auftreten von Regenscatter unmittelbar "hören": Jeder Donner, jedes dumpfe Grollen aus der Ferne ist ein "Scatter-ALARM"!! Da man meist nicht gerade in der Funkbude sitzt und nur zum Schalter zu greifen braucht, wenn es grummelt, stellt sich die Frage, ob man RS evtl. planen kann ?? Das kann man natürlich nicht, aber sehr wohl lässt sich RS "vorausahnen" und ihr mögliches Auftreten "einplanen". Dazu muss man abends 2-3 verschiedene (!) TV-Wetterbilder aufmerksam verfolgen, die meistens brauchbare Hinweise liefern, ob bzw. wo in den nächsten 52 Stunden etwas in der Luft liegen könnte. In gewisser Weise lassen sich dann die unvermeidlichen anderen Verpflichtungen mit dem Hobby koordinieren. Man sollte auch nicht vergessen, hin und wieder einen Blick auf das Barometer zu werfen, denn nahende Kaltfronten und H2O-geladene Wolkenmassen sind meist mit fallendem Luftdruck verbunden. Seit einiger Zeit kann man in dem PR-Netz mehrere Cluster finden, die es mit schlauen Frequenzfiltern und Ansagesperren ermöglichen, eine Auflistung abzurufen, die ausschliesslich 3cm-Stationen enthält. Auf diesem Weg kann man sich jederzeit Blöcke von je 16 Meldungen über die 3cm-Aktivität auf den Bildschirm holen, und so einen Überblick über die aktuelle RS-Lage in Mitteleuropa erhalten. Ausserdem kann man mehrere hundert Eintragungen zurückblättern (bei DB0MDX bis zu 2750) wenn man nach irgendeinem zurück liegenden Ereignis sucht. Da "Mikroweller " nicht unbedingt auch "PR-Fans" sind, sei dazu eine kurze "Gebrauchsanweisung" gegeben: A) Einloggen bei DB0MDX. Danach werden Filter gesetzt und 3cm-Infos abgerufen: B) 1. Eingabe: SE/FI 15 (ENTER) 2. Eingabe: SET/NOANN (ENTER) 3. Eingabe: SET/NODXDEDX (ENTER) 4. Eingabe: SH/DX/16 10368 (ENTER) 5. Warten auf Aha-Effekt.. Anmerkung; Will man doppelt so viele Eintragungen sehen, gibt man 32 statt 16 ein. Hat man Zugang zum INTERNET, dann kann man auf stündlich aktualisierte "Blitzkarten" kostenlos zugreifen.

Regenscatter bis ca. 150km:
Um Scatter bis etwa 150km in einer vermuteten Richtung aufzuspüren, gibt es folgende Möglichkeiten:
a) Beobachtung der Wolkenzugrichtung und vor allem der Wolkenart im Hinblick auf eventuelle Niederschläge.
b) Hören auf Donnergrollen -wie schon erwähnt- (bis ca. 30km).
c) Achten auf Blitze (bei Nacht bis ca. 150km).
d) Lauschen nach Bitz-QRN im 2m-/70cm-Band mit empfindlichem Vorverstärker an der Antenne- das gibt u.U. aus 100-200km Entfernung eine gute Peilung.
e) Kontrolle von Baken, die man normalerweise nur selten oder gar nicht hört.
f) Beobachtung von Baken, die sich im Umkreis bis ca. 100km befinden, auch wenn sie nur schwach hörbar sind. Wenn Sie eine 3cm-Bake im Hörbarkeitsbereich haben, dann versuchen Sie, mit ihr "passives RADAR" zu machen: Die Bake strahlt vielleicht ein in Ihrem Hörbarkeitsbereich liegendes Scatterzentrum an und Sie empfangen dessen RS-Signale als Vor-, Schräg- oder Rückscatter und erhalten dabei gleich die Werte für Azimut und Elevation des Scatterpunktes.
g) Beobachten des Bandes, vorwiegend bei 50-150kHz über Bandanfang.
h) Die besten Ergebnisse erhält man, wenn eine zweite Station die Rolle einer Bake übernimmt und anschlissend die Rollen vertauscht werden. Der besondere Vorteil dieser Methode ist, dass man aufgrund der beiden Spiegelpositionen recht gut bestimmen kann, wo sich das Scatterzentrum befindet. Nachteilig ist, dass man eine Querverbindung zwischen beiden Stationen braucht.
i) Abfragen der Mikrowellen-Cluster im PR-Netz.
j) Blitz-infos aus dem Internet ziehen.

Scatter bis maximal 450km:
Bei dunstigem Wetter ist die optische Sicht auf ca. 20-30km beschränkt und auch bei sehr klarem Wetter ist (von Ausnahmen abgesehen) bei 120km Schluss. Was jenseits liegt, ist nicht zu sehen. Der 3cm-LNA dagegen, mit vorgeschaltetem Spiegelgewinn, kann -mit Tropo-Unterstützung- bis zu 450km weit "sehen" (bzw. "hören") - wenn es dort in über 10km Höhe was zuhören gibt- ... Gibt es da was zu hören??? - Manchmal ja!!! Baken sind ürsprünglich für Tropoausbreitungen konzipiert worden und haben daher meist auf möglichst horizontale Abstrahlung gezüchtete Antennengebilde. Nahe und somit hochstehende Zentren können sie also schlecht erfassen und tief stehende sind so weit entfernt, dass die effektive Baken-Strahlungsleistung für die Überbrückung der resultierenden Entfernungen (plus Reflexionsdämpfung) nicht ausreicht. Die genannten Grenzentfernungen bis zu 450km, die sich aus der Erdkrümmumg ergeben (siehe Diagramme A und B), sind für Super-DX aber die interessantesten. Hier helfen nur die Verfahren g) bis j) weiter.

Anruf-Frequenzen
Die Zahl der OMs, die ihre Heim-Station für 3cm-RS-Betrieb fit gemacht haben, ist in den letzten fünf Jahren rasant gestiegen. Ende Mai 99 waren

an einem der zahlreichen Scattertage innerhalb von 10 Stunden 42 Rufzeichen zu beobachten, von denen nur fünf portabel unterwegs waren! Diese Entwicklung ist auch an den Kontesten nicht spurlos vorüber gegeangen. Der "Charme" hoher Bergstandorte hat durch die neuen Möglichkeiten der RS-Technik stark an Attraktivität verloren. Als Folge ist die Nutzung der "Anruffrequenzen" (144.390 und 432.350 MHz) nur noch selten anzutreffen, oft erst nach individueller Abmachnung.

Arbeiten mit den Diagrammen A (Normalhöhe) und B (Zusatzhöhe)

Die Diagramme zeigen die Höhe des Funkstrahls in Abhängigkeit von der Entfernung (zur Antenne). Im Diagramm A wird dies für 3 verschiedene Brechungsindices dargestellt, im Diagramm B für verschiedene Elevationen der Antenne.
Die Gesamthöhe H setzt sich dabei zusammen aus der „Normalhöhe", die von der Entfernung „D" und Brechungsindex „K" abhängt, sowie der „Zusatzhöhe", die sich hinreichend genau aus der Entfernung und dem vertikalen Antennewinkel „epsilon" ergibt:

$$H = Hn + Hz$$

Normalhöhe Hn

Wir betrachten zunächst den Fall der horizontal abstrahlenden Antenne (Epsilon = 0) und optischer, d.h. geradliniger, Ausbreitung (K = 1):
Diagramm A zeigt, daß der Funkstrahl nach 360km eine Höhe von 10.000m erreicht, z.B. in klaren Winternächten. In den uns mehr interessierenden Sommermonaten ist der Brechungsindex K > 1. Mit dem genormten Wert K = 1,33 (in den Monaten März bis Oktober mit 65%iger Wahrscheinlichkeit erreicht oder überschritten) wird die gleiche Höhe erst nach 410km erreicht und bei einer ausgeprägten Inversionslage (K = 2) erst nach 490km (dies allerdings nur mit einer Wahrscheinlichkeit von 25%).
Ausgeprägte Ducts, in denen der Funkstrahl einige 100km geführt wird, d.h. der Erdkrümmung folgt (K >10), braucht man nicht in Betracht zu ziehen, da sie zeitlich nicht mit Scattervorkommen zusammenfallen.
Die oben angenommenen 10.000m entsprechen im Sommer etwa der normalen Höhe der Tropospause in Mitteleuropa. Maximale Kopfhöhen von 12km wurden bei Cumulonimben nur selten beobachtet, sind aber vor allem über den Alpenregionen nicht gänzlich auszuschließen.

Zusatzhöhe Hz

Wird die Antenne vertikal angehoben (epsilon > 0), dann steigt gemäß Diagramm B die Zusatzhöhe Hz entsprechend an. Mit Epsilon = 4 Grad wird in 100km Entfernung Hz = 7000m und die Normalhöhe Hn wird 500m. Die Gesamthöhe ist dann 7500m, ein Bereich also, in den jedes bessere Sommergewitter hineinreicht!
Der Verfasser selbst ist „lage-geschädigt" und kann über einen Azimutbereich von 120 Grad nur mit Elevationswinkeln von 5 bis 15 Grad arbeiten. Das geht auf keinem SHF-Band, aber sehr wohl auf 10 GHz! Laut Diagramm B ist mit 15 Grad Elevation eine Höhe von 8000m noch 30km weit zu „sehen". Das bedeutet: Wenn ein lokales Gewitter langsam über den Berg wandert, ist auch in diesen Richtungen für eine gewisse Zeit ein „Arbeitsfenster" offen für Gegenstationen, die 360-400km jenseits des noch im Sichtbereich befindlichen Scatterzentrums liegen! Je nach Zuggeschwindigkeit des Gewitters ist dieses Fenster 20 bis 60 Minuten „offen".

Hinweise zu Aufbau und Abwicklung einer RS-Verbindung

Sobald der Spiegel auf ein Scatterzentrum ausgerichtet ist, kontrolliert man zweckmässigerweise die vorwiegend benutzten Frequenzen für Scatterverbindungen (10368.100 +-0.05MHz) auf eventuell vorhandene Signale. Wenn da nichts zu hören ist, geht man selbst mit "CQ" auf Sendung. Es ist zweckmässig, dabei auch den WW-Locator sowie (zumindest am Schluss) einen längeren Dauerstrich zu geben. Die erste Sendung sollte nicht länger als drei Minuten dauern. Erfolgt keine Antwort, kann man die nächsten fünf CQ-Rufe auf jeweils fünf Minuten ausdehnen. In der Zwischenzeit ist vielleicht das ein oder andere Telefongespräch zu führen. Oft läuft das Scatterzentrum binnen 10-15 Minuten aus der Antennenkeule, sodass man u.U. eine Spiegelkorrektur "blind" vornehmen muss, die der Halbwertsbreite der Antenne angemessen ist. Gibt es danach immer noch keine Antwort-Signale, kann man entweder eine neue Scatterortung vornehmen oder aber eine längere Schleife laufen lassen.
Antwortet man selbst auf einen CQ-Ruf, dann muss man dem CQ-Rufer Gelegenheit geben, seinen Spiegel optimal zu korrigieren. Bei schwachen Signalen ist dies mit SSB schwierig. Daher ist es es besser, nach der ersten Antwort (R R R R genügt) für 30-40 Sekunden einen Dauerträger zu stellen, oder Punkte zu geben. Denken Sie daran, dass es im beiderseitigen Interesse liegt, die Feldstärken so gut als möglich zu optimieren. Danach folgt der wichtige QSO-Text, wobei der WW-Locator nochmals mit gegeben wird. Im Rapport wird anstelle der dritten Ziffer für die Tonqualität ein S (für Scatter) gegeben. Ausserdem hat es sich als sinnvoll erwiesen, die Richtung des eige-

nen Parabolspiegels zu übermitteln. Das sieht dann so aus:

G3LQR DE DL3NQ RRRRR FB...
UR RST 52S 52S 52S
LOC JN49IN JN49IN JN49IN
QTF 294 294 294 EL 05 05 05
--HW? G3LQR DE DL3NQ AR K K.

Dieses Schema hat sich auch unter schwierigen Bedingungen bewährt, denn der in CW weniger geübte OM tut sich doch wesentlich leichter, wenn er schon weis, in welcher Reihenfolge er was zu erwarten hat. Und noch ein Tip: "High speed CW" ist auf 10GHz bei den oftmals nur wenige dB über dem Rauschen liegenden Signalen völlig fehl am Platz! Nehmen Sie sich die Zeit, Ihren Text sauber mit maximal 60 BpM zu geben. Bei sehr schwachen Signalen ist Tempo 40 angemessen! In jedem Falle sollte man eine schwierige RS-Verbindung erstmal in CW unter Dach und Fach bringen, bevor man unter Umständen einen Versuch in SSB startet. Für SSB-Verbindungen, die an der Grenze der Verständlichkeit liegen, gibt es einen Trick: Verwenden Sie statt des auf KW üblichen internationalen Buchstabier-Alphabets das alte deutsche. Dieses enthält vorwiegend drei- und viersilbige Wörter mit extra vielen "klingenden Vokalen": statt "Alfa"-"Amerika", statt "Golf"-"Guatemala", statt "Oskar"-"Ontario", statt "Victor"-"Valencia" usw. Langsam und deutlich ausgesprochen, erhöht dies die Silbenverständlichkeit im Rauschen entscheidend! Je nach Entfernung zum Scatter muss man dessen "Wanderung" während eines QSOs im Auge behalten. Bei einer Elevation von 10 Grad (kommt beim Verfasser häufig vor) beträgt die Entfernung zum Scatterpunkt nur 30-50km. Das erfordert alle 5-10 Minuten eine Korrektur beider Achsen und eine wendige Betriebstechnik. Wenn Sie zwei andere Stationen im QSO beobachten und sich anmelden wollen, dann tun Sie es keinesfalls mit einem Anruf in SSB! Die Chance, dass es verstanden wird, ist gering, aber die Wahrscheinlichkeit, dass die laufende Verbindung erheblich gestört wird, ist gross! Greifen Sie statt dessen zur Taste und geben Sie einige Male sss sss sss (für "Scatter"). Das wird meist bemerkt und stört kaum. Neben "RS" findet man gelegentlich noch die Angabe "SS" bzw. "ES" (für Schneescatter bzw. Eisscatter), da man aber die tatsächliche Zustandsform nie kennt, wird zur Charakterisierung das Kürzel "RS" in Texten verwendet. Dennoch bleibt "Scatter" (S) der gemeinsame Oberbegriff. Einen Rapport 569S sollte man besser nicht geben, da die Signalqualität ja tatsächlich nicht S9 ist. So wie auch bei Aurora statt der 9 ein A gegeben wird, sollte bei hörbarem Scattersound ein „S" für die Tonqualität gegeben werden (nicht „R" und schon gar nicht „RS"!)

Anzahl der in Mitteleuropa (Großraum JN/JO) beobachteten Scattertage auf 10 GHz:

1996	1997	1998	1999	2000	2001
58	87	199	258	225	221

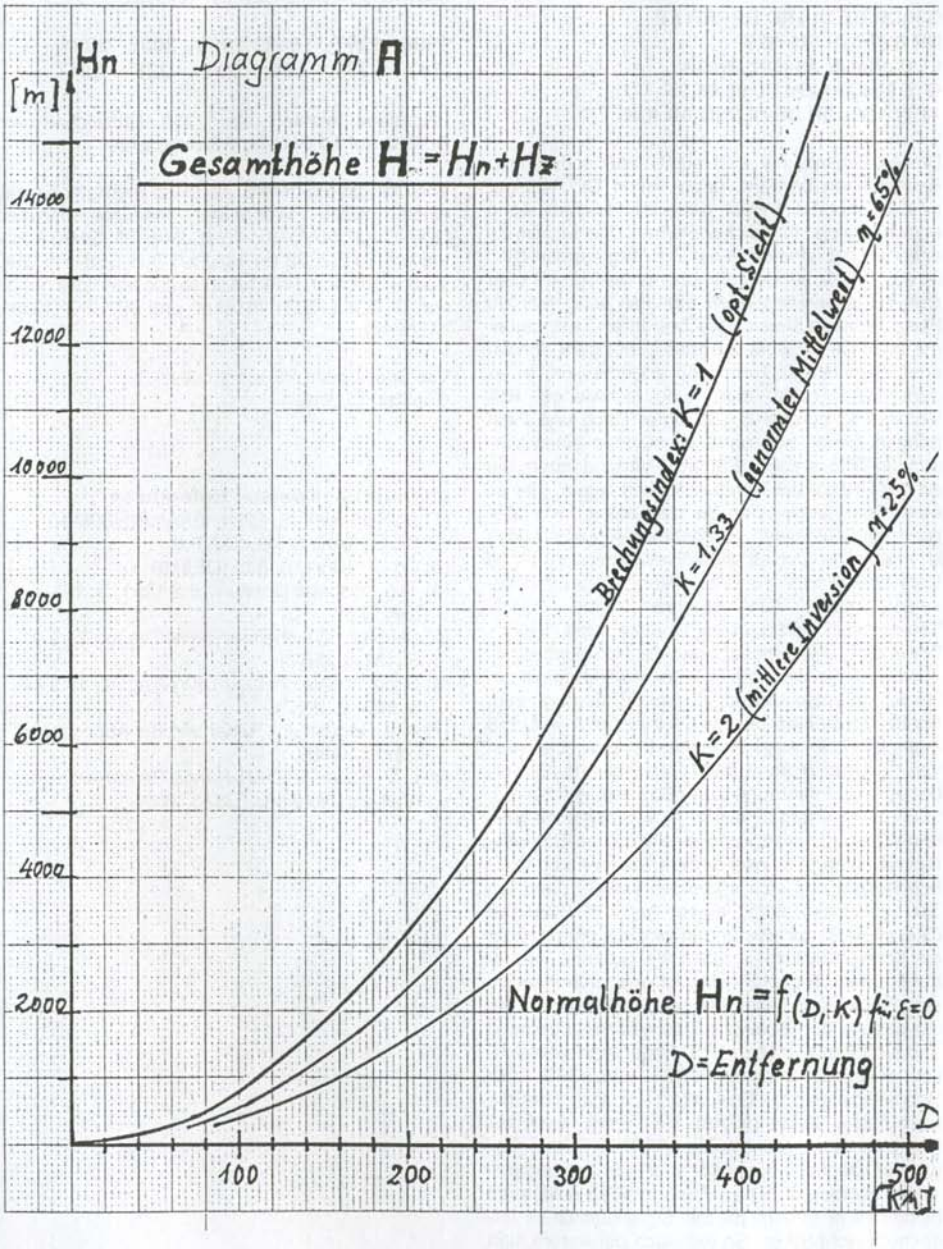
Insgesamt wurden über 250 Rufzeichen von DL3NQ auf 10 GHz via RS beobachtet.

Im 2002 gab es bereits ein tolles Highlight: Es gab einen neuen Weltrekord via Regenscatter: DL6NCI (JO50VI) und IW4CJM/p (JN72MA) konnten am 20.6.2002 un 1802 UTC in SSB ein QSO via RS machen. IW4CJM/p wurde ebenfalls gehört von DF2CK (JO71, 1018km) und SP7JSG (KO01, 1168km!).

Viel Spass beim RS auf 10 GHz!
Günther, DL3NQ

Literaturnachweise / References

(1) DUBUS 3/87, S. 226 (HB9AMH(HB9MIN)
(2) Cq DL 1/89, S. 48, (DJ7FJ)
(3) Cq DL 10/91, S. 635 (OE8MI)
(4) Tagungsband Dorsten 16.2.1991, S. 101 (DK3UC)
(5) Skriptum Weinheimer UKW-Tagung 21.9.91 S. 131 (DJ5BV)
(6) Skriptum Weinheimer UKW-Tagung 15.9.84 S. 183 (DL3NQ)
(7) A. J. Bogush Jr., Radar and the Atmosphere, London, 1989
(8) L. V. Blake, RADAR-Range Performance Analysis. Norwood (USA), 1984


Hn
[m]
Diagramm A
Gesamthöhe H = Hn + Hz
14000
12000
10000
8000
6000
4000
2000
Brechungsindex: K=1 (opt. Sicht)
K=1,33 (genormter Mittelwert) η=65%
K=2 (mittlere Inversion) η=25%
Normalhöhe Hn = f(D, K) f. ε=0
D=Entfernung
D
100
200
300
400
500
[km]

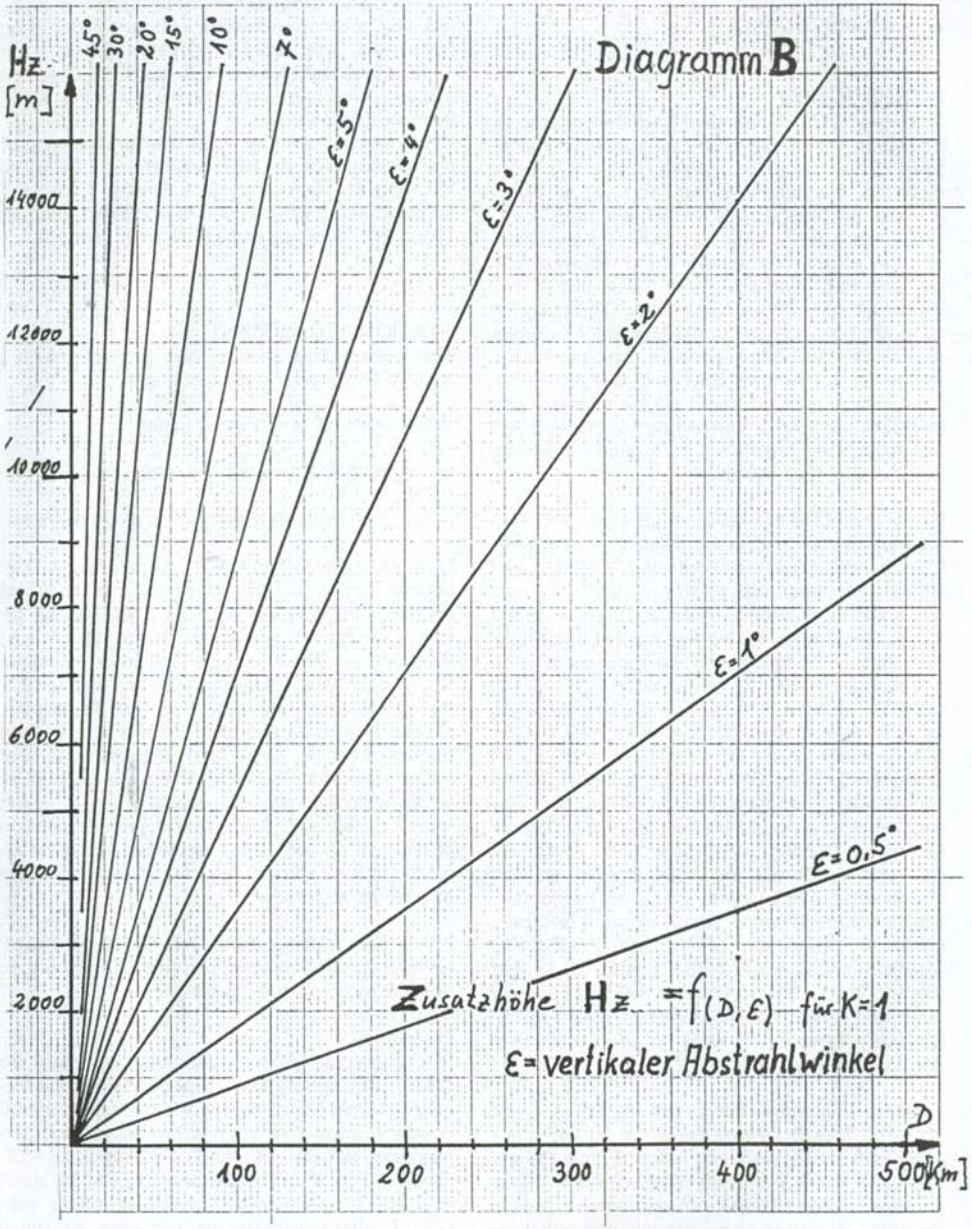


Diagramm B
Hz [m]
45°
30°
20°
15°
10°
7°
ε=5°
ε=4°
ε=3°
ε=2°
ε=1°
ε=0,5°
14000
12000
10000
8000
6000
4000
2000
100
200
300
400
500 [km]
D
Zusatzhöhe Hz = f(D, ε) für K=1
ε = vertikaler Abstrahlwinkel

Rain Scatter on 10 GHz

G. Vollhardt, DL3NQ

INTRODUCTION

Since the 1950s, it is known from the radar technique that strong rain produces echoes in the X-band. Since the 1970s, weather radar is a common tool for meteorologists and pilots. When hams started their activity on the 3cm band (1977-1982) there were only Gunnplexer transmitters with low power, and wideband FM receivers with low sensitivity available. With these rigs it was impossible to work via rain scatter. The following generation of equipment (1980) made TX powers of 100 mW and more available, and techniques moved to narrowband SSB and CW. Even so, most stations worked from portable locations and tried QSOs via direct (optical) paths. Big buildings and mountains (the Alps!) were used sometimes to make QSOs via reflections.

By the end of the 80s some 10 dB more power got available for amateurs and reflections of signals from thunderstorms were detected. HB9AMH and HB9MIN reported these effects in 1987 when they had a QSO with HB9RG (1). Also DF7FJ reported these effects when he worked stations from Italy. In August 1988 he worked via rain scatter (RS) and reported about the "Aurora sound" (2). OE8MI (JN66TN) worked in 1991 from a valley via RS to Italy (3). DK3UC started a test from 1989 to 1991 with hundreds of skeds with DJ5BV and HB9RG (distances 272 and 582 km). He found a connection between good reflections on 10GHz and rainy weather, and reported his results at the Dorsten Microwave Meeting in February 1991 (4). DJ5BV also gave a lecture at the Weinheim VHF Meeting in September 1991, where he showed the connection between increased signal strength and rainstorms in the middle of the path (5). LX1DU (JN29xm) and DL9SH (JN49dn) made daily skeds (09 and 20 UTC) from October 1991 to February 1992 and found the same results **(see Fig. 1).** Obviously these results were not used by most of the 3cm operators, at first.

I want to encourage OMs to use the RS mode on 10 GHz. Myself I have been on 10GHz since 1982, with a 1.6m dish, and heard my first RS signals from HB9RG in 1989. With 'blue sky' I was not able to hear HB9RG, but with some clouds in the path CW signals came through, and with thunderstorms in the middle of the path signals got stronger still (max. 30 dB). As a conclusion I stated in the end of 1991 that "10GHz is a bad weather band." In 1993 I improved my station with a new 1.21m dish and 18 Watt at the feed, and got a 15 dB improved S/N ratio. Several interesting RS-QSOs were then made with stations in DL. CW QSOs became possible with only 200 mW on both sides (**see table** of QSOs 1992/1993). In 1993 I gave my own first talk about 10 GHz rain scatter to the ham radio community at the Weinheim VHF Meeting.

OK, now what can I tell you know for making your first experiences via RS? Answer - you need the following: (1) Ham-spirit; (2) A 3cm rig; (3) A scatter cloud and a special kind of operation. You can supply (1) - here are some hints for (2) and (3).

STATION / EQUIPMENT

For newcomers a small system (portable station) is sufficient for your first experiments:

a) RX with a NF with 3 dB or better

b) TX with 0.3 W or more at the feed

c) Antenna: Portable dish of about 48cm diameter.

Now you have to find out if you can hear a 3cm beacon from your QTH. If not, you can try to find another 3cm operator who plays the beacon for you. The distance should be 20 to 100 km and your partner should not be behind a mountain! You should have talkback on 2m or 70cm (or use the phone). For detecting your first RS signals, choose a rainy day, tune your RX on the beacon frequency (or the signal from the other OM) and rotate your dish SLOWLY. There will be a point when the previously clear signal starts to sound "noisy" or "auroral". After making some fine-tuning of the dish on both sides, you have found the direction to the centre of reflection. Now you have a passive weather radar.

If you want to make some DX via RS on 10GHz (without going to a higher portable QTH), you then need to know / do the following.

Frequency

It is important to know your true frequency on 10GHz. At the very least, you need to hit the frequency within 5kHz. 1kHz would be much better of course. For example it is possible to synchronize a frequency counter with the DCF77 signal on VLF. (There is a kit from DK2DB available.) At the least, you should compare a crystal oscillator with DCF77. After multiplying the frequency, a suitable harmonic can be used to calibrate your transceiver somewhere close to 10368 MHz. For DSP tests a frequency accuracy of 100 Hz is needed, and this is more difficult.

Antenna

You should use a bigger dish than my 48cm example. A 60cm dish gives 1.25dB extra gain, and an 80cm dish gives 2.2dB more. It is very important to have an exact azimuth readout. For the 80cm dish you need at least +/-2 degrees of accuracy. A normal rotator designed for HF antennas is not sufficient for this. It is possible to modify these rotators mechanically with a system of prestressed gear-wheels, and by doing this I got +/- 0.5 degrees accuracy. On the market there are also rotators for satellite use. They are sufficient but quite expensive.

For optimum performance on RS, the dish must also have elevation capability, with the same accuracy. For RS normally you need (depending on the QTH) a maximum of elevation of 10 to 20 degrees only. I built a very simple system using an M8x1 stainless steel threaded bolt and a 24VDC motor with a transmission, but once again you can also use commercial rotators for satellite antennas. A scatter cloud at an altitude of 7000m and a distance of 90km needs 4 degrees of elevation - for this example, a good 60cm dish with no elevation would be 20dB below optimum! In cold months, nimbostratus clouds are at 2000m altitudes, and for those you need about 2.3 degrees of elevation to avoid a loss of about 7dB. Of course it is not absolutely impossible to make 10 GHz RS QSOs with 0 deg of elevation, but now you see why a fixed dish with no elevation is not very useful for RS!

Note: It is not very well known that it is useful also for tropo QSOs to lift the antenna a little bit above the horizon. I recommend an elevation of 40% of the full vertical 3dB beamwidth.

To be able to move the dish to a certain point (e.g. sun, horizon, mountain etc.) it is necessary to have a telescopic sight or viewer mounted at the dish. This is also needed for calibrating the azimuth and elevation readout. I am using a homemade system made from a tube (length 20cm, diameter 2cm) with crosses of wire (0.5mm) on both ends. This tube is fixed to one side of the dish.

Other equipment

The technical data of the station for the first experiments (see above) are not really sufficient for making many QSOs via RS. A modern station should have a preamp (NF < 1dB) close to the antenna. The preamp gain should be 10 dB more than all the following losses (cable etc.). With 5W of RF at the coaxial relays or the feedpoint of the antenna, you will then be able to work most of the other 10GHz stations via RS.

THEORY

The theory says that refraction and reflection of energy in an electrical field occurs if the dielectric constant (epsilon) is changing over a short distance. Drops of water give this condition quite well. They behave as little dielectric balls with a diameter < 1/20 of lambda. For the strength of reflection, the most important parameters of the raindrop are the density and size (diameter). The theory from Mie (1908) and Rayleigh (1871) can be used partly to describe this.

The strength of reflection of an area with water drops (diameter 0.001 to 0.5mm) is proportional to:

$$F \times N \times D^6 \times f^4$$

F = projected size of area
N = number of drops per unit volume
D = diameter of drops
f = frequency (RF)

For example: If 1000 drops of 0.005 mm diameter coagulate to 1 drop of 0.05 mm, there are 999 reflectors less, but the new bigger drop would reflect RF one million times stronger. If this would happen simultaneously with all drops in a scatter area, signal strength would increase by 30 B! It does not happen exactly like this in the nature, but it helps to understand why there are differences in echoes between little rain showers, strong rain storms etc., and why it is possible that signal strength can increase rapidly within minutes.

Figure 2 shows how the warm, humid, saturated air is rising and condensing into the smallest drops, which are then getting bigger and bigger and finally start to fall down. Strong up-winds transport the drops again to higher altitudes and they coagulate again, and so on.This system is called an "echo-tower", "echo-cell" or "chimney". From 8mm diameter of the drops onwards the reflection strength is not increasing any more.

Radar pictures show that the active centres of scatter are born in the middle of these young chimneys at altitudes of approximately 3500m. They grow upwards rapidly (but also downwards). Mighty chimneys can reach levels of the tropopause and higher. During the summer months (from June to August) they reach a maximum of 10 to 12km altitude, but in autumn and winter maybe only 5km. Some time after passing the 0 degrees Celsius region, the drops freeze to ice and fall down. Normally they melt again before reaching the earth, but sometimes also the ice kernels go several times through a chimney and

grow more and more. They can then reach the surface of the earth as solid hail. Ice crystals have a different scatter characteristic from water droplets: diameters up to 10mm give similar reflection effects to water, but ice gives about 10dB less strength of reflection. Diameters from 20mm upwards give the same signal strengths. Ice particles of 50mm and more give 20 times stronger reflections as long as their surface is "dry" and not melted. If their surface is just a little bit melted they reflect like water drops. Dry balls of ice do not scatter like an isotropic system - with greater size they focus the energy mostly back in the direction of origin. Also big drops of water can develop their own "life" in a chimney. Then they look more like little discs. I think that this special kind of drops could be the reason for some special scatter effects, but this is still uncertain.

The f^4 value (frequency) in the above formula means that on 24GHz the reflection strength is 14dB higher than on 10GHz. So even with the high losses due to the water vapour, RS QSOs on 24GHz are possible. Side-scatter with 20 to 40 degrees skew paths gives the best result on 24GHz (for example: QSO OE5VRL-DL6NCI in June 1998, 19 degrees skew path, QRB 281 km).

Look at the picture of the cumulonimbus system now **(Figure 2).** A cumulonimbus or thunderstorm system contains many of these chimneys (also called echo cells). Normally they "live" for about 20 minutes, but new cells appear all the time while the older cells "die". The whole cumulonimbus system exists for typically 40 to 120 minutes, depending on the system's size. Big systems can reach the tropopause at 10 to 12km altitude. They cause the well known turbulence for the jet flights. The fact that RS QSOs with distances over 300km are possible with 0.1 Watt and a 60cm dish may sound unbelievable if you think of a commercial weather radar system with magnetrons and kilowatts of output power. But this radar transmits only for microseconds and has quite a deaf receiver due to the necessary broad IF.

A typical 3.2cm weather radar (300km, 1970) had the following data:
RF Power: 100kW
Pulse length: 2 microseconds
Pulse repetition: 4 milliseconds
This is equivalent to only 50W of continuous power = 17 dBW.
The antenna gain is 39dBi. For RX and TX you have to double this and get 78dBi.
The RX sensitivity is 0.1pW or -130dBW.

If you add 17 + 78 + 130 you get 225dB, so we can take this as a typical total path and backscattering loss.

Now look at our amateur radio station: Station A transmits to the scatter point 300km away, station B (close to A) receives the backscatter signal (echo) which is 225 dB weaker now.
TX power (Station A): 100mW = -10dBW
Antenna Gain (A, 60cm dish) = 34dBi
Antenna gain (B, 90cm dish) = 36.8 dBi
Relay loss at B = 0.8 dB
Path and scatter losses = 225 dB
Total = -165 dBW

The signal arrives at station B's LNA at -165dBW. A resistor at 293K (20 degrees Celsius) produces -170dBW of thermal noise in a bandwidth of 2.5kHz; the dish produces the same thermal noise power if looking at 'warm' earth at the same temperature. An LNA with 1.5dB NF gives more noise: -168.5 dBW. As a result, station B hears the scatter at 3.5dB above noise (168.5 - 165) in the same 2.5kHz bandwidth. It is no problem to copy CW signals of this strength. With 2 degrees (or more) of elevation there is also the advantage of less noise from the earth. Knowing all these numbers, it is not a miracle any more that RS QSOs are possible with small stations.

TYPES OF SCATTER

There are three main types of scatter: forward scatter, side scatter and backscatter. "Ping-pong" scatter is rare. **(see Fig. 3)**

Forward scatter

Forward scatter on 3cm is quite closely related to troposcatter. At this wavelength not only irregularities of the troposphere refract, but also smallest drops of water do so. Often there is a mixture of troposcatter and rain scatter propagation. The difference from the direct path is +/-20 degrees. All types of clouds with some humidity inside are good for forward scatter. Signals often have fast QSB (5-15dB) and no or little scatter sound. If rain starts to fall on the path, signals get stronger with less QSB, and SSB signals get noisy and more "scatter"-sounding (like aurora). In the summer months it is possible to work via the head of a cumulonimbus cloud (at 10-12 km) and this can result in distances up to 750km, or 1000km with some help from tropo. During winter time the altitude of the clouds is typically lower, and this results in less than half (about 40%) of the maximum distances of the summer.

Side-scatter

After 7 years of experience I classify side-scatter to include angles between 20 and 90 degrees

from the direct path. From 20 to 30 degrees SSB is quite readable. From 30 degrees onwards SSB gets difficult to read, and from 40 degrees a lot of imagination is needed to understand - depending also on the signal strength, of course. Speaking slowly and clearly and repeating several times can help to make a QSO complete. From 50 degrees onwards only CW and FM are possible. The maximmum distance via side-scatter is 500 to 700km, and less during wintertime.

Back-scatter
Angles between 90 and 180 degrees from the direct path give back-scatter signals. In general CW is the recommended mode for back-scatter. SSB is impossible to use from 90 to 130 degrees, although angles from 130 degrees and more, and elevation of 15 degrees or more, can result in better SSB readability. Maximum distance is 300-500km.

Ping-pong scatter
This does not happen very often, although I have detected it several times during recent years.

Frequency Modulation
With greater azimuth angles to the scatter point, SSB signals become more distorted but FM signals remain readable, because FM is resistant to rapid changes in amplitude and phase. FM should be used on 10368.350 to 450 as proposed in DUBUS 3/1997.

HINTS FOR MAKING RS-QSOs

Rain scatter: How often? When? Duration?
During the cold months of the year there is the chance for RS QSOs much more often than was believed before 1993. Even in the winter there are days with RS. Also snow crystals do scatter 10 GHz signals, but with less efficiency than rain. Good RS conditions can be expected, if:

-Cold fronts hit warm fronts

-Local thunderstorms appear

-Mighty clouds bring rain or snow.

Cumulonimbus systems of high altitude (8-12km) occur during the hot summer months from May to September only. In this period there is the best chance for long-distance QSOs. In autumn the cumulonimbus systems are not so high any more, and more often nimbostratus clouds occur at altitudes from 2000 to 4000m, but these are still good for working DX RS QSOs. RS conditions can continue for several hours depending on the weather, and sometimes for 9 to 12 hours (12 hour openings on June 4th 1999 and August 14th 1999). In western Europe,fronts from W and NW move at 60-100 km/h on average, fronts from SW at about 30% less speed. Local thunderstorms move more slowly (10-50km/h). Close and fast-moving scatter systems give shorter windows for RS, of course.

How to locate scatter points
Any audible noise from a distant thunderstorm means, "scatter alert"! It is very useful to watch the weather forecast on TV and the barometer in the shack. Cold fronts with wet clouds let the barometric pressure fall rapidly. It is also useful to watch a DX-cluster (packet-radio or Internet) and some clusters allow to set filters so you get the 3cm spots only. Maps of thunderstorms with their lightning and maps of weather radar are also available on the Web. They are updated every hour and very useful for us.

Detecting scatter
For the detection of scatter systems in a distance up to 150 km the following suggestions may help:

a) Determine the kind of clouds and direction they come from

b) Listen for thunder (max. 30km)

c) Watch for lightning (at night max. 150km)

d) Listen for lightning QRN on 2m or 70cm; with a yagi you can find the direction (100-200km)

e) Listen for 3cm beacons you normally can not hear

f) Listen for 3cm beacons you normally can hear weakly (max. 100km).
Rotate your dish to maximise the scattered signals back from the beacon.

g) Watch the 3cm band on 10368.050 to .150MHz

h) Make tests with another 3cm station that will act as a 'beacon' for you.

i) Check the DX-cluster.

k) Check the maps in the web.

For scatter at longer ranges, remember that your 3cm LNA can "see" up to 450km if there is something happening at 10km altitude. This is much farther than the visual range, which under normal weather conditions may be only 20 to 30km; even when it is very clear the visual range may be only

120 km. For distances up to 450km, you can only use items g) to k) to help you find a scattering centre.

Talk-back frequencies
During recent years many fixed stations have become QRV on 3cm via RS. Not too many portable stations are active now, because a super site is not necessary for RS, and also the /P talk-back frequencies 144.390MHz and 432.350MHz are not used too much any more. Some years ago they were frequently used from portable stations to make skeds and carry talk-back traffic. Instead, more use is being made of the DX-cluster, the Internet and the phone.

Operating technique for RS

As soon as your dish is in the right direction to a scatter zone you should check the range 10368.050MHz to 10368.150 MHz for signals. If you hear nothing, you can start to call CQ yourself. It makes sense to transmit also the WW-Locator and a carrier for some seconds at the end of the transmission. The first CQ call should not exceed more than 3 minutes. If nobody answers, you can call again for 5 minutes and so on. The scatter zone often moves out of the beam within 10 to 15 minutes, and then you need to correct the direction again. If there is still no response, it could be necessary to find the right scatter zone again, or just to call CQ again. If you answer to a CQ call, you have to give the chance to the CQ calling station to optimise the dish bearing and elevation. With weak signals this is quite difficult on SSB, so it is better to send a carrier for 30 to 40 seconds or to send a string of dots. Now you can complete your QSO by exchanging callsigns, WW-Locator and signal reports, and perhaps also QTF and elevation. For example:

G3LQR DE DL3NQ RRRRR
FB...UR RST 52S 52S 52S
LOC JN49IN JN49IN JN49IN
QTF 294 294 294 EL 05 05 05
--HW? G3LQR DE DL3NQ AR K K.

For your report in the RST system, instead of the "T" number the letter "S" is used when working via RS - for example 59S (like 59A for aurora QSOs). 599S does not make much sense! Using this standard QSO text, and always in the same order, makes it easier for less experienced CW operators to copy. It is also important to use SLOW speed CW with a maximum of 60 lpm (12 wpm). With weak signals 40 lpm is even better. If you use SSB and the signals are marginal, it could be helpful to use other words for spelling,
e.g. Alfa -> America, Golf -> Guatemala, Oscar -> Ontario, Victor -> Valencia.

If you hear two stations in an RS QSO, just send "SSS SSS SSS" (S for "scatter") a few times in CW. The other stations will hear that you are there and you are waiting for a QSO. Their QSO is not being disturbed too much by your "SSS".

FINAL

I have counted the number of days with RS over central Europe ("JN" and "JO" field) over the last years:

1996	1997	1998	1999	2000	2001
58	87	199	258	225	221

In 2001 more than 250 different stations were QRV via 10 GHz rain scatter in central Europe! 2002 has already brought a highlight: a new word record between DL6NCI (JO50vi) and IW4CJM/p (JN72ma) was made with a SSB QSO via RS on June 20th 2002 at 1802 UTC. IW4CJM/p was also heard by DF2CK (JO71, 1018km) and SP7JSG (KO01, 1168km!).

Enjoy this mode! Günther, DL3NQ

Appendix

Diagram A (Normal Height) and Diagram B (Extra Height)

The diagrams show the hight of the beam versus the distance (from the own antenna). Diagramm A shows this for 3 different refraction indexes.
Diagramm B shows this for different elevations of your antenna.
The Total Height (H) depends from the Normal Height (Hn) and the Extra Height (Hz). The Normal Height (Hn) depends on the Distance (D) and the Index of Refraction (K). The Extra Height (Hz) depends on the Distance (D) and the elevation angle of the antenna (epsilon).

(continued on page 28!)

Microwave Europe

Editor: Simon Lewis, GM4PLM

Hello all and welcome to another edition of European Microwave News. It's been a particularly quiet period for radio at Creoch over the last month or so, mainly due to a very busy period at work. However, the poor weather has not given any encouragement to outside activities and it looks like summer 2002 will go down as one of the wettest on record in Scotland. We can only hope things can improve before the year end, at least the rainscatter operators will have had plenty of propagation (see news below)! The bands in general seem very quiet and the 6M band, another interest of mine, has been almost devoid of Sporadic E. With that wet and dreary theme I'll pass on the news for this month.

New World Rainscatter Record

Speaking of rainscatter, Jonathon HB9DRD /G4KLX reports 'On the 20th June 2002, DB6NI and DL6NCI (JO50VI) worked IW4CJM/P in JN72MA, a distance of 961kms. There is some belief that the QSO was a mixture of sea ducting and rain scatter, although QSOs of over 700kms were being worked over land at the same time. DB6NI is DL6NCI's daughter and had been licensed for three days at this point. What an introduction to amateur radio!

G3KEU Silent Key

The UK lost one of its most active 10GHz enthusiasts recently when G3KEU passed away on Tuesday, 14 May 2002. Tim Leighfield, G3KEU died of cancer in a hospice near his home in Swindon. He had entered the hospice just a few days before his death at the age of 71 years. He is survived by his wife Ena and his sons and daughters. His funeral took place at Swindon on the 22nd May and several microwavers were in attendance. Many of you already knew that Tim had been very ill with cancer over the past few months. He struggled on bravely but the last few weeks unfortunately saw a rapid deterioration. Our thoughts are with his wife and family. Plans are afoot to set up a lasting memorial to Tim, possibly in the form of a beacon (GB3KEU ??) and/or a contest trophy. Peter Day G3PHO would be interested to hear of any suggestions. He can be contacted QTHR.

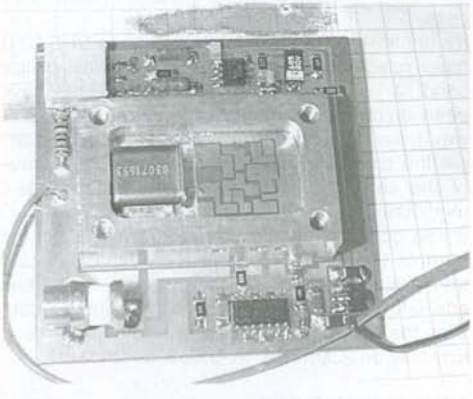
Product News. Our friends at Eisch Electronics report that their 24 GHz waveguide switch is again available. They have a new Italian fabricator supplying the switches again. The specifications say the switch has an insertion loss of <1 db and an isolation of >45 db. The construction is as per the advert in their catalogue. The price is Euro 190. You can order a catalogue or view their stock online at their webpages.

New feed from WiMo

Wimo Electronics send news that they have produced a new RHCP 2.4 GHz Satellite Feed for OSCAR use. The feed comes terminated in an N socket (SMA on request) and is totally waterproofed. Spec's are 9.5 dB gain, 63 deg beam width using right hand circular polarisation. Power handling is 100 watts. More information can be found at their webpage's.

New 10 MHZ OCXO Design

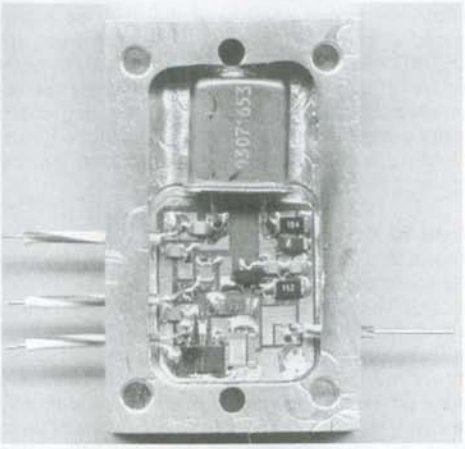
News of a new 10 MHz Ovened oscillator from Germany popped into my email this week. Walter DC9UP writes 'A long time ago I have been talking about the availability of surplus OCXOs over here in Germany and Europe to gain the needed stability for my DSP-10 transceiver project. There are none on the surplus market over here, and if, they are very expensive. This situation brought us up to start the development of an new, affordable OCXO in the low-price range but with all the possibilities and specifications of the "high-society" high-priced units. For more then 6 weeks Walter and I have been working hard (outside our normal daylight duty) to find a solution who is able to compete with the specs of the OCXOs found on the market. Now we have finished the design and have been building the first units. Lots of problems needed to be solved. One of the biggest problem was the design of the heater. It was a nightmare, but after all we are able to keep the temperature variation of the oscillator cavity below 0,06 degrees Celsius during an day-night cycle due to a special oven-cavity and regulation circuit.



OCXO by DC9UP

The unit is also voltage controllable to be steered by a GPS RX and his interface-board, like the one from Brooks Shera, W5OJM.Its over now and final

tests have begun. The results so far satisfy our goals. For those who like to see more, take a look on our website.



Inside the OSXO

For even more information please contact me by e-mail' 73 Walter. DC9UPgermany@aol.com

GM VHF NFD Report

David GM44WLL reports; 'I was operating with Jim MM0BQI from my usual /P site at Lauder Common (IO85NR).Our main entry was on 6m, 4m and 70cm, with secondary entries on 23cm and 2m. Jim operated on 4m and 6m with some success, but my activity on 70cm went downhill after a few hours when the tuning spindle on the IC735 driver locked solid. I turned my attention to 23cm instead, using 2m to drum up skeds with some success.

It's unfortunate that the rule changes to VHF NFD have relegated 23cm to the role of last-choice band, a couple of years ago there would have been much more activity. Unfortunately I was away from home in the previous week and didn't get the chance to drum up any skeds in advance of the contest! Conditions also seemed at best mediocre.

It was good to hear another entry from GM in the form of GM6MGS/P, operated by Alan GM4ZUK from Cairn O'Mount. As ever, having more than one GM station QRV helped both of us by doubling the work done to attract beams northwards.

End tally on 23cm was 11 QSOs, as follows:

G4LIP/P JO01 @ 582km
G0RRJ JO01 @ 551km
G4NBS JO02 @ 433km
G4KIY IO92 @ 395km
G3OHM/P IO82 @ 375km
G3ZME/P IO82 @ 352km
G3CKR/P IO93 @ 293km
GM6MGS/P IO86 @ 136km
MM1CXE IO86 @ 51km
MM3CXE IO86 @51km
GM8BDX IO85 @ 33km

I guess "not bad but could do better" sums it up. Lessons for next year:

i) Get the finger out in advance and make skeds with fixed stations

ii) Get the voodoo working for some better conditions

iii) More power, to wake up the softie southerners

iv) More metal in the sky (maybe a second 67ele WiMo)

If possible, drop me a note in advance for a sked or give me a ring during future contests: 0771 982 8537. Alternatively give me a ring beforehand on 01968 677868. 73 es gd dx de David GM4WLL'

9H Microwave Activity

During this summer, mainly on the weekends, 9H1BN Mark and 9H1LO Stanley will be active from a portable setup (JM75) operating various microwave bands and modes. We are therefore looking for possible skeds with amateurs along the Mediterranean coast so we can possibly have a QSO. These are the modes and bands on which we plan to be active:

10GHz SSB 10GHz ATV 1296MHz SSB
Oscar 40 Satellite (Mode U/S)
2.4GHz SSB (RX only - cross band with VHF or UHF)
432MHz SSB and FM - 144MHz SSB and FM

Equipment will be various dish and yagi antennas, transverters and homebuilt gear!

Anyone interested in contacting us kindly send an email and give us details of your setup (frequencies/modes covered and Grid Locator ect) so we can set up a sked and get the microwave bands running in 9H!!!!!!

Kindly contact us on
mark101@global.net.mt (9H1BN) and/or
stanley@nextgen.net.mt (9H1LO).
Operators that happen to be active on a band or go out /P unplanned can send us an SMS directly on +35699406050 and we will go straight onto your frequency and direction!!!
Thanks for your participation and enthusiasm and hope to meet you on the air,
73's de Stanley Grixti - 9H1LO & Mark Farrugia - 9H1BN

9H1LO 10 GHz ATV Beacon

Latest activity report is a new 10ghz atv beacon from my QTH Locator is jm75ew, the antenna is a 60cms dish pointing towards sicily (13deg from my loc), power is abt 65mW Hopefully will be adding 1.2ghz too and omni-dir antenna for 10ghz
Here is a screenshot of the test card

9H1LO ATV beacon

New World 3.4GHz EME Record

Al Ward, W5LUA, made a two way CW EME contact on the 9cm band with OK1CA in Czechoslovakia on the 13 June 2002. The distance between Al in EM13QC and OK1CA in JO70GM, is 8553 km.

Beacon News

The GM4ISM personal 9cm beacon in IO86 on 3400.067 has been switched off due to concerns over RF exposure levels reports Mark GM4ISM. Until I can borrow a hazard meter that covers the apropriate range, it must remain off. I have to demonstrate (by measurement!) that no-one can be cooked! (even though people do not generally go within 20m of the antenna) Calculation shows that the RF level is 50 % of Icnirp public exposure within 1m of the antenna.. at the maximum op of the PA excluding losses!. There is no possibility of exceeding exposure limits other than by climbing up and hugging the antenna, and then it is doubtfull that SAR limits would be exceeded. Still someone may do that I guess! Still such is the way of the world. I will let it be known when the beacon is QRV again. 73 GM4ISM

Operating Reports

1296MHz, 6./7.7.2002

S50C - JN76JG

IK2YSA/1	JN34	626
OM3CLS	KN09	519
YU1EV	KN04	463
I0FHZ	JN62	458
OL7Q	JN99	457
OK2KYC	JN99	439
OM3KHE	JN99	435
OM3W	JN99	398
OK1KPA	JN79	395
OK2KBA	JN89	374

S55M - JN65XM

IK2YSA/1	JN34	546
OK2KYC	JN99	544
OK2KRT	JN99	544
OM3KHE	JN99	540
OK2KJT	JN99	529
F1NSR/p	JN34	519
OM3KII	JN98	491
OL2R	JN89	482
HG5FMV	JN97	449
IK7XXG/7	JN71	445

S53D - JN76BD

IK2YSA/1	JN34	573
F1NSR/p	JN34	554
DH1NAX	JO50	516
DK0NA	JO50	503
OK1KIR	JO60	490
DL6NAA	JO50	486
DF0MTL	JO60	485
OK2KJT	JN99	465
OM3W	JN99	442
I0UGB	JN62	425

2304/2320MHz, 6./7.7.2002

S53D - JN76BD

IK2YSA/1	JN34	573
I0FHZ	JN62	423

S55M - JN65XM

I0FHZ	JN62	354
IW6ATU	JN63	227

5,6 GHz, 6./7.7.2002

S55M - JN65XM

OE5VRL/5	JN78	325

IW6ATU/6	JN63		227
S51ZOJN86		224	
I4CVC	JN54		212
I3CLZ/3	JN55		209
I3ZVN/3	JN55		209

10 GHz, 6./7.7.2002
S55M - JN65XM

OM3BH	KN09	622
OK1UFL/p	JO70	585
SP6GWB/p	JO80	569
SP6MLK/p	JO80	569
OK1KIR	JO60	558
OK1JKT	JO60	550
OK1VAM/p	JO60	547
IK2YSA/1	JN34	546
OK2KRT	JN99	544
OK2BFH	JN99	544

S50C - JN76JG

IK2YSA/1	JN34	626
OM3BH	KN09	519
OK1JKT	JO60	478
OK1VAM/p	JO60	478
SP6MLK/p	JO80	469
SP6GWB/p	JO80	469
I6PNN/6	JN72	462
DL0UL	JN48	462
OK2PWY	JO80	443
OK2BLE	JN99	438

73 gd dx de Matija/S53MM

Websites

Wimo Electronics – http://www.wimo.com
Eisch Electronics – http://www.eisch-electronic.com
DC9UP 10 MHz OXCO - http://www.walter-schroeer.de/id24.htm

Items for inclusion should be sent to:

Simon Lewis, Creoch Farm, Ochiltree, Ayrshire KA18 2QH, Scotland, U.K.

gm4plm@emn.org.uk
http://www.emn.org.uk

---------- end

Rain Scatter on 10 GHz

DL3NQ, D. Vollhardt

Continued from page 24:

Normal Height (Hn)

We start with the case of 0 degrees of elevation (epsilon = 0) and K = 1 (line-of-sight path). Diagram A shows that the beam reaches 10,000m of altitude after 360km. This is possible in clear winter nights. More interesting for us are the summer months with K > 1. A K value of 1.33 is reached from March to October in 65% of all cases. With K = 1.33 or more, the 10000m height is reached after 410km. With K = 2 (typical for inversions) 10000m is reached after 490km (probability of 25%). Typical tropo ducts occur if K is >10 - but these ducts over several hundred kilometres do not appear together with the bad weather needed for RS. 10000m is the normal altitude of the tropopause in central Europe during the summer months. 12000m is reached only in few cases, for example over the Alps in Europe.

Extra Height (Hz)

If the antenna is being elevated vertically (epsilon > 0), the Extra Height (Hz) appears (see Diagram B). With epsilon = 4 degrees and 100km distance we get Hz = 7000m and Hn = 500m (see above). This makes a total height of 7500m. This is an altitude that most thunderstorms reach without any problem. If you have bad take-offs in some directions (houses, mountains, trees) and need to work with e.g. 15 degrees of elevation, you can see from Diagram B that 8000m of altitude is reached after 30km. So with a scatter zone in the right place it is still possible to work stations up to 400km on the other side. The window to work via this scatter zone may be open from 20 to 60 minutes, depending on the speed of the clouds or thunderstorm. (end)

Microwave Parts

There is a new SMD 24 GHz power amplifier chip CHA5093TCF available from United Monolithic Semiconductors. It is very interesting as it gives about 1 Watt Output (19dB gain) on 24 GHz. The pice should be around 130 Euro. Using 4 or more of these units it should be possible to get the power level for rain scatter or even EME. Die Firma UMS hat einen SMD Chip Verstärker CHA5093TCF neu im Programm. Er liefert 1 W (19 dB Gewinn) auf 24 GHz und kann gelötet oder geklebt werden. Der Preis soll um 130 Euro liegen. (Weitere Infos: www.ums-gaas.com)

24-26GHz High Power Amplifier

Preliminary

GaAs Monolithic Microwave IC in SMD leadless package

Description

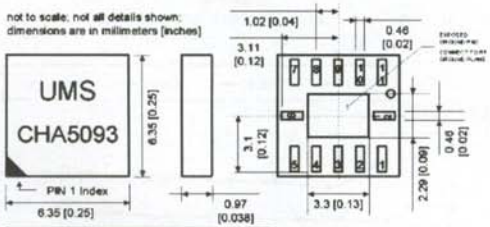
The packaged monolithic microwave IC (MMIC) is a high gain three-stage monolithic high power amplifier. It is designed for a wide range of applications, from military to commercial communication systems.

The circuit is manufactured with a PM-HEMT process, 0.25µm gate length, via holes through the substrate, air bridges and electron beam gate lithography. It is supplied in a new SMD leadless chip carrier.

Main Features

- Performances: 24-26GHz
- Gain = 19dB (typical)
- Output power (P_{-1dB}) 29dBm (typical)
- SMD leadless package
- Dimensions: 6.35 x 6.35 x 0.97 mm^3

SMD Package Dimensions

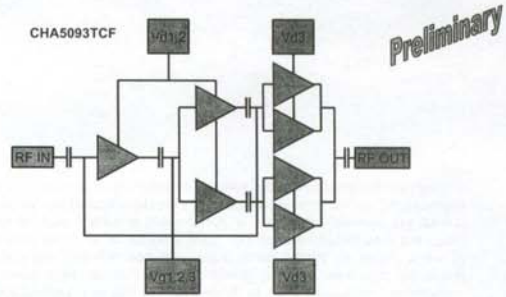


PIN	Function	PIN	Function
1	NC	7	NC
2	Vd1, Vd2	8	Vd3
3	NC	9	NC
4	Vd3	10	Vg1, Vg2, Vg3
5	NC	11	NC
6	RF out	12	RF in

"Please note that PIN 1 is located in the lower left corner of the package (front-side view) for all SMD-type packages from United Monolithic Semiconductors. It is indicated by a triangle on the package lid. Starting with PIN 1 the other pads are numbered counter-clockwise (front-side view). ATTENTION: The dot on the backside of the package (i.e. side with metallic pads) is just for fabrication purposes and does NOT indicate the location of PIN

United Monolithic Semiconductors S.A.
Route Départementale 128 - B.P.46 - 91401 Orsay Cedex France
Tel. : +33 (0)1 69 33 03 08 - Fax : +33 (0)1 69 33 03 09

Schematic



Typical Bias Conditions

for an ambient Temperature of +25°C

Symbol	Pin No.	Parameter	Values	Unit
Vd1,2,3	2, 4 & 8	Drain bias voltage	6	V
Vg1,2,3	10	First, second & third stages gate bias voltage	-0.4	V
Idd	2,4 & 8	Total drain current	600	mA

All other pins are not used for this device.

Absolute Maximum Ratings

Tamb. = 25°C (1)

Symbol	Parameter	Values	Unit
Vds	Drain bias voltage_small signal	6.0	V
Ids	Drain bias current_small signal	1200	mA
Vgs	Gate bias voltage	-2 to +0.4	V
Vdg	Negative Drain Gate voltage (= Vds – Vgs)	+8	V
Pin	Maximum peak input power overdrive (3)	+12	dBm
Ta	Operating temperature range (4)	-40 to +70	°C
Tstg	Storage temperature range	-55 to +155	°C

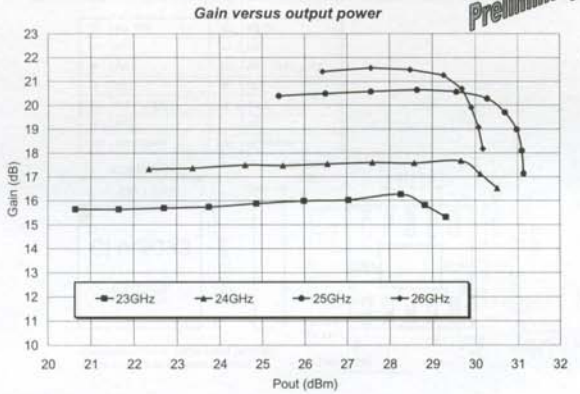
(1) Operation of this device above anyone of these parameters may cause permanent damage.
(2) 6V recommended for up to a max of 1dB gain compression.
(3) Duration < 1s.
(4) Upper temperature limit strongly dependent on motherboard design; ratings given for ideal thermal coupling

Route Départementale 128 , B.P.46 - 91401 ORSAY Cedex - FRANCE
Tel.: +33 (0)1 69 33 03 08 - Fax : +33 (0)1 69 33 03 09

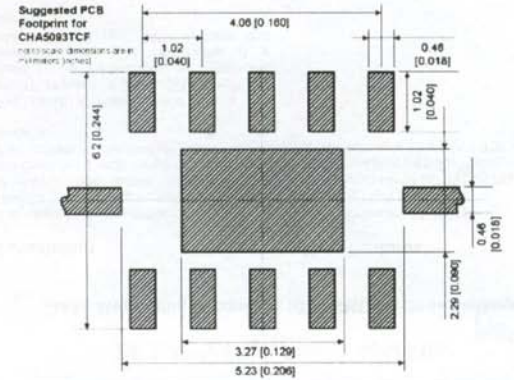
Typical results on PCB (recommended motherboard layout)

Vd=6V, Id adjusted at 600mA

Preliminary



Footprint



Route Départementale 128 , B.P.46 - 91401 ORSAY Cedex - FRANCE
Tel.: +33 (0)1 69 33 03 08 - Fax : +33 (0)1 69 33 03 09

Application note

Preliminary

The design of the motherboard has a strong impact on the over all performance since the transition from the motherboard to the package is comparably large. In case of the SMD type packages of United Monolithic Semiconductors the motherboard should be designed according to the information given in the following to achieve good performance. Other configurations are also possible but can lead to different results. If you need advise please contact United Monolithic Semiconductors for further information.

SMD type packages of UMS should allow design and fabrication of micro- and mm-wave modules at low cost. Therefore, a suitable motherboard environment has been chosen. All tests and verifications have been performed on Rogers RO4003. This material exhibits a permittivity of 3.38 and has been used with a thickness of 200µm [8 mils] and a 1/2oz or less copper cladding. The corresponding 50 Ohm transmission line has a strip width of about 460µm [approx. 18 mils].

The contact areas on the motherboard for the package connections should be designed according to the footprint given above. The proper via structure under the ground pad is very important in order to achieve a good RF and lifetime performance. All tests have been done by using a grid of plenty plated through vias with a diameter of less than 200µm [8 mils] and a spacing of less than 400µm [16 mils] from the centres of two adjacent vias. The via grid should cover the whole space under the ground pad and the vias closest to the RF ports should be located near the edge of the pad to allow a good RF ground connection. Since the vias are important for heat transfer, a proper via filling should be guaranteed during the mounting procedure to get a low thermal resistance between package and heat sink. For power devices the use of heat slugs in the motherboard instead of a via grid is recommended.

For the mounting process the SMD type package can be handled as a standard surface mount component. The use of either solder or conductive epoxy is possible. The solder thickness after reflow should be typical 50µm [2 mils] and the lateral alignment between the package and the motherboard should be within 50µm [2 mils]. Caution should be taken to obtain a good and reliable contact over the whole pad areas. Voids or other improper connections, in particular, between the ground pads of motherboard and package will lead to a deterioration of the RF performance and the heat dissipation. The latter effect can reduce drastically reliability and lifetime of the product.

Route Départementale 128 , B.P.46 - 91401 ORSAY Cedex - FRANCE
Tel.: +33 (0)1 69 33 03 08 - Fax : +33 (0)1 69 33 03 09

EME News

Editors: Bernd Wilde, DL7APV
Heinz Borde, DM2BHG

50 MHz

ZS6WB and I (W7GJ) decided to test out how possible it might be to complete on 6m EME with JT44 now that cndx have degraded since our contact 6 days ago. Not only did we complete again, but W7ALW also tail ended to work Hal for his first 6m JT44 contact.

It was quite interesting to note that I first copied callsigns from Hal on his THIRD ground gain lobe when his moon was up at 18 degrees! I have always been a strong proponent of using a single yagi's SECOND lobe, but copying him so early really surprised me. I think maybe I might have had extra ground gain on my moonrise that made that possible.

Hope to see more DX activity on 6m EME now that JT44 is available to use as a tool! VY 73, Lance, W7GJ

144 MHz

Otto and Paul, Part 3.

Otto decides how to set up his new cross yagi array.

Last issue we could read, that Otto decided to set up a new EME array and that he ordered 4 cross yagis. The question now is, how to use this new antennas. As Paul, the experienced EMEer told him, there are several possibilities:

The most common and most simple method is, to build them up as a + and switch with an additional relays between horizontal an vertical polarity. You can follow faraday and the worst case is a loss of 3 dB (instead of 20dB with an i.e. horizontal array). More about this configuration and how to deal with a metallic H-frame see in DUBUS 1/96: A Switchable Polarity Array For 144 MHz (by SM2CEW). Of course you can do even circular polarization with your x-yagis. The other station will hear you always the same, independent what Faraday is in that moment, but to obtain the same signal strength in comparition to switchable TX-polarization would require 3 dB more transmit power.

A more advanced possibility has been shown in DUBUS 1/1996 (Switchable Polarization For Cross Yagis (by DJ9BV) that enables you to switch in 45° steps. Herewith you are able to overcome the problems coming from 45° spatial offset.

Next step of sophistication would be to have the antennas as a X and bring both RX-lines down to your shack and build an equipment to move the phase for RX continuously (see : "An Differential Phase Shifter for the Receiver" and "Polarization Control for the Receiver with Diode Mixers" by SM5BSZ (under http://ham.te.hik.se/~sm5bsz). Tx switchingis done by the help of Lambda 6/4 hybrids and switchless combiners (see also SM5BSZ's home page).

The most advanced system for RX is to use LINRAD (LINUX-RADIO by SM5BSZ). All filtering, selection, DSP-ing a.s.o. is done by a Computer

Around 2-m-EME

DF2ZC in March: finally a perigee with no high winds here. Only some one-way propagations nearly drove me mad: Though, some new grids, some new QRP-stations worked.

I'm particularly pleased finally working JF4TGO/8 who is QRV with just 400 Watts and two 3wl-crossyagis. Shinobu told me I am his first 4 yagis station worked. He was audible quite well. I will place realmedia-files of most of the QSOs on my web site. Also worked DH7FB who is QRV with a GS35 and only two 9 ele TONNAs.

GJ0RUZ put a good signal here at times but calling them prooved to be unsuccessful given their bad QRM situation. Here comes my QSO-list:

23 March

1500-1530 JR5JXV O/- NC had both call signs many times but never got a report

1530-1600 JR7JPM O/RO C Ini 141, not loud but o.k.

1600-1630 RN6MT O/RO C Ini 142, much QSB but in peaks very loud 15 dB

1942-1944 KB8RQ RO/O C Random 18 dB

2100-2130 UA3TCF -/- NIL Just traces on my fft

2300-2308 KC4VI O/RO C Grid 523, Ini 143, easy and very loud: 18dB

24 March

0000-0024 S57TW RO/O C max. 12 dB Ini 144

0040-0050 PA5MS RO/O C Random after his QSO with S52LM Ini 145

1400-1424 JR5JXV O/RO C not so strong as the day before, Grid 524, Ini 146

1500-1530 JF4TGO/8 O/-- NC good sigs 8 dB at times but he had NIL from me

1930-1942 ON7UC O/RO C 12 dB max, Ini 147

2100-2120 RA1ZC O/RO C 18 dB max, Grid 525, Ini 148
2238-2242 I2RV O/RO C Random, my CQ 12 dB
2255-2257 N1BUG RO/O C Random, 15 dB most of time
25 March
1700-1730 JF4TGO/8 O/-- NC again one-way like the day before now sigs even louder
26 March
1720-1755 JF4TGO/8 O/RO C finally!!! Grid 526 Ini 149
2200-2255 DH7FB O/RO C Ini 1502300-
2330 WA4NJP -/- NIL Lots of birdies on sked frequency
2330-2400 W4FF RO/O NC Frank didn't hear my ROs
27 March
0034-0036 N5BLZ RO/O C Random, 529
0044-0050 WA4NJP O/RO C Ini 151

Results from the R/U-stn March:

RA1ZC - had RN6MT, DF2ZC, DL2RSX and W5UN.
RA3IS - is active and wkd OK1MS, UR5LX, N5BLZ and RN6MT.
RK3FG - had new W5UN, SV1BTR, SM0NKZ, K1CA, JR5JXV, JH0WJF, S57TW, ES6RQ, W4FF and DM2BHG.
UA3TCF- all skeds not complete, sri
RA4AOR- new initials W7FG, PA5MS and SM0NKZ.
UA4API- added K1CA
UA4AQL- send word WB9UWA and K6AAW.
RN6MT - had initials JN1CSO, DF2ZC, SV1BTR, RA1ZC, PA0JMV, W7FG, RA3IS, DK8ZJ, VE1KG, N1BUG and WB0GGM.
UA9FAD- had new W5UN (new qth) and Random GJ0RUZ.
UT5ER - had new stn with ES6RQ and VE2JWH

Results from the R/U-stn April:

RA1ZC - wkd this new stn: SM4IVE, IK1FJI and 7K3LGC.
RA3IS - very active...I2FAK, VE7BQH, UA9FAD, F1FLA, F3VS, LZ2US, RU1AA and UA4API.
RV3IG - only RA1ZC new. contest 7 QSOs
RW3PF – initials: W5UN, WA2FGK and KB8RQ
RA4AOR - had new VE1ZJ and DL8GP (?).
UA4API - contest 12 QSOs
UA4AQL - added LZ2US, 7K3LGC, F1FLA and VE1ZJ.
RN6MT - wkd new WA2FGK, UX3LV (equipm. UR5LX), VE1ZJ, WA4NJP, DK9ZY, DM2BHG, S51UE (?), F/G8MBI, UY5HF, UA3MBJ and YU7BCL. contest 40 QSOs
UA9FAD - added RA3IS and JT44 W7FG and WA8CLT. contest 5 QSOs
UA9YLU - worked IK1FJI, I3EVK, IK2DDR andUA9FAD - added RA3IS and JT44 W7FG and WA8CLT. contest 5 QSOs
UA9YLU - worked IK1FJI, I3EVK, IK2DDR and LZ2US
info - UX3LV is the son of UR5LX
UA4AQL have now full Elev and 4x13 el BVs.

Results from the R/U-stn May:

RX1AS cfm qso with JH0VJW, LA8KV, SV1BTR and UA4AQL.
RA3QTT - had contact with WB9UWA #51.
RK3FG - had new IK1FJI, I3EVK, LA8KV and JH0VJW.
RW3PF - had this new stn : PA0JMV, UR5LX, OH7PI and RA4AOR.
RA4AOR - had YO4FRJ #122
UA4AQL - is glad to have wkd 7J6CUU, JN1CSO, KC4VI, PA2CHR, S53J,
RX1AS - IK7EZN, PA0JMV, YO4FRJ and WA2FGK #83.
RN6MT - added LA8KV, SM3PWM, JH0WJF, KC4VI and I1ANP #116.

Results from the R/U-stn June

RA1ZC cfm QSO with UA4AQL.
RA3IS - from may and june: DL5MEA, RX1AS, UT5ER and UA4AQLL
RA4AOR - wkd OZ4MM
UA4AQL - cfm this initials: RK3FG, RZ3BA/1, SV1BTR, 9H1PA, G4LOH, RA1ZC, DL9MS, W3EME, DL8GP and RA3IS #93.
RA6MT - wkd: OH7UC, W0PT and DK3BU #119.
UA9FAD - added OK1VVP.

Results from the R/U-stn August

RX1AS - added ES8X and OH1FF.
RK3FG - wkd WSJT, and in cw IZ5EME, SP2OFW and DL7FF #113.
RA4AOR - no new stn
UA4AQL - had new JR3REX, DK3BU, DK8ZJ, VE1KG, SM5IOT and IZ5EME.
RN6MT - wkd new stn with RA3BA/1, SM7WSJ, IZ5EME and SP2OFW.

WB9UWA reported:
March 23
I5MZY nil sked, JN1CSO O O 15db sn (2 hz bandwidth Conrad, in case you forgot my previous post(s)) Sent 539 Initial #206; UA9YLU nil. line noise. UA3TCG nil. line noise.
March 24
PA2DWH O O 8db sn (2hz bw) Nice single yagi contact. Initial #207; LU6KK nil on two skeds. Array problems? N1BUG O O 12db sn. Good on random.
March 25

GJ0RUZ O O 8db sn. Neither quick or easy, but finally good contact in last hours. Lots of chasing. Most of the time it was hard to copy Conrad. Initial #208; UA4AQL O O 10db sn. (still 2hz bandwidth). Initial #209; N5BLZ O O 12db sn R539 S519. Ed is always good for a quick QSO.
March 26
RU1AA JT44 random. A quick digital contact. WA8CLT JT44 -15db (s/n 2.5khz bandwidth) Another quick digital contact even with poor faraday. IK1FJI OO 12db sn random.
March 27
N5BLZ O O 20db sn!! SM2LKW nil; K9KNW JT44 -18db (copied 73's at both ends at 500 watts). Initial #210; W7FG JT44 -13db (20db sn on FFTDSP 2hz bw) This guy sends copiable text even when faraday is nulled; DL1EJA O O 15 db sn. K1JT JT44 -24db. Initial #211 A 2 faraday peak contact with text building (averaging) as it went along. After the contact, Joe said I was louder then ever. I may have set the sced too soon (moon-set), but I needed to keep my elevation high.

K6PF reports:
I ran some skeds & worked a couple of random stations during April 20 & 21. I'm assuming W5UN now operational at his new QTH is a new initial. Therefore, hv 3 new initials & 3 new grids. Here's a summary.
April 20:
0054z W5UN RO (sent) /O (rcv'd). COMPLETED random for initial #129 & new grid. 0100z LU7DZ – nil; 2030z SM2BYA – nil; 2100z ON7UC – nil; 2130z KJ9I O/RO. COMPLETED for initial #130 & new grid. Beautiful signal fm Dave peaking 20dB snr during 2 sequences. 2200z F/G8MBI – nil; 2230z F8DO – nil; 2300z DD0VF – nil; 2330z S57TW -copied partial calls & maybe a couple of O's but not sure.
April 21:
0005z F3VS RO & 579 (sent) /O. COMPLETED random. Claude's signal peaked at 23dB snr, WOW! 0130z LU7DZ O/-. Not completed. Only copied Eduardo during his first 3 sequences. 0400z VE2JWH O/RO. COMPLETED for initial #131 & a new grid. Jimmy's signal peaked at 12dB snr. During both days, I had a tremendous amount of terrestrial noise during moonrise up to 20 degrees elevation & lots of QSB at all times.

Z30B (April 20) I found excellent conditions on 2 m. EME today evening. Three new initials have been worked:WA4NJP, KJ9I, DF2ZC.

E20NGF: Hello all, this is E20NGF and team. we were very dissapointed!! First of all i just got back from Kanchanaburi which is 180 km from Bangkok (thai capital city) and I was going to operated there during last weekend but we had a very serious problem so i was not ready to operate. I am so sorry deeply for every Sked that we made. It was my fault that i think we can get every thing done by the Sked time. So i leave the matching until i get to Kanchanaburi so i can match our antenna at the real place.
Problems are /Reason:
1. There was no electricity at all so we had to hire the electric generator which costs 2000BHT per day which is 50 USD it is not much for some of you, isn't it? But to us according to the lowest pay in Thailand is 22 BHT or about 50cent not even 1 USD so how do you think? We hired it for 2 days and we did not operate it (waste of money).
2. First we were not going to use the elvetion rotator but finally we thought we could do it. So we put the antenna down from the tower and we installed it and finally we made it so (that is why we took so long for this).
3. About the Preamp we were going to use: The xxxx (can't remember the type of transister) instead of MGF1302 because we could not find it in Thailand!! But finally we found an MPF102 so we changed it. But we could not get this done before the Skeds.
4. At he place that we useed to set the EME station there is no internet connection so did not know what was going on outside! I went to use the internet once to cancel the Sked with W5UN just 30 mins before the Sked, because i have to go to town to the internet cafe which is hard to find! So i am really sorry about it.
5.The matching problem: Since I use the DK7ZB desig, I have to insulate the elements from the boom. I let my friend do the screwing part and a few minutes before we put up the antenna I checked whether the insulation was o.k. to the boom and it was non-ionsulated to the boom so I had to change the matching design to the Gramma match but could not make it.
6. Since some of the electronic components are very special we could not find them, eg MGF1302 and for the 700 w amp of DL1EJA we could not find some stuff for it. Even we got the high voltage transformer for it ,we did not order online due to the budget. So i got the tubes from DL1EJA finally. Due to the cost of transporation and everything we had to leave that place. So I hope we can get some more budget from the university for this and will see you off the moon soon and we will make sure that we get >1000% done before we make a SKED.

DD0VF:
Hello, the amp is still under bad cond - max 350W out. I was just able to spend 4 hours on sunday, but US/VE-activity was not so much like expected. 1910z I2FAK RO/O random (539)

2010z S51ZO RO/RO sked completed in 22min #91 The LT2S of Joze is +1khz. Almost weak but brief peaks 529 1-2sec, he run 4x14el 9bvopt.
2023z F3VS RO/O random (549)
2100z S57TW O/- not completed,hrd Bojan the 1st 20min always but weak,
hrd and called: W5LBT up to 529 WB9UWA up to 519 fb Jim! RN6MT "O" agn not catched, N5BLZ up to 529, DL1EJA "O", OZ1HNE up to 519hrd and not called: SM3PWM 529 while he called OZ1HNE, his trace was much fatter on dsp than the trace of Jorgen!

DUBUS-REF-Contest 2002

VE1KG: Found conditions quiet good here in Nova Scotia worked KB8RQ,W5UN & I2FAK.Only running 55 watts to 4X17M2.

KB8RQ: I would like to thank everybody who worked me in the contest. I am sorry if you called me and we didn't work. I thought conditions were very good in the contest. I worked 82 stations and nine new ones. The new stations were SK7MW, HA6NY, DL0UL, UX3LV, OH4LA, OK1VT, RA1ZC, YO4FRJ, RA3IS. I also ran with VK3FMD after the contest. Charlie has a single 14 element antenna and 400 watts. It was a very easy contact. Also worked VE1KG who had 55 watts in the shack and around 40 watts at his four 17 element M2 antennas. Serge was not very strong but could copy his signal ok to make the contact. Hope everybody enjoyed the contest. I only worked 7 station in US. Very low activitiy from US.

SM7WSJ: Bad conds yesterday! only worked 10 stations and sometimes also the big station wastion was pressed down in the noise, i could not find them on any polarisation. Last days we have had Aurora so it have been good signals down to PA, ON, EW also yesterday we had that problem to deal whith. I heard a couple of stn i could not call because i had to take care of my daughter and i never have the PA on when she is in the room. Worked (only big stn so guess if i had trouble): OK1MS, RU1AA, I2FAK, JL1ZCG, G3ZIG, KB8RQ, W5UN, F3VS, HB9Q,OZ1HNE.
Heard not called SV1BTR 1S over noise, DL1EJA, LZ2US, SM5CFS, ??KCS, LZ??, YO??
I had many stn on my vertikal and it was completley silent on my horizontal part for long time. Sometimes it opened up and i had good own echo and super signals from the big guns, a real pleasure to hear W5UN again whith big 3 S unit signal over noise

DD0VF: still the amp problems are not solved, so 350W only: (I spend a few hours saturday night (utc) random:19:52 KB8RQ easy qso, 20:32 F3VS easy qso, 22:54 I2FAK easy qso, long time called: RN6MT 519 sometimes, what a surprise, never hrd him in skeds before called him 45 min, but only QRZ came back. Called W5UN - Daves sign was not more than a 4-yagi stn to me. Hrd: N1BUG (fb sign!), LZ2US, OK1MS, WA4NJP (loud), K2GAL (loud), EA3DXU, IK1FJI and some more I had forgot.

I3DLI: this year i was not very lucky, due a very bad high wind. I have been active only yesterday evening, April 21, between 18:30 -22:15 U.T.C. Anyway, it was a great fun, working on random, 20 stations, 18 of those,answering to my CQ and 5 new initials. I found excellent conditions on this range of time and i heard very strong signals .I'm sorry for a couple of stations that called me, as OH3--/p and another, but with heavy QSB, i wasn't able to readout the complete callsign.Thank you to REF and DUBUS, for so good contest and to all stations that called me on my limited activity.Hope to found good weather on A.R.I. contest and see you all there.

UA4AQL: During the contest i was testing my new array: 4x13 el. DJ9BV with full elevation. I had some TVI problems, so was active not all contest time. I've worked random 18 following stn's: JL1ZCG, I2FAK, RU1AA, LZ2US #64, F3VS, 7K3LGC #65, DL1EJA, KB8RQ, G3ZIG, DL5MAE, F1FLA #66, IK1FJI, W5UN, IK2DDR, OZ1HNE, OK1MS, WB9UWA, VE1ZJ #67. Heard: N1BUG, YO2AMU, SV1BTR, JN1CSO, RN6MT, LZ1DP, VE3AX, RX1AS, YO4FRJ, S53J, EA3DXU, K2GAL. I think there was very unstable conditions during the contest.

JN1CSO: Thank you very much for DUBUS EME contest. It was rainy, and there was noise in last contest, and SWR of the antenna as well wasn't good. My result of 2m EME.
20-4-02 W5UN, RN6MT, RU1AA, DK3BU, LZ2US OK1MS, DF2ZC, I2FAK, JH0MHE, F3VS, 7K3LGC
21-4-02
KB8RQ, JR3REX, JH2COZ, WB9UWA, WA8CLT #, VE1ZJ #, JA9BOH, RA1ZC, OZ1HNE, S52LM, S53J #, G3ZIG, YU7BCL #, LZ1DP, F/G8MBI #

EA3DXU: Definitely in daylight moon pass is just imposible to run 144 EME, for this reason I was only QRV after 22 UTC, only 2 QSO before this time, in my short activity period I saw excellent conditions from 00 UTC to moonset on 21 April with many and easy QSOs, final score 13 QSO and 11 M, all random CW.
20-04-02: F3VS, OZ1HNE, G3ZIG, WA4NJP
21-04-02:I2FAK, VE7BQH, F1FLA, RU1AA, W5UN, KB8RQ, S53J, S52LM

I2FAK: Dubus contest is over and I would like to thank to everybody that gave me a call. Conditions were unstable most of the time for polarity rotation sorry if I lost some of you . I hope to work in the future. I am really disappointed for the very low activity from the North America stations. I did work 11 US only. I leave to you the comment. I was

very pleased to complete with Serge VE1KG with his qrp power 55w. I did close the contest with 117 qso's and 40 multipliers. New stations: YO7IV, DL0ULT (take care Garry to the right call sign), SK7MW, UY5HF, YO3DMU, YO4FRJ, UX3LV, KC4VI, JR7JPM, DL7UDA, DH1TW, DL2BWG.

JH2COZ: Worked 14 QSOs and new 1 #QSO in the contest. The condx was one way prop for me. I was calling and calling many strong stations, but recvd "QRZ JR3... JR7.." or "J52COZ" or non. Yes, I'm JA BOY, not AF station, Hi.

Apr. 20 NA/AS window: not QRV, hrd : W5UN (Sri, Dave I was QRL..) EU/AS window: SM2CEW RU1AA, DL1EJA, 7J6CCU, I2FAK, LZ2US, hrd and called: hb9q, ok1ms, i3evk, f1fla, sv1btr, jl1zcg, 7k3lgc, jr3rex

Apr. 21: NA/AS: VE1ZJ, JN1CSO, KB8RQ hrd and called: wb9uwa

EU/AS window: YO2AMU, DH1TW#, G3ZIG, F1FLA, OH3AWW, hrd and called: dl5mae, ja9boh, jh0wjf, #ra1zc, #rk9cc, s53j, lz1dp, sv1btr, ok1ms.

ARI EME Contest 2002

-IK1FJI: I was qrv both days frm 30 degrees moonrise to moonset. I found quite good conditions but often up and down, with heavy qsb. i missed three stations very weak that receiving only QRZ from me...sorry. Anyhow i enjoy the contest and a lot of stations qrv from Asia and Europe, vy poor activity from north america i am sorry for that, any problems?? I had 61 random qsos, thanks to all who came back to my cq and the others that I had reply to their cq and all the stations active in the italian contest

-DL5MAE: I just want to thank everybody for the QSO/or call. The contest was lot of fun. My activity was not that high:1. Saturday afternoon it was very hot (30c) and too nice WX sitting all time in the radio-shack. 2. Saturday night a heavy thunderstrom kept me away completly from the station. However, sunday night was lot of fun and I did find high activity! Many thanks to the organizers of the contest for generating so much activity. About 40 QSOs (much more heard!) and very nice condx sunday night!

-PA3CMC: I was qrv several hours on saturday and sunday. Had a lot of fun and learned a lot. Worked: 18-05 I2FAK, F3VS, F1FLA #22

19-05 JH5FOQ #23 and RU1AA. Heard: SV1BTR, IK1FJI, DL1EJA, PA3DZL, N5BLZ, W5LBT, YO4FRJ, SM2CEW, 7K3LGC

-RU1AA: The propagation was exellent during Italian contest, especially on sunday evening. Unfortunately the activity was very poor. I could not wait for the end of the contest as nobody called me by sunday evening. So I've made 76 QSO's, 8 Italian stations. I'd like to thank all the Italian stations. I'd like to thank all the operators who called me. See you in ARRL contest .

-F8DO: Many thanks to organizers of Italian contest. Lot of fun in 4 hours. worked on random: IK2DDR, I2FAK, F1FLA, F3VS, IK1FJI, IZ1BPN. Heard: RU1AA HB9Q F9HS, OK1MS (called him several times), DL1EJA, I2RV, RK3FG, LZ1DP, OZ1HNE, EA3DXU, W5LBT. No great activity from USA. Sunday evening conds were vy good and I could hear sometimes my own echoes. Only 2X2.5 wl 1kw MGF1302

-RK3FG: My modest results of Italy contest - 26 QSO, 4 new QSO.

18 May: IK1FJI, 13.04, H pol., # 97, I3EVK, 20.49, H pol., # 98,

19 May: LA8KV,10.03, H pol., # 99, JH0VJW, 12.02, H pol., # 100 ! ! !.

The weather was bad. A very strong wind, rain and snow, big static electricity and May 19 my reception amplifier at 14.00 had alarm. I used new antennas system 4x18, cross Yagi, 5.3 WL, 3P602B, GS35B H and V pol. The new antennas system I is pleasant. Most important, that antennas were not broken ! ! !

Expeditions

GJ0RUZ (by G0RUZ). Well we are back home, firstly let me apologise to all those who's skeds we missed on the first day. Prior to leaving for GJ I had had a drawing of the dimensions of the site, the array should have gone up easy. We got there and found

1. A mast with a tribander and 5 ele 6m beam on it, this was a fixed tower
2. A GSM Cell TX!
3. A weather radar about 300m away
4. A 2m collinear on a scaffold pole
5. A triband 6/20/70 on a scaffold pole
6. Not enough holes for our feeders.
7. The space to be 1/3rd what I expected!

So there was no room for our antennas! We had to take down the tribander and 5 ele 6m beam, remove the broken rotator and 15 foot stub mast and replace it with our rotators and stub mast, the drop was 40 foot onto concrete and so I was pretty scared. The 2m and triband collinear was also and so I was pretty scared. The 2m and triband collinear was also removed. This took 6 hours due to the awkward location. Then we had to put up the frame for the 2 yagis, the GSM mast was at about 320 deg azimuth and was only 1m from the front or back of our array, the BPF and power fet preamp coped with this very well. Then we had to make some holes for the feeders which were 6m from the ground and we needed the ladders. The weather radar caused no problems at all once we had the BPF in line. The AZ rotator had water in the pot which eventually cleared up, this took a

few hours of peration, so our aiming was poor for the early stages.
So the first activity started and signals on RX were poor, in fact we never worked anything smaller than 8 yagis, I was very worried at stage. This continued all the first night and the noise floor was quite high for some reason.
At moonset we found a computer on in the shack with no monitor which was switched on, it was degrading our noise floor by 6-15db depending on azimuth! The backs of the yagis were only 30cm from the roof at 55 deg which was our max elevation, this was due to the height of the fixed tower.
The next day (24th) we were ready but I think we were locked out on rx. From the LZ1DP sked signals improved dramatically and we were even able to hear our echoes. Because of the lost time we only listened to sked stations for 15 mins and if nil we started to call CQ, we felt that this was a fair thing to do.We QSO'd 28 different calls on eme the majority we started to call CQ, we felt that this was a fair thing to do. We QSO'd 28 different calls on eme the majority were on Sunday/Monday morning. We had limited time for MS and tropo but the site was quite amazing for those modes and in fact we had a totally uncluttered horizon from moonrise to moonset. The conditions at rise were really bad on Sunday. All but 2 or 3 of the MS skeds were completed very quickly and we worked several more on random. The time on tropo was very rewarding but we only operated for about 1 hour total time.
I think that we will go back some time for 4 or 5 days to do some preparation work for a later GU expedition from Alderney, I am pretty sure that we will do this. Martin G4XUM and I operated around 50/50 and his contribution and experience of portable operation was indispensable, thanks a lot Martin.
My big regret was not being on for the JA boys, 9H1PA and F4AZF, sorry guys, I will return and probably with 4 x 3wl next time. I was also very disappointed with conditions for the Russian boys on Sunday.I also regret only having 11 hours sleep from Friday at 06 to Monday at 07 UTC, I am beginning to feel it.
I would like to personally thank Joe GJ0NYG and the members of the Jersey Amateur Radio Society who allowed us to use their nice warm shack and decimate their antennas, Lionel and Dave for sked coordination an distribution, Peter Rodmell at Linear amp UK for the loan of the amplifier which worked very well and gave us no problems and we hammered it! DF2ZC for the loan of the elevation drive (wanna sell it Bernd hi), PA2CHR for the loan of the 2 way splitter and Sandro I0JXX for making antennas so easy to assemble and disassemble for portable use. Of course last of all I would like to thank you all for calling. Sorry for those who felt that we were deaf (we were for a while) and those who didn't work us, we had a lot of fun but now I need to sleep for a while.
W2WD/0: Dear EME Friends, We were extremely disappointed that we could not help all the people needing a Nebraska contact towards their WAS via EME. It was not because of lack of effort. There were many Nebraska hams that worked very hard to get the two stations up and running in a short period of time. None more so than the hosts, Bill, K9RZ and Karen, N0KWH. They were there through the whole process of fixing one problem after another.
144 MHz: Antenna: two 2MXP28's fixed at about 5-degrees elevation
Preamp: MGF-1302 @ cross-boom. Power @ ant. 550 watts Xcvr: FT-767GX.
Stations heard: K9TI plus several others not identified.

LINUX for EME

Because LINUX is an alternative to WINDOWS and one will need it f.i. for usin LINRAD, here some voices which could help some newbes:

Terry, KJ7F: Before some one goes out and buys/downloads linux you should be aware of some possible pitfalls. Please note I am not a Windoze lover and I don't use "Look Out" or "Internet Exploder." I have SuSE 7.3 (8.0 is due out in days) and I am in the process of learning more about linux. I finally managed to get Linrad to work on my linux PC.
First, be aware that hardware that is working fine under Windoze may not work at all under linux. If you have an internal modem chances are good that it is a "Winmodem". Winmodem cards pass off the DSP processing to the host CPU and have windows specific drivers. If you have a winmodem, plan on throwing it out and buying an extenal modem that connects to your computer via an RS-232 cable. I found a used 56K US Robotics modem for under $20 on e-bay. There also "Winprinters" and other "Win" devices so the first thing you need to do is find out if the linux version that you are thinking of buying supports your existing hardware. SuSE didn't recognise my older STB PCI video card or my SoundBlaster 16 sound card.There are ways around these problems and you can count on learning a lot while you get these to work. Second thing to be aware of, software is not as easy to load and get working. You have to have the version for your distribution of linux and compile it for your PC.
Even if you follow the directions step by step things may not work without doing more learning. SuSE comes with ALSA sound card drivers and Linrad works with the ALSA drivers (except the ALSA drivers that come with SuSE.) So then you

may need to buy a different set of drivers from OSS in order to be able to run Linrad.
Figure on another $20 for the OSSSuSE.) So then you may need to buy a different set of drivers from OSS in order to be able to run Linrad. Figure on another $20 for the OSS drivers ($35 if you have a SB PCI512 sound card) and some more learning to get these working. If you are anything like me, don't put linux on the same computer you use windoze on and plan on reloading the system a few times while learning how linux works. I know I managed to destroy the system more than once because I did the wrong thing and didn't know how to get back to where I was. I'm not saying don't try linux, please do. Just go in with your eyes open and don't expect Nirvana.

Roger, W3SZ adds:

I have been using RedHat Linux in various versions here since September 2000. I decided to install Linux because I wanted to run Leif Asbrink's Linrad. I am happy I did so, because Linrad makes for an incredible 144 MHz EME receiver.

News and information's

Prague 2002

The 10th International EME Conference in Prague is over now. A report / results should be found under http://www.emeconference2002.cz

W5UN

W5UN is now active again from EM23MG with the "Mighty Big Array" (32 - 2M5WL Yagi's). The array has just been completed. First QSO was with KB8RQ, followed by N5BLZ, then on random, 9Y4/DL54MAE, UR5LX, and DM2BHG. The QSO's with KB8RQ and N5BLZ were made running QRP here (30 watts for KB8RQ, 75 watts for N5BLZ). Routine operation will begin. W5UN will transmit on 144.041 Mhz using one minute sequence. Operating time began March 31 at 0340Z. Operating will be limited by weather and track conditions here, as I have not yet surfaced the track, and it can become quite muddy and unusable during rainy weather.

SM5BSZ: During the 2001 ARRL contest we made some recordings of the signals coming from SM5FRH's big X-yagi array. Most stations are noise free during qsb peaks with this antenna and peak amplitudes can be measured accurately from the recordings. I have taken down the maximum value from several transmit periods of several stations and listed the corresponding ERP levels at this location:

http://ham.te.hik.se/~sm5bsz/arrl2001/levels.htmht tp://www.g7rau.co.uk/sm5bsz/arrl2001/levels.htmh ttp://nitehawk.com/sm5bsz/arrl2001/levels.htm

Most of the relative ERP levels are within +/-1.5dB or so. It will be possible, but very time consuming to extract ERP levels with better accuracy for something like 100 stations. If you were qrv during the time of the recordings you can check your own signal level to make sure it is like you expect in a comparision to other stations. If you run these files with linrad there is a direct readout of the peak power level for the station you haveselected (from version 00-40) 73,Leif / SM5BSZ

RA3IS is a new station on 2m-EME with 2x 19el LY X-pol (5wl-CEWs), 0.6 kW out

LA9NEA I will be qrv very soon with a singel 5,2 wl 19 el antenna.The re-building of the antenna system will start this spring, and look forward to be qrv with 8x 12 K1FO in October 2002. Hope to work many of you with the singel antenna...

SV1BTR: I'm QRV again. I am in the same locator, KM17vu. Antennas (2m only for now): 4*12jxx, H pol, full elevation, 1.5kw. I will upgrade for 144MHz to 4*15el. UWA for low sidelobes, H pol, by late June 2002. This qth, where i am staying since last June, is extremely windy and has qrn problems from 22KV power lines nearby from South to West. Due to tremendous take off of the new qth to the Meditteranean Sea, I also have imd problems inside 2m band from police repeater in nearby island, which produce terrible spikes every second, on 2m. These spikes can not be cut off with steep bandpass filters, and occur usually from afternoon to late night. Most quiet moon window is the EU window, US moon window has 12-15db more noise.

AF4LT is a new 4-antennas stn on 2m-EME

EA6VQ I'm not yet very far with my new array...I am collecting the last parts I need, (cable, etc) andI hope to start ensambling everything in some weeks. Hope to be back on EME in June, but this is still not sure...

E20NGF is a new 2-m-EME stn with 2x5wl and 200W

HB9Q remembers: don't forget to update your standings at www.hb9q.ch Any comment is welcome!

W5LBT: I have addes some pictures on my website of my Az and Elev encoders.
http://www.qsl.net/w5lbt

UR5LX: has got a new E-mail address: ur5lx@kharkov.ukrtel.net

UX3LV is the son of UR5LX

UA4AQL now has full Elev and 4x13 el BVs.

DK3WG is QSL-Mgr for: RU1A/RZ1AWT, RU1AA, RW1AW, RX1AS, RA3IS, RK3FG, RV3IG, RW3PF, UA3MBJ, UA3TCF, RA4AOR, UA4AAV, UA4API, UA4AQL, UA4NM, RN6MT, RK9CC, UA9FAD, UA9YLU, UR5LX and UT5ER. Please send your QSL and SASE to: J. Fiedler, P.O.Box 1531, D-15205 Frankfurt (O), GERMANY

W3EME: Finally! I am now back & ready to run again on 2 mtrs! Station has been rebuilt: IC756 Pro II & DEM converter8 x 15 K1 FO's (C3I) Power Dividers (LNA Technology: K3TV) Phasing lines

Andrews 1/2 " hardline (WA8WZG) 8877 final (Antenna Works: KA6NBC) 0.3 dB Preamp L145PM (MiComm) Rcve: Andrews 1/2 " hardline into 10 pole DCI filter into xvtrXmt Line: Xvtr into HP attenuator to 8877 to Andrews 7/8" hardline & short LMR600 rotor loop.

7J6CCU: The typhoon season is here on Okinawa. My array is down, and I'm trying to get situated with 2 yagis. I do not have a date when I will be ready to operate, but I will post it here. I will have all 4 yagis up again when it is much safer in November. Until then, I'll try to see what I can do with a 2 yagi system.

Once there was a chat about.....

Using fibreglass for long yagis (by Paul, N1BUG)

First I would like to thank everyone for the many responses to my question about drilling fiberglass. Also thanks to those who pointed out the potential problems with fiberglass booms. I respect the wisdom of those who have been working with antenna's (and fiberglass) longer than I have.

The fiberglass idea started out as a way to save money compared to conventional yagi construction. As usual I am trying to get the most gain I can on a very constrained budget. The difference in construction cost between fiberglass and conventional yagis using aluminum booms, when all is factored in, amounts to enough to allow me to realize approximately 1.5 dB more gain. Or so I thought.

However, fiberglass is starting to look a lot less attractive. I bought enough to assemble one of my proposed booms and have been testing it this week. I have found that it is far more flexible than I expected, and probably cannot be used for booms of my proposed length without multiple support lines (two sets above and at least one on each side). I was unsure how flexible the available material would be -- that is why I bought some for testing before jumping into this project with both feet. I am unwilling to use so many support lines to hold the booms straight due to the ice conditions we have in winter. I have never seen any type of line that would not ice up and add greatly to weight and wind load during an ice storm! I have tried many types over the years. I need a system that I know will hold up, as I am only going to get one chance at constructing this array. The cost savings of fiberglass also begins to disapper as the support system gets more complex.

I currently do not know how my contruction plans will change as a result of this discovery. I am considering a wide range of options at this point! All of them involve sacrificing gain and/or pattern for the sake of putting up something that I am confident will stay up.

Power zener diode

VE1KG: I am looking for a 12 volts zener diode 1N3311 50 watts dissipation to provide bias to 8877. Can anyone help me. KB7WW: The 2n3055 and small zener can be found here:http://web.wt.net/~w5un/8877-1.htm.
Look at the end of the article

SM7WSJ: Håkon, raised the question, under what conditions somebody could hear his own echoes

WB5UWA: With very good EME conditions, I have on a few different occasions seen my echo on FFTDSP and heard dashes easily and dots with great difficulty at 38 watts power level. My array gain was 18.5dbd and 100 feet of 7/8" hard line. The bandwidth was 22 hz. The best FFTDSP showed was 3db sn at 100 hz bandwidth for solid key down. For me, hearing echos at 300 watts and below happens very frequently. You may be able to improve on this by reducing your array height to an absolute minimum. Another good test is full power SSB echos. You should be able to marginally hear your SSB echos at times. I am estimating your array gain at 18dbd.

PA2DWH: I heard my own echoes (only...) once in superb conditions, but with 600 W into my single 10 element yagi. Btw I am dying to replace that antenna by a pair of X-pol yagi's of Antennspecialisten.

W2RS: I have tape-recorded an echo with 150W and 12.9 dBd, plus ground gain. Libration peaks were responsible.

EA6VQ: I have made a "glossary" for the Babylon-pro which contains a directory of over 77,000 stations and their QTH locators. It allows to click on any callsign you have on screen and it shows its locator or to click on any locator and see which stations are active from there.
The directory is free and you can download it from any of the following locations:
Spain - http://www.vhfdx.net/babdir.html
USA - http://www.qsl.net/ea6vq/babdir.html
Sweden- http://www.netwinder.nu/~gabriel/ babdir.html
And if you want to watch an animated demo of how it looks like go to:
Spain - http://www.vhfdx.net/babdirsam.html
USA-http://www.qsl.net/ea6vq/babdirsam.html
Sweden-
http://www.netwinder.nu/~gabriel/babdirsam.html

vy 73 DM2BHG
My mail address is:heinz.borde@t-online.de

432 MHZ

DL7UDA got the EME antenna from DL1DWI not from DL1YMK as reported last issue. DL1YMK is still qrv with his antenna, sorry for mistake.

VK3UM reports: Managed to get on for a short time and found conditions normal' and worked the following (no new ones) all random 432.
15/06/02 VK4AFL TH RH DL8OBU TH RH, JH4JLV TV RV
16/06/02 : K9SLQ TV RV K1FO TV RH KU4F TV RH N9AB TV RH JA4BLC TH RH JA6AHB TH RV UA3PTW TH RH OM1TL TH RH G3LTF TH RV DF3RU TH RH G4YTLTH RH
All the very best, 73 Doug (VK3UM) (TV means: transmit vertical, RH= receive horizontal)
VK3FMD reports : I am trying to arrange some 70cm EME skeds. I am a small station with 21.6 dBi Antenna gain and 200W. and no elevation control (yet!) I have had success on 2M EME with the bigger stations and the EME bug has bitten! I would now like to try 70cm. Can anyone please help. email: ibnkarim@bigpond.com,
VK3FMD Charlie QF22MC
EA3DXU reports that he was qrv for the REF/Dubus contest. The conditions were quite good (I heard ECO more than habitual) but not too much people QRV on 432 Mhz , I was QRV from time to time, especially when activity was better, finally I ended with 17 QSO all random and 3 new initials,
Total Score 17 x 12 x 100 = 20.400
23-03-02: K1FO, PA0AVS, OE5EYM, K2UYH, HB9Q, VK3UM, UA3PTW, SM2CEW, F6KHM #143, DL1YMK #144, DJ5NV, K0RZ
24-03-02: DL9KR, DF3RU, SM3AKW, WA4NJP, F2TU # 145
Also heard or called K4QI, KU4F, W7CI, ON5OF?, S52CW, K5WXN
finally I moved to 144 Mhz and worked
N1BUG and YU1IO. Equipment still the same : 432 Mhz 2 x 38 el M2 + GS23B
73 de Josep EA3DXU
OE9ERC EME report (2001):
WKD 21 NOV ON4KNG #100, IK4DCX #101,
22 NOV WB2VVV M/M #102,
05 DEC SM5DWC #103,
06 DEC G4ERG #104,
11 DEC JA9BOH #105, UA9FAD #106,
12 DEC G8OPR #107, F1EHQ #108, G3HUL #109, WA8HTL #110, K5WXN #111, RB5PA #112, W7GBI #113, HB9SV #114, I5TDJ #115, I5CTE #116, OE6AP #117,
13 DEC GM3FJG #118, OZ1HNE #119, W4ODW #120, W2CRS #121, W8TN #122, IK1HWG #123. 73 from Erich, OE9ERC
YO2IS: Hello from KN05ps...enjoyed the DUBUS contest on 70cm, found mixed conditions, never heard my echo !. Got 14 stations all on random, and of course F6KHM for my # 160. K1FO was real strong for several hours on sunday evening, same for DL9KR on the afternoon. Despite my perseverence was unable to catch the attention of PA0AVS (still no QSL response to my SAE!) and DL1YMK. Also CWNR : UA3PTW, K4QI, K0RZ in pile-up...hrd JA6AHB, UT3LL.Its now time to uprade from my old K2RIW 70cm PA, need some hardcopy details about the GS35B 70cm HPA, Season greetings, 73 Szigy.

432 & up (net) news

RA3LE finished in March new Ant, had bad wx, snow and wind, wkd new JJ1NNJ, K4EME and PA0AVS, hrd G3HUL. contest 23 QSOs
DK3WG was only qrv on 24.3. and made 20 QSOs, new DL4KG (new qth) #386.
UA3PTW had in June initials with DB6NT, JA4BLC and KO7N.
DL9KR: may 18th, wx not too good. Was on for VK3FMD 2 yagi 200w and complete #771. Heard many stations including KL6M.
Expedition to 3B8: Just wanted to let you all know that Herman, ON4AME, can be persuaded to get a 70cm eme station running on his trip in March 2003, if someone is willing to help him out with equipment. (there are some other hams going along who have eme experience)
He's looking for people willing to donate (ship stuff to a secure adress in 3B8) bits and pieces. Coax, antennas, amps, preamp. You can drop me a mail or contact Herman on4ame@pandora.be
The sponsored equipment is bound to stay in 3B8!
Johan, ON4ANT, on4ant@hotmail.com
http://www.qsl.net/on4ant
The ON4ANT 6m pages

1296 MHz

DL4MUP wkd in April:
20/4 HB9Q, G4CCH21/4 F2TU (#35), HB9BBD, OZ6OL, F6KHM (#36), OK1CA (#37), HB9SV, OE9XXI, SM3AKW, F6CGJ, G3LTF, OZ4MM, OE9ERC, JA6AHB (#38), ZS6AXT (#39), K5JL, W4OP (#40) and KA0Y.
Just before the contest the preamp was replaced - I had been working for sometime to replace the DJ9BV/FHX35 (0.39dB) with a cavity design, on metalwork from KB2AH - it proved difficult to get the NF better than the DJ9BV, Finally, with help from HB9BBD, and from DL4MEA, a NF of 0.31dB was achieved - so the preamp went in! Since the contest, skeds with IK3COJ and SM6CKU were successful for 2 more initials.
Vy 73, de Dave DL4MUP
F6ETI reports random EME activity:
17/03: G4CCH 529/529 and later in SSB 51/51, OZ6OL O/O.21/03 : OZ6OL 519/529.
22/03: OZ6OL 519/529, called me first in SSB but not readable
23/03: G4CCH 539/539, K5JL 569/559, W4OP O/O #45, N2IQ 539/539 #46, W2UHI 539/439.
24/03: HB9BBD, very loud, 589/559, and after

listen him in SSB with G4CCH, same in a local QSO ...
Good moon conditions and windows last days, calling in evenings around 2000 UTC, QSO only my echoes ...
15 june: G3LTF, GW3XYW
16 june: G4CCH, OH2DG, IK2MMB, K0YW, OE9XXI
17 june: - heard three party QSO between K5JL, W2UHI and WA1JOF. QSO K5JL and W2UHI, but not WA1JOF (thanks to K5JL for ask WA1JOF call me, but NIL). Heard IK3COJ with W2UHI, call after IK3COJ but not reply.QSO also OZ6OL.
F6ETI condx: 3,2 m - 0,5 NF, abt 150 W at the feed, 73 de F6ETI, Philippe

OE9ERC EME report

13 DEC LA8LF #81, KN6DD #82, SM3AKW, I6QGA, W7GBI, WB0TEM, OE9XXI,
5 March at 1735 DF5JJ 549/559, 1900 S53WW O/O for #84 **first OE-S53 on 23cm EME**!!! (3 mtr dish and 80 Watts)
02 April at 2021 SM0PYP 569/579.
23 April at 1355 EA6/DF5JJ 549/569 (52/41) on SSB #91 **first contact OE-EA6!**
01 May at 0006 OE9XXI 54/54 on SSB.
04 May at 2122 DK0LK O 449/O 439 #92 4 long yagy 200 watts.
29 May at 1623 55/55 on SSB.
29 May on SSB G4CCH 44/42
13 March at 0305 S57QM O/O # 90 (Toni has a 2,5 mtr dish and 60 watts)
10 Aug at 0700 DJ7FJ "O" 439/"O", 33 on SSB # 94 first contact! (3.0 mtr dish and 100 watts)
11 Aug AA6WI; F1ANH; OE9XXI all on SSB!
12 Aug ZS6AXT; AA6WI; WD5AGO all on SSB; KB2AH 549/559 # 95 first contact! (very good signal!!!)
15 Aug HB9BBD; EA6/DF5JJ; OE9XXI; F2TU; ZS6AXT; AA6WI; SM0PYP; G3LTF; all stationen on ssb!
18 Aug at 1600 HB9BHU O/O #93, first contact! (3,7 mtr dish and 90 watts)
At present I can work stations on 23 cm who are using 2 long yagis and >100 watts or >1,5 mtr dish and >100watts. If any interest contact me. (FAX :43-5574-39771 PHONE :##43-5574-39505, PACKET: OE9ERC @ OE9XPI.AUT.EU.)
My equipment on 1296 and 2320 MC is an 8.0 m dish and >500 W on 23 cm and >100 W on 13 cm at the feed-horn. I can also make every polarisation (horizontal, vertical and circular). Very best from Erich OE9ERC

13cm

OE9ERC EME report

13 Dec OE9XXI 559/439
27 March at 1900 W4HHK 559/459, 1915 F1ANH 559/559 (54/44) on SSB. 1934 OE9XXI 54/44 on SSB.
29 May 1700 OH2DG O/O #24 (good signal)and new country.
29 May 1800 DF9QX NIL, 1857 GM3XYW 449/559 (44/44) on SSB
26 June I tested with VE1BVL nil heard.
27 June I heard VE1BVL T/?, 2110 OE9XXI 559/559.
13 Aug at 1400 EA3UM "O", 549/"O", # 25 first contact **OE-EA on 13 cm**. and new country (3,5 mtr dish very, good signal!!!)
4 Aug at 1400 OE9XXI 559/559 (54/44) on SSB.Very best from Erich, OE9ERC
PA3DZL reports : I'm very happy to tell that I made my first 13cm EME QSO with Erich, OE9ERC. His outstanding station made it possible because I have only a QRP rig for this band (2.50m dish, 30W and 0.6dB NF at the feed). I heard Erich already from the beginning doing some echo-testing. Heard him all the time 449 to 549 signals. I received "O" + 339 report and sent "r O". I'm looking for more QSO's in the near future. 73's de Jac, PA3DZL

10 GHz

I4TTZ report from JN54J:
June 15th I5PPE O/O random F3VS O/O random OK1UWA O/O random OK1KIR O/O sked OK1CA O/O sked VE4MA O/O sked AA5C O/O sked HRD few seconds W6HD, Nothing from W5LUA. We will be QRV again in October. 73 Vico i4ZAU
I5PPE reports : Together Pietro I5PPE and myself IK5WJD, we have worked as "10 GHz Toscana EME Team" with the call : I5PPE (locator JN53NS). We noted a good activity during this DUBUS / REF Contest, despite the poor WX conditions. We have worked six stations and called four stations but not worked, and knowed the presence of others, but not heard:
Wkd were: F6KSX, DL0EF, OH2AXH, DL2LAC, WA7CJO, W6YFK, only hrd: F1BLL, G4NNS, K6RE, F2TU, LX1DB (?), PA3CSG (?).
We regret, we have got only 6 Qso. Alex IK5WJD & I5PPE Pietro. IK5WJD e-mail : ikcsg@tin.it <mailto:ikcsg@tin.it>

24 GHz

RW3BP: 18 and 20 of April I had my first QSOs on 24 GHz with Al W5LUA and Barry VE4MA.
My station: ANT - 2.4m (8 feet) offset dish with rectangular horn as a feed. I can set speed of Az and El motion to provide autotracking with better then 0.1 degree accuracy in 30min period. TX - 50W TWT placed at the feed point on water cooled aluminium plate. PS(13kV/5.6kV) is homemade and placed at home. Rx - DB6NT LNA

with 1.65dB NF. Converter and LO by RA3ACE. I use separate feeds for TX And RX. TX/RX change-over provided by moving TWT - LNA block up and down for 40mm. It takes 0.25 s to move it down to RX position. So it is possible to get own echo very well. In TX position RX feed is shielded by lossy rubber. It is also good reference for noise measurements. 73 Sergei RW3BP

VE4MA worked VE7CLD (M/M) for a new initial #3 and a new country #3 (a first 24 GHz EME QSO for Gunter), and then AA6IW (M/M) for initial #4. The Libration "smearing" was bad for these QSOs as the moon was at a local hour angle of -25 degrees. Unfortunately Next month is sure to bring much activity and many new QSOs. All stations are running high power TWTs (>75 Watts) most courtesy of Paul Drexler W2PED. 73 VE4MA

JT44

G4YTL: Mark (W7MEM) and I completed a 432 MHz JT44 QSO at 23.20 on April 20th. Not sure if this is a first for the band. I was running 600 watts to 6 x 11 WL DJ9BVs - not certain what Mark was running.

I didn't hear Mark's signal at any time. Got RO after 13 minutes and completed a few minutes later. Very impressed by JT44 and very much hope that it will bring many more people onto EME. I also copied some info from K7XQ, but we didn't complete. David, G4YTL, IO92MB

SETI

The American Astronomical Society has awarded a second Small Research Grant to SETI League executive director H. Paul Shuch, this one to help finance his development of a next-generation radio tele-scope. Dr. Shuch is using the $2,000 grant toward construction of a proof-of-concept prototype for The SETI League's ambitious Array2k radio telescope design.

The SETI League began conceptual design work in 1999 on Array2k, a planned phased array of satellite TV dishes, to be used as a research-grade radio telescope of unique flexibility. Array2k is intended to search specifically for intelligently generated microwave signals from distant civilizations.

A new newsletter regarding SETI atronomy is avaible. One need not be a SETI League member to submit or subscribe. Full details, including submission guidelines for authors, may be found online, at http://cic.setileague.org.

Editors Note: Pictures of the VSA project may be downloaded from http://www.setileague.org/vsa join@setileague.org, check the SETI League Web site at http://www.setileague.org/

Software/Internet

The new version (4.3.20) of the F1EHN **EME** System software (FREEWARE) is now available at : http://www.nitehawk.com/rasmit/f1ehn.html

The software can be downloaded from here. The new version includes some improvments in the real time management and Doppler shift calculation. There is also the complete new EME calculator program (EME and Noise calculators). The tracking supports now the ARSWin interface from EA4TX. Of course the complete program runs without the tracking interface (see the documentation). 73. J-Jacques, F1EHN

Slow-CW Software: CWTYPE is the best I have found so far

http://www.dxsoft.com/micwtype.htm

Dan, W0VD

WSJT Version 2.2.2 is avaible at the WSJT web page:http://pulsar.princeton.edu/~joe/K1JT

In addition to the short update file, a new full distribution of WSJT Version 2.2.2 is available, as well as a new version of the manual addressing the new program features.

Check out **W1GHZ's online antenna book**. It has just about everything you need to know about dishes in it. It is at:

http://www.qsl.net/n1bwt/contents.htm

Another good site with dish information is:

http://www.ultimatecharger.com/dish.html

Enjoy. 73, Dave, AD6A

Do a search on moonbounce at the following url

http://www.worldofradio.com/dxld2089.txt

http://www.worldofradio.com/dxld2090.txt

HP manuals

http://www.w7fg.com

http://www.w7fg.com/index.html

EME-TOPLIST

Call	small Sqr		DXCC Fields		WAS US-States		WAC	#
144 MHz								
I2FAK	484	60	112	50	1988	1993	1060	
HB9Q	460	64	120	50	1986	1994	913	
PA2CHR	431	48	79	50	1993	2001	491	
RW1AW	186	43	47	33	1999	--	224	
GM4JJJ	184	40	59	35	1986	--	271	
PA3DZL	182	33	49	28	1991	--	240	
CT1DMK	143	0	41	0	--	--	148	
UA3PTW	129	25	33	20	--	--	165	
OK1DIG	125	28	37	25	--	--	155	
DM2BHG	122	26	36	27	--	--	192	
YO2AMU	110	18	36	20	2001	--	110	
9A9B	86	18	27	16	--	--	119	
RW3PF	75	21	22	10	--	--	81	

DD0VF	73	19	31	16	--	--	78
YO2IS	65	20	24	14	--	--	66
SP7DCS	65	18	24	12	--	--	71
EA1ABZ	61	55	23	9	--	--	61
WA6PY	40	18	22	13	--	--	62
SP2JXN	15	8	9	0	--	--	15
OK1IA	12	5	11	0	--	--	12
DL1SUZ	3	0	3	0	--	--	3
OK1MS	0	52	100	50	1982	1992	745

432 MHz

DL9KR	391	53	83	50	1978	1987	768
DJ6MB	291	42	62	44	1984	--	348
OK1KIR	253	45	63	44	1982	--	353
DL7APV	167	31	38	42	1984	--	219
G4ERG	137	28	34	30	2000	--	166
HB9Q	132	27	38	22	--	--	174
OE9ERC	128	26	33	28	1993	--	168
YO2IS	124	26	38	23	2001	--	156
ON4KNG	119	25	43	18	1996	--	146
PA3DZL	112	26	38	31	1991	--	124
UA3PTW	91	24	28	22	--	--	102
RW1AW	81	27	25	21	--	--	89
S52CW	80	24	20	20	--	--	91
OK1CA	71	24	26	22	1996	--	121
EA6ADW	66	19	24	19	--	--	69
CT1DMK	61	0	19	0	--	--	64
PA2CHR	45	15	19	9	--	--	45
UT3LL	41	23	17	13	--	--	45
OK1DFC	39	17	19	11	--	--	42
RW3PF	9	5	8	0	--	--	9

1296 MHz

OE9ERC	160	31	38	22	1993	--	146
OK1KIR	147	32	39	28	1989	--	189
G4CCH	126	27	32	24	2000	--	164
DJ9YW	123	29	38	22	1998	--	140
F5PAU	108	25	31	21	--	--	134
EA6ADW	108	24	31	24	1994	--	148
CT1DMK	96	0	24	0	--	--	102
HB9Q	94	27	26	17	2001	--	109
OK1DFC	78	23	32	15	1999	--	98
OK1CA	69	23	25	17	--	--	94
HA5SHF	58	18	25	12	--	--	68
PA3DZL/P	55	16	20	12	--	--	64
WA6PY	42	13	15	13	--	--	50
F1PYR	25	0	0	0	--	--	0
PA3DZL	13	10	10	4	--	--	13
OK1UWA	12	10	11	5	--	--	22
F1ANH	0	0	15	0	--	--	40

2300 MHz

OE9ERC	49	16	22	9	--	--	54
OK1KIR	39	13	19	10	--	--	41
OK1CA	16	10	13	1	--	--	17
OK1UWA	11	7	10	1	--	--	12
WA6PY	9	6	7	2	--	--	10
EA6ADW	8	4	8	1	--	--	9

3400 MHz

OK1CA	1	1	1	1	--	--	1

5760 MHz

OE9ERC	21	12	15	3	--	--	24
OK1KIR	16	10	12	3	--	--	17
CT1DMK	15	0	10	0	--	--	16
F1ANH	1	1	1	0	--	--	1

10368 MHz

OK1UWA	23	10	13	1	--	--	24
CT1DMK	19	0	9	0	--	--	20
OK1KIR	18	9	13	2	--	--	19
IK5WJD	13	7	10	3	--	--	13
OE9ERC	11	8	7	3	--	--	11
OK1CA	7	4	5	1	--	--	8
I5PPE	4	4	8	2	--	--	10
WA6PY	1	1	1	1	--	--	1

WORLD WIDE EME MARATHON 2002

Sponsored by the Italian Radio Amateur Association, A. R. I.

SECTIONS: OM + SWL, portable or fixed station.

DATE/TIME: from 0000z January 1st, 2002 to 2400z December 31st, 2002.

Frequency	Category
VHF 50 MHz	
SWL 50 MHz	
VHF 144MHz	1A) QRO (erp >= 100 KW).
VHF 144MHz	2A) QRP (erp <100 Kw or 1 to 4 ant.).
SWL 144 MHz	3A)
UHF 432 MHz	1B) QRO (>50 DBW ERP)
UHF 432 MHz	2B) QRP (<50 DBW ERP)
SWL 432 MHz	3B)
SHF 1296 MHz	1C) QRO (>60 DBW ERP)
SHF 1296 MHz	2C) QRP (<60 DBW ERP)
SWL 1296 MHz	3C)
SHF 2304 MHz	
SWL 2304 MHz	
SHF 5760 MHz	
SWL 5760 MHz	
SHF 10450 MHz	
SWL 10450 MHz	

(If you don't SPECIFY the category you will be assigned to the QRO category). The same station cannot be worked more than once per day, but it can be worked in the following days.

VALID QSOs: 2way EME CW/SSB.

SWL: in this category are admitted also OM- stations (licensed radio amateurs) but only SWL and not transmitting.
EXCHANGE: callsignes and RST or TMO.
SCORING: 100 points per QSO multiplied by the total number of DXCC countries PLUS 1 (your country is valid for the computation).
EXAMPLE: 20 QSOs and 5 DXCC countries + 1 means 12000 points. (20 x 100) x (5 + 1) = 12000
PRIZE: the first 3 OM and SWL of each band and category.
ENTRIES: postmarked no later than January 31st, 2003 to:
IW0BET, GIOVANNI ZANGARA, P.O. BOX 36, I-00100 ROMA, CENTRO, ITALIA
or mailto:iw0bet@amsat.org
(Title: your callsing), http://www.iw0bet.3000.it
EME MARATHON A.R.I. MANAGER, 73 W0BET

Results
EME ARI MARATHON 2001

144 MHz QRO - CATEGORY 1A

Call	N. QSO	P. DXCC	Final Score
I2FAK	622	41	2.550.200 *
I3DLI	363	36	1.306.800 *
IK2DDR	185	25	462.500 *
JA4BLC	36	17	61.200
I1ANP	39	15	58.500

144 MHz QRP - CATEGORY 2A

Call	N.QSO	P.DXCC	Final Score
S53J170	32		544.000 *
I2RV	173	25	432.500 *
SM7WSJ	107	29	310.300 *
C31TLT	111	26	288.600
DD0VF	71	30	213.000
9A9B	62	21	130.200
YO2IS	29	15	43.500
IY1SP	16	12	19.200
JF4TGO/8	8	7	5.600

OK1MS Control log
* PRIZED STATIONS

The prizes were given on April 28th 2002 during the E.M.E. meeting which will took place in Lido di Camaiore (Lucca). Many thanks to all the foreign stations for taking part.
EME MANAGER A.R.I. MARATHON,
73' de IW0BET Giovanni

Treasury INTERNET

http://www.g0ruz.net GJ0RUZ result
http://web.wt.net/~w5un MOON BRAT (tracking progr)
http://qsl.net/g0ruz/software.htm EME-LINK_worksheet.xls
http://www.qsl.net/sm2cew/ Rftools
http://www.buck.comHam Addressies
http://www.nitehawk.com/rasmit/f1ehn.html Tracking SW
http://www.vhfdx.net/babdir.html Locator directory by EA6VQ
http://www.qsl.net/ea6vq/babdir.html (see News & Informations)
http://www.netwinder.nu/~gabriel/babdir.html

LAST

email DL7APV@t-online.de

DM2BHG :Heinz.Borde@t-online.de

A report from the Prague EME Confernce in August 2002 will follow in DUBUS 3/2002.

Some pictures you can find in the Web under www.g0ruz.net

73 Bernd DL7APV & Heinz DM2BHG

REF/DUBUS-EME-Contest 2002, by F6HYE

Results 144 MHz

Place	Call	Points	QSO (+Sked)	Multi	Pwr	OP
1	I2FAK	472000	118 (+0)	40	QRO	MUL
2	RU1AA	393900	101 (+0)	39	QRO	SIN
3	F3VS	357000	105 (+0)	34	QRO	MUL
4	G3ZIG	227800	67 (+0)	34	QRO	SIN
5	LZ2US	171600	66 (+0)	26	QRO	SIN
6	RN6MT	96000	40 (+0)	24	QRO	SIN
7	JL1ZCG	86700	51 (+0)	17	QRO	SIN
8	IK1FJI	80000	40 (+0)	20	QRO	SIN
9	YO2AMU	59220	28 (+2)	21	QRP	SIN
10	S52LM	58900	31 (+0)	19	QRO	SIN
11	I3EVK	41600	26 (+0)	16	QRO	SIN
12	S53J	38340	21 (+3)	18	QRO	MUL
13	HB9Q	37500	25 (+0)	15	QRO	SIN
14	WB9UWA	36000	24 (+0)	15	QRO	SIN
15	LZ1DP	35000	25 (+0)	14	QRO	SIN
16	IK2DDR	28000	20 (+0)	14	QRO	SIN
16	S51UE	28000	20 (+0)	14	QRP	SIN
18	JH5FOQ	27300	21 (+0)	13	QRO	SIN
19	UA4AQL	23400	18 (+0)	13	QRO	SIN
20	9A9B	20800	16 (+0)	13	QRP	SIN
21	OH3TR/P	19500	15 (+0)	13	QRP	MUL
22	SV1BTR	18120	15 (+1)	12	QRP	SIN
23	DF2ZC	17400	17 (+4)	10	QRO	SIN
24	DL0UL	16500	15 (+0)	11	QRP	MUL
25	RA1ZC	16500	15 (+0)	11	QRP	SIN
26	EA3DXU	14300	13 (+0)	11	QRO	SIN
27	DL2OM	12100	11 (+0)	11	QRP	SIN
28	JA0WJF	11700	13 (+0)	9	QRO	SIN
29	UX3LV	10800	12 (+0)	9	QRO	SIN
30	SM7WSJ	10100	10 (+1)	10	QRP	SIN
31	PA3CWI	9990	11 (+1)	9	QRO	SIN
32	YU7BCL	9900	11 (+0)	9	QRP	SIN
33	F1DDG	9600	12 (+0)	8	QRP	MUL
34	JA9BOH	8000	10 (+0)	8	QRP	SIN
35	DM2BHG	5600	8 (+0)	7	QRO	SIN
36	I1ANP	5600	8 (+0)	7	QRP	SIN
37	YO4FRJ	4800	8 (+0)	6	QRP	SIN
38	JH4JLV	4200	7 (+0)	6	QRO	SIN
39	S51ZO	3600	6 (+0)	6	QRP	SIN
40	SM3AKW	3600	6 (+0)	6	QRP	SIN
41	F8DO	3500	7 (+0)	5	QRP	SIN
42	RA3IS	3120	5 (+2)	6	QRP	SIN
43	SL4BP	3000	6 (+0)	5	QRP	SIN
44	SM5CFS	1600	4 (+0)	4	QRO	SIN
45	DL7UDA	400	2 (+0)	2	QRP	SIN
45	YO3DMU	400	2 (+0)	2	QRP	SIN

Results 432 MHz

1	K1FO	176700	57 (+0)	31	QRO	SIN
2	F6KHM	145700	47 (+0)	31	QRO	MUL
3	HB9Q	136300	47 (+0)	29	QRO	SIN
4	UA3PTW	118800	44 (+0)	27	QRP	SIN
5	OE5EYM	111800	43 (+0)	26	QRO	SIN
6	F2TU	97500	39 (+0)	25	QRO	SIN
7	VK3UM	92400	42 (+0)	22	QRO	SIN
8	SM3AKW	87500	35 (+0)	25	QRO	SIN
9	KL6M	69300	33 (+0)	21	QRP	SIN
10	DL1YMK	66000	30 (+0)	22	QRP	SIN
11	DJ3FI	61600	28 (+0)	22	QRO	SIN
12	JA6AHB	57000	30 (+0)	19	QRO	SIN
13	UT3LL	37400	22 (+0)	17	QRP	SIN
14	ON5OF	34500	23 (+0)	15	QRO	SIN
15	G3LTF	28650	19 (+1)	15	QRP	SIN
16	VE6TA	25500	17 (+0)	15	QRP	SIN
17	S52CW	22100	17 (+0)	13	QRP	SIN
18	EA3DXU	20400	17 (+0)	12	QRP	SIN
19	YO2IS	15400	14 (+0)	11	QRP	SIN
20	PA2CHR	11700	13 (+0)	9	QRP	SIN
21	DL4KG	10800	12 (+0)	9	QRP	SIN
22	JJ1NNJ	5670	8 (+1)	7	QRP	SIN
23	SK0CC	4970	7 (+1)	7	QRP	SIN
24	JA9BOH	3000	6 (+0)	5	QRP	SIN
25	JA0WJF	3000	6 (+0)	5	QRP	SIN
26	WA6PY	930	3 (+1)	3	QRP	SIN

Results 1296 MHz

1	G4CCH	151200	56 (+0)	27	QRO	SIN
2	OE9XXI	148500	55 (+0)	27	QRO	SIN
2	K5JL	148500	55 (+0)	27	QRO	SIN
4	HB9BBD	135200	52 (+0)	26	QRO	SIN
5	F2TU	120000	50 (+0)	24	QRO	SIN
6	SM3AKW	119600	46 (+0)	26	QRO	SIN
7	F6KHM	117600	49 (+0)	24	QRO	MUL
8	OZ4MM	103400	47 (+0)	22	QRO	SIN
9	OZ6OL	100800	42 (+0)	24	QRO	SIN
10	HB9Q	96000	40 (+0)	24	QRO	SIN
11	F6CGJ	90300	43 (+0)	21	QRO	SIN
12	W2UHI	72600	33 (+0)	22	QRP	SIN
13	W4OP	60800	32 (+0)	19	QRP	SIN
14	KA0Y	54600	39 (+0)	22	QRO	SIN
15	G3LTF	54400	32 (+0)	17	QRO	SIN
16	JA6AHB	45000	30 (+0)	45	QRO	SIN
17	ON5RR	39000	26 (+0)	15	QRP	MUL
18	F5PAU	37500	25 (+0)	15	QRO	SIN
19	VE6TA	33600	24 (+0)	14	QRP	SIN
20	F6ETI	25200	21 (+0)	12	QRP	SIN
21	WA6PY	24000	20 (+0)	12	QRP	SIN
22	DL1YMK	22800	19 (+0)	12	QRP	SIN
23	DL4MUP	22800	19 (+0)	12	QRO	SIN
24	DK0ZAB	22100	17 (+0)	13	QRO	SIN

25 F5HRY	15300	17 (+0)	9	QRP	SIN
26 KL6M	10800	12 (+0)	9	QRO	SIN
27 IK3COJ	8400	12 (+0)	7	QRP	SIN
28 G4DZU	4800	8 (+0)	6	QRO	SIN

Results 2300 MHz

1 OE9XXI	16500	15 (+0)	11		SIN
2 F2TU	14000	14 (+0)	10		SIN
3 OZ4MM	8000	10 (+0)	8		SIN
4 SM3AKW	7700	11 (+0)	7		SIN
5 G3LTF	5600	8 (+0)	7		SIN
6 JA4BLC	1600	4 (+0)	4		SIN

Results 5700 MHz

1 F2TU	2500	5 (+0)	5	SIN
2 CT1DMK	100	1 (+0)	1	SIN

Results 10 GHz

1 F6KSX	14000	14 (+0)	10	MUL
2 F2TU	13000	13 (+0)	10	SIN
3 F1BLL	5600	8 (+0)	7	SIN
4 CT1DMK	4800	8 (+0)	6	SIN
5 I5PPE	3000	6 (+0)	5	MUL
6 DL0EF	2500	5 (+0)	5	MUL

Results multiband

1 F2TU	1132200	121 (+0)	74	QRO	SIN
2 HB9Q	761600	112 (+0)	68	QRO	MUL
3 SM3AKW	697600	98 (+0)	64	QRO	SIN
4 F6KHM	528000	96 (+0)	55	QRO	MUL
5 OE9XXI	323000	70 (+0)	38	QRO	SIN
6 G3LTF	261690	59 (+1)	39	QRO	SIN
7 JA6AHB	204000	60 (+0)	34	QRO	SIN
8 OZ4MM	201000	57 (+0)	30	QRO	SIN
9 KL6M	135000	45 (+0)	30	QRO	SIN
10 VE6TA	118900	41 (+0)	29	QRP	SIN
11 EA3DXU	69000	30 (+0)	23	QRO	SIN
12 WA6PY	34650	23 (+1)	15	QRP	SIN
13 JA0WJF	26600	19 (+0)	14	QRO	SIN
14 JA9BOH	20800	16 (+0)	13	QRP	SIN
15 CT1DMK	12600	9 (+0)	7	N/A	SIN

Class winners are underlined.

This year, I2FAK has the lead on 144. On 432, K1FO is followed by F6KHM and HB9Q. G4CCH leads the 23cm section. This year, OE9XXI is again on top of the 13cm section. Once again, no report on 3400MHz and F2TU has the first score on 5760MHz. Six entries on 10GHz, the first being F6KSX. The multiband winner is F2TU.

Very good increase in participation (113 logs vs 85 last year).Everybody waits for the same increase in 2003 ! Thanks to all for participation. F6HYE

DL0EF (10000): The crew of DL0EF (www.astropeiler.de) was active on 10 GHz moon bounce again on the DUBUS contest weekend of the 20th and 21st of April 2002 from the Astropeiler Stockert, located near Bad Muenstereifel (vicinity of Cologne) in JO30IM.
We were using our 10m dish, polar mount and a 20W transverter system. Moon noise was around 3dB and we installed a magnetic polarizer unit, which proofed valuable when having big spatial offsets. We also replaced a modified satellite LNB against a DB6NT LNA which improved stability of the receive path. Increase of the ratio moon noise to colds-sky could not be observed anymore due to the big dish size.
The activity started as planned, however, we run into problems with the antenna drive at around 21h00 UTC of the 20th, just at the scheduled contact with W6HD, which did not allow us to use the required slow gear to track the moon. Faultfinding revealed a problem with one of the motor drive couplings and repair would require a major mechanical intervention, which was not possible during this weekend. We tried to continue operation by advancing the antenna in short but coarse steps and let the moon catch-up. The polar mount proofed than very valuable, as we need only to steer GHA.

DL0UL (144): This was the first time we worked 2m EME. Heared a few station more than worked. On sunday evening the signals were louder than the day before. WeZll try 2m eme again. Maybe with 2 X 8WL.

DL4KG (432): Sometimes I thought conditions were one way. I heard several stations loud and clear and couldn't get them. Gotaways were VK4AFL, JA6AHB, G3LTF, PA0AVS, K4QI, F6KHM and EA3DXU. At least I missed 5 initials.

DL7UDA (144): There are my first eme contacts. Heard: SM2CEW, DJ1EJA, KB8RQ, W5UN, RU1AA worked not complete LZ2US

EA3DXU (144, 432): Very dificult 144 EME on daylight time, too much QRM. 432 Mhz quite good, but poor activity. See you next year.
F2TU (432, 1200, 2300, 5700, 10000): Good con-

ditions on 1296 and above. Worse on 432, but with the dish, it is easy to overcome Faraday effect. Worked 5 bands with a single dish !

F6KSX (10000): The random activity was very poor during the European window and increased during the US window in spite of the large number of European stations. We regret the rules don't reward the random QSO on the microwave bands. This possibility will improve the activity.

G4DZU (1296): Despite spending a day checking out the station, I was plagued with Murphy, having problems for most of the session with Az readout and low output power. Some outstanding signals, HB9BBD hitting S7 over noise in 1Khz bandwidth.

HB9BBD (1296): The contest was primarily fun on the first day. 46 qso is a good pay for the time invested. Sunday was particularly painful. Not only many regulars were missing - the Dubus contest primarily seems to be a European event. Conditions were good. My echoes returned 59 at all times. The new preamplifier with NF of 0.15dB pulled the usually small stations well above the noise floor.

HB9Q (144, 432, 1296): We were QRV only one day per band due to QRL. During the 432 contest there was a strong Aurora which generated a lot of rotation. Condx during 1296 contest were ok. Due to a technical problem we were QRV on 144 only for a few hours. It was fun to be part of the contest and we hope to be back next year with more time and no technical problems. Many thanks for organizing the contest!

I1ANP (144): Not enough time, problems at home and with the family. Good propagation, a lot of Faraday effect on vertical.

I3EVK (144): Very high static noise (s 9 + 20) during the first part of the contest, due to the very bad wx Sunday afternoon wx improved, but the band was silent for several hours. I had a lot of fun during my first DUBUS EME experience. See all of you next year.

I5PPE (10000): We noted a good activity during this DUBUS / REF Contest, despite the poor WX conditions. We have worked six stations and called four stations but not worked, and known the presence of others, but not heard.

IK2DDR (144): I'm sorry, but this year, due to heavy wind, I was active only on April 21th, between 18:30Z and 22:13Z. I worked 20 stations, with 5 new initials. Hope to be active full time next year. Thank you for this beautyful contest and Good luck on EME!

JA0WJF (144, 432): On 144, I was active only for the show window of Europe. Although it was a short period I enjoyed it. On 432, only a few participants during the W window.

JH5FOQ (144): Very low activity during the JA-W window. I thought that there would be more QRV stations..hi. I think that it would be good to add JA call areas to the multipliers.

JJ1NNJ (432): Condx were good during the night. Many Eu stations were active.

JL1ZCG (144): QRV saturday EU window and only 3 hours sunday EU window. conditions were very good both days, especially for our V-Pol.

KL6M (432, 1296): Thank you very much for another wonderful contest. I look forward to next year. Please consider the following dates: 15/16 FEB and 15/16 MAR 2003.

PA2CHR (432): I was only QRV during the 70 cm weekend, because of QRL and (I think) very bad conditions during the 2m leg.

SM3AKW (144, 432, 1296, 2300): Was spending much time on 13cm to increase new #.instead less 432.

SM7WJS (144): It was very bad conds during the contest and a lot of Aurora so i could only work the big stn on random.

UT3LL (432): I have been active on 432 MHz EME for 3 years. Now I have 326 QSO (78 initials, small -74 , SQR - 25, DXCC - 21, USA - 20).

VE6TA (432, 1296): Weather conditions were good both weekends. Activity was down this year on 432 eme. Not many US/VE stations on either weekend. Disturbed conditions with aurora affected 1296 in April as conditions seemed to have long periods of lowered signal strengths.

VK3UM (432): The second day was effected badly due to the Aurora. Activity from North America in our window was very limited. Good fun and good activity from Europe. Insufficient time for me to work all that were available during my window.

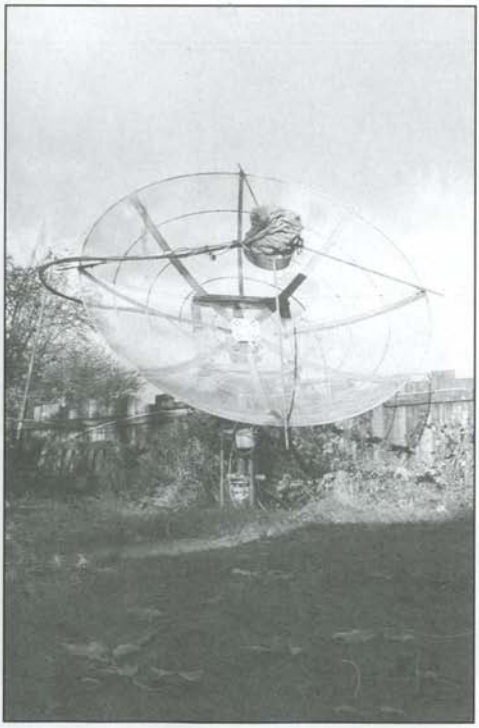
W4OP (1296): Enjoyed the contest very much and pleased with how many stations were active. Looking forward to next year with more power and bigger dish.

WB9UWA (144): Conditions badly attenuated. Fast QSB. Very breif normal signal levels. Problems with Aurora this year. JT44 stole some potential QSO's as well.

YO2IS (432): Was glad to pass the 680 QSO mark on 70cm EME, adding one initial #160. Variable condx & activity on 70cm. This was my 6th European-DUBUS contest.

YO4FRJ (144): My first EME QSO was done with W5UN. Big thanks Dave !

9A9B



G4DZU

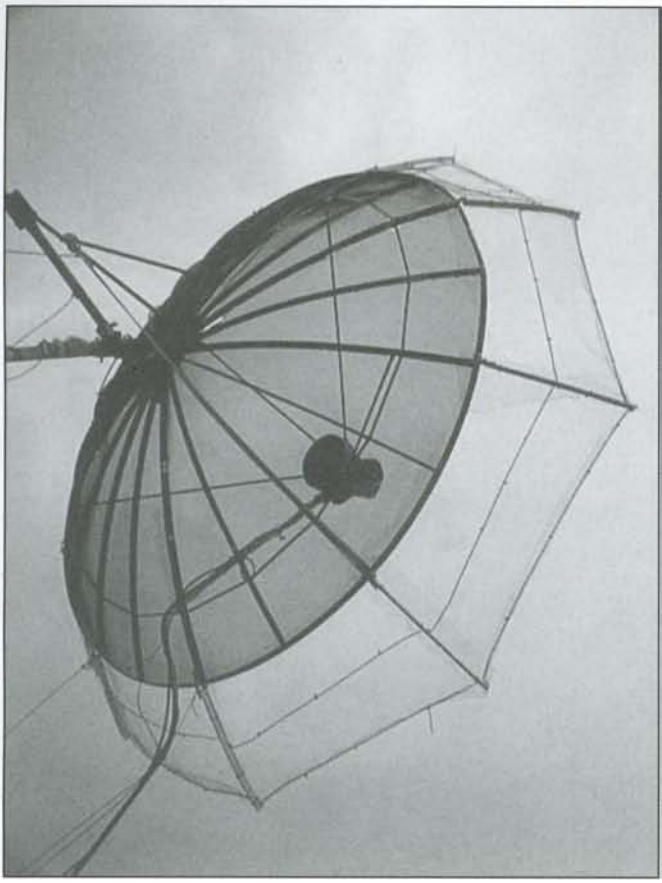
RA1ZC

DL1YMK EME QTH

F1BLL

F6KHM

JH0WJF



VE6TA

Helical-Feed für 13cm

NEU!

Links zirkularer Spiegel-Erreger für 13cm, für prime focus- und Offset-Spiegel, Gewinn mit 60er Spiegel schon 21.3dBi, mit 1m Spiegel 25.7dBi! Durch Reflexion am Spiegel ergibt sich rechtsdrehende Zirkularpolarisation. Dicht gekapselt, mit N-Buchse, paßt für viele LNC-Halterungen. Datenblatt bei www.wimo.com. ..59.50 EUR

13cm Downkonverter

für das 13cm Band. Wird direkt an der Antenne montiert, dadurch praktisch keine Verluste. ZF liegt im 2m Band (auf Wunsch im 70cm Band). Eingangsrauschzahl typ. 0.7dB, Durchgangsverstärkung 30dB. Fernspeisung möglich. UEK-3000.....357.- EUR

Power Protector

Schützt den Konverter oder Vorverstärker vor rückwärts eingespeister Leistung. Durchgangsdämpfung 0.1dB, Fernspeisung für den Konverter wird durchgeschleift, braucht selbst keine Spannungsversorgung. Verträgt 30W FM oder 50W SSB ..... 50.50 EUR

Vorverstärker

die hochwertigen von SSB-Elektronik....

SSB Electronic

SP-2000	2m	209.-
SP-7000	70cm	209.-
SP-23	23cm	305.-
DBA-270	Duo	192.-
LNA-145	2m	184.-
LNA-435	70cm	184.-
SLN-1300	23cm	212.-
SLN-2300	13cm	212.-
LNA-5000	Breitband	168.-

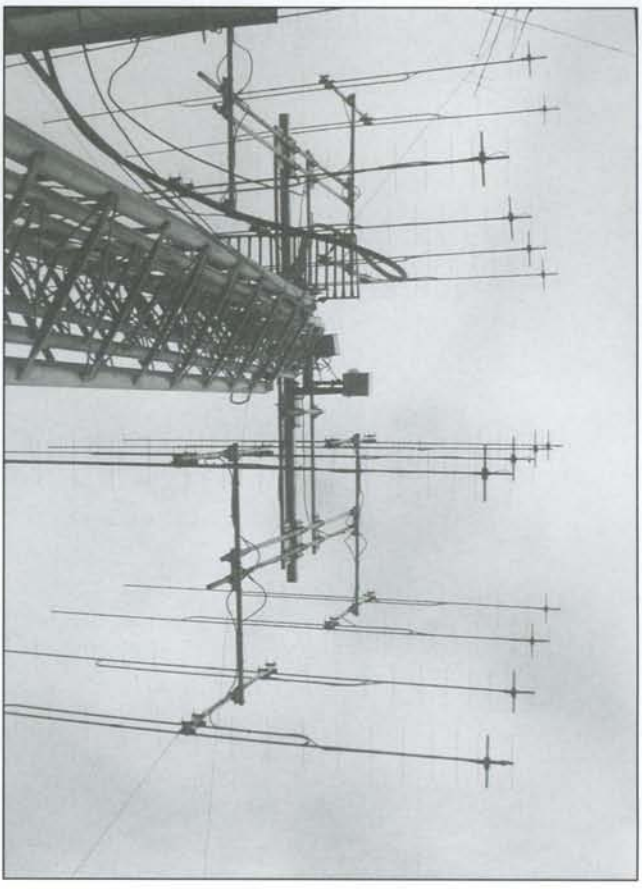
Fernspeiseweichen und Ablaufsteuerungen ab Lager lieferbar.

Rotorinterface

Universell für fast alle Rotoren, Azimut / Elevation, kompatibel zu allen Rotoren die ein Potentiometer zur Positionsmeldung haben. Anschluß an LPT-Schnittstelle, Software und Anschlusshinweise im Lieferumfang. Mit 8 oder 10 Bit Auflösung erhäl
ARS Azimuth 8 Bit
ARS-EL Azimuth + Elevatic
ARS-10 Azimuth 10Bit
ARS-EL-10 Azimuth + Elev

WiMo Antennen und Elektronik Gmb

Tel: 07276/96680 Fax 6978 www.wimo.com



ON5OF

Helixantennen 70cm bis 13cm

für Betrieb über Satelliten entwickelt und optimiert, feste zirkulare Polarisation, N-Buchse, Schrauben und Bügel aus Edelstahl

Typ	Gewinn	Wdg	Länge	Preis
Helix70	9.5	7	1.5m	110.00
Helix70-2	12.5	7	2.9m	167.50
Helix23	11	10	0.6m	56.90
Helix23-2	13	20	1.4m	73.80
Helix23-4	16	40	0.6m	125.50
Helix13	14	21	0.8m	94.80
Helix13-40	16	40	1.25m	114.90

WiMo

X-Quad

Richtstrahler mit 2 Ebenen, kurze Bauform bei hohem Gewinn, Stockungseffekt da alle Sekundärelemente immer aktiv sind, Vormastmontage..

2m: Länge 146cm, Gewinn 10.5dB 105.-
70cm: Länge 127cm, Gewinn 12.8dB 110.-

Phasenleitung 46.-

ARS

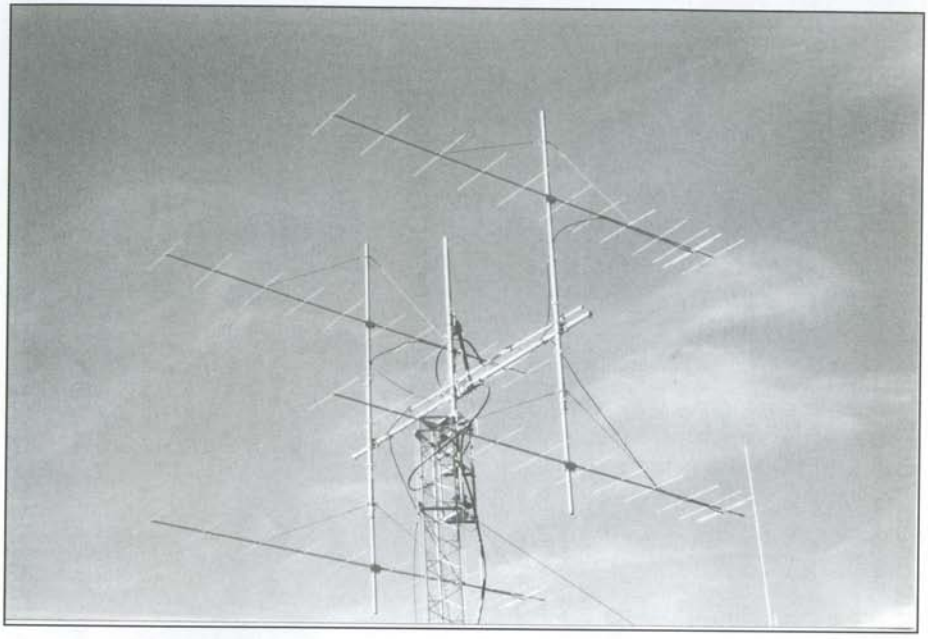
tlich.

	117.50
n 8 Bit	173.80
	127.80
ation 10 Bit	193.30

FT-847 SUPERCONTROL

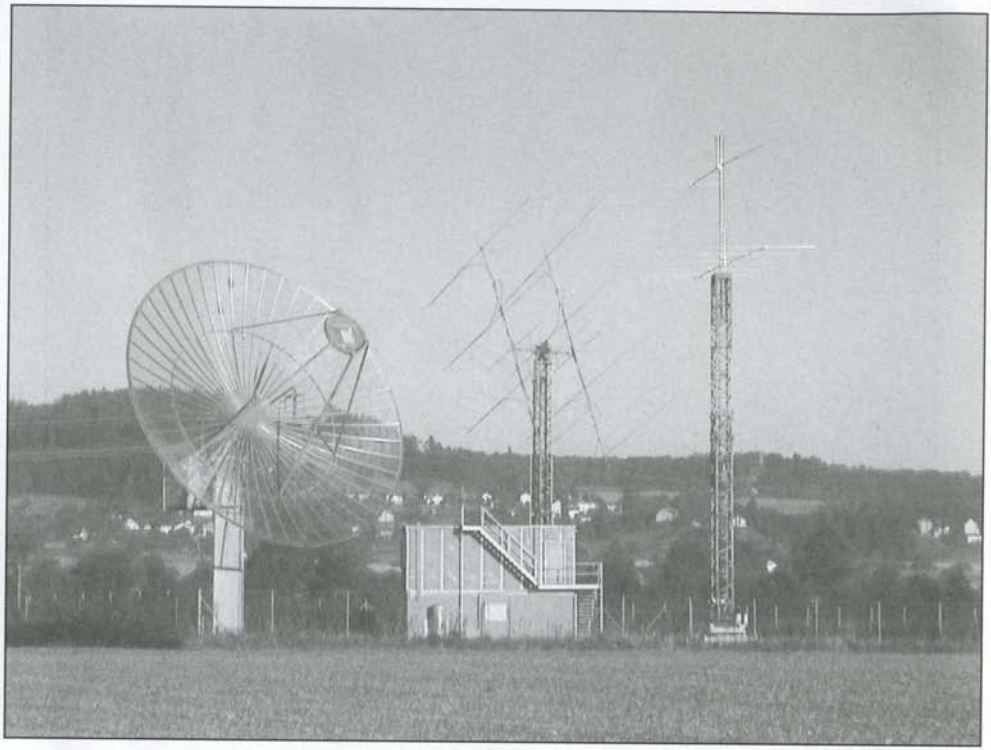
Steuersoftware speziell für FT-847, alle Funktionen sind komplett steuerbar, SAT-Betrieb wird dadurch wesentlich vereinfacht (z.B. automatische Dopplerkorrektur in Verbindung mit NOVA), automatische Transverter-Umrechnung. Schnittstelle zu ARS, NOVA, Easycom, und vieles andere mehr...
Demo-Version von unserer Webseite runterladen!
75.- EUR

H, Am Gäxwald 14, 76863 Herxheim
www.zx-yagi.com email: info@wimo.com



SV1BTR

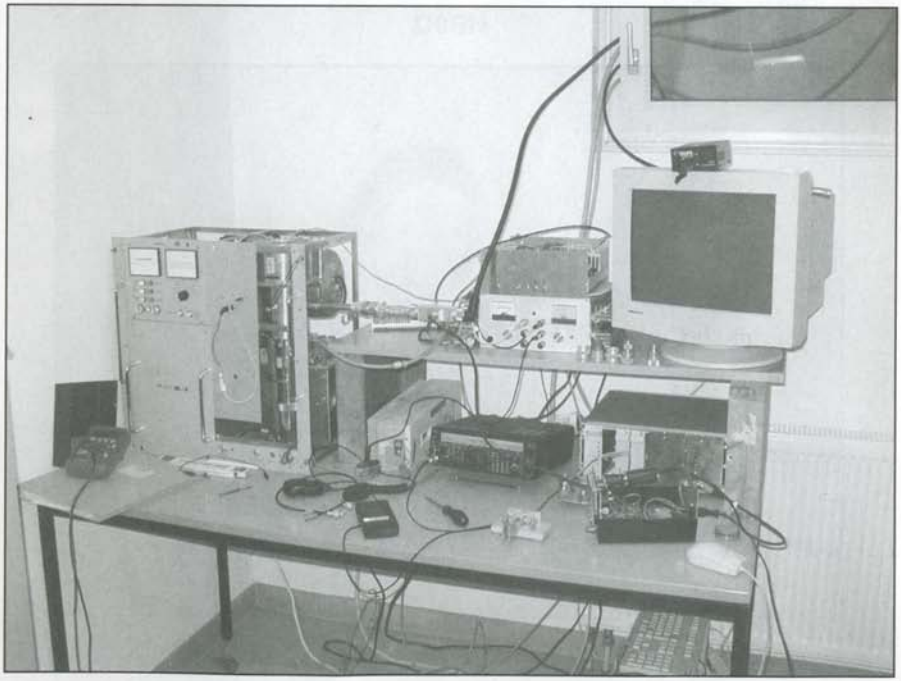
9A9B

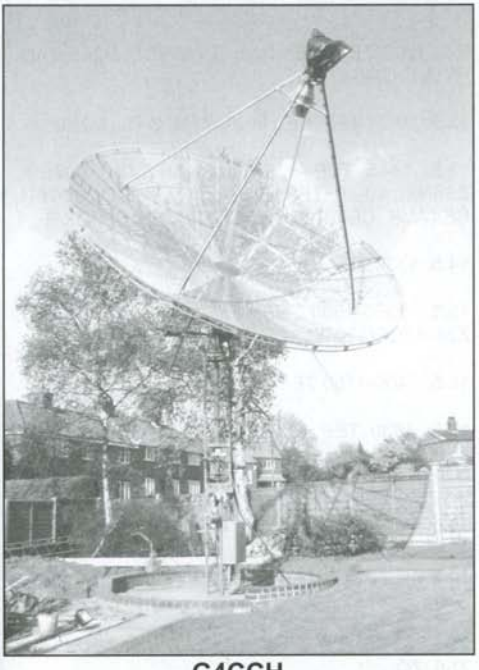


HB9Q

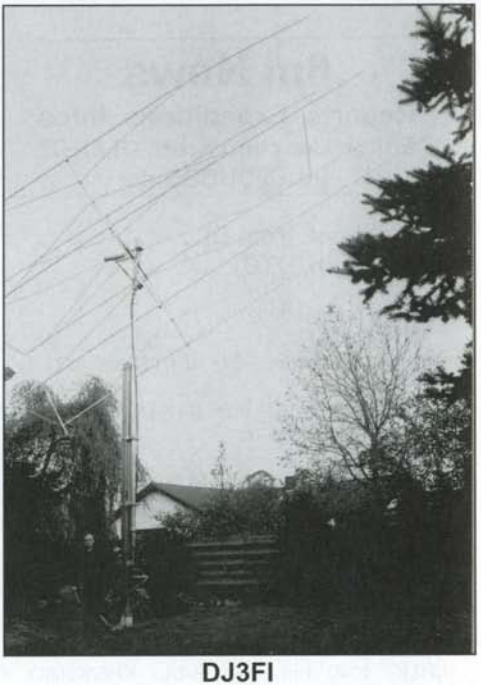
RA1ZC

DL4MUP`s dish and shack

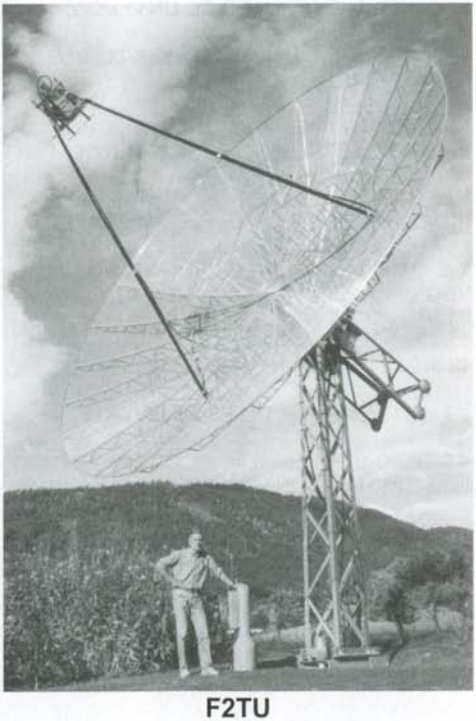




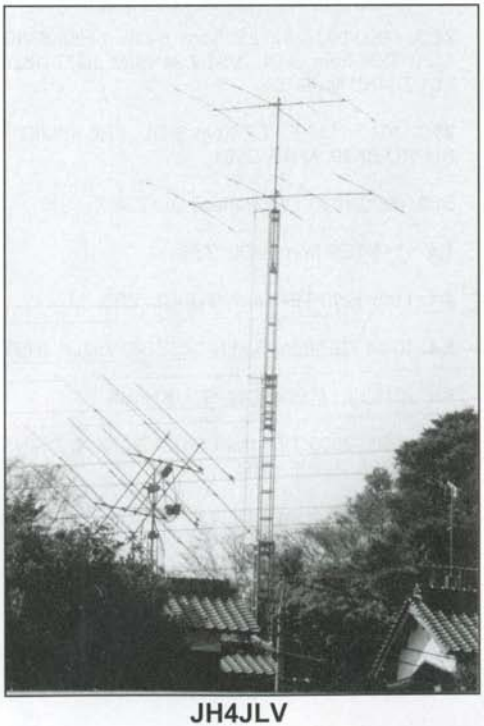
G4CCH



DJ3FI



F2TU



JH4JLV

6m News

Reports, Expeditions, Infos
Editor: Joachim Kraft, DL8HCZ
info@DUBUS.de

6m-Logbook from DL (Day, Month, UTC):

March to August 2002

22.3. 1600 TEP from S-DL: V51/ZS4NS JG77

23.3. 1020-1230 TEP from E+S-DL: ZS6, FR1GZ LG79, V51/ZS4NS JG77

24.3. 16-17 Aurora from N+M-DL

1730 TEP + Es from S-DL: CX2LI GF15

25.3. 1740-1900 TEP from S-DL: V51/ZS4NS JG78

27.3. 0950-1200 TEP from all DL: ZS6, Z22JE V51LK, 1040 hrd from S-DL: KH6/K6MIO + KH6/KF6GYM

28.3. 0900-0930 F2 LP from S-DL: KH6/K6MIO 1120 TEP from S-DL: V51/ZS4NS/M JG77 1620 V51/ZS4NS/M JG78

29.3. 1040-1130 F2 LP from S-DL: KH6/K6MIO + NH7RO BK29, KH7R BL01

31.3. 0930-1030 TEP from all DL: ZS6

1.4. 1110 TEP from S-DL: ZS6

4.4. 1145-1215 TEP from S+E-DL: ZS6

5.4. 10-14 TEP from S,M,N-DL: ZS6, V51LK JH90

7.4. 1015 F2 LP from ON, G, I: KH6SX

11.4. 1900-2030 TEP from S-DL: 7Q7SIX, ZS4NS KG32, ZS6, Z22JE KH52

16.4. 12-14 Es from S-DL: OH, ES

2100 TEP from S-DL: PP1CZ

17.4. 1400-2000 Strong Aurora from all DL.

19.4. 19-22 Aurora-E from M+W-DL: OH9SIX, OY6SMC, GB3LER

9.5. 1900 TEP + Es from S/W/M-DL: D2EB JI93, PY5CC GG54.

12.5. 19-21 TEP + Es from W, M, S-DL: D2EB.

13.5. 1645 TEP + Es from M+S-DL: 7Q7SIX, ZS6NK; 19-20 TEP+Es from M,S+E-DL: D2EB, CE4WJK, CE3SAD, PY5CC, PY2SP, PP1CZ/B

14.5. 1330 TEP from S-DL: ZS6

15.5. 1350-1500 TEP+Es from all DL: ZS6, Z2/PA3CPG KH50

16.5. 1400-1700 TEP + Es from all DL: ZS6, 7Q

17.5. 1630 TEP + Es from S-DL: 5R8FU LH31, ZS6 17-20 from all DL: M0HEN/MM JM87, 7Q, D2EB

18.5. 1739 Es from all DL: UT/RX3QFM KO90AB

19.5. 1430-1800 TEP + Es from S-DL: 5R8EE, ZS6

21.5. 15-17 TEP + Es from all DL: 5R8FU LH31, ZS6, 7Q

22.5. 1000 2x-Es from M+E-DL: UN6P MO60

29.5. 1930 TEP+Es from W, N+S-DL: PY5CC GG54, PY1RO

30.5. 1030-1230 Es from all DL: YI9OM LM23, A45XR 1730-2030 GU6AJE/MM JM84, YI9OM

3.6. 1900 Es + TEP from N-DL: PY5CC; PP1CZ/B, PY1RO

7.6. 1630-2000 Es+TEP from all DL: V51E, YI9OM, A45XR, PY5CC, PY2XB, PY2VA, PY1RO, LU7DZ

29.6. 20-21 Es from N+M-DL: FS/W6JKV

2.7. 13-18 Es from all DL: FS/W6JKV FK88

4.7. 0900-1030 Es from all DL: DK0FTG/MM IM56, 1030 from N-DL: DK0FTG/MM IM46

8.7. 11-14 Es from all DL: LA7THA/MM JP24

24.7. 12-17 Esfrom all DL: EH7VK/EA9 IM85lw Alboran Island, QSL via EA7RU, 5C2MI IM50

1730-1830 TEP+ES from W+S-DL: PY1RO GG87; PY5CC GG54

25.7. 13-17 Es from all DL: 5C2MI IM50, QSL via I2JSB

26.7. 0900 Es from all DL: J48S KM37mr Samos Island

31.7. 16-17 TEP from S-DL: ZS6, 7Q7SIX
Es: SV3/DK7ZB KM06

4.8. 09-12 Es from all DL: SM6CMU/m from JP96 and KP06

5.8. 07-09 Es from M+N-DL: SM6CMU/2 JP97, LA4SI + LA1NG JP66

17-19 TEP from all DL: ZS6, 7Q7SIX, V51KC, Z21FO

1945-2100 TEP + Esfrom all DL: PY1RO GG87, PY5CC GG54, PP1CZ/B GG99

6.8. 06-11 Es from all DL: LA/SM6CMU JP79

7.8. 1230-1300 Multihop-Es from S+O-DL: **8Q7ZZ MJ65**

19-20 TEP+Es from S-DL: PY1RO, 7Q7SIX

8.8. 11-14 Multihop-Es from all DL: **8Q7ZZ MJ65, VU2ZAP MK82**
1700 TEPfrom F/I: TY6FB

Other interesting stations which were worked from DL during June:
CN2DX IM63, OJ0VR, EH6FB/p JM09, ZB2EO, ES8/RZ1AK KO18, YL3AG/p KO27, T72EB/A, ZC40DW KM65, EI4VXB/p IO55 QSL via G4IJE, JX7DFA, EI8HT IO61BW and GU6AJE/MM from JM74+84 on June 2nd.

Expeditions and News:

/MM: G0KZG/MM is qrv from the end of September to Oct. 24th SW of Ireland also on 6m.

/MM: M0HEN / PA3HEN/MM went QRT in the beginning of June. Theo started his new trip in September from EI to southern CT. At the moment his IC706 is QRT and he is looking for donations for a new 6m/2m rig. He is not qrv during his actual trip. (Ed: Where is the UKSMG??)

/MM: GU6AJE/MM, Mike, was qrv from his Greenpeace ship Esmeralda during May/June with good openings from JM74+84 to EU. His shift has ended in July.

/MM: DJ6TK/MM will be qrv from JO12 on 6m in the morning of October 16th. QSL via DJ6TK.

IM56,46,47: DK0FTG/MM was qrv in June/July on several days with 10 W and dipole. QSL via DL8HCZ

IM56: CT1HZE/p was qrv on May 27th. QSL pse to DL8HCZ.

IM57: DL8HCZ war qrv as CT1HZE again during this summer. Locator: IM57NH. Please note that the CT-bureau is not working for my call. Please QSL via the bureau via DL8HCZ or direct .

IM61: There are 2 CN OPs expected to become qrv on 6m anytime.

KM73 OD5/OK1MU is qrv for another year on 6m+2m (100w 9 Ele)

KO27: ES6DO has moved QTH from KO28 to KO27WX now. He is very active on 6m.

KP55 The OH8K group is qrv from 17.-19.11. on 50.218 MHz in SSB/CW for MS.

3X Guinea: From 30.10.-13.11. DJ6TF, DJ7UC, DK1BT, DL4WK, DL7UFR, BO + DF are qrv as 3XY7C on 6m with 100W + 5 Ele. QSL via DL7DF. www.qsl.net/dl7df/3x bernd@df3cb.com

5W West-Samoa: K7TVF is qrv from 18.11.-19.12. as 5W0VF also on 6m.. Beacon on 50.104 MHz.

7O Yemen: G(J)4ICD will be in Yemen several times this year for QRL. He will try to become qrv on 6m.

7Q Malawi: 7Q7HB is qrv on 6m until the beginning of October. QSL via G0JMU.

8P Barbados: K4BAI is qrv from 10.-17.12. as 8P9HT also on 6m.. QSL via K4BAI.

9M6 East-Malaysia: 9M6/GM4DMA is qrv from 12.9.-30.9. on 6m with 100 W.
From Nov 18th to 25th JA1RJU is qrv again as 9M6JU on 6m. QSL via Homecall.

6W Senegal: 6W/F6HLC is qrv on 6m from 23.10.-3.11. Rig.: 50 W and GP/Dipol. Loc. may be IK14.
9Q Dem. Rep. Kongo: 9Q1A was qrv on 6m till mid September from JI75PQ and wkd many EUs. May he es qrv again in October. QSL via F2YT.

C2 Nauru: VK8RH is qrv as C21RH from 4.-21.11. on 6m. Loc. RI39. QSL via VK4AAR.

C5 Gambia: OH9MM is qrv from 20.11.-1.12. on HF and 6m. Call: C53M. Locator: IK13

CO Cuba: From 18.10.-10.11. SM0WKA + CO8ZZ will be qrv as T48W also on 6m.

CY0 Sable Island: A group from VE plans to become qrv from Nov 15th to 25th also on 6m. Call: CY0MM.

FF80: LU4EJ/D is qrv from Ariadna-Island from Oct. 4 to 6 on 6m. QRG. 50.110.

FJ St. Martin: FJ5DX, is qrv on 6m and aktive with good equipment now.. Loc. FK87ou:

FS Saint Martin: Ann/W2AZK, Brian/KF2HC, Gene/K2KJI, Maryann/K2RVH, Bob/W5GJ and Mike/WA2VUN will sign FS/homecall from December 4-11th also on 6m. QSL via homecalls.

FT/Z Amsterdam: F4DOT is qrv on 6m now until December. Locator MF82.

HC8 Galapagos: From 19.-25.11. N0JK is qrv again under HC8N on 6m. Other OPs of the team may be start some days before.

HI9 Dom. Rep.: W4WX, W9AAZ, N1WON + K9MDO/HI9 + HI9X are qrv from 22.-30.10. on 6m.

JX Jan Mayen: Per, JX7DFA, will go back to LA in October.

KH2 Guam: KG6DX is back to Guam and will be qrv again on 6m from October 2002.

KH0 Saipan: From 21.-26.11. JF2SKV will be qrv on 6m as NH0S. QSL via homecall.

KH0 N-Marianas: JF1SCQ/KH0 is qrv from Oct. 25th to 28th on 6m. QSL via Homecall.

OX, Greenland: OX3LG ist qrv until October from Kook-Island (GP34) also on 6m. QSL via OZ1ACB.

P4, Aruba: From 3.-17.12. K6KO and K6TA will be qrvon 6m as P40K and P40TA. QSL via WM6A

P5 North-Korea: P5/4L4FN is qrv also on 6m since Mai and had some pile-ups from JA. He worked with is HF-vertical.

T8 Palau: From 31.10.-4.11. T88DR is qrv on 6m.

TT Chad: TT8DX went QRT on Sept. 29th.

TZ Mali From 1.-15.10. he will be qrv from Mali and from 16.10.-30.11. from Kameron, **TJ**. Then **5H, XT and TU or TR** will follow.(1.-31.12.). Rig: 100w + dipol.

TY Benin: I8QLS and others will be qrv from Oct 19th to 26th as TY2LS (and other calls) also on 6m.QSL via I8ACB.

V6 Mikronesia: JA7HMZ is qrv as V63DX from 25.-31.10. also on 6m.

VP5 Turks&Caicos: From 22.-29.10. N2VW is qrv as VP5T also on 6m.

YI Iraq: YI9OM is qrv from Baghdad on 6m. Loc.: LM23. He will stay there till Novemer. QSL via OM6TX. Next QRL will be in EP or YK. Peter will try to get a 6m licence...

ZK North and South Cook Isl.: From Oct 17th to 31st a group from the U:S. will be qrv from North-Cook on HF and 6m. From Nov 1st to 12th they will be qrv from South-Cook.

ZL7 Chatham Island: From Oct 17th to 28th there will be an expedition qrv also on 6m.

Beacons

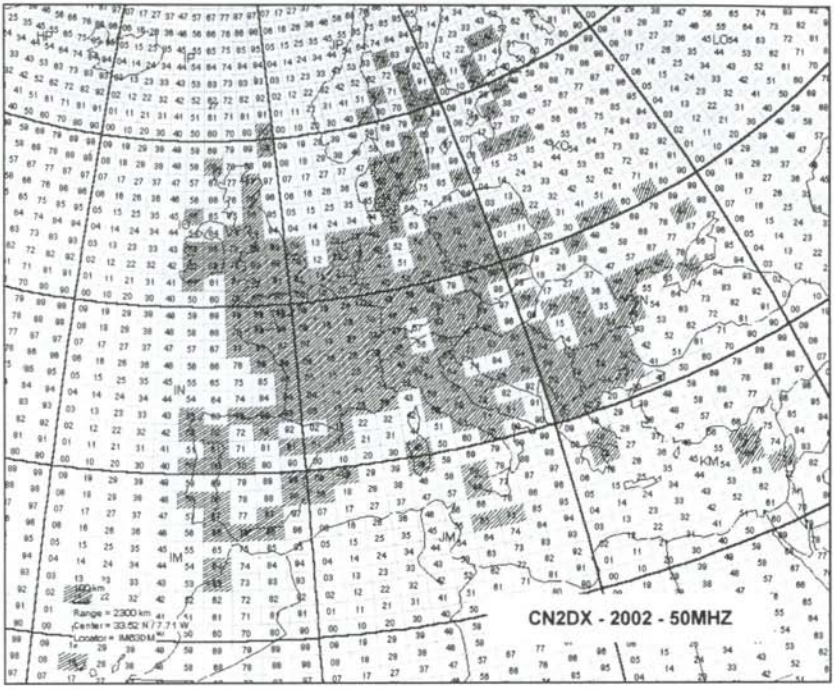
C21SIX on 50.038 MHz, Loc RI39LL, 20 Watts, dipole, FSK 170 Hz Shift, is qrv since Sept 9th 2002. Reports pse to: C21RH@internode.on.net

CU3URA on 50.013 was QRT during this summer, no info about reasons available.

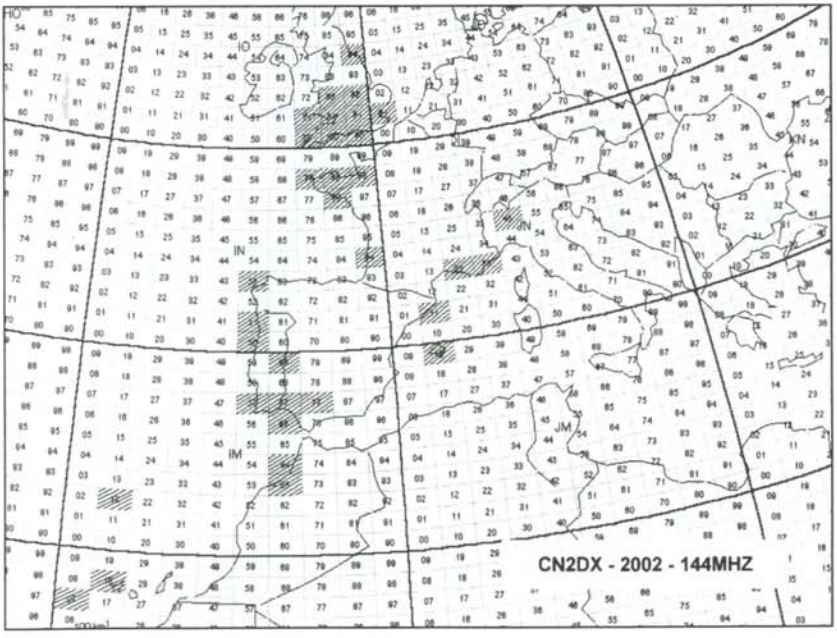
LA7SIX on 50.051 MHz became QRV again from mid of August from the new QTH in JP99EC. 20 Watts, 4 ele Yagi, QTF 190.

73s, see you on 6m!

Joe, DL8HCZ/CT1HZE



Squares wkd by CN2DX (Op HB9HLM), IM63, in June 2002 via Es and Tropo



Tropo Reports

2m, 70cm and up

Editor: Tom Doelle, DG3FK
DG3FK@darc.de

Dear readers, tnx for some tropo reports, hpe to cuagn on VHF/UHF/SHF. 73, Tom

Tropo 2m:

CN2DX, IM63DM, wkd 2m:
9. June 2002: 0902 EA7BYM IM66, 0903 CT1EPS/P IM57XI, 0929 EH1TA IN53, 1925 EA7BYM IM66, 1932 EA1AK/7 IM66VP, 1934 EA8ATG IL18CP.

D44TD, HK76, wkd 2m:
19.5.2002 15-20UT CT1DYX IN50 and other CT's and EA7-stations. First ever D4-CT and D4-EA on 2m! QRB 3200km. During the following days many openings again, on May 30th for 10 hours, to CT and EA7. Rig: 1KW and 1 long Yagi.

DG3FK, JO74AA, wkd:
06.07.2002: LX/PA1TX/P JO30BB 698; ON5PL/A JO20XL 677; DK0ES JN48TN 680; DK0ALK JN38TD 792; DL0UL JN48UO 674; OR4NOB JO20KV 711; ON1DNF/P JO20MT 707; OS4LAR/P JO10WV 771; OS4AGL JO21IB 712; HB9BQU/P JN37WE 875;

07.07.2002: HB9CC JN47RJ 804; OM3U Jn88LE 680; OE5NNN/3 JN77GX 673; S50C JN76JG 864; S57O JN86DT 818; F5KOU/P JO10KA 883; ON6NB/P JO20DW 744; ON7CL JO20JU 719; DK0UH JN48TM 685; F6KIM/P JN38BO 815; DL0BLG JN47ET 796; DF1VW JN39HJ 725; DB9SUL JN47PH 818; DH8VH JN39PN 679; DL0PH/P JN48HU 686

hrd mni stations from G (JO01/02/03/IO91/IO90)

Mni tnx Moritz DL5UH for the euipment:Rig: R2CW + PA 700W, Antenna: 15 ele Homemade 9BV, 8m agl, 14m asl

DK0TR, JO40QL, wkd:
04.05.2002: SP2MKO JO93CB 672; SP9PZU/P JO90KF 675; 9A1CMS JN86EL 681; IZ4BEH JN54WL 694; 9A5KK JN86GF 710; IK4ADE JN54OE 714; HA2R JN87VE 716; OM0C JN99PG 723; OM3KII JN98KJ 725; 9A4VM JN85FS 742; OZ6ABA JO57DJ 772; SP4SAS/4 JO93XN 801; IK5ZWU/6 JN63GN 806

05.05.2002: IZ4FWF JN54QM 680; HG1Z JN86KU 683; OM3TZQ JN98HP 698; IK5AMB/5 JN54FF 700; HA5KDQ JN97LN 770; OM7F JN98TM 771; F5KOI JN06JG 788; F5DE/P JN05AI 899 ; YT7P JN94XC 1066

06.07.2002: 9A5KK JN86GF 710; SP9AMH/P JO90RM 713; OM3KII JN98KJ 725; SP2FAV JO94MA 766; OZ5GX/P JO57FJ 773; F1USF/P JN14VM 784

07.07.2002: IK4ADE JN54OE 714; HA2R JN87VE 716; OM3RAL JN98LR 717; OM0C JN99PG 723; F6KBN/P JN07GD 745; HA8DZ/7 JN97KW 746; G7RAU IO90IR 753; HA5KDQ JN97LN 770; HA3KGC JN86VI 772; 9A1B JN85OV 772; F5KMQ/P JN15JB 778; IK5ZWU/6 JN63GN 806; F6KPQ/P IN87KW 950; F1AQS JN03EX 991; F6GEX/P JN12AM 1047; F6FZS/P IN93OA 1133; F0DPN/P IN93HG 1143; EA2CN/P IN93GF 1151; EA2URE IN93IA 1159; EA2AP/P IN83MG 1231; EE2DJB IN83FE 1271; EA1DDU IN73FM 1367; EB1DNA/P IN63AI 1532; EA1FDI/P IN52LV 1632

Rig: TS 850 + TV + PA, 600 W, Antenna : 8 * 6 ele 9BV + 4 * 6 ele 9BV 12m agl, 550m asl. tnx for info Dirk + Oli

ON4KHG, JO10XO, wkd:
07.07.2002: EA2CN/P IN93GF 917; EA1FDI/P IN52LV 1308; EE2DJB IN83FE 1002; EA1EF/P IN72TX 1058; F0DPN/P IN93HG 910; F6KBR/P JN12HM 905; EA2URE IN93IA 933; F5KEI/P JN13FL 801;

Rig : 20 W + 4 el., 5 m agl surrounded be close trees. tnx for info Gaetan

S50C, JN76JG wkd:
06./07.07.2002: LZ1KWT KN32 972; YO8WW KN36 894; DG3FK JO74AA 863; F1FIH JN23 852; DK0LK JO42 809; UT/ER3DX/p KN28 759; IS0/IV3CWI JN40 740; SP3KCL JO72 719; YU1HFG KN12 719; YT1Z KN13 701

S55M, JN65XM wkd:
06./07.07.2002: YO8WW KN36 973; F1ACQ JN12 942; F5KCU/p JN13 845; IT9ZMX/9 JM78 834; F6HEH JN23 794; IZ8WDL JM88 776; F1FIH JN23 769; F5KDK/p JN23 760; F1EYB JN23 757; F6EPE JN23 745

S59DEM, JN75DS wkd:
06./07.07.2002: LZ1KWT KN32 992; F1UCQ/p JN12 974; YO8WW KN36 941; IT9ZMX/9 JM78 862; YO8KRR/p KN27 849; UT/ER3DX/p KN28

815; DF7KF JO30 804; F1FIH JN23 801; F1EYB JN23 789; IS0/IW2MXY JN40 756

S57O, JN86DT, wkd:
06./07.07.2002: SK3MF/p JP92 1798; LZ1KWT KN32 890; DK5DQ JO31 821; DG3FK JO74AA 817; YO3DMU KN34 810; LZ7X/p KN22 790; YO6DBA/p KN35 782; YO6GUU/p KN35 782; YO8WW KN36 773; DL0ZDD JO63 773. tnx for all S5 infos Matija

Tropo 70cm:

DK0TR, JO40QL, wkd:

04.05.2002: HB9BCD JN45LV 511; SP6JLW/P JO80JK 525; OK2UDE JN89JS 535; OE3XUA JN77XX 553; G8P JO01QD 567; OE3JPC JN87EW 582; M1CRO/P JO01PU 584; S59R JN76OM 615; S50C JN76JG 616; S53T JN75GV 638; S54M JN86CM 669; I4AMD JN64CI 714

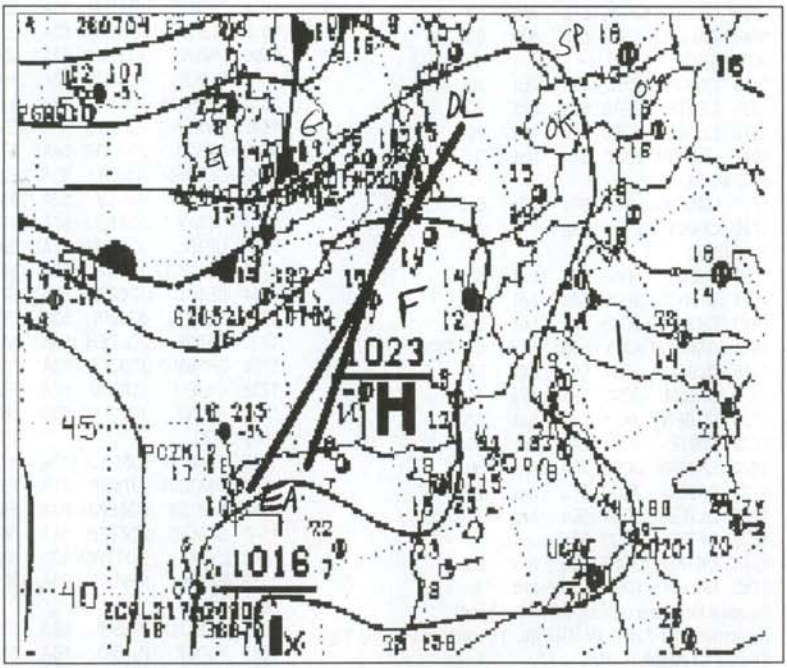
05.05.2002: OK2MWR JN89DN 505; OK2KBA JN89JI 546; OK2KRT JN99BK 637; OM3W JN99BB 648; OM3BS JN99CE 650; OK2KHF JN99HO 668; 9A1CMS JN86EL 681; HA5KDQ JN97LN 770

Rig: TS 850 + TV + PA, 400 W, Antenna : 4 * 17 ele CueDee 10m agl, 550m asl. tnx for info Dirk + Oli

S53D, JN76BD, wkd:
06./07.07.2002: YO8WW KN36 946; IK2YSA/1 JN34 573; DL0GTH JO50 558; DH9NFM JO50 495; OK1KIM JO60 494; OK1KIR JO60 490; DH1NFL JO50 486; OK2KKW JO60 483; OK2BDQ JN99 480; IK1PJU JN45 477

S55M, JN65XM, wkd:
06./07.07.2002: YO8WW KN36 973; SP9KDA/p JN90 650; HA0KHT/9 KN08 633; DL0STO JO40 626; DK0WM JO61 625; OM3RRC KN09 622; DL0EE JN49 596; OL2HQ JO70 595; SP6LTC/6 JO70 594; OK2KPD JO80 577

S50C, JN76JG, wkd:
06./07.07.2002: YT1Z KN13 701; IK2YSA/1 JN34 626; YT0A KN04 593; YU1AXY KN04 556; OM3RRC KN09 519; IK7XXG JN71 510; YU1EMN KN04 507; SP9WY/p JN99 501; YU1B KN03 500; DH1NFL JO50 493 tnx for all S5 infos Matija



Map: A nice high pressure system on July 7th 2002 produced a good tropo duct from EA1 to PA, ON and W-DL during the contest. EA1FDI/p, IN52, made almost 400 QSOs with F, DL, PA, ON etc. with a maximum QRB of 1500 km.

Aurora Reports

Editor: Stefan Heck, LA0BY
LA0BY@qsl.net

DL8EBW in JO31NF wkd on 144 MHz:

2002-03-24

1636	G4LOH	IO94	52a	hrd	30

2002-04-17

1719	SM7WT	JO65	55a	hrd	40

2002-04-19

1653	GW4VEQ	IO73	55a	56a	30
1656	DK1KO	JO53	59+a	hrd	30
1659	G4LOH	IO94	59+a	hrd	30
1700	G3UTS	IO94	57a	hrd	30
1701	G4ASR	IO81	59+	hrd	30
1700	OZ1BEF	JO46	55a	hrd	30
1848	G4LOH	IO94	57a	53a	030/065

2002-04-20

1553	GM4VVX	IO78	59a	hrd	20
1533	OZ2TF	JO46	59a	hrd	20
1546	OZ1CLL	JO65	57a	hrd	20
1627	GM4YXI	IO87	57a	hrd	0

2002-05-11

1717	G4LOH	IO94	59a	57a	010/060
1726	ON8ZS	JO55	55a	hrd	30

2002-05-23

1620	DL9MS	JO54	55a	hrd	50
1621	ON4YZ	JO20	53a	hrd	40
1640	DK3XM	JO43	52a	hrd	35
1641	GM0CLN	IO85	55a	51a	035/090
1718	DL9MS	JO54	59a	55a	50
1719	DK5JM	JO43	55a	52a	45
1720	IZ1BPN	JN35	53a	hrd	080!
1723	DJ9YE	JO43	57a	hrd	70
1724	SK7MW	JO65	55a	hrd	60
1725	PA5DD	JO22	57a	hrd	70
1726	DL1EJA	JO31	59a	hrd	70
1728	DF2ZC	JO30	59a	hrd	70
1745	DK1KO	JO53	59a	hrd	50
1752	G4LOH	IO94	55a	hrd	45

as usual long time only signal on the band!
Equipment: FT-726R, PA GU74b, 11-element DL6WU Yagi.
Thanks for report, Guido.

G4ASR in IO81MX wkd on 144 MHz:

2002-04-17

1458	GM3WOJ	IO77WS	53A	55A	15	648km
1550	GM0CLN	IO85HV	54A	54A	15	436km
1553	MM0CIN	IO75OP	54A	55A	15	425km
1554	PA5DD	JO22IC	53A	54A	20	524km
1602	DK3BU	JO33NO	53A	42A	30	701km
1614	MM0CTT	IO75PP	54A	55A	15	424km
1618	OZ9PP	JO47VA	41A	56A	40	994km
1700	LY2IC	KO14WW	53A	55A	40 1	795km
1705	YL3AG	KO26AW	55A	59A	40	1816km

2002-04-18

1437	GM4VVX	IO78TA	55A	57A	10	678km
1512	OZ2TF	JO46PE	53A	55A	40	924km
1518	GM0CIN	IO75OP	53A	57A	35	425km
1526	GM3WOJ	IO77WS	57A	55A	40	648km
1531	G3PJW	IO83PM	52A	55A	35	172km
1535	GM4ILS	IO87IP	57A	56A	35	630km

2002-04-19

1515	G7RAU	IO90IR	55A	55A	90	181km
1555	GM3WKZ	IO88CN	54A	56A	10	734km
1557	GM0TGE	IO87TF	55A	59A	10	585km
1610	YL3AG	KO26AW	55A	57A	30	1816km
1614	SP2OFW	JO93AC	57A	59A	30	1421km
1621	LY2IC	KO14WW	53A	53A	35	1795km
1625	DK2AR	JO42UC	54A	56A	50	865km
1627	DK2ZF	JO43WJ	55A	55A	50	878km
1631	GW3LEW	IO71PS	53A	57A	50	122km
1634	DL3BCR	JO43HK	53A	55A	50	796km
1636	DK3QZ	JO31LP	53A	55A	50	682km
1639	DL8YET	JO31MW	53A	53A	50	685km
1640	DK6WE	JO31GO	52A	55A	50	654km
1641	DL9QB	JO44UL	53A	56A	50	886km
1644	SP2CNW	JO93AD	53A	59A	50	1420km
1645	SM6ENG	JO67CQ	53A	55A	50	1156km
1649	DF9QT	JO30OR	54A	57A	50	719km
1652	DL3RBH	JN68HJ	53A	52A	50	1176km
1658	F6APE	IN97QI	53A	53A	50	541km
1701	DJ3AY	JO21UU	57A	55A	50	594km
1705	DF1RL	JO43MW	57A	59A	45	832km
1707	GW4BZD	IO73	52A	56A	50	218km
1714	DL1UU	JO62SP	54A	57A	50	1122km
1715	DL1RTL	JO62PI	52A	55A	50	1107km
1720	SK6DK	JO67EH	55A	55A	30	1147km
1724	SP2MKO	JO93CB	53A	55A	45	1432km
1733	G4JBH	IO70RV	55A	55A	35	163km
1736	PA9RX	JO32MT	53A	55A	50	684km

2002-04-20

1445	GM4YXI	IO87WJ	57A	57A	20	605km
1528	MM0CIN	IO75OP	57A	59A	20	425km
1534	SK6QW	JO68WR	52A	55A	20	810km
1540	SK6DK	JO67EH	54A	56A	350	1147km
1546	LY2IC	KO14WW	52A	53A	40	1795km
1552	EI5FK	IO51RT	53A	53A	45	383km

2002-05-23

1625	GM0CLN	IO85HV	52A	51A	30	436km
1659	F8DBF	IN78RI	55A	55A	75	419km
1704	DF2JQ	JO31HL	54A	55A	75	662km
1706	F6BEG	JN25JS	55A	55A	75	892km
1708	ON4YZ	JO20GG	55A	55A	75	557km
1712	DM2DXG	JO51MV	52A	53A	75	958km
1714	OK1?	31A	NC		75	
1716	F6APE	IN97QI	55A	55A	75	541km
1718	F1FLA	JN26KU	52A	55A	75	803km
1721	HB9DFG	JN37SM	53A	53A	75	901km
1723	DL6YDH	JO41NV	53A	55A	75	827km
1727	HB9QQ	JN47JN	55A	54A	75	975km
1728	DL5EBS	JO31LH	55A	55A	75	688km
1730	HB9BNI	JN37WB	53A	55A	75	953km

1731	DF1CF	JN57FP	53A	53A	75	1074km
1734	DJ2NJ	JO31GK	53A	55A	75	657km
1734	F5HRY	JN19EQ	55A	57A	75	453km
1740	F5APQ	JO00XU	55A	55A	60	363km
1745	OK2VWB	JN99CL	53A	52A	60	1510km

Equipment: TS-790E, two x 8874 triodes, 18-element DL6WU Yagi. Thanks for report, David.

G4ASR in IO81MX wkd on 50 MHz:

2002-04-20

1608	GM7PBB	IO68	57A	59A	10	770km	SSB

2002-05-23

1634	GW6TYO	IO81AO	55A	55A	35	80km
1639	LB1NI	JO59JT	52A	55A	35	1218km
1642	G4VSS	IO83RJ	57A	54A	35	160km
1645	GW3LEW	IO71PS	59A	59A	35	122km
1648	G3YY	IO90XT	55A	57A	35	240km
1654	G4UCJ	IO92	41A	55A	30	149km
1655	G0RDI	IO91QP	57A	58A	30	165km

Equipment: TS-690S, two x 4CX250BM, two x 6element DJ9BV Yagi. Thanks for report, David.

GM0CLN in IO85HV wkd on 144 MHz:

2002-05-23

1624	G4ASR	IO81MX	50	436km	
1629	GM3WOJ	IO77WS	50	213km	
1633	LA0BY	JO59FW	45	930km	
1636	ON4YZ	JO20GG	90	818km	
1639	DK3XM	JO43XL	90	897km	
1643	DL8EBW	JO31NF	80	865km	
1645	DK5WO	JO30AS	80	845km	
1648	DK2BJ	JO30CU	80	846km	
1652	DC9KU	JO30BT	80	845km	
1654	DJ7RI	JO54CI	80	879km	
1655	DO1YDS	JO42HJ	80	872km	
1657	DL5EBS	JO31LH	80	850km	
1703	OK1VT	JN79IX	75	1373km	
1707	SM6CEN	JO57XO	75	952km	
1708	DL4DWA	JO61QH	75	1213km	
1710	ON4BG	JO10WM	75	768km	
1717	DJ9MG	JO52TC	75	1064km	
1718	F6APE	IN97QI	75	968km	
1720	PA3HHE	JO22QE	75	704km	
1722	ON5GS	JO21TD	75	795km	
1725	PA0RBI	JO21VU	75	749km	
1727	DL3SWS	JO53SG	75	1002km	
1732	F5APQ	JO00XU	75	663km	
1733	OK1FPR	JO80CE	75	1448km	ODX
1738	DJ2QV	JO31PF	75	873km	
1740	DJ0SP	JO32KB	75	793km	
1745	GM4PPT	IO75SK	75	85km	SSB

Equipment: TR751E, PA 100W, 14-ele yagi.
Thanks for report, Colin.

LA0BY in JO59FW wkd on 144 MHz:

2002-04-17

1425	SP2CNW	JO93AD	55A	58A	30
1428	DJ8MS	JO63CT	58A	57A	30
1442	ES5QA	KO38JJ	55A	57A	30
1446	OH5LK	KP30ON	57A	55A	10
1451	DG5CST	JO60DS	55A	53A	10
1452	SM7BYB	JO76XR	56A	57A	10
1459	OH2LE	KP20DI	55A	55A	10
1501	ES0HD	KO18FF	58A	59A	10
1503	LA6OJ	JO28VR	53A	55A	0
1505	LY2IC	KO14WW	57A	57A	20
1508	DK6AS	JO52JJ	58A	59A	20
1519	SP2RS	JO94GK	51A	52A	20
1521	DL3BUE	JO72FH	55A	57A	20
1522	SP2DDX	JO83VE	56A	59A	20
1538	SM3RXC	JP81MX	55A	52A	20
1544	RU1AA	KP40XD	58A	58A	10
1545	DL1KDA	JO30FQ	56A	59A	340
1553	RX1AS	KO59FX	59A	57A	340
1557	RV3IG	KO87OT	55A	55A	30
1600	EW6FS	KO35LB	55A	55A	30
1602	G4DEZ	JO03AE	59A	59A	340
1605	LY2SA	KO14LL	57A	57A	30
1607	DH3YAV	JO42HH	55A	56A	10
1612	DK2ZF	JO43WJ	59A	58A	30
1614	DL3AMB	JO61EA	51A	53A	30
1615	DL6YEH	JO32VA	53A	57A	10
1617	DK2JP	JO73CB	57A	59A	30
1620	DL3JIN	JO60LX	53A	56A	30
1625	PA3EHH	JO23XA	59A	57A	0 SSB
1629	DJ2IA	JO71AO	55A	57A	20
1630	PA1GYS	JO22WW	59A	59A	340°
1634	PD0RFU	JO32LS	59A	59A	340°
1639	DF6WE	JO31GO	55A	55A	340°
1645	DG2BCP	JO43DC	59A	57A	340° SSB
1647	ON1AEN	JO10?W	47A	39A	330° SSB
1700	DL8MKG	JO52NU	55A	55A	340°
1718	GM4PPT	IO75SK	57A	53A	350°
1720	PA9RX	JO32MT	57A	55A	350°
1727	G4KWQ	IO92AQ	57A	55A	340°
1729	PA7KY	JO32LR	57A	55A	340°
1730	DF0WD	JO42FD	56A	55A	340°

2002-04-18

1345	GM4VVX	IO78TA	56A	44A	340°
1524	PA5DD	JO22IC	56A	56A	330°
1535	GM3WOJ	IO77WS	53A	55A	340°
1545	GM4ILS	IO87IP	55A	55A	340°
1632	SM5CUI	JO89WW	57A	57A	10°
1639	OH2LAK	KP20IE	53A	55A	20°
1642	LY3OD	KO24OR	55A	55A	30°
1645	DK5JM	JO43QS	57A	57A	30°
1647	DD3SP	JO72EN	55A	57A	30°
1709	OZ8ZS	JO55RT	59A	59A	10°
1715	GM0CLN	IO85HV	55A	54A	0°

2002-05-11

1455	LA2RZ	JP20ON	59A	59A	10°
1501	PA3CEE	JO33JI	59A	59A	20°
1505	PA9RX	JO32MT	55A	55A	20°
1514	DD3SP	JO72EN	57A	57A	40°
1529	OZ4VW	JO45UT	56A	57A	30°

1552	G4LOH	IO94IA	59A	57A	10°	
1636	OK1DUG/P	JO60VR	57A	55A	40°	
1642	DF0WD	JO42FD	56A	57A	30°	
1700	DG6JF/P	JO33QN	59A	59A	30°	SSB
1704	SM7WSJ	JO67WI	58A	57A	30°	SSB
1714	SP5QWB	KO02NF	57A	59A	50°	SSB
1715	PD0RFU	JO32LS	58A	52A	30°	
1720	DL1VDL	JO61WB	52A	52A	50°	
1726	DL5WG	JO52VK	57A	57A	40°	
1729	DL0DA	JO61WB	53A	55A	50°	
1730	PA3EXB	JO32LX	53A	58A	30°	
1731	DL0BZ	JO43EA	59A	59A	50°	
1733	SM6NET	JO68SD	57A	57A	40°	

2002-05-23

1614	DL1RTL	JO62PH	53A	55A	45°	
1623	SP2CNW	JO93AD	52A	57A	50°	
1625	DH7FB	JO62SM	57A	55A	45°	
1632	DJ6TK	JO53FG	57A	57A	45°	
1633	DJ7RI	JO54CI	59A	58A	50°	
1635	GM0CLN	IO85HV	57A	57A	10°	
1636	DO1YDS	JO42HJ	57A	57A	30°	
1654	OK1VT	JN79IX	53A	52A	50°	
1656	SM7FVB	JO76TE	59A	59A	50°	
1658	DL1VDL	JO61WB	55A	57A	50°	
1710	DL3WW	JO60FL	55A	55A	50°	
1714	DK7LH	JO43BB	59A	54A	50°	SSB
1724	SP6GVU	JO81LC	55A	55A	70°	
1731	DL7KM	JO62OO	55A	55A	60°	

2002-05-27

1524	DJ9YE	JO43HV	56A	57A	20	

Equipment: IC-821H, PA 180 W, 9-ele yagi

ON4LDP in JO10UM wkd on 144 MHz:

2002-04-19

1812	G4LOH	IO94IA	57A	55A	20°	517km
1818	GM4CXM	IO75TW	52A	52A	10°	806km
1840	DL1EJA	JO31DS	52A	52A	20°	227km
1844	G0GMS	IO82XT	51A	52A	15°	470km

2002-04-20

1544	GI4OWA	IO64IX	53A	53A	05°	889km
1545	SK6DK	JO67EH	52A	52A	10°	943km
1553	GM4VVX	IO78TA	56A	57A	10°	984km

Equipment: TS790E, PA 150 W, 13-ele yagi.
Thanks for report, Olivier.

ON7CL wkd on 144 MHz via Aurora:

2002-04-17

2120	SM7WS	JO67WI	57A	57A
2137	MM1BXF	IO76PA	55A	55A

2002-04-19

1627	M1CDU	IO95BM	57A	57A
1632	GM4VVX	IO78TA	59A	59A
1634	OZ1BEF	JO46OE	59A	59A
1635	G8GXP	IO93FQ	59A	59A
1639	2M1IGR	IO86AE	55A	55A
1656	G3XXW	IO94ND	57A	57A
1659	GM0BQM	IO85CE	59A	59A
1702	G4APJ	IO83UP	55A	55A
1708	G4PBP	IO82WO	58A	58A
1712	G4LOH	IO94IA	59A	59A

Equipment: FT847 - 17el M2 - 300 Watt.
Thanks for report, Rudi.

Meteor Scatter

HSCW - SSB - WSJT - Reports

Editor: Norbert Göttsche
DL8LAQ@gmx.de

Dear Readers, don't forget to send in all your reports, experiences and comments about the MS avtivity! Also experiences and reports about WSJT on 6m, 2m and 70cm are very welcome!
It happens sometimes that I can't recognize what column of your report includes the number of bursts or pings or the tx/rx report. Please don't forget to give me a short hint. In this column the order is bursts, pings and seconds. And here is again the meaning of the short cuts: c = complete, bs = backscatter, m = many, nc = not complete, nil = not in log (no reflections!), r = random, s = ssb, sc = sidescatter, t = tailend, nfr = no final rogers.
Please send your reports to my email address
dl8laq@gmx.de
or via PR to:
DL8LAQ@DB0HB.#HH.DEU.EU

73, Norbert.

DL8EBW (JO31DL) wkd on 144MHz:

10-03-02
2030 2110 SM2CEW KP15 28 hrd 6 m 1.5 onlylistened
07-04-02
0000 0043 EA6IB JM09 26 27 5 3 1 C
15-04-02
0242 0250 EM5U KN39 26 27 5 6 1.5 C
19-04-02
0232 0251 EM5U KN49 26 26 7 4 0.6 C
22-04-02
0227 0246 EM5U KN48 26 26 7 12 4 C
21-07-02
2000-2015 HA8CE KN06 27 R26 8 7 0,3 C *F*1
22-07-02
1930-1945 HA5OV JN97 26 - 5 5 0,2 NC *F*1
23-07-02
1913-1943 IK7EZN JN90 27 R27 7 5 0,4 NC *F*1
28-07-02
0000-0100 RA3LW KO54 26 R26 2 3 0,5 NC
31-07-02
1930-2000 LY2SA KO14 26 26 1 2 0,1 NC *F*1
01-08-02
0000-0115 RA3LW KO54 26 26 4 13 2,0 NC
01-08-02
2300-0015 RA3LW KO54 26 R27 1 3 0,5 NC
03-08-02
0100-0200 RA3LW KO54 R26 26 3 7 0,5 NC
04-08-02
0050-0103 LY2BIL KO24 27 R27 5 2 8,0 C *F
05-08-02
0100-0210 RA3LW KO54 26 R26 4 7 6,5 C #
08-08-02
0300-0400 LA/PA3BIY JP79 R26 26 4 10 1,0 NC
10-08-02
0400-0455 LA/PA3BIY JP79 26 R26 4 5 1,5 C #
11-08-02
0325-0333 HA5KDQ JN97 28 R27 6 4 0,5 C-R*F
0338-0400 IW2BSQ JN45 26 - 1 - 0,2 NC *F
12-08-02
0812-0915 OH8K KP45 R27 R27 15 10 21 C #
1058-1101 SM2CKR KP03 37 R37 3 1 15 C-RSSB
1151-1151 G4RRA IO80 37 R37 1 - 10 C-RSSB *SC
1152-1156 SM3VAC JP83 R27 27 2 4 6 C-RSSB
1159-1202 OH1XT KP01 29 R27 3 - 4 C-RSSB
1218-1221 LA0BY/p JO49 27 endet tropo 52/57
1227-1228 SM3JLA JP93 R39 39 1 - 12 C-RSSB
1232-1233 OH5LK KP30 39 R39 1 - 20 C-RSSB
1300-1350 RA1QA KO99 26 - 1 - 0,3 NC
1400-1500 RA3IS KO76 26 - 1 1 0,3 NC
1719-1720 I8MPO JN70 27 R29 1 - 7 C-RSSB
1744-1745 F4ARU IN94 38 R38 endet tropo55/55
1900-1930 UA1WER KO47 26 - 1 1 0,5 NC SSB
1932-1940 EA2ARD IN93 39 R37 3 2 NCRSS*2
13-08-02
0045-0046 I8MPO JN70 39 R39 1 - 16 C-RSSB
0114-0114 T94DU JN95 R39 59 1 - 8 C-RSSB
0116-0116 HA5OV JN97 39 R39 1 - 15 C-RSSB
0116-0116 9A1CAL JN86 39 R39 1 - 15 C-RSSB
0140-0140 HA8MV KN06 29 R29 1 - 45 C-RSSB
0141-0141 LZ2ZY KN13 R29 R27 1 - 45 C-RSSB
0141-0141 LZ1KWT KN21 37 R27 1 - 45 C-RSSB
0151-0151 YU7ACO KN05 R27 R27 1 - 15 C-RSSB
0151-0151 YU1BT KN03 R29 27 1 - 20 C-RSSB
0234-0238 YU1CF KN03 R27 27 3 5 2 C-R*F
0248-0248 OK2PTC JN89 R39 R37 1 30 C-RSSB
0254-0312 HA1BC JN87 27 R27 5 m 2 C?-R*F
0355-0405 YU7KB JN94 27 R27 m m 5 C-R*F
0407-0415 S50C JN76 28 - m m 5 NC-R*F
0417-0435 UT5DL KN18 27 R27 4 2 2 C-R*F
0443-0459 UR5TW KN39 R27 R26 3 2 1 C-*F
0523-0543 S50C JN76 27 - 4 - 1 NC-R*F
1230-1322 RA3IS KO76 26 R26 4 1 3 C *F #

Remarks: NIL: 04.08. RA3LW KO54 ; 04.08. EB1IVY/p IN63 *F, 11.08. RA3LW KO54 *FSK ; 12.08. TF8ITT HP94 *FSK 13.08. RA1QA KO99 ;
: new SQUARE for me
*SC : Sidescatter-QSO (my antenna beaming to radiant)
*F: test with digital ms mode FSK441 (part of WSJT)
*1 : I did use QRP for these MS tests (30-40Watts)
*2 : station did use wrong procedure...

PERSEIDS: I was up on a hill in front of my city to avoid problems with TVI and noise and have a bit better take off than from my home. I startet 12.8. 6UT and ended activity 13.8. after QSO with RA3IS. All time ms-condx were really flat. Therefore we have had a lovely tropo duct to EA1 area mostly both day - shit also there was poor activity... At home

my datalogger was logging bursts from UA CH R1 and counted the shower peak (I believe the 2nd!) at 13.8. 04-08UT! (send mail to me if you want the screenshot) Condx on 144 MHz were quite well - lot of 10-30° bursts occured on 144,370 MHz while 144,200 MHz was dead (where are the good old times.....). Hope to cuagn in LEONIDS 2002!
Equipment: FT726R (preamp MGF1302), 144MHz 11 el DL6WU, PA GU74b, DTR (RX/TX max 3500lpm). All infos are welcome via VHFNet or PR (BBS DB0NDK), or GSM +1745430884. Thanks for report, Guido.

ON4LN, JO20IV, wkd on 144 MHz:

2002-08-12
2251 IZ8DWL JM88BR 37 37
1654 HA5MV JN97MM 37 37
1653 HA2VH JN87WG 37 37
1652 HA5UK JN97MM 38 38
1643 HA5OV JN97NG 37 37
1600 I8MPO JN70FP 39 39
1426 S53G JN65TM 37 37
1416 9A2PT JN73WV 59 59
1054 OK2ZW JN89HI 38 38
1003 YU1EV KN04DL 37 37
1002 S51MQ JN75NT 37 37
0908 ES1AJ KO29HK 37 37
0848 OH1XT KP01UK 37 37
0846 SK4AO JP70TO 27 27

Some qso's were not completed, as for me they don't count. Rig: TS711e, 800W (home made GS35b amp) and 17 ele abt 50m asl. 73, Eric

PAØZM (JO32GK) wkd on 144 MHz Random-WSJT:

2001-12-12
2251 2259 F6FHP IN94TR 26 27 QTF 200°
2001-12-13
1448 1510 OH3KLJ KP21PI 26 26 QTF 65
2033 2042 GMØEWX IO67UL 27 27 QTF 320
2001-12-14
0823 0844 TK5JJ JN41IW 37 27 QTF 200
2001-12-25
0942 1005 OM5CM JN98DF 26 26 QTF 135
2001-12-26
1006 1015 GW8IZR IO73TI 26 26 QTF 298
2001-12-29
1235 1332 HA2VH JN87WG 26 26 QTF 130
2002-01-02
0945 0956 RA3DRC/1 KO55JR 26 27 QTF 70
2002-01-03
0846 0909 S51DX JN75DW 26 26 QTF 130
1220 1235 I4XCC JN63GV 26 26 QTF 175
1308 1316 OH1FA KP1ØPL 27 27 QTF 58
1714 1746 OM3TZZ JN88TI 26 27 QTF 130, 4 Pings
1805 1821 EB1EHO IN73DM 26 26 QTF 220
1949 1955 RU1AA KP4ØXD 26 27 QTF 60
2002-01-19
1251 1329 OH8NXE KP25SB 26 26 QTF 45
1341 RU1AA KP4ØXD 26 27 2nd QSO
2002-01-22
1337 1420 SM2AZG KPØ4AB 26 26 QTF 20
2002-04-20
0555 0614 S51WX JN75NT 26 26 QTF 165
2002-05-04
0643 0710 EA6VQ JM19HO 26 26 QTF 200
0808 0827 F1FIH JN23GS 26 27 QTF 200
2002-05-11
0420 0452 SP/DL9AN KO13CW 26 27 QTF 45

These are all confirmed good contacts but I heard many more calls which did not come to a 100% QSO. Nevertheless it is a realy wonderfull piece of software and as LY2MW can confirm even with 8W output I was heard in LY. 73, Geert.
Thanks for report, Geert.

Perseids 2002:

Astronoms also report that there was not a very sharp maximum of the Perseids this year. They give a maximum from 17-21 UTC on August 12th. Probably many of the radio amateurs missed this time. (DL8HCZ)

Sporadic E

144 MHz – Reports 2002

Editor: Norbert Göttsche
DL8LAQ@gmx.de

Dear Readers, please send your reports via email to dl8laq@gmx.de or packet radio to DL8LAQ @ DB0HB.#HH.DEU.EU. 73, Norbert
All QSOs in UTC!

2002-06-01

EI4IX, IO53, wkd:
16.39, HA0MK/9 KN08

F1ORL, JN08VP, wkd:
17:26 YO8RGJ KN36KN

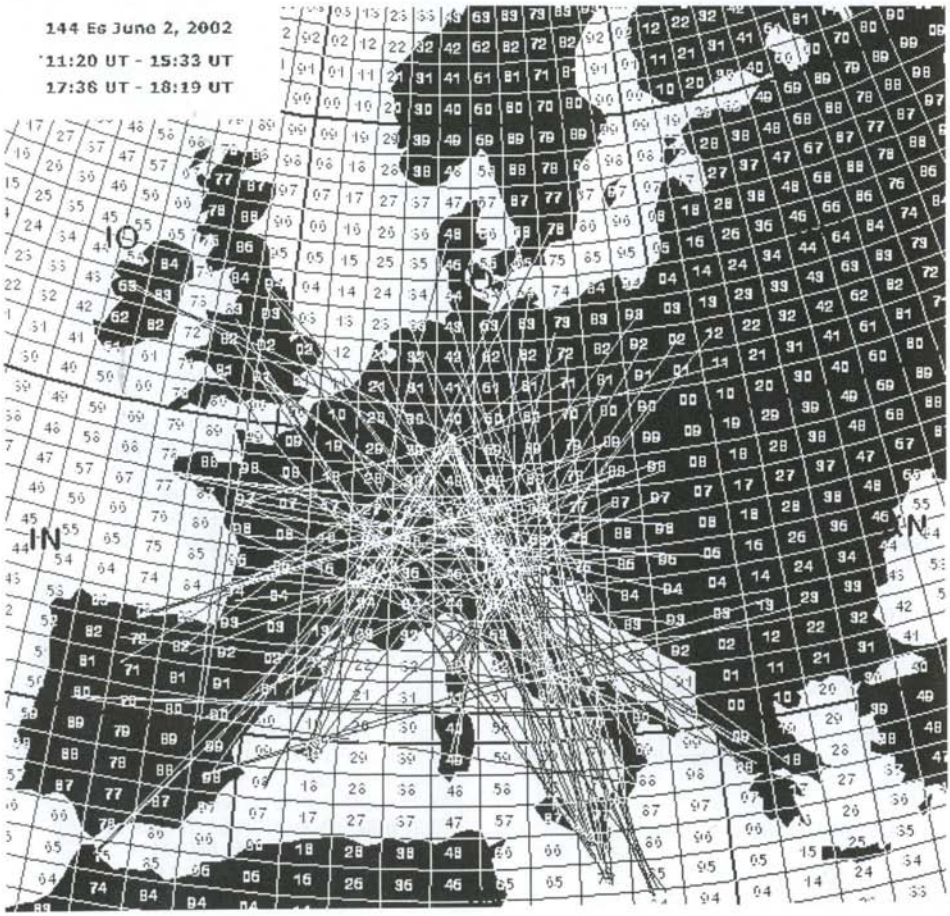
G8IZY, IO91VC, wkd:
17:32, YO3DMU KN34BJ

LZ2ZY (KN13OT) wkd: 1713 DG6JF/p JO33QN, 1718 TM9R JN04AR. 73, Rady.

YU7EW (KN05HP) wkd: 1709 DJ9YE JO43HV, 1729 G4LOH IO94IA. 73, Pista.

2002-06-02

DF2ZC, JO30RN, wkd:
12:39 9H1ET JM75GU 59 59 SSB 1731
12:40 9H1PA JM75 59 59 SSB 1780+-
12:55 IT9VKY/9 JM77EU 59 59 SSB 1515
12:57 IW9ELR JM68OB 59 59 SSB 1462
13:06 GU6AJE/MM JM84 59 59 SSB 1944 #537
13:21 IK8YFU JM88AI 59 59 SSB 1516
13:25 I8MPO JN70FP 59 59 SSB 1228
13:35 IZ8EDJ/M JN70LO 59 59 FM 1250
13:55 IC8CQF JN70CN 59 59 SSB 1228



14:05 I8MIB JM88AQ 59 59 SSB 1482
4x17 F9FT, EME-Power

DF7KF, JO30, wkd:
12:29 9H1PA JM75
12:31 9H1ET JM75
12:48 IT9RYJ JM77
13:05 GU6AJE/mm JM84
13:26 IT9NGN JM78
13:19 IK8YFU JM88
13:21 I8MPO JN70
13:34 IK8XSY JN70
13:31 IK8YOQ JN70
13:43 IZ8DPL JN70
13:48 IW9ELR JM68
13:51 IT9NGN JM78 dupe
13:55 IT9KSS JM68
14:07 IC8CQF JN70
14:10 IW0GPN JN62 QTF 170
14:16 IW8DZL JM88
14:17 IK8YVG JM88

DF8IK, JO30, wkd:
12:17 9H1ET JM75
12:21 9H1PA JM75
13:09 GU6AJE/mm JM84 new, tks DF1BN fr qsp
13:22 IT9NGN JM78
13:32 IK8YFU JM88
13:36 IK8YOQ JN70
13:42 IZ8DDG JN70 FM 145.550
13:45 IK8LIU JN70 FM 145.550
13:52 IT9KSS JM68
14:04 I8MIB JM88
all qso ssb except 2 fm qso. hrd: IZ8DPO, IW0GPN, IC8CQF, IW9ELR, I8MPO, IZ8DPL, IK8YVG. Still missing JN80!!

DG1YBO, JO32RG, wkd:
13:17, 9H1ET JM75GU 59/59 1908kms
13:27, 9H1GB JM75FU 59/59 1906kms
14:10, IK0PEA JN61GV 59/59 1215kms
Hrd : IT9, I, EA6, EA.

DG5CST, JO60DS, wkd:
11:30 EA9MH IM85ng 59/59

DH5HV, JO31AS, wkd:
9H1ET (JM75), GU6AJE/MM (JM84), IT9NGN (JM78), I8MPO (JN79), IC8CQF (JN70), IK8YOQ (JN70), IW9ELR (JM68), IT9KSS (JM68), IK8AJ (JM88). Special thanks for GU6AJE/mm for new ODX ! Equipment: LT2S + IC 756 Pro 2 + LNA 0.3dB + 2M12 Msquare, barefoot due to broken PA

DH0GHU (JN38VN) wkd: 1218 9H1PA JM75FU, 1220 9H1ET JM75GU, 1244 IT9RYJ JM77NM, 1258 GU6AJE/mm JM84, 1302 IT9VKY/9 JM77EU, 1314 IK8YFU JM88AJ, 1315 IT9NGN JM78PE, 1320 I8MPO JN70CN, 1328 IK8YOQ JN70GR, 1335 IK8LIU JN70RH (FM!). 73, Ulrich.

DJ8MS, J063CT, wkd:
14:01 EA3GCJ JN11EM 59 59 SSB 1549
14:04 EA3FLX JN01UF 59 59 SSB 1602
14:13 EA5/DJ4UF JM08BR 59 59 SSB 1911
14:15 EB3EDT JN01TN 57 53 SSB 1571
14:15 EH3AND JN11CK 57 55 SSB 1563
14:18 EB3DYS JN11CK 59 59 SSB 1563
14:19 EB5EIB IM98VX 59 59 SSB 1898
14:21 EA6FB JM08PW 59 59 SSB 1848
Heard:IS0TH?, IS0GQX (JM49) , IK0VJH (JN61), EA5EZJ, EA6VQ, EA3EVJ, EA3BHM
2x7el DL6WU + 100W

DK1VI (JN49HH) wkd: 1250 9H1ET JM75GU, 1259 IW9ELR JM68PD 59/59, 1313 IT9VKY/9 JM77EU 57/59, 1315 GU6AJE/mm JM84 56/hrd, 1321 I8MPO JN70FP 59/hrd, 1330 IT9NGN JM78PE 59/hrd, 1337 IC8CQF JN70CN 57/hrd, 1420 EA5DIT IM99CO 58/59, 1426 EA4AKH IN70UA 59/59. JM84 would have been a nice squre for me, hi. Called I8MPO very often, but no chance. Hams with longer skip had much better luck. Equipment: IC251E, PA 600W, 16 El. F9FT. 73 de Ernst, dk1vi@gmx.de.

DK2CF, JO41GG, wkd:
1321 UTC 9H1ET 59/59 JM75
1325 UTC 9H1GB 59/52 JM75fU
1418 UTC EA3GCJ 59/59 JN11EM
1420 UTC EA6FB 59/59 JM08PW
1421 UTC EA6VQ 59/59 JM19
1427 UTC EA3DXU 59/59 JN11CM
1246 UTC IW9ELR 59 hrd JM68
1303 UTC IT9KSS 59 hrd JM68

DK3WG (JO72GI) wkd: 1356 EA6XQ JM19, 1356 EA5DIT IM99, 1358 EA5AGR IM88WV, 1400 EB6AOS JM19IO, 1407 F1UCQ JN12IN, 1409 EA3CBH/6 (c?), 1410 EB5EHE/p IM99OC, 1420 EA3TI JN11DO, 1422 F6DRO JN03TJ, 1424 EA4AQQ IN80GL, 1428 EA6UH, 1434 EA3DHR JN01TN. 73, Jurg.

DL1KDA, JO30, wkd:
12:18 9H1PA JM75FV 59 59 SSB 1765
12:20 9H1ET JM75GU 59 59 SSB 1771
12:45 IT9RYJ JM77NM 59 59 SSB 1616
12:57 GU6AJE/MM JM84 59 59 New # 1990+-
13:08 IT9NGN JM78PE 59 59 New # 1554
13:18 IK8YFU JM88AJ 59 59 SSB 1560
13:19 I8MPO JN70FP 59 59 SSB 1276
13:25 IK8XSY JN70VB 599 599 CW 1385
13:30 IK8YOQ JN70GR 59 59 SSB 1271
13:34 IK8LIU JN70 59 59 FM 1311+-
13:38 IW8EQP JN70QI 59 59 FM 1340
13:39 IZ8DPO JN70EP 59 57 FM 1273

13:47 IW9ELR JM68PD 59 59 SSB 1494
13:53 I8MIB JM88AQ 59 59 SSB 1531
13:56 IT9GIE/9 JM77EU 59 59 SSB 1557

DL1RNW, JO62GH, wkd:
14:00 IW9ELR hrd
14:02 EA5MR IM99
14:04 EA5/DJ4UF JM08
14:05 EB5ECB IM98
14:07 EA3DHR JN01
14:09 EB3EDT JN01
14:12 EA5AFP IM98
14:15 EB5EHT/p IM99
14:21 F1UCQ JN12
14:25 EB5EIB IM98
rig: 160 w 2x9el yagi

DL2DN, JN48MX, wkd:
1250z IW9ELR 144.300 JM68PD 1252km
1252z 9H1ET 144.311 JM75GU 1527km
rig: 300W 2M5WL

DL6YEH, JO32VA, wkd:
12:51 IW9ELR JM68AA 59 59 SSB 1591
12:54 9H1ET JM75GU 55 59 SSB 1875
13:14 IT9KSS JM68QC 59 59 SSB 1607
13:30 9H1GB JM75FU 59 59 SSB 1873
13:40 IT9GIE/P JM77EU 59 59 SSB 1656
13:42 9H5L JM75FV 59 59 SSB 1868
IC735/LT2-S, 2x2.2wl 9BV, 400W

DL8EBW (JO31DL) wkd/hrd: 1729 LZ1KWT KN32AS hrd, 1221 9H1ET JM75 hrd, 1239 9H1PA JM75, 1245 IT9RYJ JM77 hrd, 1253 IW9ELR JM68, 1300 GU6AJE/MM JM84, 1303 9H1GB JM75 hrd, 1305 9H1ET JM75, 1308 IT9VKY/9 JM77, 1313 IT9NGN JM78 hrd, 1323 I8MPO JN70, 1324 IK8YFU JM88, 1326 IT9KSS JM68 hrd, 1328 IK8YOQ JN70 hrd, 1334 IK0FTA JN61, 1336 IC8CQF JN70, 1341 IT9NGN JM78, 1343 I8MIB JM88 hrd, 1355 IT9KSS JM68, 1401 IK8YOQ JN70, 1408 I0JX JN61 hrd, 1410 IZ0DBO JN61, 1411 IK8YVG JM88 hrd, 1417 I0JX JN61, 1418 I0RHJ JN61 hrd, 1420 IK0SOI JN62, 1423 EA3GCJ JN11, 1425 EA6VQ JM19 hrd. One of the best openings these direction in past years! Was pleased to catch the /MM bcse vy rare one and nice to see these good activitys from south europe and stations spread out btwn .230 to .350! 16 complete QSOs all in all at MUF btwn 144 to over 190MHz - all in 35° warm shack!73, Guy.

EI4IX, IO53, wkd:
14:13 IW0GPN JN62FB 59 59 SSB 2076kms
14:15 I8MPO JN70FP 59 59 SSB 2305kms
17:43 9A4VM JN85FS 59 59 SSB 2045kms
17:43 9A2TE JN84KK 59 59 SSB 2161kms
17:44 9A2YF JN85OO 59 59 SSB 2103kms
17:44 9A3GL JN95 59 59 SSB 2225kms
17:47 T94NK JN95DA 59 59 SSB 2209kms
17:49 9A2RD JN65TF 59 59 SSB 1905kms
17:54 S53X JN65WS 59 59 SSB 1884kms
18:02 S53VV JN65UM 59 59 SSB 1890kms
18:04 9A6NDX JN65TF 59 59 SSB 1905kms
18:06 9A4KF JN83GD 59 59 SSB 2232kms

EI5FK (IO51RT) wkd: 1404 I5WBE JN53JR, 1406 IK5VHU JN53OU, 1409 IW0QNX JN62IQ, 1413 I7CSB JN71QQ, 1417 IK6EIW JN63RJ, 1417 IK7UXU JN81HE, 1420 IK4WMA JN54WG, 1426 IK4DRY JN64BL, 1736 YU7EW KN05HP, 1737 YO2BBT KN05WH, 1743 HA1FV JN87JJ, 1745 HG1DLL JN87GF, 1748 9A2YF JN85OO, 1750 T94DU JN95DA, 1752 9A4VM JN85FR, 1754 9A1CMS JN86EL, 1756 YU7KB JN94XX, 1758 YU1IO KN04IQ, 1758 YU7BCL KN05FW, 1800 9A5AGL JN85OO, 1802 9A1CAL JN86FJ, 1804 HA3HV JN86UJ. 73, Charles.

G4HGI, IO83PL, wkd:
1343 IW0GPN JN62
1346 IW0BET JN61
1348 IW0QNX JN62
1358 IK8XSY JN70 CW!
1403 I0JX JN61
1408 I8MPO JN70
1415 IC8CQF JN70
1425 IT9NGN JM78
1428 IZ8DWL JM88
1429 IK8YVG JM88

G7RAU, IO90, wkd:
18:05 HA5OV 59 59 JN97NJ 1528
17:52 YU7EW 59 59 KN05HP 1713
14:35 I8MPO 59 59 JN70FP 1653
14:31 IW0GPN 59 59 JN62FB 1424
14:28 IZ5ENH 59 59 JN53PS 1222
14:28 IZ0DBO 59 59 JN61NQ 1492
14:27 IW0RNA 59 59 JN62IW 1369
14:27 IK7UXU 59 59 JN81HE 1737
14:26 IK6EIW 59 59 JN63RJ 1379
14:25 I7CSB 59 59 JN71QQ 1623
14:23 IZ8DHE 59 59 JN70IR 1661
14:23 IZ5EKV 59 59 JN53PQ 1229
14:22 IK8RKH 59 59 JN70FR 1646
14:21 IW5DNZ 59 59 JN53FQ 1181
14:21 I2FAK 59 59 JN45OB 1003
14:20 I5YDI 59 59 JN54BB 1133
14:20 IZ8DPL 59 59 JN70FU 1636
14:19 IK5VHU 59 59 JN53OU 1211
14:19 IZ5EBL 59 59 JN53KT 1195
14:18 IK0SOI 59 59 JN62HN 1394
14:18 I0AKP 59 59 JN61FU 1441
14:17 IW1CCH 59 59 JN54AA 1131
14:17 I1ANP 59 59 JN44VH 1094
14:16 I1SBU 59 59 JN44WD 1112
14:15 I5RUR 59 59 JN53PD 1271
14:14 IK0VJH 59 59 JN61FV 1438

14:12 SV2DCD 55 55 KN00NF 2089
14:06 I0QM 59 59 JN61HF 1503
14:04 IK7YZI/7 59 57 JN81AW 1645
14:03 IK4DRY 59 59 JN64BL 1220
14:02 SV6DBG 59 59 KM09KP 2117
14:00:IK7IMQ 59 59 JN80XP 1860
13:59:I5TAT 59 59 JN53FL 1198
13:54:SV6DBG 59 57 KM09KP 2117
13:52:I7DZG 59 59 JN81KC 1759
13:48:IZ2DJP/6 59 59 JN72LC 1566
13:47:IW7CMV 59 59 JN81FV 1673
13:36:IK7LMX 59 59 JN80XP 1860
13:33:I7UGO/7 59 59 JN80WG 1884
13:28:I7OXH 59 57 JN90DB 1925
13:26:SV3CYM 59 57 KM08UF 2278
13:23:I7CSB 59 59 JN71QQ 1623
13:18:IK7UXY 59 59 JN90DC 1922

G8IZY, IO91VC, wkd:
13:36 I7CSB 59/59 JN71QQ new #
13:41 IK7UXY 59/59 JN90DC
14:00 IZ2DJP/P6 59/59 JN72PC
14:04 IK7LMX 59/59 JN80
14:08 IZ7AUD 59/55 JN90CD new#
14:19 I0JX 59/59 JN61
14:25 IW1CCH 59/59 JN54AA
14:24 I0QM 59/59 JN61IR
14:25 IW0GPN 59/59 JN62FB
14:27 I5WBH 53/55 JN53JR
14:29 IZ5EKV 57/59 JN53
14:34 I8MPO 56/57 JN70FP

GM4JJJ, IO86GB, wkd:
1421 TK5JJ JN41JW SSB 59/59
Just too far south for me, very frustrating.

GW8IZR, IO73TI, wkd:
14:03 I8MPO JN70FP 59 59 SSB 1997
14:14 I7CSB JN71 SSB 1953+-
14:47 IOJX JN61 59 59 SSB 1847+-
14:55 IZ0DBO JN61 59 59 SSB 1847+-
14:58 I1ANP JN44VC 59 59 SSB 1457
15:02 IK5/DK3EE JN53 59 59 SSB 1571+-
15:05 IK0SME JN61FW 59 59 SSB 1780
15:06 IW1CCH JN54 59 59 SSB 1488+-
15:20 IK0UDH JN61ES 59 59 SSB 1790

HA6NY wkd Es:
13:20 EB6AOS JM19IO 59 59 SSB 1663
13:26 EA6FB JM08PW 59 59 SSB 1804
13:30 EA5/DJ4UF JM08BR 59 59 SSB 1896
13:32 EB3DYS JN11CK 59 59 SSB 1574
13:33 EA5AFP IM98VX 59 59 SSB 1901
13:35 EA3FLX JN01UF 59 59 SSB 1621
13:42 EA3BHM JN11CK 59 59 SSB 1574
13:46 EA3DXU JN11CM 59 59 SSB 1569
13:48 EA3TI JN11DO 59 59 SSB 1558
13:53 EB3GEK JN01UI 59 59 57 SSB 1613
13:55 EA3DHR JN01TN 59 59 SSB 1607
13:57 EA3EVS JN11DM 59 59 SSB 1563
13:59 F6EAP JN03DS 59 59 SSB 1584
14:01 EA2BVD IN91OO 59 59 SSB 1774
14:06 EA1ACP IN81QT 59 59 SSB 1894
14:07 F1BLL JN23LL 59 59 SSB 1263
14:10 EA2AZW/P IN82RO 59 59 SSB 1847
14:12 F1GTU JN05IF 59 59 SSB 1492
14:15 F8CH JN03PO 59 59 SSB 1519
Rig: IC-821/800W/17 ele. F9FT/CF-300

HA5TS, JN97LL, wkd:
13:24 EB6AOS JM19IO
13:25 EA5EZJ IM98VX
13:29 EA6FB JM08DW
13:32 EB5EIB IM98VX
13:33 EA3BHM JN11CK
13:37 EA5/DJ4UF JM08BR
13:41 EA3GEK JN01UI
13:41 EA3GCJ JN11EM
13:44 EB3DYS JN11CK
13:45 EA3DXU JN11CM
13:50 EA3TI JN11DO
13:54 F4BWJ IN93MP
13:58 EA1EF IN73WB
13:59 EA3DD JN01VH
14:05 F6DRO JN03TJ
14:06 F5IF JN12IL
14:06 F1RFH JN23XT
14:09 EA2AZW/p IN82RO
14:10 EA2CN IN93IF
14:22 F8CH JN03PO
14:25 F6ANQ IN94RT
Rig: FT-225RD 25W , CF-300, ANT: 8 ele 1.5wl

HA6NA, JN98VC, wkd:
1336 EA5/DJUF 59 57 SSB JM08BR 1891 km
1346 EA5EZJ 59 59 SSB IM98VX 1895
1350 EA3TI 59 59 SSB JN11DO 1552

HA7UL, JN97KK, wkd:
1326 EB6AOS 59/59 JM19IO
1344 EA3DXU 59/59 JN11CM
1358 EA3DD 599/59 JN01VS CW/SSB
1359 EA3GCJ 59/59 JN11EM
1401 F6DRO 59/59 JN03TJ
1410 EA1DDU 59/59 IN73FM
1432 F6CRP 59/59 IN96KE
1436 F5GHP 59/59 IN96LE

I0QM, JN61IR, wkd:
14.07 – 1435 Z:
G7RAU IO90IR, PA1BUM JO21RI, G7LTX, GW8IO, ON1IM J011JY, G3JHM I091IC, PE9DI JO33MD, G0NFA IO91NE, GW0BDX/P IO90, G4VRC IO90NX, GI4SNA IO64XM, G3NAQ IO91HL, ON3CHP JO21JN, G3YVR IO91WD, G3JHM IO91LC, G8IZY IO91VC, G3... IO90UX, G3NNG IO91EP, G4R.. I092, G4RUW I091IJ, G4KWQ IO90, G4KIY IO92WN, G4PBP

IO82WO, G4MKF IO91HJ, G4RGV IO90

IW0GPN, JN62FB, wkd:
1108 CT1DIN 59 59 IN60IM
1108 EB1HYC 59 59 IN70EW
1110 CT2GRW 59 59 IN60CO
Only 3 qso in a vy short opening.
1336 PE9DX 59 57 JO33MD
1343 DJ9YE 59 59 JO43HV
1344 2E1IDX 59 59 JO01BT
1345 G4KUY 59 55 IO92WC
1345 G4HGI 59 59 IO83PL
1345 G4RUW 59 59 IO91
1346 G1HWY 59 59 IO90UV
1347 G0FIG 59 59 IO90UU
1350 ON4CHP 59 59 JO21JD
1352 G4LOH 59 59 IO94IA
1353 G3BNE 59 59 JO01BJ
1354 GW4VBM 59 59 IO83LF
1356 ON6ZK 59 59 JO20KW
1357 G4RRD 59 59 JO02KU
1357 PA5WX 59 59 JO33GA
1358 G0EVT 59 59 IO93GR
1358 PA5TA 59 59 JO33GD
1359 DL6BF 59 59 JO32QI
1359 PA1BVM 59 59 JO21
1400 ON5GS 59 59 JO21
1400 PA0WWM 59 59 JO22FE
1401 PA7FM 59 59 JO21DV
1401 PD5FDV 59 59 JO21HV
1402 MW0AXA 59 59 IO81FM
1402 PA3HHE 59 59 JO22QE
1403 PA4ZP 59 59 JO21
1404 PA3BIY 59 59 JO22EB
1404 PA0CIS 59 59 JO22FD
1404 PE1HWO 59 59 JO21GV
1405 G4NRG 59 59 JO01FN
1405 G0UYC 59 59 JO02OP
1406 OR6ZT/P 59 59 JO10UU
1410 DF7KF 59 59 JO30GU
1411 PE1GFR 59 59 JO32CC
1411 G3XPO 59 59 JO01OC
1412 EI4IX 59 59 IO53HV
1413 F1CBC 59 59 JN09BO
1414 G0UYC 59 59 JO02OP
1415 GW3MFY 59 59 IO81FL
1416 G0IUE 59 59 IO81WJ
1416 EI4IX 59 59 IO53HV
1416 PE1FEI 59 59 JO22VQ
1417 G4MKF 59 59 IO91HJ
1420 GW8JLY 59 59 IO81JM
1421 G4AEP 59 59 IO91NJ
1422 G3JHM 59 59 IO91LC
1422 G3WZT 59 59 IO90UX
1422 G3XVR 59 59 IO91LC
1423 M0DBX 59 59 IO90NX
1424 G4VRC/P 59 59 IO90
1425 G8IZY 59 59 IO91VC
1425 G3NNG 59 59 IO91EP
1426 G0CUZ 59 59 IO82WM
1428 G4KWQ 59 59 IO92AQ
1428 G3PJV 59 59 IO83
1429 G0NFA 59 59 IO91NE
1429 G4DOL 59 59 IO80SO
1430 G3YVR 59 59 IO91WD
1431 G7RAU 59 59 IO90IR
FT-736r and 16 el.

I7CES, JN71, wkd:
I was on at 1320z and for me the band close at 14.30z. Worked 90 qso with 2 new country (EI and HB9) and 7 new squares. I worked to EI, GW, G, F, ON, PA, DL, HB9.
I worked with FT847 (50W) and 9 ele. Tonnà, time to time I used PA with 200 W.

IK7UXY, JN90DC, wkd:
12.07 F6DRO JN03SM 59 59 1436
12.15 SV1BTR KM18VX 59 59 488
12.25 F6FHP IN94TR 59 59 1612
12.26 F6ELI IN94TS 59 59 1612
12.30 F4BKV IN95PT 59 59 1666
12.31 F5MLY JN05BP 59 59 1598
12.36 F1GHX JN24JT 59 59 1223
12.39 F9HS JN23AT 59 59 1246
12.50 F1CPX IN97DD 59 59 1783
12.51 F1NZC/P JN25HS 59 59 1276
12.52 F5ODK JN16FI 59 59 1455
12.54 F1OMQ JN25IO 59 59 1262
12.54 F4ARJ JN16LH 59 59 1418
12.57 F5JKK IN87PR 59 59 1875
12.58 F8ALX JN06RN 59 59 1534
13.00 F5AGO JN06DV 59 59 1631
13.03 F4JVG JN16UM 59 59 1375
13.04 F1DUO JN26MB 59 59 1261
13.04 F6ITQ 59 59
13.06 F6DYY JN07SM 59 59 1571
13.08 F0CXO JN26PP 59 59 1275
13.09 F5JJA JN08GM 59 59 1687
13.10 F8OP JN26MM 59 59 1285
13.11 F6JXR IN98HW 59 59 1834
13.11 F5HRY JN18EQ 59 59 1579
13.12 F1ORL JN08VP 59 59 1613
13.12 F6HMQ JN18GP 59 59 1566
13.13 F6DKW JN18CS 59 59 1594
13.13 F1CXX JN18AT 59 59 1607
13.15 F6EAS IN98LV 59 59 1810
13.16 HB9SNR JN36MQ 59 59 1165
13.16 F6FLV JN18AT 59 59 1607
13.16 G7RAU IO90IR 59 59 1921
13.17 F6APE IN97QI 59 59 1714
13.18 G0FIG IO90UU 59 59 1868
13.20 G4RRA IO80BS 59 59 2083
13.21 ON7RY JO20AI 59 59 1589
13.21 F1PHJ JN19DA 59 59 1603
13.22 F1AKK/P JN29PD 59 59 1434
13.22 F4BUC/P JN29PD 59 59 1434
13.23 F1DBN JO00VT 59 59 1745

13.23 HB9MIO JN37SB 59 59 1159
13.23 HB9CLN JN47BH 59 59 1142
13.23 HB9BQU JN37VD 59 59 1150
13.26 F4AOA JO10ID 59 59 1649
13.26 G3YVR IO91WD 59 59 1876
13.27 F6HVK JN27LH 59 59 1335
13.27 F5MFO JN19IB 59 59 1580
13.28 F1JGG JN27MH 59 59 1330
13.29 F1RJ JN18AT 59 59 1607
13.30 G3WZT IO90UX 59 59 1876
13.30 F1BKM IN98MV 59 59 1804
13.30 GJ0JSY IN89XE 59 59 1890
13.31 MQ0DBX/P IO90NX 59 59 1910
13.31 G4SWX JO02PB 59 59 1858
13.32 F5OZK JN18GU 59 59 1578
13.33 HB9EAH JN37SN 59 59 1194
13.33 HB9BNI JN37WB 59 59 1139
13.34 G0NFA IO91NE 59 59 1923
13.34 HB9DFG JN37SM 59 59 1191
13.36 G4VRC/P IO90NX 59 59 1910
13.37 G4MKF IO91HJ 59 59 1965
13.37 DK8GA JN37VN 59 59 1180
13.38 F1CBC JN09BO 59 59 1771
13.39 G8IZY IO91VC 59 59 1879
13.39 DC5TD JN37VP 59 59 1186
13.39 DO3GI JN37VP 59 59 1186
13.40 M1DNJ JO01GJ 59 59 1854
13.40 G4AEP IO91NJ 59 59 1935
13.41 G3NVO IO91JK 59 59 1957
13.41 M5BXB IO91XR 59 59 1908
13.41 G3NAQ IO91HL 59 59 1969
13.41 G3LTF IO91GG 59 59 1962
13.41 MW1MFY IO81 59 59 2066+-
13.42 MW8JLY IO81JL 59 59 2079
13.45 F1HUM JN18AS 59 59 1604
13.45 GW3MFY IO81FL 59 59 2099
13.46 GW8JLY IO81JM 59 59 2081
13.47 F1EHE JN09UL 59 59 1666
13.48 F5PZP JO00TF 59 59 1717
13.49 F/PA2CHR IN77UV 59 55 1993
13.51 G3BNE JO01BJ 59 59 1878
13.53 G8HGN JO01FO 59 59 1872
13.53 G8RZA JO01BO 59 59 1891
13.54 G0IUE IO81WJ 59 59 2009
13.55 G4NOO JO01BO 59 59 1891
13.56 F8AIL 59 59
14.00 G3XVR JO91LC 59 59 1224
14.03 G4KWQ IO92 59 59 2011+-
14.05 G3XPO JO01OC 59 59 1798
14.06 F6HHR JO10AV 59 59 1737
14.07 G1TWS JO01HO 59 59 1863
14.08 LX2DX JN29WO 59 59 1436
14.08 G8VHI IO92FM 59 59 2043
14.08 OR6ZT/P JO10UU 59 59 1643
14.08 M1MGD IO91FC 59 59 1957
14.08 G3IMV IO91OX 59 59 1967
14.08 GQ3PJB JO01CJ 59 59 1873
14.14 G3NNG IO91EP 59 59 1994
14.14 GW8ASA IO81EM 59 59 2106
14.16 ON1DO JO11PC 59 59 1684
14.16 G3DGW IO92NC 59 59 1979
14.17 2E1IDX JO01BT 59 59 1905
14.17 G7TZZ IO92PJ 59 59 1989
14.17 ON4YZ JO20GG 59 59 1556
14.18 G8IYG IO82XT 59 59 2089
14.18 G8KIY IO92WN 59 59 1968
14.19 G4RGV IO91XC 59 59 1869
14.20 G4CLA IO92LJ 59 59 2007
14.26 GQ1MZD IO92OB 59 59 1972
14.26 G4TIF IO92FH 59 59 2030
14.27 G0NNF IO92AL 59 59 2063
14.28 G4PBP IO81WO 59 59 2021
Rig: FT847 + 20 element yagi.

IK8YFU, JM88AJ, wkd:
1005 IT9KSS JM68QC, 1021 I5VOW JN52GW, 1152 EA5DGC IM97IT, 1158 IZ8DWL JM88BR, 1217 TK5XN/P JN41NI, 1239 F5DKW JN18CS, 1255 ON7RY JO20AI, 1300 F4AOA JO10IO, 1301 F1AKK/P JN29PD, 1301 F4BUC JN29PD, 1302 ON4KHG JO10XO, 1303 G4SWX JO02PB 2105km, 1304 HB9DFG JN37SM, 1305 F4AZF JN38IW, 1306 ON1DO JO11PC, 1307 DL4VS JN39LF, 1307 G3LQR JO02QF, 1307 HB9CLN JN47BH, 1308 DH3VE JN39KK, 1308 ON4AFO/P JO11QA, 1309 DK8GA JN37VN, 1310 HB9BQV JN37VD, 1311 ON4LN JO20IV, 1312 DC5TD JN37VP, 1312 DH0GHU JN38VN, 1313 DH3GI JN37VP, 1314 DH2KT JO30IV, 1314 PA0CIS JO22FD, 1315 HB9DDS JN47IK, 1315 PA5DD JO22IC, 1316 PA1BVM JO21RI, 1317 DF7KF JO30GU, 1317 DL1KDA JO30FQ, 1318 DB8KJ JO30CM, 1318 DJ0VZ JO30MM, 1318 PA3CMC JO21WI, 1318 PI4RTD JO22JC, 1319 LX1JX JO30MM, 1319 ON4AMX JO20KV, 1320 DF2ZC JO30RN, 1321 DL2OM JO30MM, 1321 OR1DB/P JO20MW, 1321 PA3BIY JO22EB, 1323 DL8GP JN39LH, 1324 DF1BN JO31GD, 1325 DL8EBW JO31NF, 1326 ON4CPN JO20GJ, 1327 DB2KA JO30JT, 1327 DL9EAJ JO31DH, 1328 OR6ZT/P JN10UU, 1328 PA0PVW JO22VA, 1329 PI4RCK/P JO22HK, 1330 DC9KU JO30BT, 1330 PI4SRA/P JO22JS, 1331 ON5GS JO21TD, 1332 PA0WWM JO22FE, 1333 DF8IK JO30MM, 1333 DH1IJB JN28EW, 1333 PB0AOL JO21MM, 1334 DG8UAW JN48OV, 1335 PA1TK JO22IJ, 1335 PA2DWH JO22GD, 1336 DF2JQ JO31HL, 1336 PA3CNX JO22KJ, 1336 PE1DVL JO22MC, 1337 ON4CHP JO21JD, 1340 DH2DAM JO31PH, 1340 G8VHI IO92FM 2072km, 1340 PD0MGX JO22PE, 1341 DK5DQ JO31PG, 1342 DG5YIL JO32KB, 1342 DL8YET JO31MH, 1343 PE2RMI JO23MH, 1344 DD5JC JO31MH, 1344 PA7FM JO21DV, 1345 DK2FI JO40DA, 1345 PA5WX JO33GA, 1345 PE1GNP JO31MM, 1345 PI4ZOD JO32LS, 1346 G4KWQ IO92AQ 2105km, 1347 DG3FEH JN49HU, 1347 DL5EBS JO31MM, 1348 DF6WE JO31GO, 1348 DF7VO JO32MM, 1348 DH2KT

JO30IV, 1348 G4HGI JO20VQ, 1350 PI4RTU JO22KJ, 1354 OS4ZN JO21FB, 1355 ON1IM JO11VB, 1355 ON4KST JO20HI, 1355 ON6ZK JO20KW, 1355 PD0EAP JO22JK, 1356 G0UYC JO02MR, 1358 GQ0OOO IO94TG 2155km, 1359 G8AZA IO94TF 2152km, 1400 G0COL IO94SG 2159km, 1400 PA2VST JO22MM, 1400 PD0PSQ JO21VU, 1401 DJ9CZ JO31BC, 1402 DC6IA JO30IV, 1402 PE1HWO JO31MM, 1403 DH5HV JO31AS, 1405 PA3HHE JO22QE, 1406 DO6KDS JO31CF, 1406 PE1GUR JO22TH, 1412 G4SWX JO03PB. Rig: 40W + Vertical. 73, Alex.

LZ2ZY (KN13OT) wkd:
1251 EA3FLX JN01RF, 1253 EA3DHR JN01TN, 1256 EA3DXU JN11CM, 1259 EB3GEK JN01UR, 1301 EB3DYS JN11CK, 1305 F1UCQ JN12IW, 1310 F1ACE JN12JP, 1312 F1VBW JN03WL, 1314 F5LNU JN04JV, 1315 F6DRO JN06TJ, 1315 F4CPS JN25MD, 1316 F6FHP IN94TR, 1316 F9HS JN23AT, 1316 F1FIH JN23GS, 1317 EA1EF/p IN73WB 2197km, 1319 F6EPE JN23JW, 1320 F1FMU JN03OM, 1320 F1RFH JN23XT, 1321 F4BWJ IN93MP, 1321 F5LIN JN24JC, 1323 F8CH JN03PO, 1326 F6ANQ IN94RT, 1327 F6HRY JN04IK, 1329 F1GHX JN24JF, 1331 F5MLY JN05BP, 1331 F5AJE JN05AN, 1333 F6ELI IN94TS, 1336 IK1SPR JN34TO, 1337 F1FHP/p JN04VL, 1338 F4BKV IN95PT, 1341 F6CRP IN96KE, 1344 F1DVI JN05UD, 1345 F6CBC IN94QV, 1346 F6ARQ JN05BO, 1355 F4KCV JN16NM, 1355 F5IRQ IN96PT, 1357 F1DCG JN25KR, 1357 F1GTU JN05IE, 1358 F5JRY JN25AW, 1404 F5HLL JN26AB, 1404 F5GHP IN96LL, 1405 F1DUO JN26MB, 1407 F5ODK JN16FI, 1407 F8CIL JN16KL, 1414 F6DYY JN07SM, 1415 F1DUZ IN97NT, 1417 F2LQ IN98EB, 1418 F6GA IN97RL, 1419 F1CKB IN97SL, 1420 F1FHD IN87UN 2014km, 1422 F1BRV JN16MX, 1426 F5MGD JN07AW, 1427 F1DUJ JN07AT, 1429 F8DBF IN78RI 2186km, 1433 F0DEB. 73, Rady.

OK2XPJ, JN89RK, wkd:
14:03 EA5EZJ IM98VX
14:05 EA1BFZ IN81SS
14:06 EA3TI JN11DO
14:08 EA3GCJ JN11EM
14:19 F2BWJ JN03MP
14:24 EA1DDU IN73FM
14:27 F5IVP IN95XD
RIG: Home made , 50W, 15 el. F9FT

OM3TZZ (JN88TI) wkd: 1332 EA5/DJ4UF JM08BR, 1336 EA6XQ JM19LH, 1338 EB6AOS JM19IO, 1340 EA5EZJ IM98VX, 1344 EA5AFP IM98VX, 1345 EA5HB IM98WX, 1348 EB3GEK JN01UI, 1351 EA3GCJ JN11EM, 1352 EA3TI JN11DO, 1354 F4BWJ IN93MP, 1356 EA1EF/P IN73WB, 1359 EA1CRK IN73DM, 1400 EA2URE IN93IA, 1402 F1GTU JN05IE, 1404 F0DPN/P IN93GH, 1407 EB1EHO IN73DM, 1409 EA3DXU JN11CM, 1413 F1VBW JN03WL, 1414 EA1DDU IN73FM, 1415 F0DNX IN93FJ, 1417 EB1DNA/P IN63AI, 1418 F6FHP IN94TR, 1421 F5IVP IN95XD, 1424 F6EAP JN03DS, 1426 F6ANQ IN94RT cw, 1430 EA1FDI/P IN52LV, 1755 RZ6BU KN84PV cw. 73, Jaro - OM3TZZ ex SU9ZZ.

OM7AQ (JN98UI) wkd: 1357 EA3DXU JN11, 1403 EA3TI JN11, 1405 EA1DDU IN73, 1409 F1FBW JN03, 1410 F1VBW JN03, 1414 F1BLL JN23, 1416 F6EPE JN23, 1431 F5LNU JN04, 1432 F6FHP IN94 hrd. 73, Zoli.

ON1IM (JO11UB) wkd: 1331 I7CSB JN71, 1351 IK8YFU JM88, 1402 IZ8DPL JN70, 1403 IZ8DWL JM88, 1404 IK8YVG JM88, 1406 IZ0ARN JN61, 1408 IW7CMV JN81, 1410 IC8CQF JN70, 1415 I0QM JN61, 1420 I8YGZ JN70. 73, Dirk.

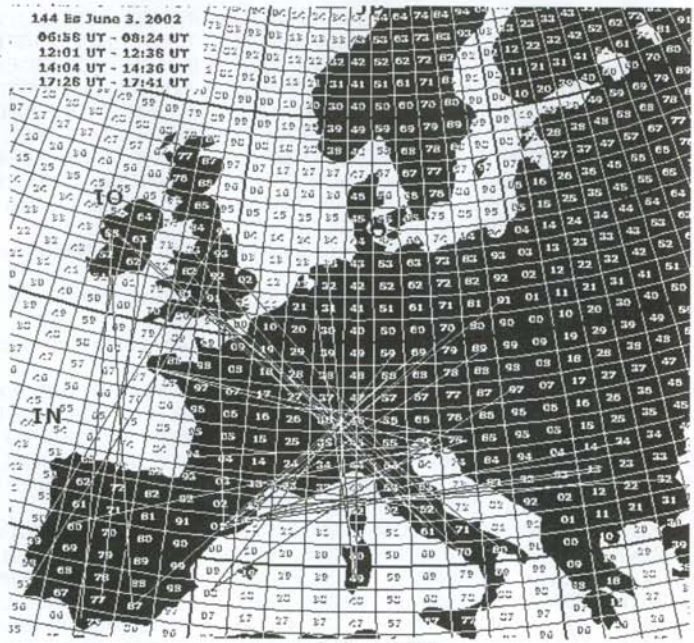
ON4KHG (JO10XO) wkd: 1300 IT9NGN JM78PE 59/59, 1303 IK8YFU JM88AJ 59/55 #332, 1311 I8MPO JN70FP 59/59, 1346 IC8CQF JN70CN 59/59, 1407 I7UGO/7 JN80WG 59/59, 1410 I7CSB JN71QQ 59/59. Heard: IW0GPN JN62, IZ0DBO JN61, IK8YOQ JN70, IZ8DPL JN70, IK8XSY JN70. Rig: 20W, Vertical 5/8, 5 m agl. 73, Gaetan.

PE1HWO (JO21GV) wkd: 1315 GU6AJE/MM JM84, 1402 IK8YFU JM88AJ, 1404 IW0GPN JN62FB, 1405 IZ8DWL JM88BR, 1406 IK8YVG JM88BR, 1407 I8MPO JN70FP, 1408 I8YGZ JN70HR, 1410 IK0SOI JN62HN. 73, André.

SP6GVU (JO81LC) wkd: 1320 IS0GQX JM49OH, 1400 EB5CGV/P IM99OC, 1403 EA5MR IM99IT, 1405 EA5AFP IM98VX, 1405 EB3FYM JN11CI, 1412 EA3DXU JN11CM, 1415 EA3GHV JN01WL, 1416 EA2CN IN93GF, 1422 EA2AWD IN93CI, 1425 EA1BFZ IN81SS, 1430 EA3GCJ JN11EM, 1431 EA3TI JN11DO, 1435 EA5EZJ IM98VX, 1436 EB3DYS JN11CK. 73, Andy.

YU7EW (KN05HP) wkd: 1240 EB6AOS JM19JN, 1242 EB5EIB IM98VQ, 1248 EA5EZJ IM98VX, 1251 EA5AFP IM98VX, 1254 EA5HB IM98WX, 1303 EA5AYG IM99TN, 1309 EA3GCJ JN11EM, 1312 EA3DXU JN11CM, 1315 EB3GEK JN01UI, 1316 EB3EDT JN01TN, 1317 EA3BHN JN11CK, 1318 EA3TI JN11DO, 1319 EB3DYS JN11CK, 1322 EA3DD JN01VS, 1323 EA3DHR JN01TN, 1325 F1BLL JN23LL,
1329 F1UCQ JN12IW, 1330 EA1DDU IN73FM, 1334 EA1BFZ IN81SF, 1338 F6DRO JN03TJ, 1340 F6ANQ IN94RT, 1341 F1RFH JN23XT, 1342 F1FIH JN23GS,

1343 F6HZL JN23QU, 1344 F4BWJ IN93GP, 1345 F6EPE JN23JW, 1345 F8DBN JN24JG, 1346 F1DRN JN23MT, 1347 EB1ILV JN82HS, 1352 F5LNU JN04JV, 1355 EA2CN IN93GF, 1401 F6FHP IN94TK, 1403 F0DPN IN93GH, 1404 EA1EF/p IN93WB, 1409 F5IVP IN95XD, 1412 F5AJE JN05AN, 1414 F1NZC/p JN25HS, 1415 F1UMQ JN25IO, 1417 F5XU JN15MT, 1420 F6CRP IN96KE, 1425 F5ODK JN16FI, 1426 F4CKF JN16NM, 1433 F/PA2CHR IN77UV, 1450 F/PA5MS IN77UV, 1736 EI5FK IO51RT 2231km, 1737 EI7GL IO51TU 2220km, 1737 EI9GQ IO51TV 2220km, 1745 EI2FSB IO51DN 2308km, 1745 EI3EBB IO52TA 2222km (SQ #460), 1751 M5FUN JO00DX, 1752 G3XVR IO91, 1752 G7RAU IO90IR. 73, Pista.



3. June 2002

2002-06-03

CT1HZE, (Op DL8HCZ, IM57NH) wkd: 1412-1438 G8VHI IO92FM, G4YTL IO92MB, G3TA IO81XS, G0CUZ IO82WM, G4PBP IO82WO, G3NAQ IO91HL, G8IYG IO82XT, G8GXP IO93FQ, G0EAT IO93OT (These 9 QSOs in only 1 Minute thanks to the superb G-OP`s!), M0GIZ IO93, G4CLA IO92LJ, G7RUP, G4HGI IO83PL, G0JFC, G4DOL IO80SP, GQ6HMS IO93, G8JVM IO82SP, G0UCN, G4RRA IO91OF, G0FYD IO83LS, GW4HBK IO81KP, GW8JLY IO81, G0NMY IO83VA, MW0AXA IO81, G4WAM IO83, G4LOH IO94IA, F8DBF IN78, G0EVT IO93GR, GW8ASR. Rig: 120 W + 7 Ele Yagi. QSL via DL8HCZ. 73, Jo.

DK3WG (JO72GI) wkd: 0810 EA6TC JM08RV, 0812 EA5AFP IM98VX, 0815 EA3GJO JN11BI, 0815 EA3TI JN11DO. 73, Jurg.

DL8EBW (JO31DL) hrd: 1627 EA4CTF IM89 hrd. 73, Guy.

EA7GTF, IM87CS, wkd:
12:12 EI5FK JO51RT 55 55 SSB 1962
12:12 EI2FSB IO51DN 59 59 SSB 1602
12:13 EI4IX IO53HV 55 55 SSB 1842

EI4IX, IO53, wkd:
14:10 EA7AJ IM87IS 59 59 SSB 1852kms
14:12 EA7HZ IM76SR 59 59 SSB 1945kms
14:16 EA7GTF IM87CS 55 55 SSB 1842kms
14:18 EA7AMJ IM87EE 59 59 SSB 1909kms
17:28 I4TDK JN54EU 59 59 SSB 1738kms
17:29 IZ2AAL JN54EU 59 59 SSB 1738kms
17:30 IW2DAL JN45NN 59 59 SSB 1612kms
17:30 IK2YXK JN45OP 59 59 SSB 1611kms
17:31 I4XCC JN63GV 59 59 SSB 1937kms
17:32 IZ4AIK JN63HV 51 51 SSB 1941kms
17:33 IZ2DJP/6 JN72DL 55 59 SSB 2148kms
17:34 IK4PMB JN54LL 51 59 SSB 1800kms
17:35 IW2NBL JN45WO 59 59 SSB 1653kms
17:35 IK6FWJ JN63 59 59 SSB 1900kms
Heard IW0GPN, IK0BZY and later CT1HZE and TK5JJ (not sure).

G4HGI, IO83PL, wkd:
1420 CT1HZE IM57NH

F8DBF, IN78RI, wkd:
14:32 CT1HZE IM57NH 1276 km; Heard before CT1ART/B on 407.0 during 10 minutes but no CT on 2 , QSY on six and tell to Joe CT1HZE to QSY and QSO made 10 minutes after.

G7RAU, IO90IR, wkd:
17:11:35 J1JTQ 59 JN35UB 919 N/C
08:18:51 I4XCC 59 59 JN63GV 1287

07:57:35 IK7QPB 59 59 JM99 2013
07:56:20 IK7IWY 59 59 JN80 1814
07:55:37 IZ4AIK 59 59 JN63HV 1292
07:42:45 IC8FAX 59 59 JN70CN 1646
After the opening to Italy I worked i5wbe on an unknown mode, maybe iono or tropo.

G8IZY, IO91VC, wkd:
07:44 IC8FAX 59/59 JN70.

HA6NA, JN98VC, wkd:
F5ADT 08.18 59 59 SSB IN94WO 1572
EA1DDU 08.21 59 51 SSB IN73FM 2018
Rig: FT 221 R (7 Watts out+40 mtrs H100), 9 ele F9FT.

HA7ÜL, JN97KK, wkd:
0756 F5ADT 59/59 IN94WO
0757 EA1DDU 59/59 IN73FM
no more station sorry, because I hrd EA1 about 1 hour with S9+MAX+- 15 KHz disturb
RIG: IC-202 2W 13 el. DL6WU

I5WBE, JN53JR, wkd:
12:09 CT1DNF 59 59 IN50QP

IW0GPN, JN62FB, wkd:
0746 G4AJC 59 59 IO91VJ
0759 G3LQR 59 59 JO02QF
0759 G0EVT 59 59 IO93GR
0809 G4ASR 59 59 IO81MX
0810 G4RRA 59 59 IO80BS
0811 G4EAT 59 59 JO01HR
0815 G3NVO 59 59 IO91JK
0817 G0CUZ 59 59 IO82WM
0819 G0NNF 59 59 IO92AL
0821 144 CW G0GMS 599 559 IO82XT
10 qso only ..maybe because was monday morning.
1205 EA1YV 59 59 IN52OC
1208 EA1TH 59 59 IN72WW
1211 F0NDX 59 59 IN93FJ
1216 EA1DDU 59 59 IN73FM
1217 EA1BLA 59 59 IN53UM
Other short opening 5 qso for me ... at 30-35 km south of me in southern part of Rome nil heard or worked..incredible DDU BLA was 9+40dB here.

OE1SOW, JN88FF, wkd:
08:05 UTC EA1DDU 144.310 SSB IN73FN
08:14 UTC F0DNX 144.300 SSB IN93FJ

S55OO, JN76HD, wkd:
0735 EA1DDU 59 59 in73fm
0738 F5ADT 59 59 in94wo
0744 F6IHA 59 59 jn05cq

SP2MKO, JO93CB, wkd:
07:58 EA5AFP JM98VX 59 59 SSB 1570km
08:00 EA3TI JN11DO 59 59 SSB 1744km
08:01 EA3GJO JN11BI 59 59 SSB 1775km
08:01 EA3TA JN11AM 59 59 SSB 1765km

YU7EW (KN05HP) wkd: 0712 EA3GJO JN11BI, 0717 EA3GHV JN01WL, 0719 EA3TA JN11AM, 0720 EA3TI JN11DO, 0734 F5ADT IN94WO, 0739 EA1DDU IN73FM, 0743 F0DNX IN93FJ, 0745 F6IHA JN05CQ, 0746 F4DHA IN95RN, 0756 F5AJD JN05CV, 0757 F8CIL JN16KL, 0757 F5SBP JN13BG, 0801 F6CCH IN96BU, 0815 F6IFI IN87OI, 0820 F5AJE JN05AN, 0822 F/PA5MS IN77UV. 73, Pista.

2002-06-04

G7RAU, IO90IR, wkd:
0821 OH3BYZ 59/59 kp21
0832 OH1CO 59/59 kp10!!
0833 OH5KE 59++ kp30

G8IZY, IO91VC, wkd:
08:34 OH3BYZ 59 59 KP21 New sq.
08:37 OH1CO 59 Lost N/c, Sorry

2002-06-05

CN2DX (IM63DM) wkd: 1909 EA6VQ JM19, 1935 EA3BHM JN11, 1937 EA3DJL JN11CP, 1937 F1AFZ JN33, 1938 F5APG JN23QH, 1938 I2FAK JN45OB.

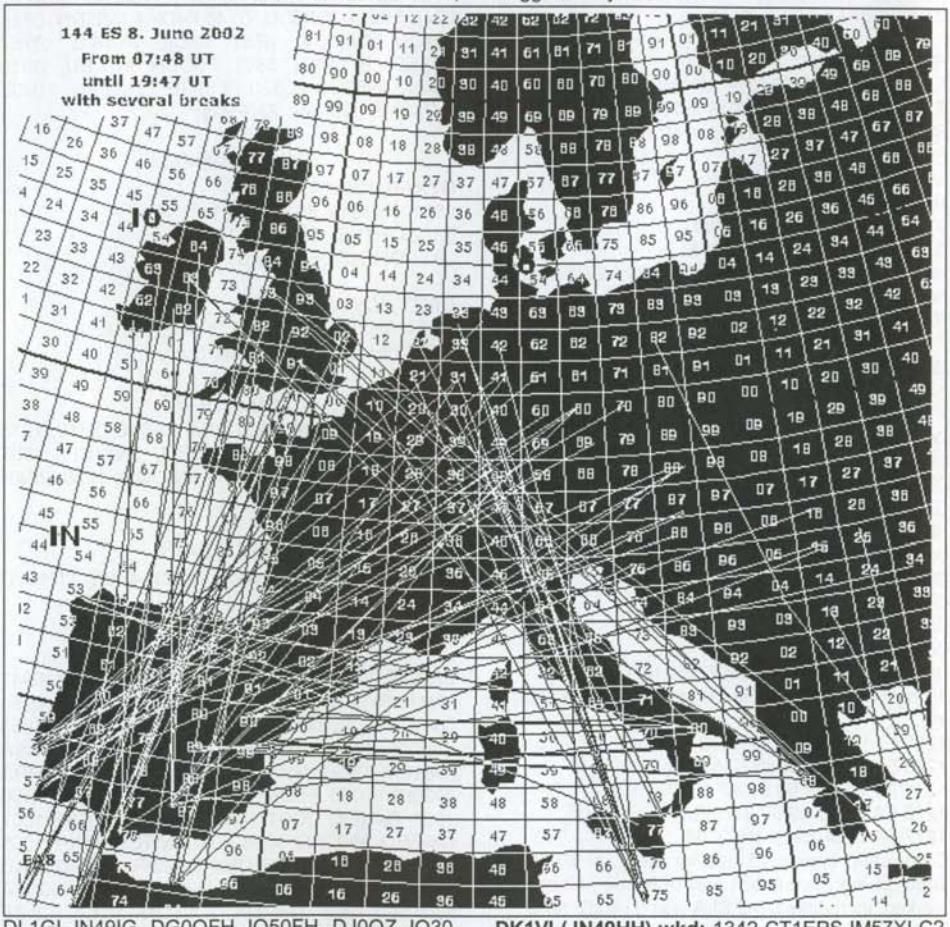
2002-06-06

YU7EW (KN05HP) wkd: 1023 4K6D LN40VD 2427km. 73, Pista.

2002-06-08

CN2DX (IM63DM) wkd: 0947 G0CUZ IO82, 0947 MW1MFY IO81, 0950 G6ION IO70, 0950 GW6TYO IO81, 0951 G4RRA IO80BS, 0953 CN8YZ, 0954 MW1TYO IO81, 0954 GW8ASA IO81EM 0955 GW8JLY IO81JM 0956 G4RRA IO80BS 1000 F8DBF IN78RI 1000 G0FIG IO90 1001 G4NOO JO01 1002 G0DKM/M IO81 1002 G4KWQ IO92AQ 1003 GW3HWR IO71XN 1005 G4AEP IO91 1006 F5JKK IN87PR 1006 G7RAU IO90IR 1007 G3JHM IO91LC 1008 G0NFA IO91NE 1008 G4RGK IO91ON 1013 G3LTF IO91GG 1014 G0RRJ IO91 1014 G0VZS IO91NE 1014 G0XDI IO91RP 1015 G6XRK IO91RN 1015 G3NNG IO91EP 1016 G4TIF IO92FH 1018 F6ETI IN87IQ 1018 F6HRP IN88KN (20w avec GP avec 6 tos) 1019 G4BRK IO91DB 1020 GW8ASA IO81EM 1022 GW7SMV IO81 1028 G0CAX IO92 1029 G3MQY IO70 1032 G4LOH IO94IA.

CT1HZE, (Op DL8HCZ) IM57NH wkd: 1331-1400 DG3GAG JN48NB, DK5TE JN58BG, DL8RDI JN58, DK7DR JN47, HB9DFG JN37SM, DF9NP JN58LU, DL1SP JN48QQ, DL1SDN JN48PP, DF1IAZ JN49LD, DH0GHU JN38VN, DF2UQ JN49IB, DL6NAA JO50VF, DJ5NV (C?), DK2EA JO50UF, OK1FFD JO60CF, DK1VI JN49HH, DL1GI JN49IG, DG0OFH JO50FH, DJ0QZ JO30, DF2AP/p, DL3HRT JO61AB, DL2ARD JO60AR, DB5WC JN49EJ, DL3IAS JN49EJ. Rig: 160W & 7ele Yagi. Extremly high QSB during this opening. QSL via DL8HCZ. 73, Jo.



DD0VF, JO61WA, wkd:
1856 9H1GB JM75 57/59
1857 9H1PA JM75 57/59

DH0GHU, JN38VN, wkd:
13:44 UTC CT1HZE IM57NH
19:28 UTC IT9NAN JM77
19:37 UTC 9H1CG JM75
The "afternoon opening" was very short. It happened 3 times for about 1-2 minutes, that CT stations were audible. Twice, I heard CT1EPS very weak, and once there was CT1HZE very loud (59+20dB). Probably, those short openings were "triggered" by meteors.

DK1VI (JN49HH) wkd: 1342 CT1EPS IM57XI C?, 1348 CT1HZE IM57NH . Both stations could be heard several times till 1405UTC. 73, Ernst.

DK3WG (JO72GI) wkd: 0858 TK5JJ JN41CC (ES?). 73, Jurg.

DL1HRT, JO61AB, wkd:
13:52 CT1HZE IM57

DL1RNW, JO62GH, wkd:
1902 9H1GB JM75FU
1904 9H1CG JM75FW

DL5GAC, JN47UT, wkd:
13.51 CT1DDW 59 57 IN60BP
Very short opening here (<1min.) Was the only station I heard. Seems it was a very fast moving small es-cloud
DL8EBW (JO31DL) wkd: 1337 EA7AJ IM87 hrd, 1341 EA7GTF IM87 55/59, 1914 IZ8DWL JM88 hrd, 1916 IT9NAN JM77 hrd, 1930 9H1CG JM75 hrd, 1936 9H1GB JM75 hrd. 73, Guy.

EI5FK (IO51RT) wkd: 0956 EA9AI IM75IV, 0959 EA7JX IM77BM, 1005 EA7DGR IM76NM, 1006 EB7BQI IM76, 1007 EB7HAF IM76, 1008 EA7BYM IM66UM, 1009 EB7EBV, 1016 EA9IB IM85NG, 1855 IK0BZY JN61FV, 1855 I8MPO JN70CT. 73, Charles.

F1RAD, JN25WF, wkd:
1852 SV1BTR 55 55 KM17VU 1696KM
1857 SV3CYM 52 52 KM08VF 1529KM
Condx : TR751 200W RX+16dB and ... a GP antenna !

F8DBF, IN78RI, wkd:
09:59 CN2DX IM63DM 1669 km
10:06 CN8YZ IM63EA 1726 km
10:09 EA7HBP IM67MG 1249 km
10:22 CN8AT IM63EL 1673 km
10:23 EA7JX IM77BM 1209 km
10:26 EA7BYM IM66UM 1323 km
10:27 EB7EBV IM66UM 1323 km
IC706MKII 15W ,11 Elts Tonna
Hrd EA8BPX but can't confirm QSO

GM4JJJ, IO86GB, hrd:
1017 CN8YZ 51 working G4RRA

GW8ASA, IO81FL, wkd:
0955 CN2DX, 1000 CN8AT
CN8YZ was a big signal but not his qrg.
also hrd EA8BTV and several EA7's

I5WBE, JN53, wkd:
18.56 SV3CYM 59 59 KM08VF

IK2YXK (JN45OP) wkd: 1906 IZ8DWL JM88BR. 73, Mau.

PE1HWO (JO21GV) wkd: 1934 9H1CG JM75FW, 1940 9H5ZA JM75GU. 73, André.

YU7EW (KN05HP) wkd: 0920 OD5/OK1MU KM73ST 1828km. 73, Pista.

2002-06-09

DL5MAE, JN58, wkd:
UA6IT 59 59 LN16

EA6VQ, JM19, wkd:
08:40 YO3DMU KN34 59 59 SSB 2081+-
08:55 LZ3GM KN32RL 59 59 SSB 2100

F5LKW, JN23SJ, wkd:
09:24 SV1VH KM18 55 51

OE1SOW, JN88FF; wkd:
15:58 UA6MA KN97VE

OM3TZZ, JN88TI, wkd:
1535 RN6MT 59/59 KN97LN
1540 UA6MA 59/59 KN97VE

2002-06-10

CN2DX (IM63DM) wkd: 1124 F6EAS IN98, 1156 G4RRA IO80BS.

DG9MAQ (JN58LJ) wkd: 1736 LZ3GM KN32RL. Rig only 10W into 9ele F9FT. The MUF was very high this evening, abt 164 MHz, but no more Stations QRV! 73, Raimund.

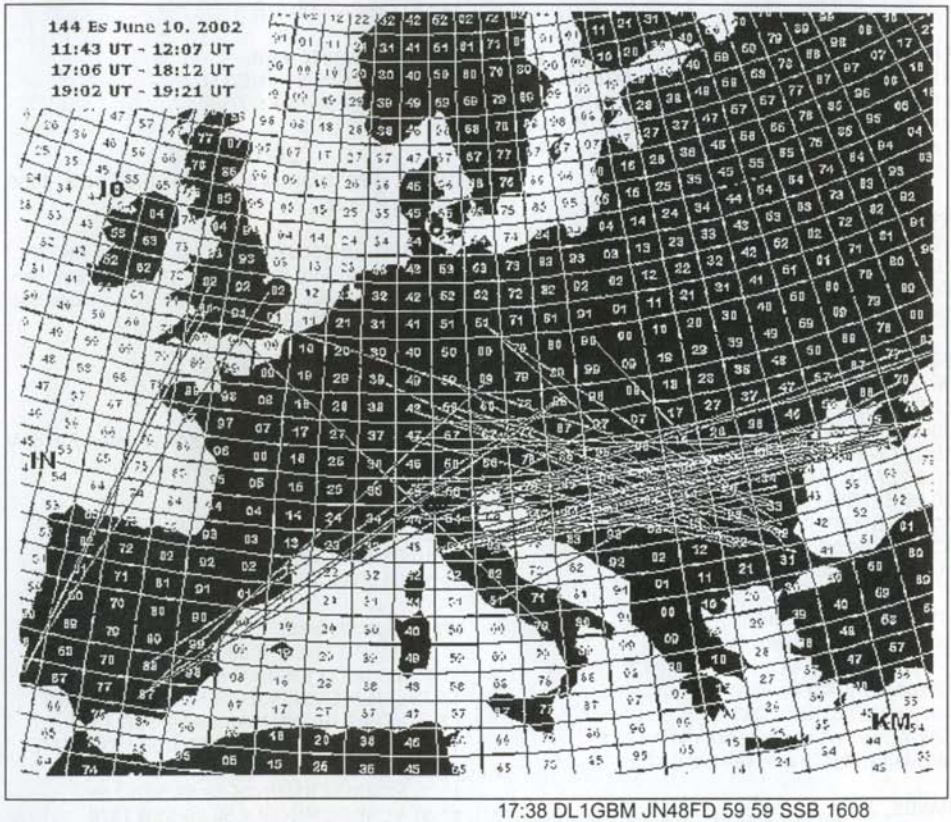
DL5GAC, JN47UT, wkd:
1734 LZ3GM 59 59 KN32RL
1742 LZ5GM 59 59 KN32
The band was open for over half an hour. But only these two stations copied here...

EA7GTF, IM87CS, wkd:
19:08 OM3TZZ JN88SI 59 59 SSB 2083
19:10 OM5CM JN98EF 59 59 CW 2132
19:10 OM2TW JN88 59 59 CW 2059+-

I5WBE, JN53, wkd:
17.22 RZ6BU KN84PV 59 59 SSB 2102 #SQ
17.25 YO4ATW KN35XG 59 59 SSB 1369
17.26 UU4JKE KN55QE 59 59 SSB 1637 #SQ
17.29 YO/RE1BL KN45AK 59 59 SSB 1376
17.29 UU4JKE KN55QE 59 59 SSB 1637 DUPE
17.30 YO4KBJ KN45AK 59 59 SSB 1376
17.31 YO4RDK KN35WK 59 59 SSB 1363
17.31 YO4BZC KN45AK 59 59 SSB 1376
17.35 YO7AQF KN24KU 59 59 SSB 1126
17.36 YO4RQK KN45AK 59 59 SSB 1376
17.36 YO7HMH KN25MG 59 59 SSB 1141 #SQ
17.43 UT5JCL KN64SN 59 59 SSB 1811
17.45 UA6BJM KN84PV 59 59 SSB 2102
17.47 UA6BHM KN84PV 59 59 SSB 2102
17.54 UT5JCL KN64SN 59 59 SSB 1811 DUPE
17.55 UU4JKE KN55QE 59 59 SSB 1637 DUPE
17.58 YO3ACX KN34BL 59 59 SSB 1225
18.05 UT5JCW KN64SN 59 59 SSB 1811

IW0GPN, JN62FB, wkd:
1727 RN6MT 59 59 KN97LN 2171 km
1731 YO8RGJ 59 59 KN36KN 1252 km
1735 UY5HF 59 59 KN66HP 1681 km

1736 YO6FNA 59 59 KN36BA 1178 km
1737 YO4RDK 59 59 KN35WK 1295 km
1744 UR5GPT 59 59 KN76BQ 1795 km
1747 RZ6BU 59 59 KN84PV 2025 km
1753 UR3GT 59 59 KN76CL 1798 km
1755 UR5GP 59 59 KN76CN 1799 km
1803 UA6MA 59 59 KN97VE 2230 km
1804 UR7GG 59 59 KN66HP 1681 km



IK0WGF, JN52VC, wkd:
1735 UY5HF 59 59 KN66
1741 RN6MT 59 59 KN97LN
1745 UR5GPT 59 59 KN76BQ
1755 UT5GP 59 59 KN68MT
1758 RN6MT 59 59 KN97LN

I0QM, JN61IR, wkd:
17.50 UY5HF 59 59 KN66hp

LZ3GM, KN32RL, wkd:
17:28 OE2UKL JN67LX 59 59 SSB 1286
17:29 DL6MFK JN67JX 59 59 SSB 1298
17:30 DL5MAM JN58UB 59 59 SSB 1376
17:31 DF9NP JN58LU 59 59 SSB 1460
17:32 DL5MAE JN58VF 59 59 SSB 1377
17:32 DF1VW JN39HJ 59 59 SSB 1777
17:33 DG3GAG JN48NB 59 59 SSB 1558
17:33 DK2WV JN58TB 59 59 SSB 1382
17:34 DL3IAS JN49EJ 59 59 SSB 1657
17:35 DL1SP JN48QQ 59 59 SSB 1562
17:35 OE2LCM JN67NU 59 59 SSB 1270
17:35 DL5GAC JN47UT 59 59 SSB 1508
17:36 DG9MAQ JN58LJ 59 59 SSB 1441
17:38 DL1GBM JN48FD 59 59 SSB 1608
17:39 DL3UP JN48HU 59 59 SSB 1620
17:40 DK5TE JN58BG 59 59 SSB 1494
17:41 DL2RDT JN59WK 59 59 SSB 1427
17:41 DJ6DZ JN49CB 59 54 SSB 1656
17:47 DG3GAG JN48NB 59 59 FM 1558
17:53 S51DI JN76VL 59 59 SSB 1025
17:57 S51AT JN75GW 59 59 SSB 1097
18:01 F5JNX JN37PV 59 59 SSB 1685

OM3TZZ, JM88, wkd:
19:09 EA7GTF IM87CS

OE1SOW, JN88FF, wkd:
17:37 UTC 144.301 LZ1ZP KN22ID
IC-821H, 2x13-el Yagi, BEKO HLV-300
S55OO, JN76HD, wkd:

1731 RZ6BU 59 59 kn84pv
1736 LZ2PI 59 59 kn23xu

UT5JCW, KN64SN, wkd:
18:01 IW5DAN JN53GU 59 59 SSB 1828
18:02 IZ4AIK JN63HV 59 59 SSB 1663
18:02 IK5CQV JN53 59 59 SSB 1796+-
18:02 I4XCC JN63GW 59 59 SSB 1669
18:03 IK5QLO JN53FU 59 59 SSB 1835
18:03 IK4DRY JN64BL 59 59 SSB 1693
18:03 9A2RD JN65TF 59 59 SSB 1566
18:04 I4RSH JN64GA 59 59 SSB 1667
18:04 IW1ESM JN45FB 59 59 SSB 1971
18:04 I5ARS JN53DN 59 59 SSB 1854
18:04 I2FAK JN45OB 59 59 SSB 1912
18:05 I5WBE JN53JR 59 59 SSB 1811

YU7EW (KN05HP) wkd: 1910 CT1DIN IN60IM 2326km. 73, Pista.

2002-06-19

DG9MAQ (JN58LJ) wkd: 1549UT RZ6BU KN84PV 2036km, 1551UT UY5HF KN66HP. 73, Raimund.

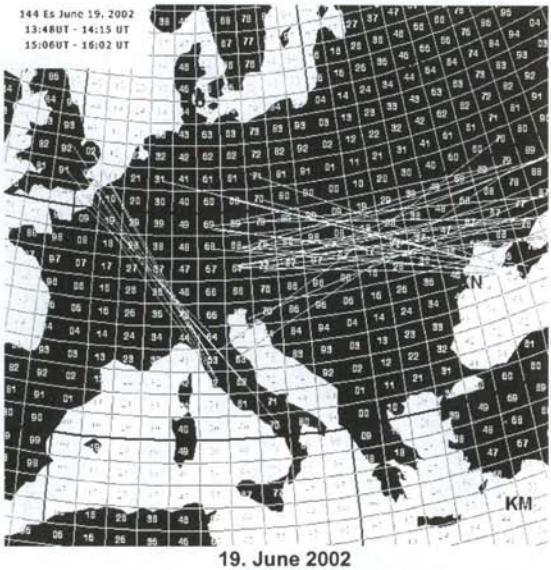
DK3WG (JO72GI) wkd: 1500 UT5JCW KN64SN. 73, Jurg.

G8IZY, IO91VC, wkd:
13:50 I8MPO JN70 59 59
13:54 I5WBE JN53 59 59
13:55 IK5OEA JN53 59 59

I5WBE, JN53JR, wkd:
13.54 G3YVR IO91WD 59 59 SSB 1161
13.54 G0BBB IO91PK 59 59 SSB 1213
13.55 G3BNE JO01BJ 59 58 SSB 1167
13.55 G8IZY IO91VC 59 59 SSB 1162
13.56 M3TOK JO01BI 59 59 SSB 1164

OK1TEH, JO70FD, wkd:
15.46 UT5JCW KN64SN 59 59 SSB 1561

UT5JCW, KN64SN, wkd:
15:04 DK3WG JO72GI 59 59 SSB 1639
15:17 DL3BUE JO72FH 59 59 SSB 1643
15:18 DL7NN JO62VK 59 59 SSB 1690
15:22 YU7EW KN05HP 559 559 CW FAI 1019
15:23 HA7UL JN97KK 559 549 CW FAI 1175
15:31 DL2ARD JO62AO 599 599 CW 1806
15:37 OK1AMI JO70VA 579 599 CW 1465
15:38 OK1AMI JO70VA 59 59 SSB 1465
15:38 DL2ARD JO62AO 59 59 SSB 1806
15:44 DL4MO JO50EN 59 59 SSB 1852
15:46 DK4RC JO60EQ 59 59 SSB 1718
15:46 DK1TEH JO70FD 59 59 SSB 1560
15:47 OK1OAS JO60EB 59 59 SSB 1701
15:48 DC8RN JN59 57 57 SSB 1783+-
15:48 DF5NK JN59QM 59 56 SSB 1760
15:48 DJ9MH JO50EB 59 59 SSB 1841
15:49 DA1NNN 59 59 SSB
15:50 OK1YA JN79IO 59 59 SSB 1527
15:50 OK2KKW JO70FF 59 59 SSB 1562
15:52 DG1VOG JO60JS 57 57 SSB 1692
15:52 OK1MHZ JO70VA 59 59 SSB 1465
15:52 OK2VFO 59 59 SSB
15:53 OK1XOD JO70 59 59 SSB 1533+-
15:55 DC0OU 57 57 SSB



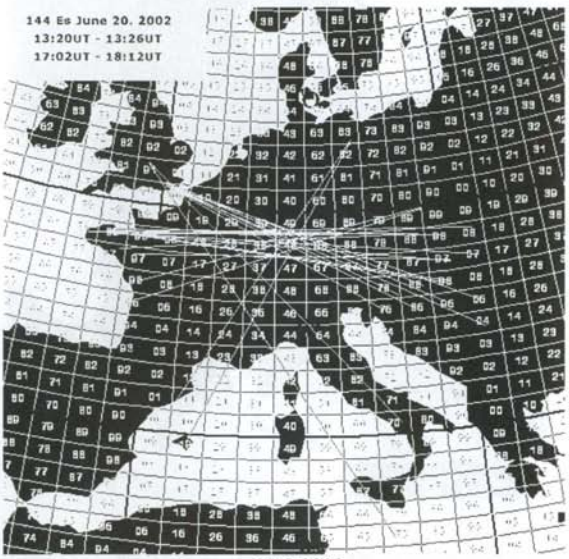
19. June 2002

YU7EW (KN05HP) wkd: 1522 UT5JCW KN64SN 55F/559 1020km FAI on 44/45deg. 73, Pista.

2002-06-20

F8DBF, IN78RI, wkd:
17:14 HG9MET KN08DF 1828 km
17:15 HA9MDP KN08DF 1828 km
17:15 OM3WMA JN88RP 1615 km
17:16 HA6NQ JN98WA 1802 km
17:17 OM7AQ JN98UI 1783 km
17:17 HA0HO KN07SU 1927 km
17:18 OM3TZZ JN88TI 1631 km
17:19 OM5LD JN98BI 1668 km
17:19 HG9AS KN07LT 1885 km
17:26 HA7UL JN97KK 1741 km
17:27 HA5OV JN97NJ 1760 km
17:37 HA7MB KN07BM 1831 km
17:49 HA5BSW JN97JD 1742 km
Heard also DK5RQ (JN68) but too short.

G7RAU, IO90IR, wkd:
17:38:04 YU7ON 59 59 KN04AX 1708
17:37:48 YU1LA 59 59 KN04FR 1750
17:34:30 9A2SB 59 59 JN95GM 1576
17:25:09 YZ1BUL 59 59 KN04GS 1754
17:23:47 YZ7PEK 59 59 KN05PC 1787
17:21:01 HA3HV 57 59 JN86UK 1472
17:19:59 YU7RF 59 59 KN05PC 1787
17:19:23 YZ7MON 59 59 KN04AX 1708
17:14:27 YU7MS 59 59 KN05FW 1687
17:13:50 YU7ZZ 59 59 KN05 1748
17:11:17 YU7OP 59 59 KN05AO 1675
17:10:24 YU7EW 59 59 KN05HP 1713



20.6.2002

G8IZY, IO91VC, wkd:
17:01 YU1TT 59 59 JN94US

HA6NA, JN98VC, wkd:
17.25 144.294 F1ANH 59 55 IN88MR 1673

HA7UL, JN97KK, wkd:
1722 F1ANH 59/59 IN88MR new sqr.
1728 F8DBF 59/59 IN78RI new sqr.
RIG: FT726R + 30W 13 el. DL6WU

OM3TZZ, JN88TI, wkd:
1715 F6KHM 59/59 IN78RJ
1717 F1ANH 59/59 IN88MR
1718 F8DBF 59/59 IN78RI
1722 F6FAI 59/59 IN88HM

OM7AQ (JN98UI) wkd:
1718 F8DBF IN78, 1719 F6KHM IN78, 1722 F6FAI IN88, 1725 F1AHN IN88. 73, Zoli.

YU7EW (KN05HP) wkd: 1709 G7RAU IO90IR, 1720 GW8JYL IO81JM. 73, Pista.

2002-06-27

DL3HRT, JO61AB, wkd:
17:16 UR3GT KN76
17:18 RZ6BU KN84
17:19 UA6BHM KN84
IC-910H - 100Watt - 2x9-Ele. Yagi (5m-Boom)

OK1TEH, JO70FD, wkd:
17:16 RN6BN KN95LA 59 59 SSB 1920

UT5JCW, KN64SN, wkd:
Esporadic is not open on 27.06.02 only FAI.
I heard IC8FAX within two hours but him not answer. Much little stations in my region.
18:56 IC8FAX JN70CN 559 559 CW 1640
19:07 YU7BCX KN05HO 55F 55F CW 1019
19:16 YU7EW KN05HP 559 579 CW 1019
19:17 IC8FAX JN70CN 57 57 SSB 1640

YU7EW, KN05HP, wkd: 1807 UT5JCW KN64SN 559/559 1020km FAI on 44/45deg, 1858 UT5JCW KN64SN 559/559 Tropo! 1918 UT5JCW KN64SN 579/579 FAI on 65deg or ES? 73, Pista.

2002-07-03

7X7LS (JM16MT) wkd: 1245-1255 HA5TS + HA5OV JN97, 1335-1355 OK1TEH JO70, DH2UAK JO71, DK3WG JO72, DK5RQ JN68 and others.
EB3FBA (JN01TG) wkd: 1235 LZ2ZY KN13OT, 1250 HA8VM KM08GU, 1252 HA5OV JN97NJ, 1253 9A2DA JN86JE, 1305 YU7EW KN05HP, 1305 HA5TS JN97LL, 1306 YU7AR KN05BW, 1307 YU7KB JN94XX, 1310 9A2OM JN95IN. 73, Ivan.

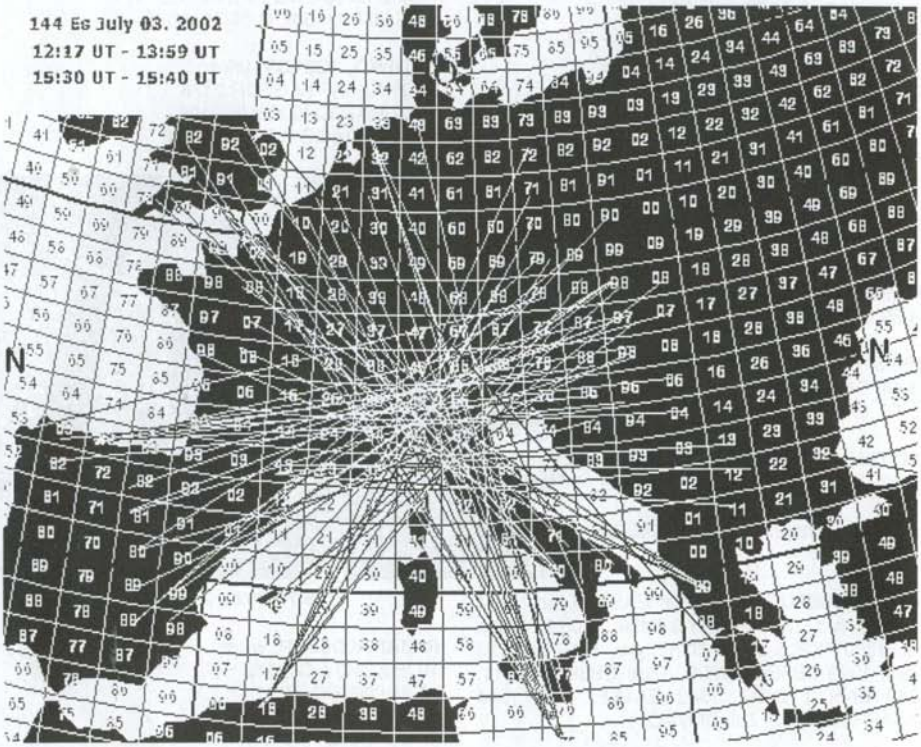
DB5WC, JN49EJ, wkd:
12:35 9H5L 59/58 JM75FV 1583 km
13:06 9H1XT 59/59 JM75GV 1585 km
13:09 9H1CG 59/59 JM75??
Rig: 60 W, 11 el.; It was the second opening on 2 m in 2002 for me and it was nearly "strange" like the first one (8.6.02, only CT1HZE). The show starts suddenly at 12:34 with Roger (9H5L) and he was the one and only for approx. 15 min.. At 13:05 he was back again with John (9H1XT) and Joe (9H1CG).

DF7KF, JO30GU, wkd:
12:38 9H5L JM75, 12:42 9H1CG JM75, 12:44 9H1XT JM75, 13:04 IW9GSC JM77. Until 13:32 few signals, mni QSB, poor cloud for JO30.

DK3WG (JO72GI) wkd: 1433 7X2LS JM16MT 1944km, DXCC #111. 73, Jurg.

12:59 IK8ETN 59 59 JM89CH 1863
12:58 IZ8DWL 59 59 JM88 1977
12:53 IK8ETN 57 50 JM89CH 1863
12:52 I8MPO 59 59 JN70FP 1653
12:49 IC8FAX 59 59 JN70CN 1646

G8IZY, IO91VC, wkd:



F1ODA/M, JN13LD, wkd:
1230 LZ2ZY 59 59 KN13OT 1630 Km
1235 YZ1KU 59 59 KN04ET 1402 Km
1250 YU7EW 59 59 KN05SP 1498 Km
1255 9A3GJ 59 59 KN ?? ??
FT480R - 90W - RX : BF966 - BIGWHEEL

G4FUF (JO02) wkd:
1240 SV9/LA4XFA KM15WO.

G4KWQ IO92AQ, wkd:
1330 IT9NGN JM78PE 56 2088KM
1347 9H1XT JM75GV 559 2269KM

G7RAU, IO90IR, wkd:
13:37 I8YZO 59 59 JM78WO 1905
13:24 IT9NGN 55 53 JM78PE 1909
13:12 IZ8DWL 59 59 JM88 1977
12:59 IZ8DWL 59 Lost
13:10 IZ8DWL 59 59 JM88BR 1815km
13:26 IT9NGN 59 51 JM78PE 1880km
Also heard IC8FAX at 12:55 for 10 seconds! and I8YZO(?) weakly. Very patchy opening from here, I think that I may have been on the edge of it.

HA5TS, JN97II, wkd:
12:44 7X2LS JM16MT
12:55 EB5BCF IM99TK
13:05 EA3FBA JN01TG
13:08 EA5AFP IM98VX
13:11 EA5EZJ IM98VX
13:23 EA5DIT IM99CD
13:32 EA3GJO JN11BI
Also heard EA6VHF/B and F5XAL/B beacons 599++, Rig: FT-225RD 25W 8ele DL6WU + CF-300

HA6NN, JN98VC, wkd/hrd:
12:55 144300 EA5EZJ 57/? IM98VE
12:58 144309 EB5BCF 59/? IM99TK
13:04 144280 EB3DYS 59/? JN11CK
13:10 144284 EB5AYG 59/? IM99TN
13:14 144304 EA5AZJ 59/? IM98VE
13:24 144275 EA5AFP 59/59 IM98VX
13.28 144321 EA2DIT 59/? IM99CD
13:38 EB5DYS 59/59 JN11CK
20 w, 7 ele DL6WU beaming abt 340 degrees

LZ5GM, KN32QL, wkd:
15:33 4K6D 59/59 LN40VK

LZ3GM, KN32RL, wkd:
13:23 EB3DYS JN11CK 59/59 SSB 2083
15:45 4K6D LN40VK 599/559 CW 1869

M1MGD, IO91VC, wkd:
13.39 IT9NGN 59/55 SSB JM78PE

OE5MPL, JN78CJ, wkd:
13.44 EA6FB JM 08 pw
13.50 EA5AFP IM 98 vx

OK1TEH, JO70FD, wkd:
13:41 7X2LS JM16MT 55 55 SSB 1741
and it is perhaps 1.st QSO OK-7X on 144MHz !!

OM7AQ (JN98UI) wkd: 1258 EA5AOJ hrd, 1304 EB5BCA hrd, 1305 EB5AYG IM99, 1306 EB3FBA hrd, 1310 7X2LS JM16MT nc qsb, 1318 EA5EZJ IM98, 1329 EB5BCF IM99, 1336 EB3DYS JN11, 1340 EA5DIT IM99, 1342 EA1BFZ hrd, 1344 EA5AFP IM99. 73, Zoli OM7AQ

PE1GNP, JO31IX, wkd:
1308 9H5L JM75, 1308 9H1CG JM75, 1310 9H1XT JM75

PE1HWO (JO21GV) wkd:
1241 9H5L JM75FV 1243 IT9FRH JM76MV, 1248 9H1XT JM75GU, 1259 9H1CG JM75FW, 1301 IT9NGN JM78PE, 1303 IW9GSC JM77JC, 1305 9H1ET JM75GU. 73, André.

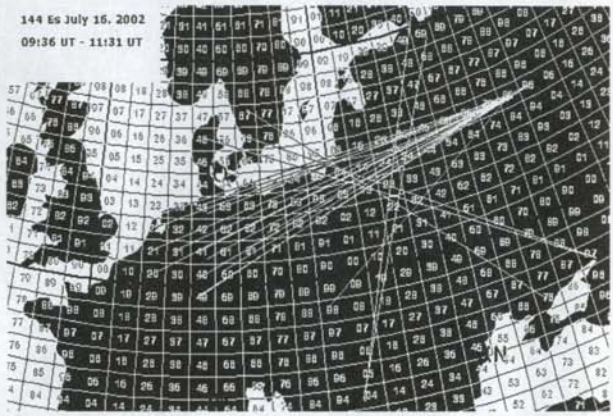
YU7EW (KN05HP) wkd:
1234 EA3GJO JN11BI, 1244 F1JRD JN13WO, 1248 F1ODA/m JN13WO, 1252 EA5EZJ IM98VX, 1254 EB5BCF IM99TK, 1303 EB3AYG IM99TN, 1304 EB3DYS JN11CK, 1305 EB3FBA JN01TG, 1312 EA1BFZ IN81SS, 1314 F1RJ/p JN12MQ, 1327 F1JOK C?, 1332 F4BWJ IN93MP, 1336 F0DNX IN93FJ, 1343 EA2AWD IN93CI, 1358 EB1CTQ IN73FM 2077km. 73, Pista.

2002-07-16

DK3WG (JO72GI) wkd:
10.23 RK3AF 57 59 KO85QR, 10.25 RA3DQ 59 59 KO85US. 73, Jurg.

DK3XM, JO43XL, wkd:
1105 UTC RK3AF 59 59 KO85
1106 UTC RA3DQ 59 59 KO85
1109 UTC UA3AOG 59 59 KO85

PE1HWO, JO21GV, wkd:
11:05 RK3AF KO85QR 2176
11:07 RA3DQ KO85US 2196
11:10 UA3AOG KO85SQ 2186



16.7.2002

RK3AF, KO85QR, wkd:
10.25z DK3WG JO72
10.44z DF2JQ JO31
10.45z DM1HD JO31
10.45z DL1JJ JO31
10.45z DL4OL JO52
10.46z DK9TF JO31
10.46z DK5DQ JO31
10.47z DL0SE JO31
10.48z DK3DS JO31
10.49z ON4AMX JO20 2202 km
11.01z DL6BF JO32
11.02z DK1KO JO53
11.02z PA3CEG JO33
11.02z DL5BBW JO32
11.03z PD0PQS JO32
11.03z PA0PVW JO22
11.04z DG8BX JO42
11.04z PE1HWO JO21
11.04z PA3FOC JO21
11.05z DK3XM JO43
11.07z DB6LJ JO43
11.07z PE1KLQ JO33
11.09z DL6HCE JO43

11.09z PD0JEM JO22
11.10z PA2CHR JO22
11.12z PA0WWM JO22

2002-07-28

CT1HZE, (Op DL8HCZ), IM57NH, wkd:
0852-0921 G4DBL, G8OFA IO91, GW8IZR IO73, G4KWQ IO92, G4JZF, G0GMS IO82, G6FZV IO82, G4PBP IO82, G8TIC IO82, GW7SMV IO81, G4HGI IO83, G0GRI (C?). Had several times QRM from EA8-stations who called me via Tropo from 1200km away... Pse QSL via DL8HCZ! CT-bureau is not working o.k. 73s, Joe, DL8HCZ

EI5FK (IO51RT) wkd:
0920 EA7ERP IM87EE. 73, Charles.
G4HGI, IO83, wkd:
0920 144295 59/59/ io83-im57
He was here in io83 for 3 minutes then nothing!!

G4KWQ, IO92AQ, wkd:
08:55 CT2HBZ 57 IM58LV
09:14 CT1HZE 59 IM57

G7RAU, IO90IR, wkd:
09:13:16 CT1DRB 59 51 IM58LO 1479
09:12:40 CT2HBZ 59 57 IM58LV 1449
Also hrd ct1hze in 57 and missed agn grrrr

2002-08-04

RU3ACE, KO95KG, wkd:
10:54 SP9APC/5 59 59 KO02BW

OH6KTL, KP02OJ, wkd:
1040 UA6MA 59/59 KN97VE, hrd UA6LQ
Rig: TS700+100W and 4 x 15el
OH7HDU, KP32RT, wkd:
10.34 RZ6BU 559/599
10.38 RZ6BU ssb , 59/59 (40db over s9)
I also heard UT5, but no contact.
Rig: Kenwood TM 255 and 2 x 17 el Cushcraft 17B2 at 218 ASL and 38.5m from ground with 7/8 hardline. Power was 40w. This summer has been very poor for ES, this was 1st time in central Finland.

OH7MA, KP52BN, wkd:
1028 RZ6BU 599 599 KN84pv 2017
1047 RZ6BU 59 59 KN84pv 2017
1048 UT5ER 599 599 KN78er 1560
Rig: IC-746 100 W + 4x10el

2002-08-05

DK3XM, JO43XL, wkd:
11:22 I8MPO 59 59 jn70fp 1465km

DK2CF, JO41GG, wkd:
1120 UT I8MPO 59 59 JN70 hrd
1122 UT IZ4AIK 59 JN63HV

EI5FK (IO51RT) wkd: 1400 DG0KW JO64MH, 1432 DB6LJ JO43TS, 1433 SM7WT JO65QP, 1434 SM7FMX JO65KN, 1435 SM7OVK JO65RL, 1439 DG6JF/P JO33. 73, Charles.

GW8ASA, IO81FL, wkd:
11.25 T94DU 59 59 JN94ir

G8IZY, IO91VC, wkd:
11:17 T94DU JN95DA #DXCC, heard 9A1CAL.

PD2DB, JO22MD, wkd:
13:17 9A4KF JN83GD 59 59 SSB 1317
13:19 IZ4AIK JN63IK 59 59 SSB 1123
13:21 I7CSB JN71QQ 59 59 SSB 1400
13:33 I8MPO JN70FP 59 59 SSB 1465

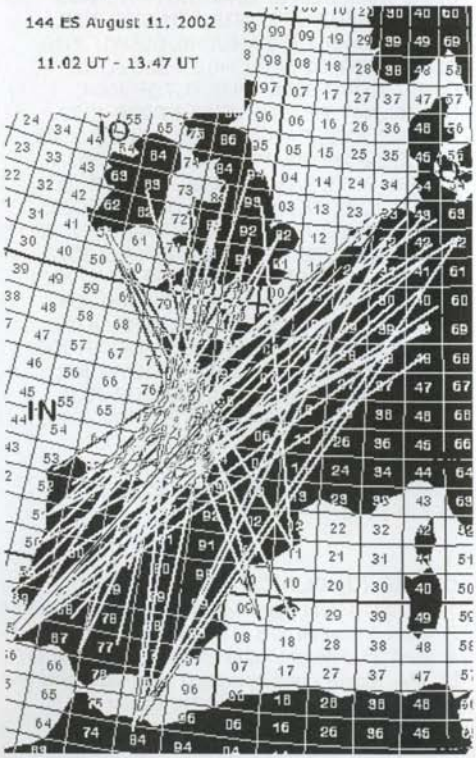
PE1HWO, JO21gv, wkd:
11:25 I8MPO JN70FP 1462

2002-08-11

CT1ANO, IN51re, wkd, 1106-1315 UTC:
DL1NAI JN59, DL3IAS JN49, DG5CST JO60, DB9IZ JN49, DL5FDP JN49, DK1WN JN49, DK5YA JN49, F4AZF JN38, DD1WKS JN39, DK1FUN JN49, DH4FAH JO40, DL6WU JN49, DL8GP JN39, DD7ZT JO40, DF2ZC JO30, DJ5BV JO30, F5SMZ JN39, DJ7OF JO51, DF1CF JN47, PE2ENG JO30, PD2DB JO22 PA3CNX JO22, PA1GYS JO32, PE2RMI JO23, PA3CEG JO33, PA1YL JO33, PA5WX JO33, PA3FFX JO33, PA3AOE JO32, PA3DYS JO21, PA5DD JO21, PE1HTL JO33, DL6YEH JO32, PD4HDB JO32, PA3ERT JO21, PA4VHF JO32, PA5TA JO33, PE1HWO JO21, PD1AIQ JO22, DG6JF/P JO32, ON1ALJ JO21, PE3CMC JO21, PA3GFY JO23, ON4YZ JO20, DL8BEH JO42, DG6JF/P JO33, DK3BE JO33, ON7CL JO20, PA0WWM JO22, PA2DWH JO22, DF8XR JO32, DK7BY JO33, DL6YDP JO32, PA1BVM JO21, F6CBH JN19, PA2CHR JO22, DL2DR JO31, DK5DK JO31, DL1KDA JO30, PD3FDV JO21, DL1JJ JO31, DJ2QV JO31, DF1BN JO31, DJ9CZ JO31, DL9GS JO31, DK3EE JO41, DL2OM JO30, DL1EAP JO31, DF2JQ JO31, DF7JP JO30.

CT1HZE, (Op DL8HCZ), IM57NH, wkd:
1119-1321 Great opening, band was open almost 2 hours. I worked 175 QSOs within 95 minutes to at least 26 different squares from ON, F, G, GW, DL, PA. Mostly good operation technique, only few stations asking for my complete locator etc.
Here the complete list, incl. dupes:

ON4YZ 20, PD2DB 22, PA7FM, PA5DD, PE1PTQ, PA3EHH 23, ON7CL 20, DF8XR 32, F6DKW, DF7VO 32, DG9YIH 32, ON5GS 21, DL6YEH 32, PD0HCV 31, DJ9CZ 31, DF2JQ 31, PA3DYS 21, PA3ECU, PA0WWM 32, PA3DOL, PE1RLF, PD4HDB 32, PA9RX, PD0FFU 20, ON4LN 20, ON6DP 20, DL8BEH 42, DL1EAP, DJ9YE 43, DJ3QB 32, DL0JT 32, DM1HD 31, F5HRY 18, F6CTW 18, ON1VS, PA0STE 31, ON1LMN 20, F1DES, PE1PQX 32, PD3AWD 32, DG6JF 33, DK7BY 32, DF1BN 31, DL9GS 31, ON5PU 20, ON4ANT, PA2CHR 22, PE2ENG 32, PE1RLF 32, ON4KHG, DF7KF 30, PA0ZM, DC5JQ, PE1LWT, PA9JP 32, PA0JMV 21, PA3HHE 22, ON1DIB 20, PA0PVW 22, ON4AVJ 11, PA0GHB 11, PE1HTL 33, PA3FOC, PE1CJG, PA3GDL 22, PE5AB 22, PA3CNX 22, PA3CEG 33, PA5WX 33, PE1CZG 22, ON4KHG 10, PD5FDV, PA3ERT 21, PD1ANQ, PE1KLQ, DL8EBW 31, DK3EE 41, DJ4UF, DJ6JJ, PE1RBG 22, DG1YBO 32, ON4BAR 10, PA3DII 23, PE1OPK 23, PA1GYS, DG7YGI/p, F1DBN, PD2EZ, PA1GYS 22, ON4AVJ 11, PA1YL 33, G3LQR 02, G4ZFJ 01, G4EZP 01, G4EZP 01, M1DNJ 01, G4FUF, G0FIG 90, G1HWY 90, G8IZY 91, G8YVR 91, G4AJC 91, M5BXB 91, DK5YA 49, DL6WU 49, DL8GP 39, DD1WKS 39,



DJ7OF 51, F4AKF 39, DF2ZC 30, DL2OM 30, DK5DQ, DL2KK, PA3DYS 21, DL5YET 41, DB4ET 31, DJ2QV 31, DL1KDA, DH4TW, DC6IA 30, DK1VC, DF1BN 31, EI5FK (NC), PA5WX 33, ON4LN, ON4YZ 20, F1DBN 00, G4AJC 91, G7RAU 90, G4YTL, G4HAI 03, F6FEO 09, G3LTF 91, DL6YDP 33, PA0BAT 31, PA3BGM 33, PE2RMI 22, G3BNE, DL6BF 32, G0BBB, PD1AIQ 22, PA1GYS 22, PA5TA 33, PE1PMM, PA5WX 33, PA0DVM 21, G6ZQY 02, G0AFH (?), F6FAI 88, F6FEO 09, PD0PQS 33, PA9KT 33, PD0NHM 33, PA3GFY 23, PA4VHF 32, PA0WJT 22, DD7BY, ON1IM 11, PA5KM 11, PA0GRB 22, PE1OLM, PA3FFX 33, DG9BDV, DL0RSH/p JO44PD 2325km ODX, PE1AXM 11, PA7PG 22, PE1KNL, PA3BGM 22, PE1FEI, PE5VD, PA3BQC 32, PE5AB 22, PD1AEX 22, GW4VEQ 73.

It was really great fun to be for the first time on the other side of the pile-up after working 2m Es for 22 years as DL8HCZ from JO53.
Also very happy to meet so many of the 2m DXers on the band. Many of them I know personally from the Weinheim VHF meetings.
The Netherlands were clearly favoured in this opening, signals were strong up to S 9+30 for long periods. After the opening I felt that I have worked all PA`s now, hi. Only for a few minutes the skip shifted a bit more to the east (JO44, 43, 42, 41) and it was hard to catch the DL´s through the PA pile-up.
My Rig is CT is modest: 150 W solid state PA, 11 ele Flexa yagi, but good take-off to NE.
After this experience I would suggest that the stations in the north should call more CQ if the MUF is high. Several Es openings this year I have detected only because I heard somebody chatting somewhere on 2m. I am here within a range of 200 km for 99% of the time the only station qrv on 2m and I can not call CQ all the time myself, hi.
Check also the CT1ART beacon on 144.406 from IM67AH for Es during the season. It is a good indicator and was heard this year several times via Es with no stations qrv from EA/CT.
Pse QSL only via DL8HCZ! The CT-bureau is not working o.k. 73s, Joe, DL8HCZ

DD1WKS, JN39KK, wkd:
11:23 CT1EEB IN50QR, 11:28 CT1ANO IN51RE, 12:00 CT1HZE IM57NH 59/59 ODX 1844km.
Rig: FT 736 R + TLA80, Preamplifier SHF electronic, 12 Element Yagi (homemade DL6WU)

DF2ZC, JO30RN, wkd:
11:15 EA4LU IM68 51 hrd, 11:28 CT1EEB IN50, 11:38 CT1ANO IN51RE 1612, 12:01 CT1HZE IM57NH ´1961, 12:12 CT1EWA IM59 hrd, 12:12 EB4EXV hrd, 12:15 CT1FAK IN50QE hrd.

DK6AS, JO52JJ, wkd:
1233 EA9IB IN85, 1303 CT1FAK IN50, 1309 CT1EEB IN50, 1313 EB1DNK IN62

DL6YEH, JO32VA, wkd:
11:23 CT1HZE IM57NH 2089km, 12:40 CT1FAK IN50QS 1766, 12:46 CT1ANO IN51RE 1726, 13:08 CT1EWA IM59NR 1870, 13:10 CT1EEB IN50QR 1770. 4 new squares for me, condx very unstable. Hrd also EA4LU and EA?BYM.

DL8EBW (JO31DL) wkd: 1143 CT1HZE IM57, 1144 CT1CLR IN50 hrd, 1207 EA4LU IM68 hrd, 1214 CT1HZE IM57 hrd, 1305 CT1FAK IN50, 1307 CT1ANO IN51 hrd, 1308 CT1EEB IN50 hrd, 1309 CT1EWA IM59. We got guests inbetween, so my xyl was very happy abt these opening and I left station after QSO, hi. 73, Guido.

EA3GJO, JN11BI, wkd:
12:32 EI2FSB IN51, 12:59 EI5FK 57 IN51

EI5FK, IO51RT, wkd:
1230 EA6VQ JM19, 1235 EB6AOK JM09, 1237 EA6SA JM19, 1240 EA6XQ JM19, 1250 EA3GJQ JN11, 1257 EA5AFP IM98, 1300 EA6/DF9UX JM09, hrd CT1HZE

F5SMZ, JN39EJ, wkd:
11:28 CT1EBB IN50QR 1517km, 11:29 CT1CLR IN50QP 1523, 11:41 CT1ANO IN51RE 1476

G7RAU, IO90IR, wkd:
11:19 EA7RM IM87 1475km, 11:25 EA7ERP IM87EE 1517, 11:45 EA4CTF IM89AT N/C, 12:30 CT1HZE IM57NH 1608, 12:44 EA7BEL IM77 1497km; Very patchy here, only constant was HZE, ~30 mins, new sq 358. I wish people would spot with ES in the spot info, makes my life easier with livemuf hi.

G8IZY, IO91VC, wkd:
11:46 EA7OC -- Lost N/C Sorry, 11:52 CT1HZE IM57 new#, 11:58 EA9IB IM85NG new DXCC, #, and continent! 12:53 EH9AI IM75 New#, 13:11 EA6SA JM19 New DXCC & #.
Maybe the best Es of the season for me! 1 new continent, 2 new DXCC and 4 new # and all in my worst direction!!

ON7CL, JO20JU, wkd:
11:14 EA4LU IM68TV 1590km, 11:18 CT1EPC IM68 1651, 11:21 CT1HZE IM57NH 1853, 11:50 EB4EUB IN80DJ 1335, 12:45 CT1EEB IN50 1563 12:50 EA7ERP IM87EE 1659, 12:53 CT1FAK IN50QO 1539, 12:55 CT1ANO IM59RE 1662, 12:55 CT1EWA IM59NR 1629, 13:05 CT1EKF IN50 1563

PA5DD, JO22IC, wkd:
1313 CT1EWA IM59NR 1724km, 1309 CT1EAT IM68DA 1837, 1250 CT1EWA IM59NR 1724 , 1244 CT1EEB IN50QR 1619, 1244 CT1ANO IN51RE 1573, 1242 CT1FAK IN50QO 1631, 1128 EA4EHI IM68TV 1698, 1124 CT1EPC IM68GD 1815, 1123 EA4LU IM68TV 1698, 1120 CT1HZE IM57NH 1955.

PA5KM, JO11WL, wkd:
1246 UT hrd YU1EV, 1249 EA9IB IM85NG, 1252 UTC CT1FAK IN50 QSO NC, CT1HZE IM57NH.

PD2DB, JO22MD, wkd:
13:19 CT1HZE IM57NH 1974km, 13:24 EA4LU IM68TV 1716, 13:26 CT1EPC IM68GD 1833, 14:34 CT1EEB IN50QR 1640, 14:37 CT1FAK IN50QO 1651, 14:39 CT1ANO IN51RE 1594, 14:43 CT1AKL IN51RE 1594, 14:47 CT1EWA IM59NR 1744, 15:09 CT1EAT IM68DA 1856.

PE1HWO, JO21GV, wkd:
11:28 EA4LU IM68TV 1674, 11:31 EA4EHI IM68TV 1674, 11:33 CT1EPC IM68GD 1791, 11:38 CT1HZE IM57NH 1932, 12:04 EA7BYM IM66UM 1911.
12:39 CT1FAK IN50QO 1608, 12:43 CT1EEB IN50QR 1596, 12:48 CT1ANO IN51RE 1551, 13:05 CT1EAT IM68DA 1814, 13:14 CT1EWA IM59NR 1701.

---

mni tnx to DK5YA for providing the maps from his websites!!

New Products

Editor: Joachim Kraft, DL8HCZ

Starting with this issue there will be this new column "New Products". Here we want to give information about new commercial products, like techniqual equipment, books, software etc. which are of interest for the VHF/UHF/Microwave amateur.
If you have something that should be presented here, please let me know.

Mit dieser Ausgabe führen wir die Rubrik "Neue Produkte" ein. Hier wollen wir über kommerzielle Produkte, wie Technische Geräte, Bücher, Software usw. informieren, die für den VHF/UHF/ Mikrowellen-Amateur von Interesse sein könnten.
Wenn hier ein neues Produkt präsentiert werden soll, wenden Sie sich bitte an miich.

73s Joe, DL8HCZ info@DUBUS.de

International Microwave Handbook

Edited by Andy Barter, G8ATD

The microwave bands are an excellent area for radio amateurs who want to experiment and construct their own equipment. The RSGB in partnership with the ARRL has produced this invaluable source of reference information for those interested in this area, along with excellent designs from around the world to fire the imagination. Material has been drawn from many sources including the RSGB journal RadCom and the ARRL publications QST & QEX. Alongside this material a truly international range of sources have been used including items from Germany, Denmark, New Zealand, Slovenia and many more.
The earlier chapters in the book provide the invaluable reference material required by all interested in this exciting area of experimentation. Techniques and devices are covered in depth, leading the reader to understand better the wide range of equipment and techniques now available to the microwave experimenter. This book contains a wide selection of designs using the latest technology that can reasonably be used by radio amateurs and ranges from ones that can be reproduced by most radio amateurs to those that require a high degree of skill to make.
With the explosion in consumer electronics using microwave frequencies the opportunity to experiment has never been greater and this book is simply the best guide to the area of microwave radio.

2002 Edition, RSGB, paperback, 480 pages, size 240x175mm ISBN 1-872309-83-6

Ganz druckfrisch seit Juni 2002 gibt es das gemeinsam von den US- und britischen Afu-Clubs ARRL und RSGB herausgegebene Buch für alle Fans der Mikrowellenbänder „International Microwave Handbook".
Das Buch wurde von Andy Barter, G8ATD, zusammengestellt und bringt auf 480 Seiten in englischer Sprache alles Wissenswerte für die Bänder ab 23cm und höher. Es gibt 15 Kapitel, in denen folgende Themen behandelt werden:
-Betriebstechnik,
-Ausbreitungsarten.
-Antennen
-Kabel, Wellenleiter, Koppler,
-Halbleiter und Röhren
-Techniken und Tipps für den Selbstbau
-Gebräuchliche Stationsausrüstungen
-Meßgeräte
-Geräte für das 23cm-Band
-Geräte für das 13cm-Band
-Geräte für das 9cm-Band
-Geräte für das 6cm-Band
-Geräte für das 3cm-Band
-Geräte für das 1,2cm-Band
-Geräte für die Bänder über 24 GHz
-Anhang: Daten und Diagramme

Zu diesem Buch haben bekannte Autoren aus vielen Ländern Artikel beigesteuert. In Großbritannien wird dieses Buch für umgerechnet 40 Euro plus Porto verkauft. Der DUBUS-Verlag hat ein kleines Kontingent zu Sonderkonditionen abzugeben:
Der Preis pro Buch beträgt 30 Euro inklusive Porto, d.h. über 25% günstiger. Das Buch kann ausschließlich durch Einsendung von 30 EURO in bar oder als V-Scheck bestellt werden bei: DUBUS-Verlag, Grützmühlenweg 23, 22339 Hamburg.
Bei Bestellungen nach dem 15.10. bitte kurz vorher unter Tel.: 040/5383186 anfragen, ob das Buch noch lieferbar ist. Es handelt sich nämlich um eine begrenzte „Einmal-Aktion"!

News & Comments

Editor: Klaus Tiedemann, DL4EBY
tklaus@snafu.de

TV carriers via EME

Tony Mann writes:
Hi folks, I am pretty sure I have detected UHF TV carriers from the USA via moonbounce here in Australia.
With my Yagi pointed at the moon, weak carriers with frequency drift (~ -1.5 Hz/minute) were noted on 26, 27 & 28 May 2002:

Date	Time (UTC)	Freq (MHz)	Freq. drift / predicted Doppler (Hz/min)	
May 26th	1021-1028	483.250537	-2.5	-0.9
26th	1115-1122	501.248339	-1.5	-1.4
27th	1147-1206	501.248312	-1.4	-1.4
28th	1235-1258	501.248292	-1.26	-1.28

Frequency was measured at fade-out.
The timing is in excellent agreement with a moon scheduling program (such as GM4JJJ's) for moonset at the US TV tx sites:
501.25 MHz, KWBT-19,
Muskogee, OK, 35.75N, 95.8W
483.25 MHz, WNDU-16,
South Bend, IN, 41.6N, 86.2W
Both of these transmitters radiate 5000 kW ERP horizontal polarisation, with an omni-directional pattern and have no vertical beam tilt. Info on these stations may be found at the FCC TV database http://www.fcc.gov/mb/video/tvq.html#start
On all 3 days the frequency drift of the 501.25 signal is in excellent agreement with the predicted rate of Doppler shift. The -2 Hz/minute drift of the 483.25 tx is about 1.6 Hz/min faster than prediction. Maybe the tx frequency itself is drifting, which is why I didn't find it after the first night.
The signal-to-noise ratio was several dB, as can be seen from spectrum analyser scans, at www.physics.uwa.edu.au/~agm/eme1.jpg

These scans were done every 40 seconds and the bandwidth (spectrum analyser bin width) is about 2 Hz. One could watch progress of signal in near real time: the signal on 501.25 on 27 & 28 May fluctuated by at least 7 dB (in/out) several times and was strongest a few minutes before fade-out.
The antenna is a 22 director Yagi (in Australia, Jaycar's "91" element fringe antenna, model LT3182) with nominal 15 dB gain at 500 MHz. It was mounted (on a camera tripod) at 1.5 above ground level, with manual adjustment of the elevation and azimuth to track the moon. It was mostly elevated at about 22 degrees (optimum for 501.25, KWBT).
The (1st) preamp is a 2 dB noise figure GaAs FET unit, with 20 dB gain, mounted at the antenna. It is a JIM model M-75, made in Japan (once sold in Australia by Dick Smith Electronics). Its bandwidth is 225-1500 MHz.
The rx is an Icom R7000, in USB mode, plus PC (Mac) based audio spectrum analyser sampling the receiver's audio through the sound card.
To measure frequency accurately I use harmonics (weak at UHF) of a frequency divider chain which provides combs every 10 kHz from a very stable 5 MHz crystal oscillator. The 5 MHz reference is a high performance Vectron ovenised quartz crystal (ca 1989 vintage), with a frequency drift of better than 0.001 ppm/day.
A simple calculation of the signal-to-noise ratio [= PG/LkTB, where P = tx erp, G = rx ant gain, L = path loss (264 dB at 500 MHz), k = 1.4x10E-23, T = noise temp., B = bandwidth (Hz)] gives about 15 dB for a 3 Hz bandwidth and 300 K noise temp., which is in the right ballpark. There are many more UHF transmitters to investigate via EME. Here in Australia the task is made easier by the lack of TV allocations below 526 MHz.
73s, Tony Mann, Perth, Australia, 32S, 116E via Tim Bucknall, UK, DX LISTENING DIGEST (found on Packet Radio, VHF@WW)

10GHz Regenscatterrekord von DL6NCI

Am 20.06.2002 herrschten hervorragende Bedingungen für Regenscatterverbindungen auf 10 GHz. Man konnte von hier aus JO50VI zur gleichen Zeit nach SM, PA0, HB9, I, SP arbeiten.
Station hier: 10W Output, NF 1,2dB, 90cm Parabolspiegel, 640m uNN Hier die Highlights: QRV waren ausser mir noch meine Tochter Sabrina, DB6NI. Sie hat ihr Rufzeichen erst seit 18.06.2002.
20.06.2002 17.23UTC I6XCK/6 JN63QM 769km rst 57s/59s in SSB
20.06.2002 18.02UTC IW4CJM/P JN72MA 960km (neuer Regenscatter Weltrekord) RST 52s/57s in SSB
(Fotos sind auf meiner Homepage http://www.dl6nci.de unter NEWS).
Sabrina, DB6NI konnte diese beiden Stationen auch arbeiten!! Nicht schlecht für 3 Tage Lizenz! Das Signal von IW4CJM/P wurde auch in JO71AD von DF2CK (1018km) und in KO01BW von SP7JSG (1168km!) gehört.
Weitere QSOs von mir:
20.06.2002 20.14UTC SP3DRT JO91CQ 473km rst 55s/59s in CW
20.06.2002 21.06UTC SP7JSG KO01BW 607km rst 52s/55s in CW

VY 73 de Lorenz, DL6NCI
Lorenz@dl6nci.de, www.dl6nci.de

Transatlantik-Rekord auf 2m...
im DUBUS 1/2002 auf Seite 87 hatten wir über ein (angebliches) Transatlantik-QSO am 20.3.02 auf 2m via WSJT (MS) zwischen VO1/N2PIG und EI/VA3PIG berichtet. Das ganze ist u. E. eine Ente. Es sind weder Audio-Dateien noch Fotos veröffentlicht worden. Emails von DUBUS an N2PIG mit entsprechenden Fragen wurden nicht beantwortet.
The report in DUBUS 1/2002 on page 87 about the 2m WSJT QSO between VO1/N2PIG and EI/VA3PIG seems to have never really happened. N2PIG never ansered to emails from DUBUS staff. No pictures, audio files etc were publishes in the Web as promised from N2PIG.

Corrections to Beacon List
F5XBE is on 5760.815 and mode is F1A.
F1XBD correct call is F5XBD on QRG 10368.005, 9W ERP, 160 m asl, F1A (tnx to F5HRY for info!)
DB0UL antenna is Slot WG, mode is A1A.
DK0UU/B was the test call of DB0UL, this entry has to be cancelled. (tnx DL5EBT)
GB3SCK, IO80UU: correct QRG is 24192.905. (tnx to G0API for info)
SR0CWK, JO90NS: correct QRG is: 10368.840 MHz.
SR7JSG is a new beacon qrv on 10368,810 MHz, Loc. KO01BW 1W ERP OMNI WG-SLO T. (tnx to DL6NCI for info)

Further beacon news
OE3XLB/B new beacon qrv on 6m
Since June 2002 the first 6m beacon from Austria is qrv. Call: OE3XLB/B, Loc. JN87, QRG: 50.058 MHz. Power: 10 W, Ant.: 5 Ele Yagi.

HB9SIX: New 6m-beacon
Since May 2002 there is a new 6m beacon qrv from Switzerland: HB9SIX, JN47KM, 0,1 W Output, Dipole.

Neue 23cm-Bake DB0WTT
Im Juli wurde die Bake DB0WTT qrv. Hier die Daten: Qrg 1296,960 Mhz, 1 Watt Output, Antenne Big-Weel, Tastung A1A, Sie gibt DB0WTT - JO40LG - Dauerstrich Der Verantwortliche ist der Horst, DL1ZBR.

SR3SIX qrv
Since June the 6m beacon SR3SIX is qrv from JO92DF on 50.015 MHz.

Neue Bake YO7AQF auf 6m
Seit Juni 2002 ist auf 50.000 MHz die Bake YO7AQF qrv. Daten: KN24KV, 1 Watt, GP.

Neue Bake JX7SIX qrv
Seit Juli ist die Bake JX7SIX auf 50.079 MHz aus IQ50RX mit 10W an einem Rundstrahler qrv.

LA7SIX and LA7VHF qrv again
Since mid August LA7SIX is qrv again on 50.051 with 20 W and 4 ele Yagi, QTF 190.
Also LA7VHF is qrv again on 144.451 MHz with 50 Watts, 10 ele Yagi, QTF 190. It is a new QTH for both beacons in JP99EC, 310m a.s.l.
Reports please to LA5TFA. la5tfa@hamradio.no
QSLs please via LA3T.

Activities

G0KZG/mm qrv Sept - Dec 2002
Andy GKZG, writes:
I will be QRV again from the "R.R.S. DISCOVERY" Sept to Dec 2002. The first cruise will be sailing from Glasgow (IO75) from Sept. 27th to Oct 24th to a working area approx 60-100 miles west of Ireland. The second cruise will be sailing from Scotland (Glasgow) on Nov 6th up to a working area southwest of Iceland, returning to Southampton / England on about the 21st Dec 2002.
There will be a 2 days stop in Reykjavik (TF).
I hope to run my usual high power 2m station, and possibly 100Watts on 6m (for the first trip). Probably no 6m on the second trip as I have not found an antenna that will survive the 100mph plus winds!
Equipment will be: FT 847, 3CX800 LINEAR (I have a special permit for 1000 Watts from the ship) 11ele F9FT for 2m, low noise masthead pre amp., station fully equipped for HSMS using WSJT & "standard" HSCW.
Sked-QRG: 144.120 CW-MS mostly 04-07z, Random 144.125 WSJT mostly 18-21z, during weekends also qrv in the afternoon.
Any emails to me will be forwarded by my XYL Lynne to my ship. I look forward to working you.
Infos/skeds : Andy, G0KZG, g0kzg@aol.com

KP24 OH6HFX etc will be qrv during the Leonides (17.-19.11.) on 2m via CW-MS+WSJT (144.172) and SSB-MS (144.224 MHz) with 350 Watts and 12 Ele. Skeds: oh6hfx@sral.fi

KP55 OH6JW+ZZ etc. will be qrv during Leonids (17.-19.11.) as OH8K on 2m via CW-MS (144.147) and SSB-MS (144.218 MHz) with 2 x 16 Ele + EME-Power. May be also WSJT. Skeds: oh6jw@sral.fi

PA3HEN/MM not qrv
Theo will not be qrv on 2m/6m as M0HEN/MM and PA3HEN/MM during his trip during September/October. His Rig is broken and he is looking for sponsors for a new one.

Dates

Microwave Update 2003
Rick, NU7Z, already plans for the "Microwave Update" conference next year! Please note the date and location: September 25th-28th, 2003 in Seattle, Washington, USA. Thanks to DF6NA for info.

Belgian Microwave Roundtable 2002
The Radio Club Leuven (RCL) organises for the fourth time the Belgian Microwave Roundtable.
We invite you to attend this event on Sunday 17 November 2002 at the Koninklijk Atheneum Redingenhof (Redingenstraat 90) in Leuven.
Our provisional program is:
- Measurements: RF and noise figure measurements up to 26 GHz, ATV measurements
- Lectures: ATV, Microwaves, Antennas, VHF,..
- Demonstrations: ATV, 10/24/... GHz equipment, simulation programs, etc.
- Commercial stands (limited amount): books, VHF/UHF/SHF/ATV components and kits
- VHF meeting point
- Book with a synopsis of the lectures and other interesting articles

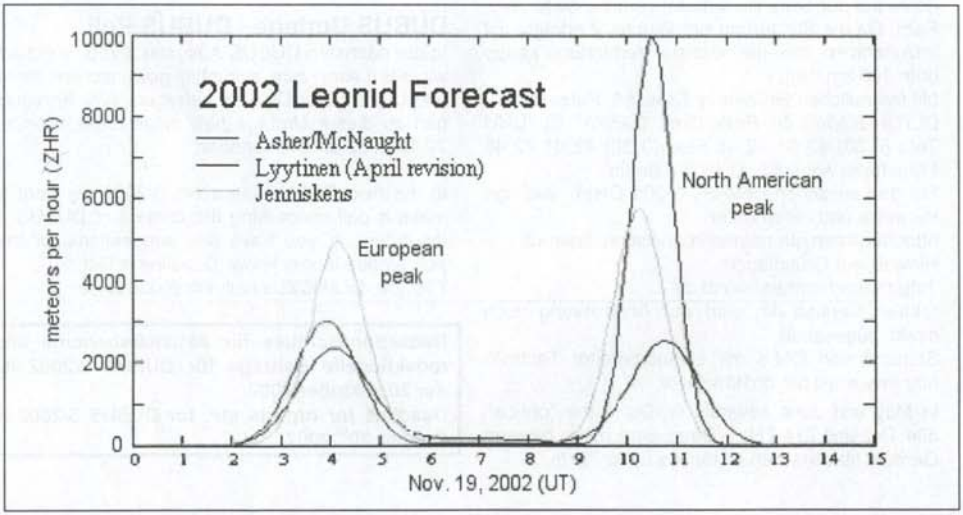
For up-to-date information and how you can reach us, please visit our website
www.on4cp.org

See you in Leuven and bring some equipment with you to show around.
73, Hans ON4CDU

Leonids 2002

Erstaunlicheweise sagen die Astronomen auch für dieses Jahr wieder ein starkes Maximum des Meteoritenschauers Leoniden vorraus. Es soll am 19.11. sein. Europa und Nordamerika sind diesmal bevorzugt. Das Maximum in EU soll am 19.11. gegen 4 UTC sein, das über Nordamerika am 19.11. gegen 1030 UTC. Immerhin werden von verschiedenen Experten (siehe Grafik unten) im Maximum mehrere tausend Meteoriten pro Stunde vorhergesagt.
Man sollte sich die Nacht vom 18. auf den 19.11. sicher freihalten!

Surprisingly several astronms predict now also for 2002 a strong maximum of the Leonids meteor shower for November 19th. Europe and North-America are favoured this year with several thousand meteors per hour in the maximum. (see Fig. below). For Europe the maximum is excpected on Nov 19th at 0400 UTC, for NA at 1030 UTC.
We recommend to stand bye on the bands in the night from Nov 18th to 19th.
(DL8HCZ)



Aktivitäten im optischen Bereich (>300 GHz)

53 km wurden von Gert DG8EB und Michael DB6NT auf 660 nm, (394 THz-Band) am 16.05.2002 um 19:45 UTC zwischen JO60DJ und JO50TI trotz "Dunst" überbrückt. In Telegrafie RST 599+, in Telefonie starkes QSB.
Technische Daten: Sendeleistung <5 mW, LASER, Durchmesser der Empfangsoptik 12 cm, Interferenzfilter, OPT210, Schaltung DL2CH, Justage horizontal und vertikal.
Fotos: www.db6nt.com/kuhne.html
9 km wurden von DH7AEQ Detlef, DL7VJB Hans und DA5FA Pit auf 940 nm, (214 THz-Band) am 25.05.2002 um 9 Uhr UTC aus und über Berlin trotz Regen überbrückt. In Telefonie RSM 599+.
Technische Daten: Sendeleistung 1mW, LED!, 6 mrad, effektiver Durchmesser der Empfangsoptik 12 cm, Rotfilter, diskrete Si-Fotodiode mit KP303G, Justage horizontal und vertikal.
Fazit: Damit ist wieder bewiesen, Theorie und Praxis stimmen überein, primär ist nur das Wetter und der Standort entscheidend, die Leistung ist sekundär. Alles andere hat man ja im Griff.
Einfach den Mut haben größere Strecken bei passendem Wetter angehen!
Am 3.06.2002 um 19:45 UTC kamen weitere Verbindungen über 72 km im 394 THz-Band zustande. Beteiligte waren DG8EB/p Gert und DA5FR/p (DJ5NQ) Frank in JO60HL Auersberg und DB6NT in JO50TG Döbraberg.
Das WX war nicht optimal, "Dunst", aber die Feldstärken waren sehr gut. ie Rapporte lagen bei 59 in AM und 599 in CW.
Verwendete Sendeleistungen: ca. 5 mW, Rotlichtlaser ca. 660 nm, Empfänger: OPT210 mit Interferenzfilter und 120 mm Linse
Fotos auf der Seite www.db6nt.com/kuhne.html
Fazit: Da die Steigerung um Wurzel 2 erfolgte, ist anzunehmen, das die nächste Verbindung knapp über 100 km liegt.
Mit freundlichen Grüßen/vy 73 es 55, Peter/Pit
DL7UHU@darc.de Peter Greil DA5FA DL7UHU
Tel.: (0 30) 42 01 72 45 Fax: (0 30) 42 01 72 46
Frankfurter Allee 83 D 10247 Berlin
Für den optischen Bereich, (>300 GHz), wichtige Hinweise und Hilfen unter:
http://mailman.qth.net/mailman/listinfo/laser-dl
Hinweis auf Grundlagen:
http://www.hamradioworld.de
(aktuell Version 41, wird auf Anforderung auch direkt zugesandt)
Standort von OM´s mit einsatzbereiter Technik:
http://www.qsl.net/do1khs/laser

In May and June severals QSOs in the "optical" 394 THz and 214 THz – Band were made beween German stations with distances up to 72km.

ERAC/SETI: Call for Papers

The European Radio Astronomy Club together with the SETI League will be holding the Third international Congress for Radio Astronomy on the 5th 6thand 7th of September 2003 in Heppenheim Germany (Near Heidelberg) This is the largest Meeting for Radio Astronomers in Europe and is also the Main Meeting for the European Wing of the SETI League . I would like here to call for Lecturers wishing to hold a lecture to send in an abstract of their papers to be submitted for review . We Specialise in Radio Astronomy and Microwave related subjects to do Science and this congress we would like to invite Radio Amateurs also interested in Science to attend for the first time . On approval you will need to submit your Full lecture by June 2003 so that it may be included in the Congress Script. Lectures may Register that they will be coming on Submission of the Abstract . It will be possible for a small number of external guests to attend this meeting, if you are interested please submit your request in writing stating the reason why you wish to attend so that your request may be reviewed . This is a 3 day event with Scientists coming again from all over the world with this time workshops on the Sunday so if you have a theme for such a workshop that will be most welcome .
It is the first time that we are opening our doors to the European Radio Amateur Community it is my sincere hope that we may learn from each other to advance our individual interests in the future so building the foundation for Future co-operation .
Peter Wright B.Sc. ERAC President
The European Radio Astronomy Club
Ziethen Str 97, D-68259 Mannheim, Germany
Tel 0621 794597, e-mail erac@wegalink.com

DUBUS Umfage / DUBUS Poll

In der nächsten DUBUS Ausgabe 3/2002 möchten wir alle Leser zum zukünftig gewünschten Inhalt und Umfang der DUBUS befragen. Wer Anregungen zu dieser Umfage hat, möge diese bitte bis 20.10.2002 an mich senden.

In the next DUBUS issue Nr. 3/2002 we want to make a poll concerning the content of DUBUS in the future. If you have any suggestions for this poll, please let me know. Deadline is Oct. 20th.
73s Joe, DL8HCZ. email: info@dubus.de

Redaktionsschluss für Aktivitätsberichte und redaktionelle Beiträge für DUBUS 2/2002 ist der 20. Oktober 2002.
Deadline for reports etc. for DUBUS 3/2002 is Ocober 20th 2002

DUBUS Toplist

Editor: Norbert Goettsche, DL8LAQ

50 MHz Toplist

NR	Call	WW Loc	Wkd Sqr	DXCC	Tropo	Aurora	MS	Es	(ODX) F2
1	ON4ANT	JO20	1150	210	1180	1952	1975	9007	16802
2	VE1YX	FN74	1076	154	0	0	0	0	0
3	ON4GG	JO20	1089	211	813	1757	1695	8317	16727
4	DL7QY	JN59	1055	204	741	1665	2186	****	27926
5	SM7FJE	JO65	1050	197	0	0	0	0	0
6	PY5CC	GG54	1032	215	0	0	0	0	0
7	PA0HIP	JO21	1002	204	0	0	0	0	0
8	IK0FTA	JN61	985	208	0	0	0	0	0
9	SM7AED	JO65	982	190	0	0	0	0	0
10	PA0RDY	JO22	967	180	750	1617	1597	****	16320
11	G4IGO	IO80	945	195	578	1308	2528	7301	16188
12	G3WOS	IO91	895	202	0	0	0	0	0
13	ON4KST	JO20	856	163	801	1415	1509	8374	16498
14	DL7AV	JN58	856	191	0	0	0	0	0
15	SV1DH	KM17	820	217	0	0	0	0	0
16	OK1DDO	JO60	802	161	620	1423	1340	6100	16266
17	F8OP	JN26	793	141	631	1023	1369	5508	13547
18	ON4PS	JO20	791	155	752	1740	1902	6520	16358
19	SM6CMU	JO57	790	169	762	1452	1642	5922	0
20	PA2VST	JO22	764	155	0	0	0	0	0
21	GJ4ICD	IN89	758	167	0	0	0	0	0
22	DL8HCZ	JO53	742	115	365	1250	1356	3350	0
23	G4UPS	IO80	734	148	0	0	0	0	0
24	DL3AMA	JO51	726	146	519	1431	1600	4001	14810
25	SP4MPB	KO03	722	164	710	1836	1507	8290	17521
26	PA2TAB	JO32	659	152	857	1370	1809	5797	15339
27	SP6GWB/P	JO80	657	139	696	1774	1880	8583	17887
28	OK1FFD	JO60	654	148	580	1231	1380	7450	14773
29	OK2ZW	JN89	618	138	1681	0	0	0	15580
30	IK5JWQ	JN52	616	151	820	0	1485	5908	15237
31	YL3AG	KO26	591	131	691	1817	0	8115	14305
32	PE1HWO	JO21	582	129	835	1671	1674	6061	11443
33	DF7RG	JN68	581	122	652	1576	824	4864	14802
34	SP6MLK/P	JO80	575	116	1051	1607	1505	8557	27874
35	DL7HG	JO62	568	115	0	0	0	0	15600
36	IZ5EME	JN52	567	122	583	0	1712	5216	15152
37	OK1KT	JO70	561	121	0	1545	1486	4377	15999
38	I4XCC	JN63	548	0	707	0	1427	4456	18627
39	DL2DR	JO31	530	108	1003	0	0	4769	12047
40	SP6GZZ	JO81	529	0	515	1394	1826	8103	14443
41	F5DE	JN05	519	128	860	704	1368	3638	15789
42	OK1VBN	JN78	512	92	455	1496	897	8790	14645
43	ES1CW	KO29	503	104	959	1968	2116	6337	13090
44	DL6NCI	JO50	503	132	708	1294	505	7815	14239
45	DJ6MB	JO30	503	114	0	1058	0	2685	13285
46	YO2IS	KN05	465	109	412	1253	1404	7775	15931
47	ES2RJ	KO29	458	88	971	1923	2052	4642	13682
48	ON1IM	JO11	456	106	223	1278	1302	5607	16205
49	IW1AZJ	JN35	450	120	445	800	1341	3221	15261
50	OK1FAV	JO60	444	96	0	579	1093	6250	12924
51	ES2WX	KO29	443	85	562	1924	1847	4651	13682
52	ES1AJ	KO29	439	94	415	1710	1850	3340	13694
53	ES2QN	KO29	437	81	848	2380	1963	5689	13098
54	DL4ALI	JO50	431	87	464	628	1850	3969	12195
55	DJ6XV	JO31	428	85	512	1007	1130	4805	11502
56	DL9GU	JN49	402	0	721	450	0	8500	15625
57	ES2NA	KO29	393	80	883	1870	1983	4647	11576
58	OK1MP	JO70	390	82	1125	1077	1753	3541	13452
59	ES2RW	KO29	382	55	410	1896	0	3827	9515
60	OK1IBL	JO60	377	77	530	1320	1717	6941	11816
61	HB9SJV	JN26	374	90	526	768	1474	5784	14658
62	PA5DD	JO22	374	107	0	0	0	0	0
63	SP2IQW	JO94	367	68	631	1537	1470	4034	10964
64	ES1II	KO29	367	81	335	1569	1410	3325	13978
65	DL6BF	JO32	365	71	1193	1326	0	4955	11582
66	HB9AOF	JN36	350	82	500	0	0	5400	10663
67	F5PAU	IN88	345	90	0	0	0	0	0
68	DG1VL	JO61	344	63	430	1336	0	4697	10502
69	ES1RF	KO29	340	63	340	1250	0	2800	11549
70	SM3BIU	JP73	336	77	907	1704	1982	4414	0
71	LY2SA	KO14	336	74	374	960	904	4031	12947
72	DL1SUZ	JO53	335	70	546	1434	865	5921	11859
73	ES4EQ	KO39	334	63	392	1869	0	4750	13005
74	PE1OGF	JO21	332	76	0	0	0	0	0
75	SM7JUQ	JO65	331	84	372	1349	1062	3900	14070
76	OZ7IS	JO65	324	84	410	1294	850	3100	0
77	PA2CHR	JO22	316	95	1334	1403	0	5215	0
78	F8CS	JN27	313	68	336	0	0	7454	9753
79	ES6QB	KO37	310	74	450	625	0	5145	13410
80	ES3BR	KO29	309	55	387	1900	1600	4536	11530
81	DC9YC	JO31	306	68	666	1154	0	5112	11921
82	I3ZVN	JN55	304	69	532	0	0	5742	8422
83	OE1SOW	JN88	302	68	0	0	0	0	11921
84	ES1MW	KO29	298	60	315	650	0	3972	9619
85	ES5AM	KO38	289	53	452	1754	1981	4500	12923
86	DL3YEE	JO42	284	69	540	1056	1300	2700	13053
87	LZ1AG	KN22	281	74	375	0	0	3782	10628
88	HB9STY	JN36	280	65	367	0	1431	4448	7810
89	ES2QH	KO29	279	60	372	1740	1710	2542	13682
90	DL7YS	JO62	275	64	342	461	1086	3547	8767
91	F1FIH	JN23	273	98	796	0	1637	2492	15613
92	ES2CM	KO29	270	56	353	1841	1228	4236	11537
93	ES0HD	KO18	264	51	400	1111	0	2430	0
94	ES4NG	KO39	261	55	1044	1129	1625	3105	11635
95	CT1HZE	IM57	261	55	0	0	0	0	0
96	OK1UDX	JN79	260	50	440	1054	0	3513	7505
97	OK1VQ	JO60	259	46	245	539	0	2002	2755
98	ES1AC	KO29	258	51	540	1724	0	5698	11543
99	PA4VHF	JO32	257	58	559	902	755	4832	11534
100	ES6DO	KO28	252	61	489	308	0	3839	8429
101	SP2JXN	JO94	249	55	0	0	0	0	0
102	ES1ABR	KO29	248	50	540	1724	0	5698	11543
103	OE3OKS	JN87	243	45	467	0	0	7985	0
104	DF1EQ	JO31	242	0	279	0	0	2769	11510
105	ES5DE	KO38	239	56	228	606	0	5299	8249
106	DK2BJ	JO30	236	50	471	805	0	3194	8274
107	G7LRQ	IO91	234	59	0	0	0	3574	0
108	ES5MC	KO38	232	61	432	1786	0	5143	13142
109	IW2DVK	JN45	230	51	534	0	1649	7332	9837
110	OK1DIG	JO60	224	58	177	1340	1003	4258	14624
111	CT1BGE	IM58	215	1	0	0	0	0	0
112	ES5RY	KO38	214	53	317	0	0	3640	8249
113	DL8GAP	JN48	212	61	365	0	0	6924	13801
114	ES5GI	KO38	210	45	310	650	0	2510	11610
115	OK2PPP	JN99	201	40	0	0	0	3200	0
116	OK1DKS	JO70	198	42	934	0	0	1973	8514
117	HB9Q	JN47	197	60	0	0	0	0	0
118	DC0KO	JO31	196	46	224	532	0	3261	0
119	DL8EBW	JO31	187	50	247	1050	1150	5800	0
120	DJ5VW	JO31	185	60	0	0	0	8065	0
121	CT1DIN	IN60	174	37	1581	0	0	3169	0
122	IK1PAG	JN35	174	50	350	0	0	3300	0
123	DG3HS	JO53	157	45	422	0	0	3578	13892
124	IT9VDQ	JM68	129	48	837	0	0	2814	7811
125	F1JKY	JN25	128	35	688	0	815	2043	7197
126	ES3RM	KO28	127	31	210	692	0	3111	0
127	ES5QA	KO38	115	28	0	0	0	2852	0
128	CT1DDW	IN60	110	50	2100	0	0	4699	0
129	CT1FAK	IN50	108	1	0	0	0	5395	0
130	S53J	JN75	105	33	0	0	0	0	0
131	PA0JUS	JO22	92	0	325	1706	0	0	14850

144 MHz Toplist (without EME)

NR	Call	WW Loc	Wkd Sqr	DXCC	Aurora Tropo			Es MS	(ODX) Iono
1	DK1KO	JO53	695	0	2124	2057	2210	3285	0
2	DK3WG	JO72	679	72	2243	2034	2295	2782	1429
3	PA3BIY	JO22	630	64	1550	2026	2205	3143	0
4	DL8EBW	JO31	607	66	1454	1918	2123	2305	0
5	DF8LC	JO53	600	70	2105	2045	2226	3291	0
6	PA0RDY	JO22	568	67	1582	1979	2272	2819	0
7	DL8HCZ	JO53	561	0	1615	1976	2096	3527	1500
8	SM6CMU	JO57	534	146	1760	1928	2280	2540	0
9	PA3FOC	JO21	522	59	1373	2010	2209	2326	0
10	OH5LK	KP30	521	0	1962	2041	2235	2891	0
11	I2FAK	JN45	521	0	1797	1508	2405	2995	0
12	SP6GZZ	JO81	520	0	1670	1794	2017	2717	0
13	SP9EWU	JO90	517	63	1710	1927	2154	2871	0
14	DK6AS	JO52	516	0	1460	1885	2510	2260	0
15	PA2CHR	JO22	515	101	1514	1751	2240	3201	1971
16	HA1YA	JN87	513	72	1548	1876	2183	2885	0
17	I4XCC	JN63	508	0	1177	1803	2275	3257	0
18	DD0VF	JO61	489	62	1736	1701	2017	2617	0
19	DK0OG	JN68	489	67	1708	1722	2172	3320	0
20	DJ7OF	JO51	489	63	1512	1518	2152	2156	0
21	PA3DZL	JO21	484	59	1405	1851	2167	3107	0
22	LY2WR	KO24	483	57	2051	2075	2347	3007	0
23	DH3YAK	JO31	472	61	1424	1162	2105	2650	0
24	ON4ANT	JO20	469	67	1420	1965	2150	2725	0
25	DL8LAQ	JO43	465	0	1376	1806	1934	3302	0
26	ON4GG	JO20	464	68	1420	1965	2150	2124	0
27	DL3AMA	JO51	463	58	1785	1803	1925	2083	0
28	YU7EW	KN05	459	67	1404	1868	2179	2430	2082
29	IZ5EME	JN52	458	65	1590	0	2090	2893	2030
30	SP4MPB	KO03	457	53	1886	1764	2090	2697	0
31	OH7PI	KP32	451	0	1902	1926	2151	2489	0
32	OK2ZW	JN89	445	56	1417	1775	2113	2471	0
33	YU7MS	KN05	437	62	1319	1856	2160	2438	2130
34	F8OP	JN26	431	63	1228	1196	2028	2720	0
35	OK2VMD	JN89	428	58	1662	1765	2031	3605	0
36	YO2IS	KN05	417	67	1360	1916	2130	2556	0
37	PA4VHF	JO32	416	0	1536	1337	2085	2086	0
38	OK1KT	JO70	416	58	1411	1545	1900	2808	0
39	ES2WX	KO29	415	40	1370	1950	2270	2071	0
40	IW1AZJ	JN35	411	62	1115	1188	2151	2780	0
41	OK1FM	JN69	403	56	1843	1438	2200	2150	0
42	ES6RQ	KO37	391	37	1500	1840	2172	1725	0
43	HB9Q	JN47	391	66	1404	1288	2060	2959	0
44	OK1JKT/P	JO60	389	52	1701	1764	2121	2269	0
45	F8CS	JN27	387	54	1161	1468	2124	3231	0
46	PE1HWO	JO21	384	62	1357	1403	2184	2316	0
47	OE6IWG	JN77	381	61	1221	1110	2220	2126	1214
48	YL3AG	KO26	374	39	1552	1912	0	2452	0
49	S50C	JN76	369	62	1463	1817	2233	3356	1608
50	DL1KDA	JO30	366	59	1388	1924	2101	2339	0
51	SM7JUQ	JO65	365	41	1902	1646	1921	2332	0
52	DL6BF	JO32	363	50	1542	1932	1814	2332	0
53	IK1PAG	JN35	361	57	1186	0	2254	2725	0
54	DL7YS	JO62	360	53	1512	1528	1826	2136	0
55	ES2RJ	KO29	358	40	1190	1861	2000	2127	0
56	OE3OKS	JN87	356	59	1441	1273	1867	2788	0
57	SM3BIU	JP73	353	32	1460	1844	2260	2242	0
58	UR5BAE	KN29	351	53	1994	1924	1866	2492	0
59	F6DKW	JN18	349	53	1519	1712	2051	2755	0
60	YU1WP	JN94	346	53	1422	1850	2236	2825	1953
61	UT5ER	KN78	345	0	1975	2014	2135	2525	0
62	PA2DWH	JO22	345	59	1230	1950	2150	2250	0
63	OK2BFH	JN99	340	46	2092	1929	1699	3790	0
64	YU7VA	KN05	340	60	1316	1399	1954	2446	0
65	YU7EF	KN05	340	58	1135	987	2248	2440	2373
66	PE1OGF	JO21	338	58	1391	1602	1959	2259	1856
67	G3LQR	JO02	337	0	1776	2031	0	2406	0
68	DK1KR	JO53	336	0	1481	2103	0	2375	0
69	PA0WWM	JO22	336	52	1303	1839	1997	2255	0
70	F1FIH	JN23	334	58	1305	999	1860	2934	0
71	OK1DKS	JO70	334	56	1230	1308	0	3530	0
72	ON4KHG	JO10	332	51	1507	1592	2094	2312	0
73	F5HRY	JN18	324	55	1276	1695	2038	2758	0
74	LY2SA	KO14	322	48	1906	1846	2220	2088	0
75	OK1FFD	JO60	322	54	1388	1808	1991	2197	0
76	DB6BX	JO32	321	55	1534	1541	1921	2126	0
77	ON1IM	JO11	320	42	1420	1310	1865	2306	0
78	OK1MG	JO70	319	50	1522	1685	1549	2631	0
79	ON4KST	JO20	314	54	1435	1612	1940	2383	0
80	PA5DD	JO22	312	50	1382	1829	2098	2307	0
81	PA2TAB	JO32	312	53	1302	1239	2103	2183	0
82	OK1DFC/P	JO60	310	52	1775	2453	2289	2453	0
83	ES2XM	KO29	308	37	1389	2198	0	2222	0
84	ON4PS	JO20	307	51	1449	1878	2018	2364	0
85	SP6GWB/P	JO80	306	47	1780	1581	1875	2437	0
86	ES4EQ	KO39	302	39	1541	1840	2240	2245	0
87	OK1AXH	JO70	300	0	2142	1486	1366	1768	0
88	DF1IAZ	JN49	299	54	1038	1177	2069	1996	0
89	HB9DFG	JN37	298	53	1367	1323	1942	2302	712
90	DL1SUZ	JO53	293	47	1238	1661	1963	2309	0
91	SP2JXN	JO94	289	41	1650	1690	0	2634	0
92	DK2BJ	JO30	287	49	1476	1934	1593	2231	0
93	DH0GHU	JN38	284	49	1170	1170	2117	3067	0
94	ES3GZ	KO28	281	35	1495	1720	2134	2101	0
95	ES5WE	KO38	278	32	1406	1695	1934	2530	0
96	G4LOH	IO94	277	43	3130	2143	2045	2460	0
97	OM7AQ	JN98	274	50	1484	1691	2045	2483	0
98	DG1VL	JO61	267	46	1373	1223	1817	2325	0
99	OK1IBL	JO60	266	50	1438	1462	2003	3398	0
100	DH8GV	JO33	263	42	1565	1018	1102	2450	0
101	GM4JJJ	IO86	261	44	3253	1804	1868	2858	0
102	PA0ZM	JO32	259	45	1156	1771	2061	2246	0
103	RW3PF	KO93	256	30	1031	2153	2134	2268	0
104	LZ1AG	KN22	256	42	915	0	1779	2503	0
105	ES1RF	KO29	252	30	1184	1820	1978	2084	0
106	DK1VI	JN49	251	50	1270	1215	1604	3165	0
107	DH9NBB	JN49	249	54	1363	1228	1846	2039	0
108	YU1VG	JN94	248	47	1407	826	1727	2294	1982
109	DC9YC	JO31	247	44	1548	1724	1849	1822	0
110	OK1VMS	JO70	246	51	1692	1423	0	2587	0
111	F5PAU	IN88	246	46	1630	0	0	2425	0
112	HA8MV	KN06	245	38	1062	1736	2026	2162	0
113	OK1PG	JO70	243	50	1773	1243	0	3488	0
114	PA0BAT	JO31	239	48	1311	1714	2498	2366	0
115	OK2QI	JO80	238	50	1475	1686	1380	2050	0
116	DG3XA	JO43	237	42	1371	965	1832	2333	0
117	OK1KEI	JO70	236	36	1861	1259	1482	2067	0
118	F5DE	JN05	232	42	1891	1671	1892	2399	0
119	G3XDY	JO02	232	38	1355	2049	1835	2124	0
120	F5HGO	JN05	231	44	1782	0	2024	2486	1540
121	OK1VBN	JN78	225	45	1578	1682	1915	2209	0
122	ES5EJ	KO38	218	30	1422	1804	0	2070	0
123	OK1DDO	JO60	218	46	1329	1500	1720	2418	0
124	ES0IW	KO19	216	32	1545	1687	0	1861	0
125	DL2DR	JO31	212	39	1158	980	0	2057	0
126	OK1DIG	JO60	208	42	1420	1684	1840	2218	0
127	ES0NW	KO19	207	30	1060	1720	1797	1965	0
128	DL0UL/P	JN48	207	37	1026	0	1839	2019	0
129	OK1IAS	JO60	205	41	1392	1957	0	2466	0
130	OK1SC	JO70	204	0	1490	1673	0	1729	0
131	YU7ON	KN04	203	37	914	0	1897	2273	1485
132	OE5VRL/5	JN78	201	0	1665	1634	1990	2157	0
133	OH0NC	JP90	201	26	1544	1982	1647	2493	0
134	PA0JUS	JO22	200	38	1409	1050	0	2167	0

135	ES8RO	KO28	199	27	1802	1800	0	1780	0	
136	UA4AQL	LO20	199	23	1124	1994	2158	2195	0	
137	IT9VDQ	JM68	197	45	1676	0	2169	2491	0	
138	ES0SM	KO08	196	31	1578	1767	1991	0	0	
139	DK2DB	JN48	195	0	1239	1136	0	3106	0	
140	F1HDF/P	JN18	194	0	1452	0	0	2425	0	
141	ES1OX	KO29	194	18	1016	1449	1158	2121	0	
142	DL3YEE	JO42	191	40	1574	1450	1480	2106	0	
143	ES7RDR	KO27	189	31	1200	1750	1000	2101	0	
144	ES0HD	KO18	187	23	1550	1918	0	0	0	
145	HB9MIO/P	JN37	185	0	1316	975	0	2183	0	
146	DG3HS	JO53	184	35	1152	1091	0	2306	0	
147	ES5RY	KO38	183	32	1198	1695	2002	1409	0	
148	YU7KB	JN94	183	42	853	0	1874	2256	1532	
149	PA3AOH	JO31	182	38	1457	1341	0	2345	0	
150	YZ7MON	JN95	180	37	1004	0	1837	2279	1536	
151	DK5WO	JO30	177	35	1474	1219	0	1993	0	
152	SP2IQW	JO94	174	28	1611	1611	997	1877	0	
153	OK1KOK	JO80	173	27	1486	1062	0	1920	0	
154	HB9AOF	JN36	173	45	1201	670	1675	2166	0	
155	OK1VEI	JO70	170	32	1677	1197	1398	0	0	
156	ON4ZN	JO21	169	35	1428	980	0	2149	0	
157	ES1AO	KO29	169	25	1162	1176	1792	2136	0	
158	OK1KRY	JN69	166	40	1437	977	0	1830	0	
159	SP9FG	JN99	163	31	1647	1283	0	1798	0	
160	ES1JL	KO29	163	17	1379	1596	0	0	0	
161	OK1CDJ	JO70	159	42	1580	0	2066	2655	0	
162	*ES1AW	KO29	158	25	1230	1680	0	1924	0	
163	OK1CA	JO70	156	0	1540	1065	950	2096	0	
164	DJ6XV	JO31	156	34	1337	992	0	2007	0	
165	ES0BI	KO18	154	21	1439	1823	1528	0	0	
166	ES2QN	KO29	152	22	1175	1460	0	2116	0	
167	OZ7IS	JO65	151	32	1128	1294	1901	1845	0	
168	ES6PZ	KO38	151	20	1101	0	0	2532	0	
169	CT1FAK	IN50	149	25	2129	0	2250	2488	968	
170	DK0PX	JN48	147	0	1161	0	1815	1649	0	
171	ES1CW	KO29	142	21	1192	1570	0	2143	0	
172	DL0GTH	JO50	139	23	1124	0	0	0	0	
173	OK2UFB	JN99	136	27	1526	0	0	1983	0	
174	RW4AK (sk)	LO20	136	0	1126	1480	2158	2301	0	
175	ES5QA	KO38	135	35	1665	1788	1555	2236	0	
176	DL3IAS	JN49	130	36	988	1123	1830	1866	0	
177	OK1DTG/P	JO70	127	27	1351	1352	0	0	0	
178	YU7AZX	KN04	126	30	914	0	1389	2173	1484	
179	OZ1FF	JO45	125	35	974	1239	1520	2357	0	
180	F1PYW	JN38	124	30	936	888	1522	1958	0	
181	HB9S/P	JN36	123	24	1135	0	0	0	0	
182	S53J	JN75	123	27	1123	1036	983	1984	0	
183	OK1VDA	JO70	123	30	938	641	0	2220	0	
184	DJ8ES	JO43	122	20	1306	0	1445	2116	0	
185	F1PYR	JN19	120	0	0	0	0	0	0	
186	F6FGO	JN25	118	31	1390	0	0	2218	0	
187	OL5Z	JN89	118	26	1061	1621	0	0	0	
188	OK2KJU	JN89	115	32	1318	1766	0	1494	0	
189	DL0SP/P	JO62	115	23	1315	785	0	1608	0	
190	OK2KKW	JO60	115	24	1040	0	0	0	0	
191	OE1SOW	JN88	112	32	0	1286	0	2250	0	
192	DL5NEN	JN59	106	30	748	0	1767	1640	0	
193	OK1TEH	JO70	103	30	1191	1474	0	2058	0	
194	I3ZVN	JN55	98	32	1212	0	0	2237	0	
195	OK2PHM	JN89	97	20	829	1265	0	2262	0	
196	YU1EBC	JN94	94	28	907	0	1427	2179	1766	
197	LA/DL7YS/P	JO37	93	22	1207	0	1673	0	0	
198	DK0FLT	JN59	93	18	975	0	0	0	0	
199	CT1DIN	IN60	91	18	1218	0	0	2338	0	
200	OK1UDX	JN79	91	19	537	0	0	0	2197	
201	CT1DDW	IN60	90	17	2100	0	0	2500	0	
202	DK2MN	JO32	87	19	858	0	0	0	0	
203	CT1CAD	IM67	85	18	1304	0	0	2249	0	
204	YU1AAV	KN04	71	21	828	0	0	2031	0	
205	OK1HRR	JO70	66	16	762	0	0	1890	0	
206	G7LRQ	IO91	60	19	1088	0	0	0	0	
207	OK2DTF	JN79	60	16	805	0	1607	1533	0	
208	SP6MLK/P	JO80	58	16	853	756	0	1446	0	
209	DG7SFL	JN49	57	11	759	0	0	1750	0	
210	OK1VVW	JO70	55	15	913	0	1339	1096	0	
211	F5OIH/P	JN08	49	8	666	0	0	0	0	
212	IW3HTU	JN55	43	13	1180	0	0	0	0	
213	F1JKY	JN25	41	10	798	0	400	991	0	
214	IZ0BXT	JN63	37	12	804	0	0	1946	0	

432 MHz Toplist (without EME)

NR	Call	WW Loc	Wkd Sqr	DXCC	Tropo	Aurora		Es MS	(ODX)
	Iono								
1	DK3WG	JO72	214	43	1547	1494	0	0	0
2	PA0RDY	JO22	207	38	1979	1807	1376	0	0
3	PA0EZ	JO22	207	35	1787	1445	0	0	0
4	G3LQR	JO02	206	0	2031	1613	0	0	0
5	PA0WWM	JO22	196	37	1547	1836	0	0	0
6	HA1YA	JN87	190	43	1438	1221	0	0	0
7	DL8QS	JO43	189	35	1513	1513	0	0	0
8	OZ7IS	JO65	188	32	1499	1048	1294	0	0
9	OK1AXH	JO70	181	0	1861	1239	0	0	0
10	G3XDY	JO02	176	28	1589	1619	0	0	0
11	DB6BX	JO32	174	34	1550	662	0	0	0
12	DL7QY	JN59	173	0	1640	1848	1292	0	0
13	PA3DZL	JO21	172	32	1405	1851	1864	0	0
14	DJ6MB	JO30	171	0	1278	1733	0	0	0
15	LY2WR	KO24	169	26	1995	1593	1935	0	0
16	F6DKW	JN18	165	23	1519	0	0	0	0
17	DK6AS	JO52	164	0	1569	775	0	0	0
18	DK1KO	JO53	163	0	1643	694	0	0	0
19	SP6MLK/P	JO80	162	31	1780	0	0	0	0
20	DF8LC	JO53	161	0	1615	1361	0	0	0
21	DB6NT	JO50	158	31	1823	0	0	0	0
22	PA4FP	JO33	156	32	2114	1010	0	0	0
23	SM7ECM	JO65	156	26	1389	1073	0	0	0
24	SP6GWB/P	JO80	155	30	1780	759	0	0	0
25	DK1KR	JO53	154	0	1400	1827	0	0	0
26	OK2BFH	JN99	153	31	1914	0	0	0	0
27	OZ2OE	JO45	152	27	2216	1020	0	0	0
28	SM6ESG	JO67	152	26	1436	712	0	0	0
29	YL3AG	KO26	150	20	1571	1041	0	0	0
30	DH3NAN	JO50	147	0	1437	1008	0	0	0
31	OK1CA	JO70	146	0	1670	0	0	0	0
32	DL3YEE	JO42	144	29	1574	1728	0	0	0
33	PA3AOH	JO31	143	27	1530	573	0	0	0
34	ES2WX	KO29	140	17	1232	1415	0	0	0
35	OK1KEI	JO70	138	27	1682	1185	0	0	0
36	SP9FG	JN99	136	26	1660	0	0	0	0
37	OH0NC	KP00	136	20	1598	920	0	0	0
38	OK1VEI	JO70	136	21	1532	811	0	0	0
39	PA2CHR	JO22	136	35	1423	695	1099	0	0
40	SP9EWU	JO90	135	30	1589	1558	1664	0	0
41	OK1KIR/P	JO60	133	28	1773	0	0	0	0
42	PA0JUS	JO22	133	26	1340	0	0	0	0
43	OK1VMS	JO70	131	32	1434	972	0	0	0
44	OH5LK	KP30	131	0	1386	1196	0	0	0
45	PA0BAT	JO31	125	23	1396	413	0	0	0
46	PA0ZM	JO32	122	25	1358	1693	0	0	0
47	OE5VRL/5	JN78	121	0	1524	1031	0	0	0
48	ON4PS	JO20	121	22	1425	721	0	0	0
49	OK2KKW	JO60	120	26	1186	0	0	0	0
50	F5PAU	IN88	119	24	1630	0	0	0	0
51	DK0OG	JN68	115	27	1459	745	0	0	0

52	ON4ZN	JO21	115	21	1173	0	0	0	0
53	OK2QI	JO80	114	25	1410	0	0	0	0
54	DL3AMA	JO51	114	22	1015	1219	0	0	0
55	DL0UL/P	JN48	113	22	1238	0	0	0	0
56	DL6BCT	JO43	113	0	1152	0	0	0	0
57	DJ6XV	JO31	113	19	1128	976	0	0	0
58	SP6GZZ	JO81	112	0	1549	870	0	0	0
59	PE1OGF	JO21	112	18	1288	0	0	0	0
60	DH9NBB	JN49	109	24	1363	0	0	0	0
61	DL2DR	JO31	109	21	1158	0	0	0	0
62	SM6CMU	JO57	108	0	1641	670	0	0	0
63	F1HDF/P	JN18	108	0	1204	0	0	0	0
64	PA5DD	JO22	106	19	1462	1025	1808	0	0
65	DL0GTH	JO50	106	20	1113	0	0	0	0
66	DL4KG	JO31	105	21	1273	0	0	0	0
67	OK1DFC/P	JO60	104	22	1179	0	0	0	0
68	DK5WO	JO30	104	20	1150	0	0	0	0
69	DC4XH	JO43	104	20	1133	808	0	0	0
70	ES6RQ	KO37	103	19	1452	1148	0	0	0
71	OK1AIY/P	JO70	102	0	1490	0	0	0	0
72	ON1IM	JO11	102	20	1410	0	0	0	0
73	DL1KDA	JO30	102	22	1286	999	1334	0	0
74	F5HRY	JN18	102	18	1222	583	0	0	0
75	OK1DKS/P	JO60	102	23	1118	0	0	0	0
76	DG3XA	JO43	100	16	1131	0	0	0	0
77	ON4GG	JO20	98	23	1407	0	0	0	0
78	LY2SA	KO14	97	20	1669	946	0	0	0
79	ON4ANT	JO20	96	23	1407	0	0	0	0
80	PE1HWO	JO21	94	19	1306	369	0	0	0
81	DH8GV	JO33	94	19	1259	0	0	0	0
82	F5HGO	JN05	94	21	1237	0	0	0	0
83	DL6BF	JO32	94	15	882	894	0	0	0
84	OK1KRY	JN69	93	23	1350	0	0	0	0
85	DJ8ES	JO43	93	13	1087	0	0	0	0
86	DK2DB	JN48	92	0	1331	0	0	0	0
87	ES2XM	KO29	92	11	1271	1259	0	0	0
88	S50C	JN76	91	18	977	0	0	0	0
89	DL1SUZ	JO53	89	18	1218	707	0	0	0
90	OK1KPA	JN79	89	0	1176	0	0	0	0
91	DK0PX	JN48	89	0	1168	0	0	0	0
92	OK1OKL	JO60	88	0	1199	0	0	0	0
93	ES2RJ	KO29	87	17	1261	1123	0	0	0
94	DK1VI	JN49	87	21	1125	936	0	0	0
95	IZ5EME	JN52	86	20	1458	1670	374		
96	DG1VL	JO61	86	16	1245	0	0	0	0
97	HB9MIO/P	JN37	84	0	1096	0	0	0	0
98	HB9AOF	JN36	84	15	926	0	0	0	0
99	ES0HD	KO18	83	19	1565	614	0	0	0
100	OK1KOK	JO80	81	22	1486	0	0	0	0
101	OK1MG	JO70	81	21	1329	691	0	0	0
102	DL7YS	JO62	81	18	1100	0	0	0	0
103	OZ1FF	JO45	81	18	1092	633	0	0	0
104	DF1EQ	JO31	80	0	1249	0	0	0	0
105	ES4EQ	KO39	80	16	1160	907	0	0	0
106	ES0IW	KO19	79	17	1342	906	0	0	0
107	DL5NEN/P	JN59	76	16	964	0	0	0	0
108	DH3YAK	JO31	75	13	1165	0	0	0	0
109	F1PYR	JN19	75	0	0	0	0	0	0
110	OK1FFD	JO60	74	23	1339	0	0	0	0
111	DG6GP	JN48	74	13	1024	0	0	0	0
112	DL9MCC	JN58	73	20	1338	0	0	0	0
113	OK1KRQ/P	JN69	73	16	1091	0	0	0	0
114	OK1SC	JO70	71	0	1310	758	0	0	0
115	OK2PWY	JN89	70	17	1135	0	0	0	0
116	OL5Z	JN89	70	15	761	0	0	0	0
117	DL0SP/P	JO62	69	13	1018	0	0	0	0
118	OK1DTG/P	JO70	68	14	1436	0	0	0	0
119	DK2MN	JO32	67	13	715	0	0	0	0
120	DD0VF	JO60	66	19	1106	0	0	0	0
121	SM7JUQ	JO65	65	15	1232	0	0	0	0
122	UR5BAE	KN29	64	18	1517	0	0	0	0
123	OM7AQ	JN98	64	13	922	0	0	0	0
124	HB9CRQ	JN47	63	16	1010	0	0	0	0
125	ES5WE	KO38	62	11	1406	0	0	0	0
126	DG7SFL	JN49	61	10	947	0	0	0	0
127	DL3IAS	JN49	61	12	886	0	0	0	0
128	F6FGO	JN25	60	11	1016	0	0	0	0
129	ES0NW	KO29	59	17	1213	675	0	0	0
130	ES0SM	KO08	59	20	1202	925	0	0	0
131	DK2BJ	JO30	59	16	1053	0	0	0	0
132	OK2UFB	JN99	56	20	1232	0	0	0	0
133	DH0GHU	JN38	56	12	852	0	0	0	0
134	OK1VBN	JN78	56	14	723	753	0	0	0
135	YO2IS	KN05	55	15	1020	1741	1030	0	0
136	LA/DB1DI/P	JO37	55	12	1013	0	0	0	0
137	OK1PG	JO70	54	18	1773	0	0	0	0
138	ES3GZ	KO28	52	10	1035	0	0	0	0
139	RB5EF	KN78	50	0	1805	0	0	0	0
140	SP2JXN	JO94	49	15	1149	0	0	0	0
141	OK1TEH	JO70	49	15	912	0	0	0	0
142	S53J	JN75	49	9	688	0	0	0	0
143	ES1JL	KO29	48	11	1324	0	0	0	0
144	F5DE	JN05	48	7	740	0	0	0	0
145	DK0FLT	JN49	48	14	695	0	0	0	0
146	ES1RF	KO29	47	10	875	682	0	0	0
147	HA8MV	KN06	47	15	713	1500	0	0	0
148	F5OIH/P	JN08	46	5	651	0	0	0	0
149	DL5NEN	JN59	46	13	630	0	0	0	0
150	SM3BIU	JP73	45	3	917	763	0	0	0
151	GM4JJJ	IO86	44	15	1457	297	0	0	0
152	I3ZVN	JN55	43	13	1197	0	0	0	0
153	OE1PLW	JN88	42	12	1114	0	0	0	0
154	OK2KJU	JN89	42	13	731	0	0	0	0
155	OK1KT	JO70	40	7	1289	757	0	0	0
156	OK1HRR	JO70	40	13	765	0	0	0	0
157	OK2PHM	JN89	39	9	746	0	0	0	0
158	G7LRQ	IO91	37	15	1208	0	0	0	0
159	OK2VMU/P	JN99	36	11	880	0	0	0	0
160	ES1AO	KO29	35	12	1131	0	0	0	0
161	DF0RU	JO62	35	9	682	0	0	0	0
162	ES0ZA	KO19	33	8	1077	0	0	0	0
163	ES1DF	KO29	32	7	511	0	0	0	0
164	ES1CW	KO19	32	7	500	688	0	0	0
165	F1FIH	JN23	30	7	796	0	0	0	0
166	ES0IC	KO18	30	7	673	0	0	0	0
167	RW3PF	KO93	30	5	614	1697	0	0	0
168	OK1DIG	JO60	28	28	640	0	0	0	0
169	ES5MG	KO38	28	9	626	0	0	0	0
170	ER5MG	KO38	28	9	626	0	0	0	0
171	ES0B I	KO18	28	7	378	0	0	0	0
172	ES1CR	KO29	27	12	930	0	0	0	0
173	ES5QA	KO38	26	8	803	0	0	0	0
174	ES0QY	KO18	25	8	650	0	0	0	0
175	ES1AW	KO29	24	7	512	0	0	0	0
176	CT1DDW	IN60	23	3	2100	0	0	0	0
177	ES1II	KO29	22	4	506	0	0	0	0
178	IW3HTU	JN55	21	6	1110	0	0	0	0
179	CT1FAK	IN50	20	4	1588	0	0	0	0
180	UA4AQL	LO20	18	4	1124	0	0	0	0
181	CT1DIN	IN60	7	2	334	0	0	0	0
182	RW4AK (sk)	LO20	6	0	679	0	0	0	0

1296 MHz Toplist (without EME)

NR	Call	WW	Wkd	DXCC	ODX
1	PA0EZ	JO22	140	24	1298
2	PA0WWM	JO22	130	24	1298
3	PA0RDY	JO22	124	27	1286
4	G3XDY	JO02	123	23	1341
5	F6DKW	JN18	121	21	1273
6	OK1AXH	JO70	118	0	1444
7	G3LQR	JO02	118	0	1274
8	HB9AMH/P	JN37	114	0	1351
9	DB6NT	JO50	109	22	1243
10	SM7ECM	JO65	104	17	1326
11	SP6GWB/P	JO80	101	24	1580
12	PA0BAT	JO31	100	22	1368
13	SM6ESG	JO67	99	19	1445
14	DB6BX	JO32	99	25	1125
15	SP6MLK/P	JO80	92	23	1580
16	OE5VRL/5	JN78	92	18	1524
17	OZ2OE	JO45	92	17	1425
18	OK1KIR/P	JO60	92	22	1208
19	OK2BFH	JN99	91	20	1713
20	F5PAU	IN88	89	19	1630
21	G6DER	IO93	89	20	1306
22	PA3DZL	JO21	89	19	1000
23	PA3AOH	JO31	86	19	1306
24	DL7QY	JN59	86	0	1261
25	OK1DFC/P	JO60	86	17	1177
26	DK1KR	JO53	86	0	1097
27	PA4FP	JO33	86	17	957
28	DL3YEE	JO42	85	16	1136
29	OK1VEI	JO70	82	14	1313
30	OZ7IS	JO65	82	18	1205
31	DK0OG	JN68	82	0	1160
32	DK6AS	JO52	81	0	1421
33	OK1KEI	JO70	81	16	1316
34	F5HRY	JN18	80	11	1064
35	F1HDF/P	JN18	80	9	886
36	HB9AOF	JN36	77	15	975
37	DC9YC	JO31	74	16	1046
38	DL0UL/P	JN48	74	17	962
39	OK1AIY/P	JO70	73	0	1490
40	PA5DD	JO22	73	17	1302
41	OK1VMS	JO70	73	19	1302
42	PA0JUS	JO22	72	16	1265
43	HB9MIO/P	JN37	72	0	1000
44	DH3NAN	JO50	71	0	1143
45	DH9NBB	JN49	71	13	1016
46	OK1CA	JO70	70	0	1421
47	PA2CHR	JO22	69	16	1329
48	DK5WO	JO30	69	16	1137
49	PA0ZM	JO32	68	16	1329
50	DL2DR	JO31	68	13	1158
51	DC4XH	JO43	67	14	1090
52	DL0GTH	JO50	67	16	1073
53	DF1EQ	JO31	67	0	908
54	OK2KKW	JO60	66	18	1128
55	OK1OKL	JO60	63	0	1177
56	ON4PS	JO20	63	14	1098
57	SP9FG	JN99	62	17	1492
58	OK1DKS/P	JO60	62	13	1207
59	OK1FFD	JO60	60	14	1058
60	DJ8ES	JO43	60	10	1025
61	ON4GG	JO20	60	10	982
62	OH0NC	KP00	57	13	1592
63	ON4ANT	JO20	57	9	914
64	DJ6XV	JO31	56	11	946
65	DC8UG	JO30	56	10	900
66	DC0DA	JO31	55	1	1034
67	LY2WR	KO24	53	14	1026
68	F1PYR	JN19	53		
69	PE1HWO	JO21	52	14	1315
70	DL3NQ	JN49	51	9	920
71	DK0FLT	JN59	51	12	684
72	DL1KDA	JO30	50	12	940
73	DJ1KP	JO40	50	0	698
74	OZ1FF	JO45	49	13	980
75	DL1SUZ	JO53	49	14	968
76	SP9EWU	JO90	48	12	946
77	DL3IAS	JN49	48	9	769
78	DK2MN	JO32	48	10	692
79	DK0PX	JN48	47	0	942
80	F6CGB	JN18	45	0	700
81	S50C	JN76	43	12	626
82	IZ5EME	JN52	42	10	1036
83	DJ6MB	JO30	42	0	876
84	YL3AG	KO26	42	11	867
85	HA1YA	JN87	42	13	862
86	ES2RJ	KO29	40	9	765
87	OK1KRQ/P	JN69	39	11	962
88	DK2DB	JN48	39	0	873
89	OK1KEI/P	JN79	39	10	740
90	LA/DB1DI/P	JO37	38	9	1013
91	DK2BJ	JO30	38	10	886
92	DG1VL/P	JO61	37	7	723
93	ON4KHG	JO10	37	6	642
94	I0LVA/0	JN62	35	0	1152
95	G7LRQ	IO91	35	10	746
96	ES2WX	KO29	35	9	692
97	DG6GP	JN48	33	7	732
98	DH3YAK	JO31	33	5	715
99	ES4EQ	KO39	33	9	636
100	ES6RQ	KO37	33	9	600
101	DK1VI	JN49	30	10	717
102	ES5WE	KO38	29	7	1249
103	F5HGO	JN05	29	4	796
104	DL7YS	JO62	29	7	535
105	I3ZVN	JN55	28	9	1197
106	IW3FZQ/4	JN54	27	7	732
107	ES0SM	KO08	26	8	873
108	F6FGO	JN25	26	4	839
109	DF5JJ	JO43	25	3	433
110	OK1DTG/P	JO70	24	8	742
111	OK2QI	JO80	23	7	1275
112	F1FIH	JN23	23	6	605
113	OK1VBN	JN78	22	9	950
114	G4LDR	IO91	22	5	593
115	HA8MV	KN06	22	9	576
116	OH5LK	KP30	21	0	1349
117	OK1PG	JO70	21	9	985
118	PE1OGF	JO21	21	6	588
119	OK2BFF/P	JO80	21	8	536
120	ON1IM	JO11	20	5	650
121	OK2VMU/P	JN99	20	7	570
122	DL0SP/P	JO62	20	5	430
123	OK1KRY	JN69	19	7	865
124	OK1KPA	JN79	19	0	783
125	OK2BBF	JN89	19	8	563
126	OL5Z	JN89	18	6	694
127	F5OIH/P	JN08	17	5	517
128	IW3HTU	JN55	16	4	838
129	S53J	JN75	16	6	410
130	DL5NEN	JN59	16	16	320
131	ES1RF	KO29	15	5	506
132	DG7SFL	JN49	15	3	358
133	OK1TEH	JO70	15	4	343
134	ES1AJ	KO29	14	5	531
135	ES2XM	KO29	14	5	478
136	DF0RU	JO62	14	3	373
137	ES2WR	KO29	13	5	694
138	ES0Z	KO18	13	5	453
139	F5DE	JN05	13	2	440
140	SM7JUQ	JO65	12	7	1061
141	ES1NJ	KO29	12	4	507
142	ES1MW	KO29	11	4	507
143	ES0W	KO18	11	5	443
144	OK1SC	JO70	10	0	440
145	OM7AQ	JN98	10	5	426
146	OK2PWY	JN89	10	6	357
147	OK2KJU	JN89	10	6	347
148	OK2PHM	JN89	10	0	341
149	IT9VDQ	JN68	9	1	899
150	ES1OX	KO29	9	5	772
151	ES1DW	KO29	9	5	330
152	YO2IS	KN05	8	5	472
153	OK1HRR	JO70	8	2	292
154	DL3AMA	JO51	8	3	162
155	ES1TCA	KO29	7	2	246
156	ES2NA	KO29	6	4	349
157	OK1ZVP	JO60	6	1	263
158	ES0NW	KO19	5	2	190
159	ES1AW	KO29	3	2	269
160	OK2UFB	JN89	3	2	142
161	ES1WQ	KO29	2	2	337
162	ES2NT	KO29	2	1	149
163	ES6RAT	KO28	2	1	125
164	ES1JL	KO29	2	2	108
165	DG3XA/P	JO43	1	1	289
166	ES2QN	KO29	1	1	198

2320 MHz Toplist (without EME)

1	PA0EZ	JO22	81	15	1014
2	DB6NT	JO50	69	15	1119
3	PA0WWM	JO22	67	15	1155
4	PA0RDY	JO22	65	15	1000
5	G3LQR	JO02	58	0	1006
6	SM6ESG	JO67	53	8	1054
7	OK1KIR/P	JO60	51	10	1115
8	PA0BAT	JO31	50	13	923
9	OE5VRL/5	JN78	48	12	1291/495
10	G3XDY	JO02	47	10	1176
11	DL7QY	JN59	47	0	1018
12	G6DER	IO93	46	18	1265
13	SM7ECM	JO65	45	9	942
14	OK1AIY/P	JO70	44	0	1296
15	PA4FP	JO33	44	12	727
16	DL0GTH	JO50	42	7	1052
17	F5HRY	JN18	41	6	877
18	PA5DD	JO22	36	9	1155
19	DJ1KP	JO40	36	0	698
20	DC8UG	JO30	35	8	900
21	PA3DZL	JO21	34	11	913
22	OK1OKL	JO60	34	0	830
23	DF1EQ	JO31	34	0	678
24	DL0UL/P	JN48	33	11	961
25	OZ2OE	JO45	33	8	914
26	HB9MIO/P	JN37	32	0	744
27	DC0DA	JO31	31	1	775
28	DC9YC	JO31	30	10	858
29	DL3NQ	JN49	29	8	890
30	OZ7IS	JO65	29	9	860
31	DK0OG	JN68	29	1	675
32	DL3YEE	JO42	29	10	520
33	DH9NBB	JN49	27	7	654
34	DK0PX	JN48	26	0	853

35	DL2DR	JO31	26	0	823
36	DK2MN	JO32	25	6	635
37	I0LVA/0	JN62	25	0	612
38	OK2BFH	JN99	24	9	1026
39	F1PYR	JN19	24	0	0
40	DK2DB	JN48	22	0	873
41	OK1KEI/P	JN79	22	7	677
42	OK1DKS/P	JO60	22	4	602
43	SP6GWB/P	JO80	21	5	650
44	DL3IAS	JN49	21	6	604
45	F1HDF/P	JN18	20	3	621
46	OK1DFC/P	JO60	20	6	549
47	I3ZVN	JN55	19	7	603
48	ON4PS	JO20	19	6	574
49	DJ8ES	JO43	18	7	1025
50	HB9AMH/P	JN37	18	0	933
51	LA/DB1DI/P	JO37	17	7	825
52	DL1SUZ	JO53	17	5	644
53	S51WI	JN75	17	5	533
54	PA3AOH	JO31	16	6	785
55	HA1YA	JN87	15	5	476
56	OK1KRQ/P	JN69	15	4	350
57	DK6AS	JO52	14	0	620
58	PA0JUS	JO22	13	5	800
59	DK1KR	JO53	13	0	792
60	SP9FG	JN99	13	5	747
61	OK2BFF/P	JO80	13	6	418
62	DJ6XV	JO31	12	3	396
63	IZ5EME	JN52	10	3	552
64	G4LDR	IO91	10	2	444
65	IW3FZQ/4	JN54	10	3	403
66	OK1KEI	JO70	9	4	786
67	IW3HTU	JN55	9	2	542
68	OK2VMU/P	JN99	9	4	376
69	S50C	JN76	8	5	346
70	OK1CA	JO70	8	1	291
71	SP6MLK/P	JO80	8	3	272
72	F1FIH	JN23	8	1	239
73	F6CGB	JN18	7	0	407
74	DG6GP	JN48	7	2	388
75	OK1PG	JO70	6	4	855
76	OK1KRY	JN69	5	3	189
77	OK2QI	JO80	4	2	305
78	F5PAU	IN88	4	0	260
79	DG1VL/P	JO61	4	2	230
80	OL5Z	JN89	4	3	158
81	OM7AQ	JN98	3	3	281
82	OK1VBN	JN78	3	3	158
83	DL1KDA	JO30	3	2	98
84	G8BKE/P	IO80	1	1	114

3400 MHz Toplist (without EME)

1	DB6NT	JO50	44	7	741
2	PA0EZ	JO22	31	8	835
3	PA0WWM	JO22	25	6	850/414
4	G3LQR	JO02	23	0	924
5	PA0BAT	JO31	23	4	729
6	PA0RDY	JO22	19	3	643
7	PA5DD	JO22	18	5	867
8	DC0DA	JO31	17	1	660
9	G6DER	IO93	16	7	859
10	PA4FP	JO33	16	5	733
11	DK2MN	JO32	16	3	422
12	DL3NQ	JN49	15	5	637
13	DL7QY	JN59	15	0	565
14	G3XDY	JO02	15	3	506
15	DC8UG	JO30	13	6	724
16	DF1EQ	JO31	13	0	532
17	DL2DR	JO31	13	0	470
18	DL6NCI	JO50	13	3	413
19	HB9MIO/P	JN37	12	0	463
20	DK2DB	JN48	11	0	331
21	DK0PX	JN48	9	0	632
22	DL0UL/P	JN48	9	1	239
23	DL0GTH	JO50	7	2	466
24	OK1AIY/P	JO70	6	0	768
25	OZ2OE	JO45	5	4	772
26	DJ8ES	JO43	5	3	578
27	DJ6XV	JO31	5	3	396
28	OK1KEI/P	JN79	3	2	306
29	S51WI	JN75	3	1	98
30	DG1VL/P	JO	3	1	91
31	DK0OG	JN68	3	1	78
32	OK1DFC	JO60	2	2	59
33	G8BKE/P	IO80	1	1	114
34	SP6GWB/P	JO80	1	1	2
35	SP6MLK/P	JO80	1	2	1

5760 MHz Toplist (without EME)

1	DB6NT	JO50	49	13	1000
2	PA0EZ	JO22	44	15	1017
3	SM7ECM	JO65	41	7	960/647
4	F5HRY	JN18	38	5	675
5	HB9AMH/P	JN37	37	9	929
6	OE5VRL/5	JN78	34	10	901/683
7	HB9MIO/P	JN37	34	0	694
8	F1PYR/P	JN19	33	0	0
9	PA0BAT	JO31	32	11	729
10	SM6ESG	JO67	30	6	951
11	F1HDF/P	JN18	30	4	638
12	PA0WWM	JO22	26	9	863/589
13	DL6NCI	JO50	25	9	600
14	G3LQR	JO02	23	0	949
15	PA5DD	JO22	22	7	867/415
16	F1GHB/P	IN88	22	4	779
17	I3ZVN	JN55	19	7	573
18	OK1KIR/P	JO60	17	3	393
19	SP6GWB/P	JO80	16	5	1024
20	OK1UWA/P	JO70	16	1	998
21	S51JN/P	JN65	16	5	557
22	OK1KEI/P	JN79	16	6	393
23	S51WI	JN75	15	4	586
24	G6DER	IO93	14	8	947
25	OK1AIY/P	JO70	14	0	736
26	DL0UL/P	JN48	14	5	660
27	I0LVA/0	JN62	14	0	557
28	DK2MN	JO32	14	3	422
29	G4LDR	IO91	13	4	444
30	PA4FP	JO33	12	4	733
31	DC0DA	JO31	12	1	660
32	DL3NQ	JN49	12	4	318
33	OK2BFH	JN99	11	5	756
34	DC8UG	JO30	11	5	724
35	OZ7IS	JO65	11	4	593
36	DK2DB	JN48	11	0	315
37	DL7QY	JN59	10	0	565
38	DG1VL/P	JO61	10	4	525
39	DK0OG	JN68	10	2	375
40	OK1OKL	JO60	9	1	611
41	DK0PX	JN48	9	0	409
42	IW3FZQ/4	JN54	9	4	291
43	DL2DR	JO31	9	0	201
44	IW3HTU	JN55	8	3	542
45	LA/DB1DI/P	JO37	7	5	746
46	DL0GTH	JO50	7	2	674
47	HA1YA	JN87	6	5	461
48	SP6MLK/P	JO80	6	4	339
49	OK1DKS/P	JO60	6	1	318
50	DC8EC/P	JN57	6	1	278
51	OZ2OE	JO45	5	5	679
52	DJ8ES	JO43	5	5	578
53	DF1EQ	JO31	5	0	461
54	F6CGB	JN18	5	0	407
55	DJ6XV	JO31	5	2	176
56	OK2VMU/P	JN99	4	2	376
57	OK1KRY	JN69	3	2	175
58	S50C	JN76	3	1	126
59	F6CGB/P	JN24	2	0	375
60	G8BKE/P	IO80	2	1	242
61	OK2QI	JO80	2	1	108
62	ES2WX	KO29	2	2	89
63	OK1KRQ/P	JN69	1	1	96
64	OK1SC	JO70	1	1	10

10368 MHz Toplist (without EME)

Nr	Call	Loc	Sqr	Dxcc	ODX Tropo/RS
1	F6DKW	JN18	76	11	1215
2	PA0EZ	JO22	75	14	1017
3	F5HRY	JN18	65	9	877
4	SM7ECM	JO65	59	8	1110/701
5	PA0WWM	JO22	59	13	850/689
6	OK1JKT/P	JO60	58	14	655/845
7	OE5VRL/5	JN78	56	14	1135/786
8	DB6NT	JO50	56	17	1000
9	PA0BAT	JO31	56	13	785
10	G3WDG	IO92	55	0	1135
11	DK1KR	JO53	55	11	868
12	F1HDF/P	JN18	55	8	867
3	G4KGC	IO92	53	0	1135
14	G3LQR	JO02	52	0	1006
15	HB9AMH/P	JN37	51	0	939
16	DM2AFN	JO61	49	13	661
17	DL4EAU/P	JO51	48	9	826
18	DL3YEE	JO42	48	12	625/700
19	DJ1KP	JO40	46	0	656
20	HB9MIN/P	JN37	45	0	939
21	PA5DD	JO22	45	11	867
22	I6CXB/6	JN63	44	0	751
23	OK1DIG	JO60	44	12	551/689
24	DL3NQ	JN49	42	9	712
25	DL6NCI	JO50	42	11	567
26	HB9MIO/P	JN37	40	0	744
27	OK1VAM	JN79	40	12	304
28	G4BRK	IO91	39	0	1115
29	I6XCK/6	JN63	39	0	702
30	DK0FLT	JN59	39	10	683
31	DC8EC	JN57	39	12	661
32	OK1VAM/P	JO60	39	11	640
33	SM6ESG	JO67	38	6	1275
34	DL0UL/P	JN48	38	8	658
35	S51JN/P	JN65	38	12	637
36	DK0OG	JN68	38	7	524
37	I0LVA/0	JN62	37	8	850
38	SP6GWB/P	JO80	37	10	787
39	LX1DU	JN29	37	0	700
40	DK8ZP	JO40	37	0	586
41	DG1VL/P	JO61	36	5	658
42	DH9NBB	JN49	36	9	654
43	G3GNR	IO70	34	0	1275
44	HB9RG	JN47	34	0	761
45	OK1AIY/P	JO70	34	0	736

46	OK2BFH	JN99	33	7	769/669	
47	G4LDR	IO91	32	9	1118	
48	DL6NAQ/P	JO40	32	8	656	
49	DK2MN	JO32	32	8	633	
50	DC9YC	JO31	32	9	599	
51	G4DDK	JO02	31	0	901	
52	OK1KEI/P	JN79	31	8	636	
53	DL1BKK	JO43	30	0	842	
54	OK1DFC/P	JO60	30	7	668	
55	DL0GTH	JO50	30	7	240	
56	EA6ADW/P	JM19	29	7	1090	
57	IW6AEG/6	JN63	29	0	751	
58	OZ1IPU	JO57	28	7	941	
59	OK1KIR/P	JO60	28	6	658	
60	DL3IAS	JN49	28	9	584	
61	OK1OKL	JO60	27	0	795	
62	F1GHB/P	IN88	27	5	669	
63	S50C	JN76	27	9	505	
64	PA4FP	JO33	25	8	865	
65	DK0PX	JN48	25	0	567	
66	S51WI	JN75	24	6	586/343	
67	DK4GD/P	JN48	24	0	566	
68	ON4KHG	JO10	24	6	565/496	
69	PA3AOH	JO31	24	7	531	
70	OZ2OE	JO45	23	6	789	
71	ON7WR	JO20	23	9	756	
72	SP6MLK/P	JO80	23	9	747	
73	I3ZVN	JN55	23	8	573	
74	DC0DA	JO31	22	1	816	
75	DL2DR	JO31	22	4	603	
76	G3XDY	JO02	21	6	595	
77	DJ5VW	JO31	21	5	474	
78	DC8UG	JO30	20	6	753	
79	DB1BX	JO32	20	7	705	
80	DL4VCG	JN39	20	0	533	
81	DF9QX	JO42	19	0	504	
82	DK2DB	JN48	19	0	432	
83	DF5JJ	JO43	19	5	297/555	
84	LA/DB1DI/P	JO37	18	6	825	
85	DL5NEN/P	JN49	18	6	466	
86	HA1YA	JN87	16	6	564	
87	OK2PWY	JO80	16	5	558/594	
88	IW3FZQ/4	JN54	16	5	557	
89	ON7YK	JO20	16	0	494	
90	F5PAU	IN88	16	2	430	
91	OK1KRQ/P	JN69	16	3	325	
92	HB9AMH	JN37	15	0	567	
93	DL7QY	JN59	15	0	492	
94	OK1UWA/P	JO70	15	0	434	
95	IW5ADB	JN53	14	0	1053	
96	G4PMK	IO93	14	0	958	
97	OZ1FF	JO45	14	7	740	
98	I4XCC	JN63	13	0	496	
99	OZ1DOQ	JO65	13	5	472	
100	DF1IAZ	JN49	12	12	515	
101	GW4LXO	IO81	12	0	309	
102	G4KNZ	IO91	12	0	247	
103	OK1DKS/P	JO60	11	2	616	
104	DJ6XV	JO31	10	3	285	
105	F6CGB	JN18	9	0	677	
106	DJ8ES	JO43	9	4	593	
107	G4LRT	IO92	8	0	824	
108	IW3HTU	JN55	8	2	542	
109	IW3QCV	JN65	8	2	532	
110	F5HRY/P	JN08	8	2	491	
111	DL1KDA	JO30	8	4	477	
112	F6CGB/P	JN12	7	0	823	
113	DF1EQ	JO31	7	0	283	
114	DF1EQ/P	JO31	7	0	283	
115	ES0SM	KO08	5	2	384	
116	DG0CAL	JO52	5	0	255	
117	LA8AK	JO38	5	0	212	
118	OK2QI	JO80	4	1	303	
119	OH0NC	KP00	4	12	269	
120	G8BKE/P	IO80	4	1	242	
121	F5OIH/P	JN08	4	1	149	
122	OK2VMU/P	JN99	3	2	376	
123	PA0JUS	JO22	3	2	245	
124	SP9FG	JN99	3	3	204	
125	DH3NAN	JO50	3	0	134	
126	DG5NEX	JN49	1	0	173	
127	OK1KRY	JN69	1	1	78	
128	GM0ICF	IO75	1	1	53	
129	DL0SP/P	JO62	1	1	28	
130	SM4SJY	JP70	1	1	160	

24 GHz Toplist (without EME)

1	DB6NT	JO50	11	4	301	
2	OE5VRL/5	JN78	11	3	289/289	
3	DC8EC/P	JN57	10	2	301	
4	HB9AMH/P	JN37	10	0	286	
5	HB9MIO/P	JN37	10	0	172	
6	PA0EZ	JO22	9	3	391	
7	IW3EHQ/P	JN66	8	1	461	
8	I0LVA/0	JN62	8	3	444	
9	DJ1KP	JO40	8	0	273	
10	PA0BAT	JO31	8	3	195	
11	DC0DA/P	JO41	8	1	131	
12	OK1AIY/P	JO70	7	0	281	
13	SM6ESG	JO67	7	3	242	
14	EA6/DF5JJ	JM19	7	2	226	
15	DK0OG	JN68	7	2	193	
16	S51JN/P	JN65	6	3	293	
17	DL3NQ	JN49	6	3	287	
18	DL6NCI	JO50	6	3	280	
19	IW3FZQ/4	JN54	6	3	250	
20	I3ZVN	JN55	6	2	210	
21	G3LQR	JO02	5	0	261	
22	OK1KIR/P	JO60	5	2	227	
23	OK1OKL	JO60	5	0	185	
24	DL3YEE/P	JO42	5	1	151	
25	DK2MN	JO32	5	2	132	
26	F1PYR/P	JN19	5	0	0	
27	OK1UWA/P	JO70	4	0	188	
28	OK1DFC/P	JO60	4	2	185	
29	DK8ZP	JO40	4	0	178	
30	DK0PX	JN48	4	0	168	
31	F1GHB/P	IN88	4	0	158	
32	G3GNR	IP70	4	0	154	
33	PA5DD	JO22	4	1	121	
34	PA3AOH	JO31	4	2	121	
35	DL2DR	JO31	4	1	98	
36	F5HRY	JN18	4	1	96	
37	F1HDF/P	JN18	3	1	230	
38	OK1KEI/P	JN79	3	2	189	
39	G4KNZ/P	JO02	3	0	173	
40	SM7ECM	JO65	3	1	168/168	
41	IW3HTU	JN55	3	1	160	
42	DG1VL/P	JO61	3	2	113	
43	DL0GTH	JO50	3	1	108	
44	GW8BKE/P	IO71	2	1	170	
45	DF1EQ	JO31	2	0	133	
46	DC9YC	JO31	2	2	87	
47	OZ2OE	JO45	2	1	52	
48	DK2DB	JN48	2	0	48	
49	SP9FG	JN99	2	1	33	
50	PA0WWM	JO22	2	1	32	
51	DF5JJ	JO43	2	1	55	
52	G8BKE/P	IO80	1	1	100	
53	F5OIH/P	JN08	1	1	90	
54	CT1FP	IN50	1	1	82	
55	CT1DMK	IN50	1	1	82	
56	DJ6XV	JO31	1	1	75	
57	F6CGB/P	JN37	1	0	74	
58	DJ5VW	JO31	1	1	61	
59	OK1OGS/P	JN69	1	1	60	
60	OK1JKT	JO60	1	1	18	
61	DL7QY	JN59	1	0	13	
62	SP6GWB/P	JO80	1	1	2	
63	SP6MLK/P	JO80	1	1	1	

47 GHz Toplist

1	DF1EQ/P	JO30	10	1	2	
2	HB9MIO/P	JN37	8	1	166	
3	DC0DA/P	JO41	7	1	131	
4	IW3FZQ/4	JN54	6	1	188	
5	I3ZVN	JN55	5	1	179	
6	HB9AMH/P	JN37	5	1	166	
7	OE5VRL/5	JN78	3	2	201	
8	IW3EHQ/P	JN65	3	1	111	
9	DL2DR	JO31	3	1	95	
10	OK1OKL	JO60	2	2	96	
11	OK1UWA/P	JO70	2	1	96	
12	OK1AIY-P	JO60	2	1	96	
13	DB6NT	JO50	2	2	95	
14	DL6NCI	JO50	2	2	83	
15	DK0PX	JN48	2	1	62	
16	DL3YEE/P	JO42	2	1	45	
17	DK2MN	JO32	2	2	30	
18	DC8EC/P	JN57	2	1	29	
19	F1PYR/P	JN19	2	1	0	
20	DL/HB9AMH/P	JN48	1	1	184	
21	GW8BKE/P	IO71	1	1	93	
22	IW3HTU	JN55	1	1	87	
23	G8BKE/P	IO90	1	1	54	
24	OK1KIR/P	JO60	1	1	5	
25	OK1AIY/P	JO70	1	1	5	
26	SP6MLK/P	JO70	1	1	1	
27	PA0BAT	JO31	1	1	1	
28	CT1FP	IN50	1	1	1	
29	CT1DMK	IN50	1	1	1	

76 GHzToplist

1	HB9MIO/P	JN37	4	1	114	
2	DB6NT	JO50	2	1	77	
3	DC0DA/P	JO50	2	1	48	
4	G8BKE/P	IO91	1	1	33	
5	OK1AIY/P	JO70	1	1	12	
6	DC8EC/P	JN57	1	1	5	
7	HB9AMH/P	JN37	1	1	1	

145 GHzToplist

1	DB6NT	JO50	1	1	3	
2	IW3EHQ/P	JN65	1	1	2	
3	DC0DA/P	JO41	1	1	1	
4	G7FRE	JO01	1	1	1	
5	G4FRE/P	JO01	1	1	1	

241 GHzToplist

1	DB6NT	JO50	1	1	2	
2	HB9MIO/P	JN37	1	1	1	

DUBUS Order form - Bestellformular

Quantity / Anzahl

----→ TECHNIK 1 + 5 book – Buch SOLD OUT!!! / AUSVERKAUFT!!! ←

..... x TECHNIK 2 book – Buch EUR 20,- / USD 25,- = ... EUR/USD

..... x TECHNIK 3 book – Buch EUR 20,- / USD 25,- = ... EUR/USD

..... x TECHNIK 4 book – Buch EUR 20,- / USD 25,- = ... EUR/USD

Add EUR 3,-/$ 3,- per book for airmal delivery outside Europe = ... EUR/USD

DUBUS Magazine back issues / ältere Einzelhefte:

2/81, 4/81, 4/83, 1/84, 2/84, 4/84, 1/86, 1/87, 2/87, 3/87, 4/87, 1/88, 3/88, 1/89, 2/91, 3/91, 4/91, 2/92, 3/92, 4/92, 1/93, 3/93, 4/93, 2/94, 3/94, 4/94, 2/95, 3/95, 1/96, 2/96, 4/96, 1/97, 4/97 (1/88, 3/88, 1/96, 1/97 are very limited!)

Mark issues you want. Bitte gewünschte Nummern markieren.
Price per issue: DL EUR 3,- inkl. Porto, Other EUR 4,-/USD 4,- incl. Postage

Anzahl der Hefte ..... x EUR 3,- = ... EUR
Nr of back issues ..... x EUR 4,- / USD 4,- = ... EUR/USD

.... x DUBUS 1998 complete set (Jahrgang) EUR 18,-/USD 25,- = ... EUR/$

.... x DUBUS 1999 complete set (Jahrgang) EUR 18,-/USD 25,- = ... EUR/$

.... x DUBUS 2000 complete set (Jahrgang) EUR 18,-/USD 25,- = ... EUR/$

.... x DUBUS 2001 complete set (Jahrgang) EUR 20,-/USD 30,- = ... EUR/$

.... x DUBUS 2002 Subscription: DL + EU EUR 20,- = ... EUR

.... x DUBUS 2002 Subscription: Outside EU: EUR 30,-/$30,- = ... EUR/$

Gesamtsumme / total amount : ..... EURO / USD

(Books, Back issues, Subscriptions)

Gesamtsumme bitte als V-Scheck oder bar beilegen.
Please enclose total amount cash or cheque in EURO/USD
(No creditcards, no other cheques)

Name: .....

Call: .....

Street/Str.: .....

ZIP/Town – PLZ/Ort: .....

Bitte einsenden an – Please send order to:

DUBUS-Verlag, Grützmühlenweg 23, D-22339 Hamburg, Germany

We deliver all microwave modules required for operations on OSCAR 40, from L-Band 1268 MHz transmitting mixer to 2400/2446 MHz S-Band transverter/ converter. We also produce the 5,6 GHz C-Band transmitting mixer and 10 GHz X-Band and 24 GHz K-Band converter. All models are built according to the very latest circuit-technology, and are of high end technology in communications electronics. Our ceramic-filled PCBs, HEMT amplification technology, not to forget the anti-rust coating in German Silver (essential for mounting on a tower) stand for the uncompromising quality of our products.

13cm Converter for OSCAR 40 Downlink

SUPER LOW NOISE CONVERTER for conversation of the 2400 MHz microwave downlink band to the 144 MHz or 432 MHz band. Employing a balanced mixer and helixfilter and using ceramic filled circuit board as well as state of out circuit design and modern HEMT-FETs, this converter was developped with outstanding specifications. The converter is useful for mounting in a waterproof case direct on the antenna.
Built-in-bias "T". For power feed up the coax cable.

Typ: MKU 24 OSCAR 255.- EURO

Input frequency range:	2400...2402 MHz
Noise figure:	typ. 0,6 dB NF
IF frequency:	144...146 MHz or 432...434 MHz option 70cm IF
Gain:	min. 26 dB adjustable

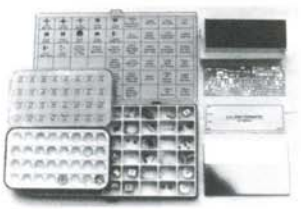
Ready for use on the tower

Typ: MKU 24 TM OSCAR 287.- EURO

Transverter for the 9 cm Band MKU 34 G2

Two 9 cm Transverter were developed by using modern components, which outstanding technical data despite their small mechanical dimensions. The circuits could be realized by the application by MMIC, Helical- filters, and balanced mixer in SMD technology. The Transverter-version with 144 MHz IF uses silver tuned high Q cavities- resonators for selection.

Specifications	MKU 34 G2	MKU 34 G2 432
Frequency range:	3400 - 3402 MHz	Option USA: 3456 - 3458 MHz
IF frequency range:	144 - 146 MHz	MKU 34 G2 432 = 432...434 MHz
IF input power max. 3 watts. adjustable		
RX - Gain:	>20 dB adjustable	Noise figure: max. 0,9 dB NF
TX - Output power:	>0,2 Watt RF	Operating voltage: +12...14V
MKU 34 G2	489.- EURO	MKU 34 G2 432 407.- EURO
MKU 34 G2 KIT	306.- EURO	



All Transverters are available in milled aluminium case. Option "professional"

Sequence controler

Many coaxial- relays have a too small uncoupling between transmitting and receiving ports. This problem during the change or process can do the destruction of the input transistor in the converter or the preamplifier lead. The relay should achieve an uncoupling of approx 50dB. The power on the RX input may not exceed 1mW.

Urgently the use of a sequence controlers is recommended.

SEQ 1 max. 1A DC Power	SEQ 2 max. 4A DC	SEQ 3 max 18A DC
17.- EURO	20.- EURO	26.- EURO

www.db6nt.com

KUHNE electronic GmbH

MICROWAVE COMPONENTS

Alle Module werden selbstverständlich mit Messprotokoll ausgeliefert.
Weitere Baugruppen sowie professionelle Ausführungen auf Anfrage lieferbar.

Katalog anfordern!

KUHNE electronic GmbH
Scheibenacker 3
D - 95180 Berg
Tel: 09293/800939
Fax: 09293/800938
kuhne.db6nt@t-online.de

DUBUS, Grützmühlenweg 23, 22339 Hamburg, PVSt., DPAG, Entgelt bezahlt, C11159

Stars of 6m-DX:

BG7OH

OP Liu from Shenzen, China
Loc.: OL72

BG7OH wkd many DL´s and EU´s on 6m from Nov. 2001 to Feb. 2002 BG7OH is the first Chinese station who worked 100 DXCC´s on 6m.

For the latest info please check

www.DUBUS.org