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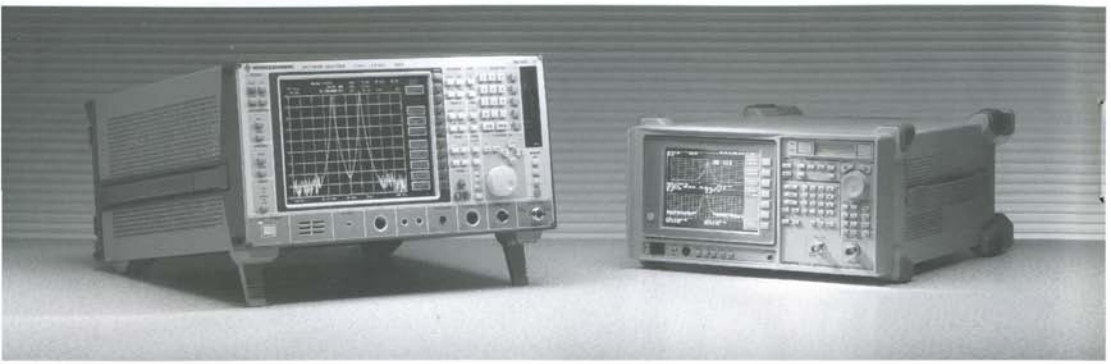
Communications



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die zweisprachige Zeitschrift für den Schmalband-DX-Amateur auf UKW von 50MHZ bis 241GHz. Geschrieben von aktiven UKW-Amateuren für aktive UKW-Amateure.

DUBUS
Entirely devoted to DX-ing on VHF/UHF and Microwaves (50MHz...241GHz). Fully bilingual and written by active radio amateurs for active radio amateurs.

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Inhalt/Contents

Redaktion/Editorial Staff

Technical Reports, Microwave Parts:	Rainer Bertelsmeier, DJ9BV, Glücksburger Str. 20, D-22769 Hamburg
Hints&Kinks, Computer News:	Gerold Bächle, DF5GX, Elberfelder Str. 12, D-10555 Berlin
Microwave News:	John Sørensen, OZ1IPU, Rosenvej 49, DK-9300 Sæby, Denmark
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EME-News:	Bernd Wilde, DL7APV, Amsterdamer Str. 9, D-13347 Berlin
Tropo News & 6 m News & Beacon List:	Joachim Kraft, DL8HCZ, Grützmühlenweg 23 , D-22339 Hamburg
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Technical Reports

Editor: Rainer Bertelsmeier, DJ9BV

LNA for 10 GHz

Michael Kuhne , DB6NT

Uwe Nitschke, DF9LN

Beschreibung

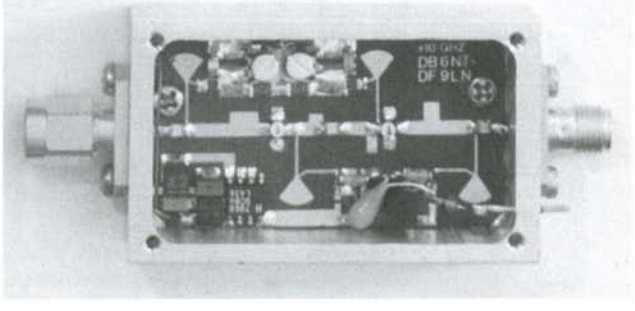
Der zweistufige Vorverstärker für 10368 MHz benutzt zwei HEMT's NE324 von NEC und erreicht bei einer Rauschzahl von kleiner als 1 dB eine Verstärkung von 23 dB. Der Verstärker ist stabil. Die Stromversorgung ist in die Platine integriert. Die Gehäuseabmessungen betragen 50 x 30 x 18 mm.

Description

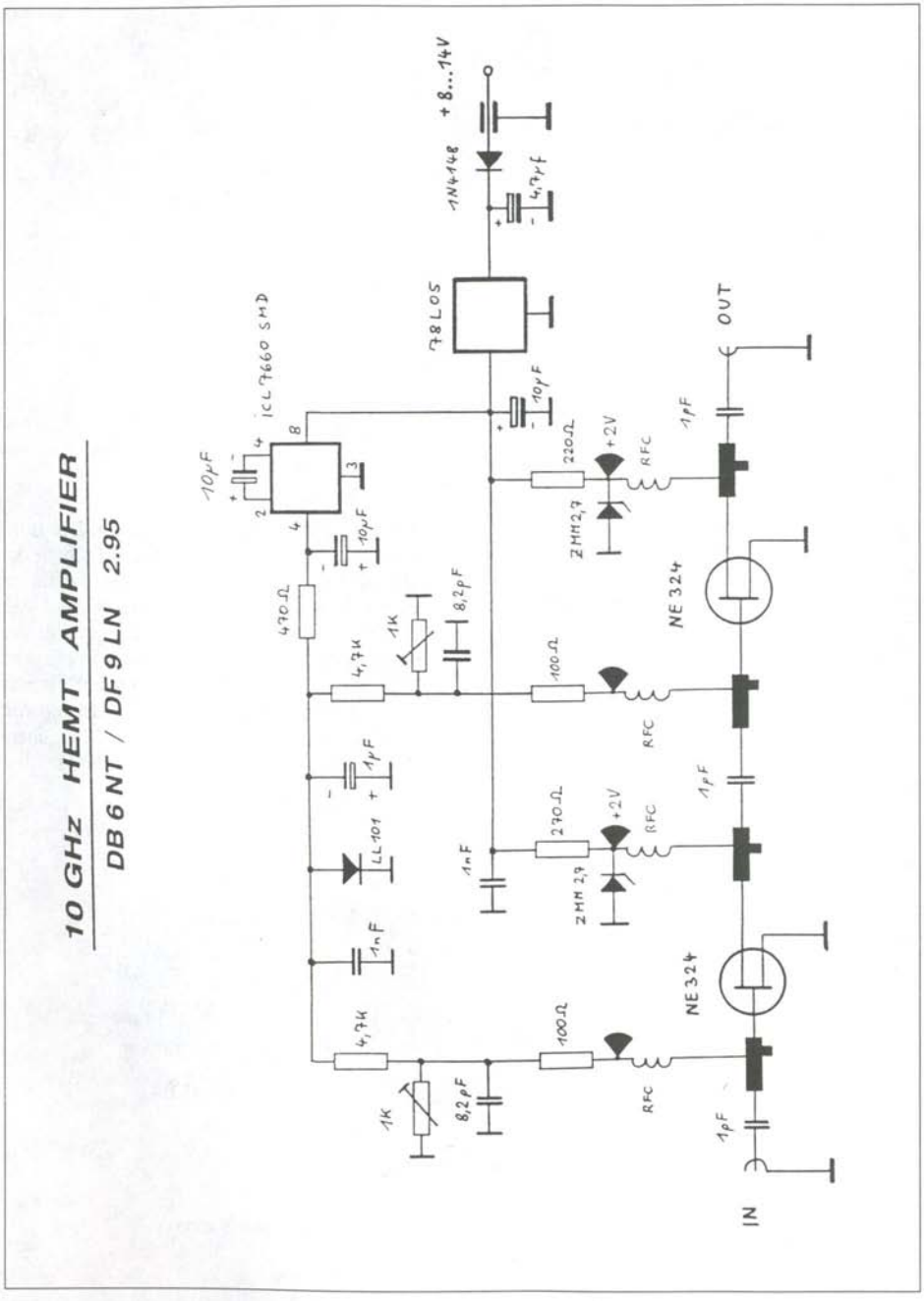
The 2-stage preamp for 10 GHz uses two NE32484 HEMTs. The total noise figure is below 1 dB and the gain is about 23 dB. The bias circuit is integrated. The size of the aluminium machined box is 50x30x18 mm.

Konstruktion

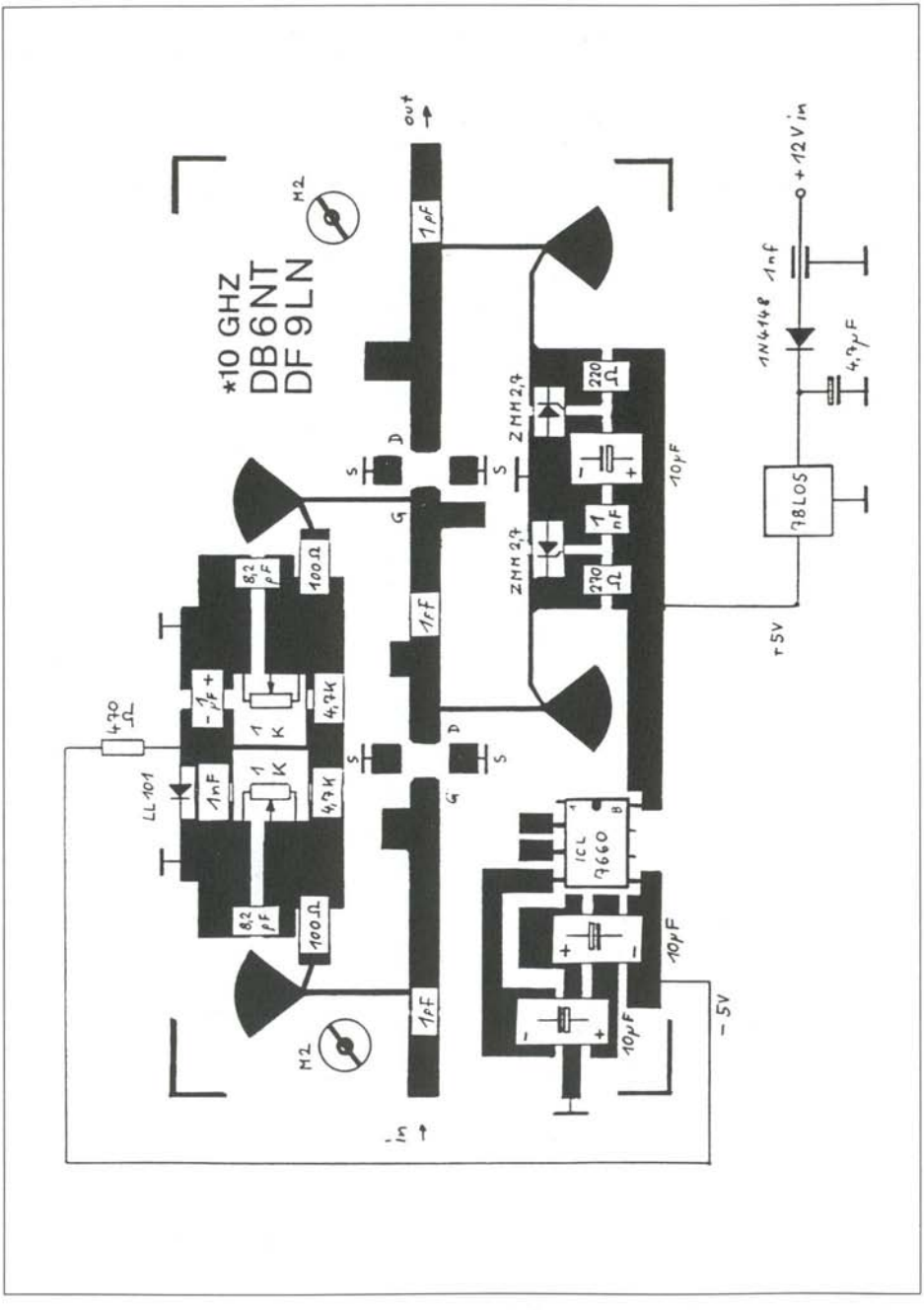
Der Verstärker ist auf einer Teflonleiterplatte aufgebaut und kann am Eingang entweder mit SMA-Microstrip-Buchsen oder mit Steckern bestückt werden. Alle Massepunkte müssen mit dünner Kupferfolie oder noch besser mit 0,8 mm Kupferhohlnieten durchkontaktiert werden. Die Bohrungen in dem Gehäuse werden nach Maßgabe der eingelegten Platine durchgeführt. Die bestückte Leiterplatte wird mit Silberleitkleber und M2 Schrauben befestigt. Der Spannungsstabilisator und seine externe Beschaltung werden freitragend eingebaut. Die Ruheströme werden auf 10 mA eingestellt. Damit muß sich eine Verstärkung von > 20 dB und eine Rauschzahl von < 1 dB ergeben. In den Deckel werden zur Dämpfung der Hohllei-



2-Stage Preamp for 3 cm

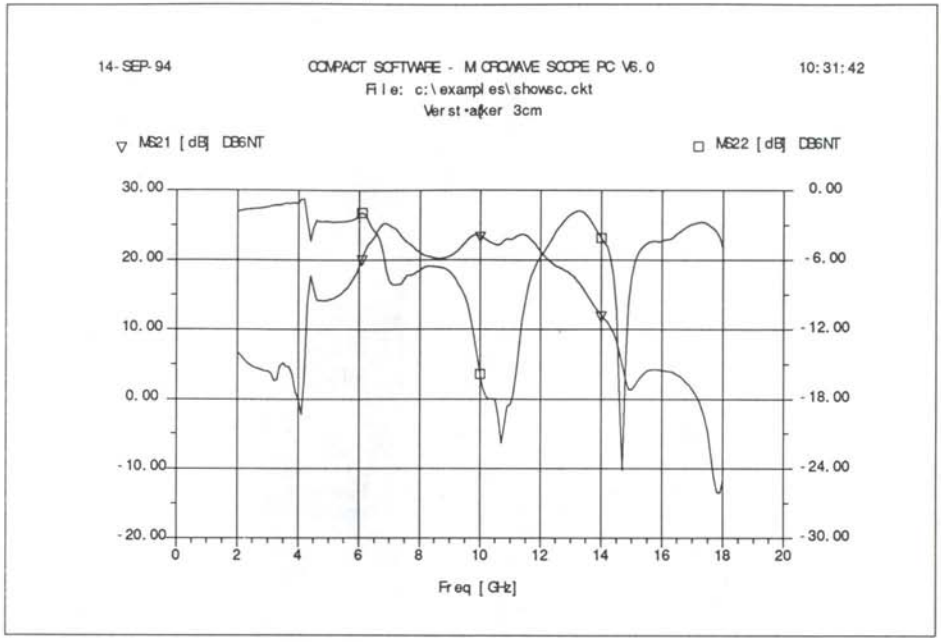


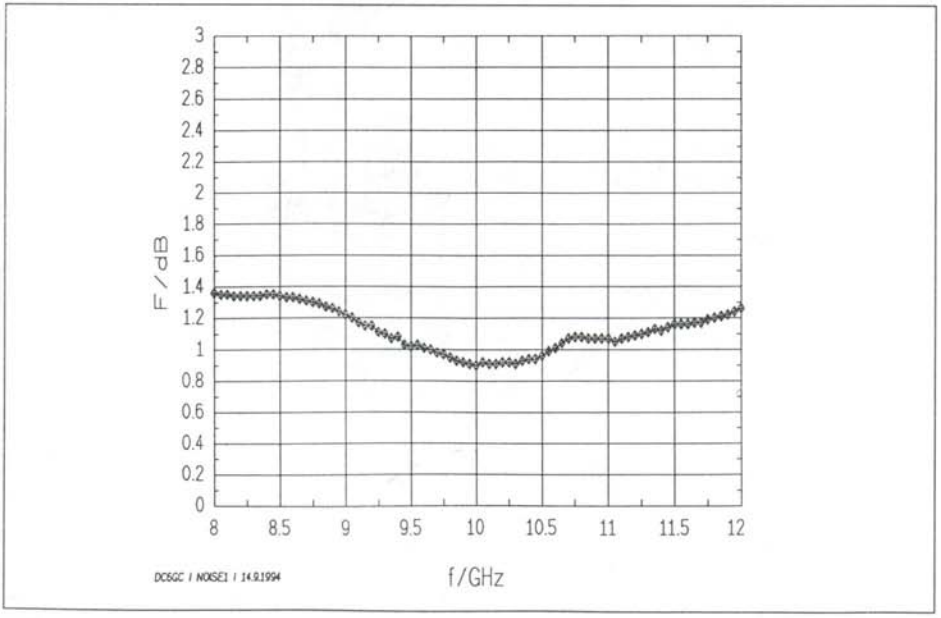
Figure/Abb. 1: Circuit Diagram



Figure/Abb. 2: Parts Layout

Figure/Abb. 3: Measured Gain





Figure/Abb. 4: Measured Noise Figure

Table 1: Parts

Anzahl	Bezeichnung	Bauform
1	Widerst. SMD 270Ω	1206
1	Widerst. SMD 220Ω	1206
2	Widerst. SMD 4k7Ω	1206
2	Widerst. SMD 100Ω	1206/0805
1	Widerst. 0.25W, 470Ω	0207
2	SMD-Poti 1k	4312
3	SMD-C 1pF	0805 oder ATC 100A
2	SMD-C 8,2 pF	0805
2	SMD-C 1 nF	0805
1	SMD-C 1 uF/16 V	Tantal
3	SMD-C 10 uF/16 V	Tantal
1	Elko 4.7 uF/16V	4x7mm
1	Durchf. C 1nF	schraubbar
2	HEMT NEC NE324	
2	Zenerdiode SMD 2.7V	
1	Diode LL101 (MELF)	
1	Diode 1N4148	
1	Regler 78L05A	
1	Invereter ICL7660	
1	Koaxbuchs, Microstrip	SMA, 2-Loch
1	Koaxstecker, Microstrip	SMA, 2-Loch
1	Alugehäuse gefräst	
1	Teflon PCB DB6NT	

termoden MOS-Schaumstoff eingeklebt. Der Verstärker ist sowohl offen als auch mit geschlossenenem Deckel stabil.

Construction

The preamp is constructed on a PTFE board in microstripline. Input and output connectors are SMA. All vias must be soldered either by inserting copper foils or by soldering small copper rivets with 0.8 mm diameter. The box is drilled by using the PCB as a ruler. The finshed PCB is mounted into the box by applying some silver adhesive and by M2 screws. The regulator and its external parts are mounted in free fashion above the board. Bias currents are about 10 mA for each HEMT. The top cover is fitted with some absorption material to dampen the waveguide transmission modes. The amplifier is stable with and without cover.

Meßergebnisse

Die Verstärkung (Abb. 3) beträgt 23 dB auf 10 GHz und hat ein zweites Maximum mit 25 dB bei 6 GHz. Die Ausgangsanpassung beträgt 24 dB. Die Rauschzahl ist im Minimum 0,9 dB bei 10368 MHz und hat einen sehr breiten Verlauf (Abb. 4). Der Vertsärker zeigte keine Anzeichen von Instabilität.

Results

Gain is 23 dB (Fig. 3) on 10 GHz. Also at 6 GHz the gain peaks to 25 dB. Output return loss is about 24 dB. Noise figure is 0.9 dB (Fig. 4) with a very broad minimum.

Bezugshinweise

Die Platine und fertige Vorverstärker sind bei DB6NT, Michael Kuhne, Birkenweg 15, 95119 Naila, erhältlich.

Das Gehäuse bei: Hubert Krause DG 1 KBF, Berghagen 60, 53773 Hennef.

Teile bei Eisch Electronic, Abt-Ulrich Str. 16, D-89079 Ulm, Tel.: (++49) 7305-23208/Fax.: (++49) 7305-23306.

Parts

PCBs and ready made preamps are available from DB6NT, Michael Kuhne, Birkenweg 15, 95119 Naila.

Parts are available from Eisch Electronic, Abt-Ulrich Str. 16, D-89079 Ulm, Tel.: (++49) 7305-23208 / Fax.: (++49) 7305-23306.

Box and waveguide components: Hubert Krause DG 1 KBF, Berghagen 60, 53773 Hennef

Power-GaAsFET Preamps

Kent Britain, WA5VJB

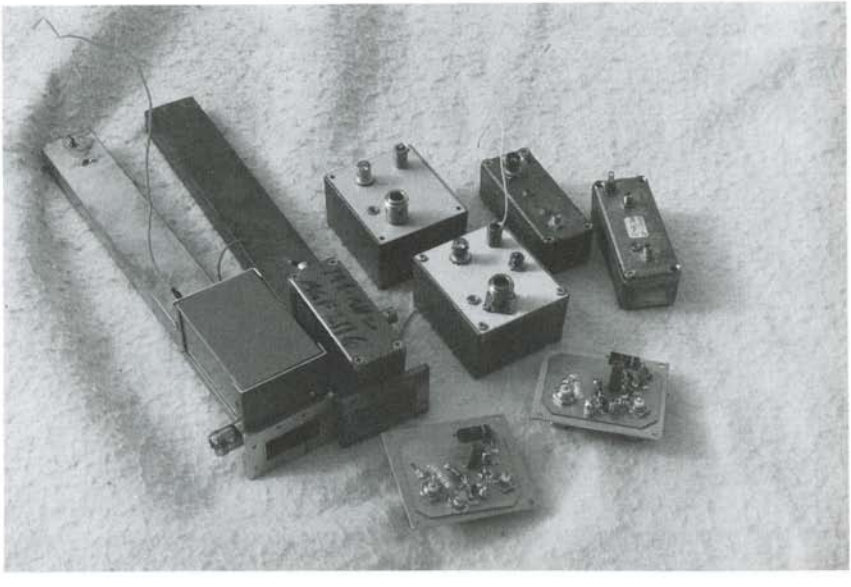
Description

Since the designs for Large Gate FET's were first published in Dec 1990 by the VRZA EME Newsletter, the designs have been improved and we have a better understanding of the circuit. My thanks to WB5LUA, who has done extensive computer models and precision measurements of the input circuits.

There is nothing magical to the MGF 1801's. Extremely low noise preamps have built with the MGF-1601, MGF-2116, NE0800, and many Avantek power devices. For the typical MFG-1302 style GaAs FET the 1/f curves predict device noise figures of .02 to .05 dB in the VHF region.

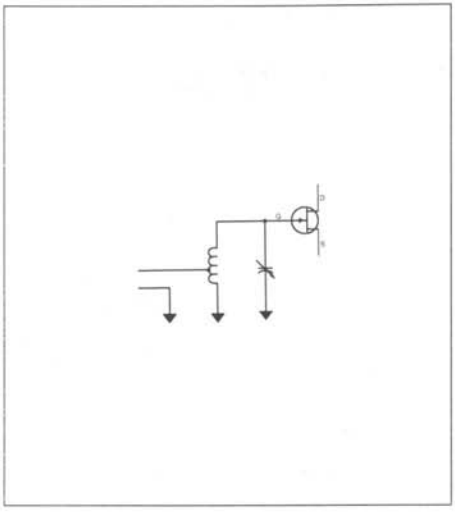
However, Γ_{OPT} [1] typically rises to over 3000 Ohms. The loaded Q of the input matching has .3 to .4 dB of loss transforming the impedance from 50 Ohms to 3000+ Ohms. HEMT's have an even lower noise figure at VHF, but matching to the higher Gamma Opt has even more loss.

By using a GaAs FET with a 800 μm wide gate vs. a 250 μm wide gate, the Γ_{OPT} drops to about 900 Ohms at VHF. This allows a lower Q, lower loss, input matching network. The MGF-1801 has a

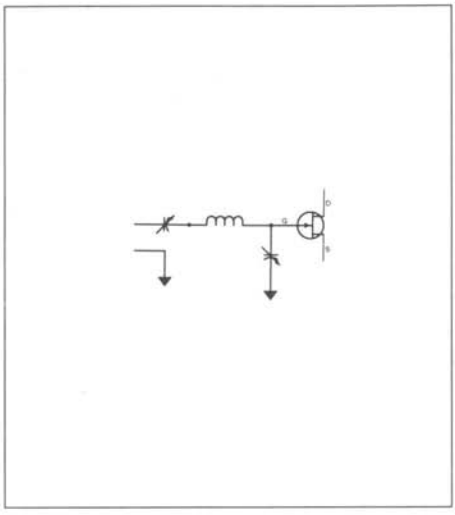


Power GasFET Preamps for 144 MHz

1 *Denotes the source reflection coefficient for minimum noise figure of the device*



Figure/Abb. 1: Input Circuit #1



Figure/Abb. 2: Input Circuit #2

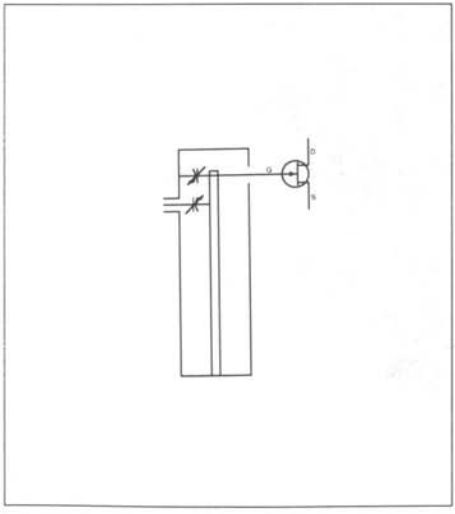
higher device Noise Figure than a MGF-1302, but the matching network has far less loss!

For the last 6 years, these designs have consistently given .1 to .25 dB Noise Figures at Noise Figure Contests. .1 to .15 dB for the 50 MHz versions, .1 to .25 for the 144 MHz versions, and .2 to .25 dB for the 222 MHz versions has been very consistent.

At 432 MHz the Noise Figures rise to .5 to .7 dB and these designs are not competitive.

Design Alternatives

Fig. #1 is the most commonly used input circuit. The tapped L input consistently gives .1 dB lower Noise Figures than a cavity input. This design has been used by KB8RQ on 144 MHz EME for 4



Figure/Abb. 3: Input Circuit #3

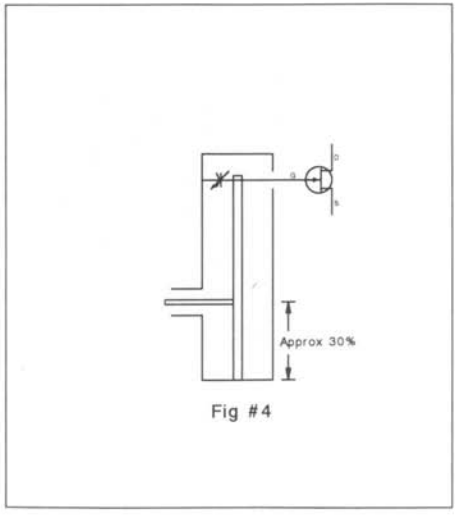
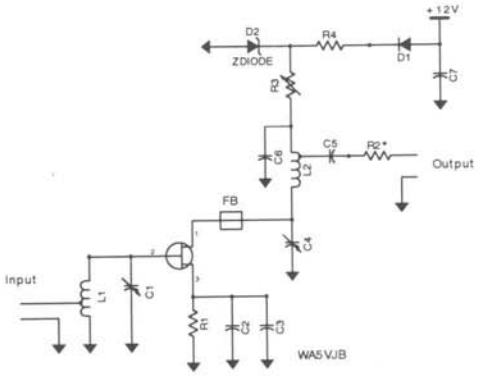


Fig #4

Figure/Abb. 4: Input Circuit #4

Figure/Abb. 5: Circuit Diagram



Power GasFET Preamp for 144 MHz

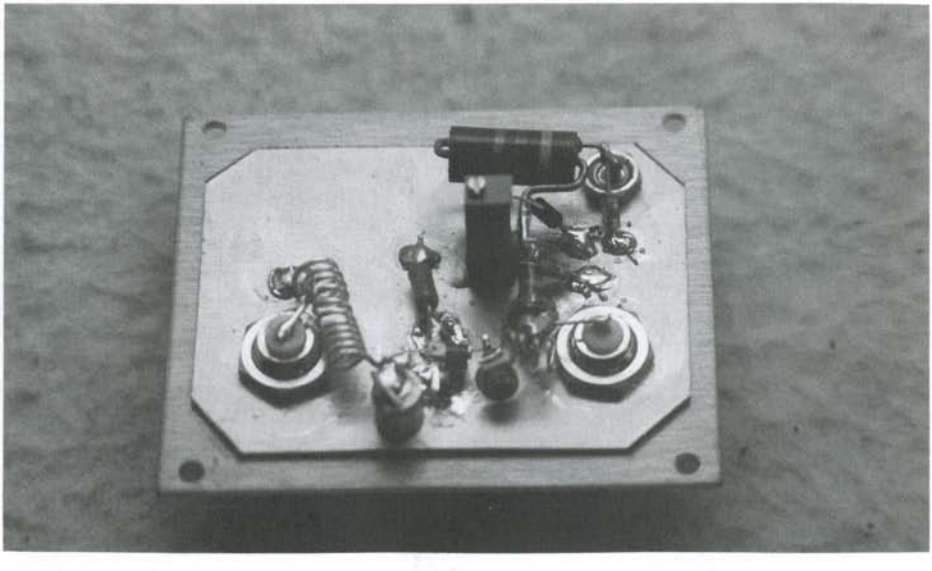


Table 1: Parts List

Item	Designation	Value
1	L1	10 turns, CuEl 1.2 mm dia., 16-18 mm long, wound on 7 mm diam.
2	L2	5 turns, CuEl 0.6 mm dia., 7 mm long, wound on 5 mm diam., tapped 2 t. from ground
3	R1	27Ω for MGF1601/1801, 22Ω for MGF2116
4	R2	10Ω for improved stability
5	R3	100Ω poti
6	R4	100Ω/2W or 80Ω/2W
	C1	Piston Trimmer 0.8-10pF
	C2,3	500 to 1000pF Chip Capacitors
	C4	4-40pF Trimmer
	C5	100 pF
	C6	1000pF F.T.
	C7	0.01 uF feed through
	D1	1N4002
	D2	4.7V/1W Zener
	FB	Ferrite Bead
	Box	Die Cast or metal shet
	Connectors	as desired

years with excellent results. Currently, 8 North American EME'ers are using one of these Preamps.

Fig. #2 is the lowest loss input circuit, but the 3 dB bandwidth is over 50 MHz. The preamp has gain from 25 MHz to 350 MHz making the preamp useless in any urban environment.

Fig. #3 is the cavity input circuit. The cavity is used for both impedance matching and filtering. This is the circuit I personally use.

My QTH is 10 km from 18 Television transmitters and I trade an extra .1dB of input loss for out-of-band rejection.

Fig. #4 is the tapped cavity. The tapped cavity has less loss than theCapacitively coupled cavity, but it can be difficult to find the besttap point. With the capacitive coupled cavity, the input capacitor can be tuned to lower capacitance, increasing the cavity Q, trading NoiseFigure for tight bandwidth. This is very useful in high EMIareas such as my QTH.

C Band waveguide makes an excellent cavity and Copper water pipe has also been used. Theoretically 72 Ohms is the best impedance for the line, but cavities ranging from 30 to 120 Ohms have been built with little difference in Noise Figure.

KH6CP has had good luck using sections of 1/2 inch Heliax to build up tapped lines for his inputs.

A straight Voltage Regulator is not recommended. Many of these devices are capable of 1 watt output if the preamps oscillates! Current limiting resistors protect the device and your receiver. The voltage adjustment will help when tuning for that last .1 dB.

A 4 to 1 transformer does not match the outputs of these 800 μm GaAs FETs very well. While a transformer does work, a tapped, Low Q tuned circuit works better. The tap point on the output inductor can me moved for best match. Be sure to wind the input and output coils in opposite directions.

For K5GW I build a 2 stage preamp with a MGA-0385/MAR-3 second stage. The MMIC makes and excellent broadband 50 Ohm load for the preamp, and gives K5GW an extra 12 dB of gain for his long coax run. Even with 35 dB of gain, the preamp was quite stable.

Conclusion

These designs have been empirically developed during the construction of over 40 PowerFet preamps. We have not been able to computer model the entire preamp. The GaAs FET manufactures just don't publish the 150 MHz Noise Parameter data for their 1/2 watt 10000 MHz devices!

My thanks to Henk Ripet for first publishing these design, and to Al Ward, WB5LUA for analysis and cleaning up my technical points.

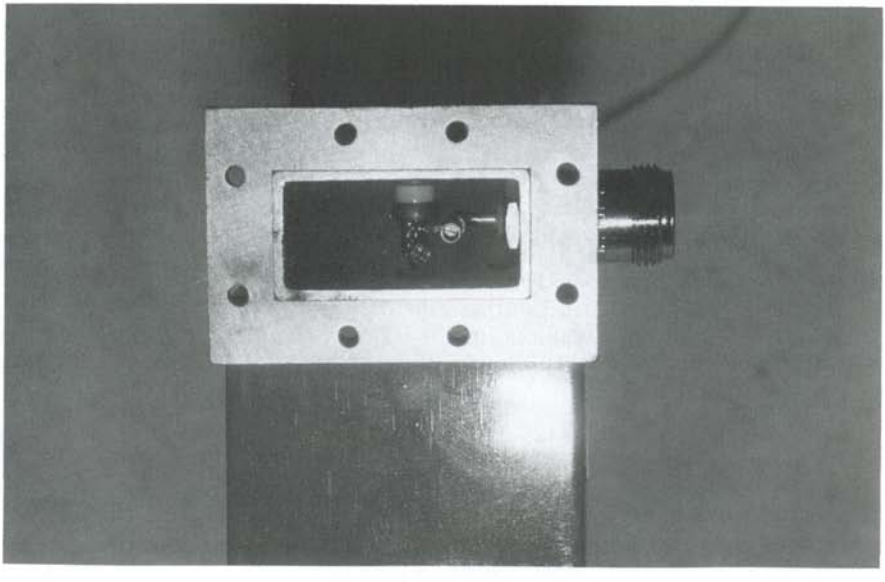
Beschreibung

Seit der Veröffentlichung im VRZA Newsletter im Jahre 1990 wurde das Design für den Leistungs-GaAsFet Vorverstärker verbessert. Mein Dank gilt WB5LUA, der das Design im Rechner modellierte und viele Messungen der Eingangskreise durchgeführt hat.

Die niedrige Rauschzahl der MGF-1801 ist nicht Magie sondern einfach zu erklären. Extrem rauscharme Verstärker für 144 MHZ wurden mit den Typen MGF-1601, MGF1801, MGF2116, NE0800 und einigen Avantek Leistungstransistoren gebaut. Für einen typischen MGF-1302 kann man eine z.B. eine Rauschzahl von 0,02 bis 0,05 aufgrund der 1/F Kurve voraussagen.

Leider ist die optimale Generatorimpedanz für minimale Rauschzahl, charakterisiert durch Γ_{OPT}, sehr hoch, ca. in der Größenordnung von 3000 Ohm. Transformiert man von 50 Ohm auf diese Impedanz, kann man leicht 0,3 dB Anpaßverluste haben. HEMTs haben noch geringere Rauschzahlen, aber leider auch mehr Anpaßverluste.

Benutzt man nun einen GaAs-FET mit 800 μm statt mit 250 μm Gateweite, erniedrigt sich die optimale Impedanz auf ca. 900 Ohm. Damit kann man die Lastgüte des Eingangskreise kleiner gestalten und hat dann bei gleicher Leerlaufgüte weniger Verluste. In der Tat hat der MGF-1302 eine niedrigere Rauschzahl als der MGF-1801 aber wesentlich höhere Anpaßverluste.



Look on Waveguide Input Cavity

In den letzten 6 Jahren habe diese Verstärker auf allen Konferenzen bei den Rauschzahlmessungen Werte zwischen 0,1 bis 0,25 dB erbracht. Auf 50 MHZ und 220 MHZ sind die Werte ähnlich. Auf 432 MHZ sind allerdings nur noch Rauschzahlen von 0,5 bis 0,7 dB erzielbar.

Alternative Eingangskreise

Abb. 1 zeigt den am meisten verwendete Eingangskreis. Dieser angezapfte Kreis hat ca. 0,1dB weniger Rauschzahl als ein koaxialer Leitungskreis. Dieses Design wird seit 4 Jahren bei KB8RQ für 144 MHz EME benutzt. Acht andere EME-Stationen aus den USA benutzen diesen Vorverstärker ebenfalls.

Abb. 2 zeigt den Eingangskreis mit den niedrigsten Verlusten. Die 3 dB Bandbreite ist allerdings 50 MHz. Damit kann man diese Art in der Stadt nicht benutzen.

Abb. 3 zeigt einen koaxialen Leitungskreis. Dieser Kreis dient zum Filtern und zur Anpassung. Er hat etwa 0,1 dB mehr Eingangsverlust, ist aber selektiv. Diese Version benutze ich selbst, da ich von 18 Band II Fernsehsendern umgeben bin.

Abb. 4 zeigt den angezapften Koaxialkreis. Es ist möglicherweise schwierig, den besten Anzapfpunkt zu finden.

C-Band Hohlleiter ist gut als Gehäuse für die koaxiale Variante geeignet. Üblicherweise legt man den Wellenwiderstand auf ca. 72 Ohm aus. Tatsächlich sind aber die Verluste kaum höher bei Wellenwiderständen von 30 bis 120 Ohm. KH6CP benutzt 1/2" Heliax für seinen Eingangskreis.

Ein Spannungsregler wird nicht empfohlen, da er im Schwingfall 1 W Ausgangsleistung abgeben kann. Das mag der FET gar nicht. Stattdessen wird eine Kombination aus Widerständen und Zenerdioden verwendet.

Im Ausgang kann man nicht den üblichen 4:1 Transformator verwenden, weil die FET's zu niederohmig sind. Stattdessen wählt einen angezapften Kreis mit niedriger Güte für den Ausgang. Für K5GW habe ich eine zweistufige Version mit einem MAR-3 in der zweiten Stufe gebaut. Damit sieht der FET gute 50 Ohm und die Verstärkung ist ungefähr 35 dB.

Schluß

Die oben beschriebenen Vorverstärker sind das empirische Resultat der Konstruktion von mehr als 40 Vorverstärkern. Eine Rechnersimulation wurde mangels der Rauschparameter nicht erstellt.

Mein Dank gilt Hank Ripet, der dieses Design zuerst veröffentlicht hat, und WB5LUA für die Analyse der Schaltung und viele, hilfreiche Diskussionen.

3 dB-Hybride in Triplatetechnik für 1,3 GHz und 2,35 GHz

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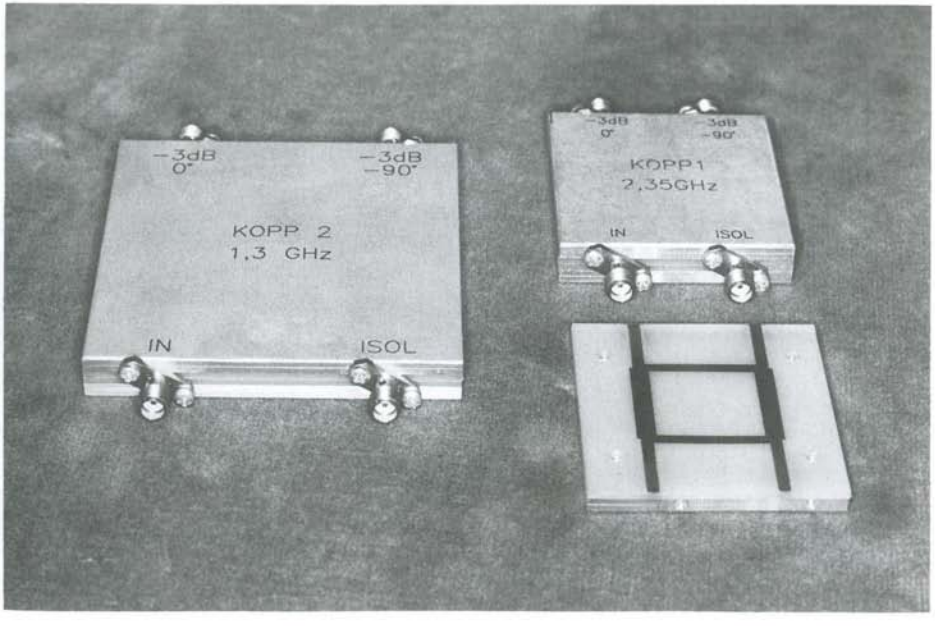
Einführung

Wie schon von anderen OM's, z.B. Rainer DJ9BV im DUBUS 4/94 beschrieben, können mit -3 dB Branchline-Koppler einzelne Verstärkerstufen zusammengeschaltet werden.

Ebenso kann durch die Zusammenschaltung von zwei linearen Antennen mit den Branchline-Kopplern eine Zirkularpolarisation erzeugt werden.

Da die Theorie von Rainer DJ9BV in dem Artikel " Quadrature Hybrids for 1,3 GHz " DUBUS 4/94 hinreichend beschrieben wurde, werden hier nur die grundsätzlichen Dinge nochmals angeführt. Inhalt des Artikels ist die Realisierung der Branchline-Koppler in Triplate-Technologie.

Der in Abbildung 1 gezeigte Branchline-Koppler setzt sich aus $\lambda/4$ Leitungen mit der Impedanz von 50 und =35,35 Ω zusammen. Bei Einspeisung an Tor 1 und reflexionsfreiem Abschluß der übrigen Tore erfolgt eine Leistungsaufteilung zu gleichen Teilen (-3dB) auf die Tore 2 und 3. Die Signale in Tor 2 und 3 haben eine Phasendifferenz von 90°



Triplate Branchline Coupler

(-3dB -90° Hybride). Die Tore 1 und 4 sind voneinander entkoppelt. Ebenso ist keine Übertragung zwischen Tor 2 und 3 möglich. Bei Fehlanpassung an Tor 2 und Tor 3 steht die dort reflektierte Leistung an Tor 4 an und muß dort absorbiert werden.

Beschreibung der Triplatetechnik

Die Branch-line-Koppler wurden in Triplatetechnik aufgebaut. Die Triplateleitung ist ein zur Mikrostreifenleitung alternativer Leitungstyp. Sie ist zum Aufbau von Mikrowellenkomponenten wie z.B. Filter, Leistungsteiler, Koppler, Verstärker, Frequenz-vervielfacher, Empfänger und Oszillatoren geeignet.

Bei der Triplateleitung ist der Streifenleiter mittig, zwischen zwei auf Massepotential liegenden Platten, die von dem Boden und Deckel des Schaltungsgehäuses gebildet werden, in homogenes Dielektrikum eingebettet.

Die Grundwelle der Triplateleitung ist für den verlustfreien Fall wegen des homogenen Dielektrikums eine reine TEM-Welle (**T**ransversale-**E**lektro-**M**agnetische Welle). Da sich die Welle ausschließlich im homogenen Dielektrikum ausbreitet, sind die Verluste (Dämpfung) geringer als bei einer Mikrostreifenleitung.

Durch die Einbettung der Triplateleitung in das Dielektrikum und der äußeren Aluminiumplatten wird sogut wie keine Leistung abgestrahlt bzw. die Schaltung selbst durch eingesrahlte Leistung beeinflußt. Die über die Triplateleitung transportierbare Leistung wird einerseits durch die ohmschen Verluste des Streifenleiters und die daraus entstehende Erwärmung begrenzt.

In der Praxis wurde bei 2,3 GHz eine Leistung von 25W ohne Probleme übertragen.

Als Substrat wurde das mit Aluminium verstärkte Polyguide mit einem und einer Substrathöhe von 1,57 mm verwendet.

Zusammenfassung

Mit den in Triplatetechnik erstellten Branch-line-Kopplern lassen sich auf Grund der geringen Dämpfung Leistungen bis 100 Watt übertragen. Somit können Leistungsverstärker, wie z.B. von DK2DB in DUBUS 2/94 beschrieben, mit jeweils 10 Watt bei 2,3 GHz zu 20 Watt zusammengeschaltet werden. Es ist darauf zu achten, daß die Leistungsverstärker phasengleich (gleiche Leitungslängen) zusammengeschaltet werden.

Die einzelnen Branch-line Koppler wurden mit dem Optimierungsprogramm TOUCHSTONE der Fa. EEsof bzw. seit letzter Zeit der Fa. Hewlett Packard optimiert.

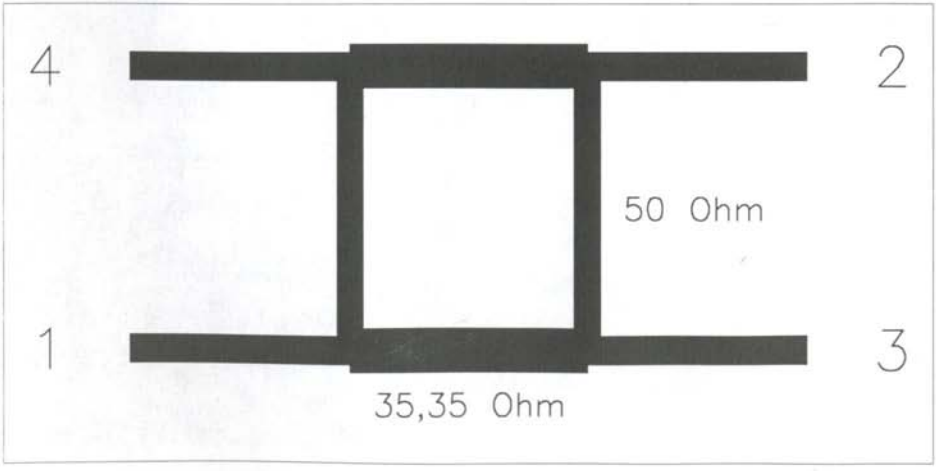


Fig. 1: Branchline Coupler

Die Leiterbahnbreite w, die Leitungslänge für 50 bzw. 35.35 Ω sowie die Printgröße A * B können der folgenden Tabelle entnommen werden.

Technischen Daten	1.3 GHz	2.35 GHz
Leiterbahnbreite w für 50Ω in mm	2,441	2,441
w für 35Ω in mm	4,031	4,031
Leitungslänge bei 50Ω in mm	38,09506	21,36571
Leitungslänge bei 35Ω in mm	35,62702	18,49329
Printgröße A * B in mm	75 * 75	50 * 50

Die Leitungslänge für 50 bzw. 35,35 Ω ist theoretisch gleich. Durch die parasitären Eigenschaften der T-Verzweigung ergeben sich nach der Optimierung mit TOUCHSTONE leichte Abweichungen.

Mit der beschriebenen Triplatetechnik lassen sich mit gleichen Spezifikationen -3dB/180° Koppler mit $^{6}/_{4}$ λ-Leitungen oder auch Richtkoppler mit wählbarer Koppeldämpfung herstellen.

Vergleich der Simulation mit der Messung

Die mit TOUCHSTONE optimierten Branch-line-Koppler wurden aufgebaut und mit dem Netzwerkanalysator HP8510C gemessen. In den Abbildungen 2 und 4 sind die simulierten Kurven in dem jeweiligen Frequenzbereich für Reflexion, Isolation und Transmission an Tor 2 und Tor 3 dargestellt.

Die Abbildungen 3 und 5 enthalten die Meßkurven des HP8510C im jeweiligen Frequenzbereich für Reflexion, Isolation und Transmission an Tor 2 und Tor 3. In dem für die Amateurfunkbänder interesanten Frequenzbereich wird eine Isolation besser 25 db und eine Symetrie besser 0,1 dB erreicht.

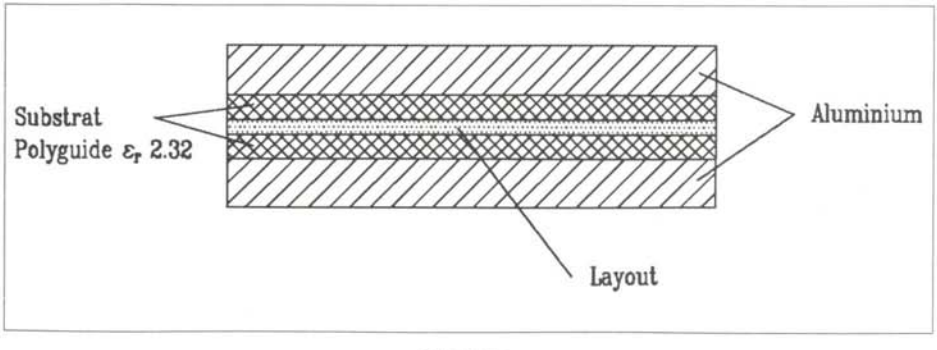
3 dB Triplate Hybrids for 1.3 & 2.3 GHz

Introduction

As already described in other OM's, e.g. Rainer DJ9BV (DUBUS 4/94), it is possible to interconnect amplifier stages with -3dB branch line couplers. In the same way a circular polarisation can be achieved by interconnection of two linear antenna with branch-line-couplers.

The theory has already been described in detail by Rainer DJ9BV in the article "Quadrature Hybrids for 1.3 Ghz', therefore basic elements will be addressed within this article only.

Topic of this article is the realization of branch-line-couplers in triplate technology. The branch-line-coupler shown in Figure 1 consists of $^{\lambda}/_{4}$-line with the impedance of 50 and 35,35 Ω.



Triplate

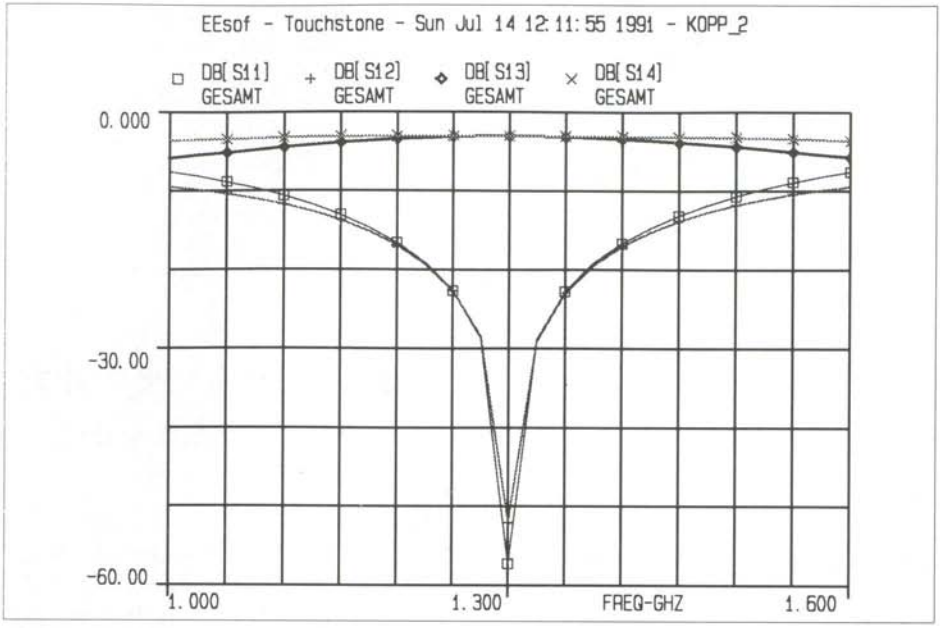


Fig. 3: Simulation for 1.3 GHz Coupler

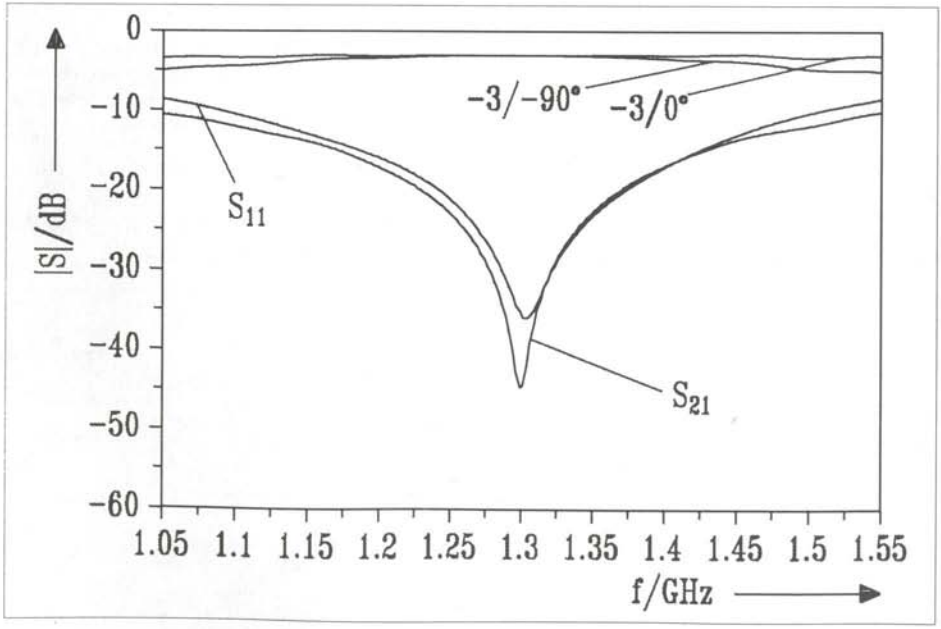


Fig. 2: Measurement of 1.3GHz Coupler

With feed at port 1 and anechoic termination of the other ports, the power is distributed to port 2 and 3 in equal parts. The signals of port 2 and 3 have a phase difference of 90° (-3dB -90° hybrid). port 1 and 4 are decoupled. Furthermore, no transfer between port 2 and 3 is possible. In the case of mismatch at port 2 and 3 the reflected power is transferred to port 4 and has to be absorbed there.

Description of Triplate Technology

The branchline coupler have been realised in triplate technology. The triplate line is an alternative for microstrip lines. It is suitable for realisation of microwave components, such as filters, power dividers, couplers, amplifiers, frequency multiplier, receivers and oscillators.

In triplate technology the stripline is centred between two grounded plates, which form cover and bottom of the housing. It is embedded in a homogenous dielectric. In the case of no loss the basic wave of the triplate line is a pure TEM-wave (**T**ransversal-**E**lectro-**M**agnetic **W**ave) due to the homogenous dielectric. Because the wave spreads out in homogenous dielectric, the loss is lower than with microstrip lines.

Due to the embedding of the triplate line into the dielectric and the outer aluminium plates almost no power is radiated and the circuit is not influenced by other radiated power.

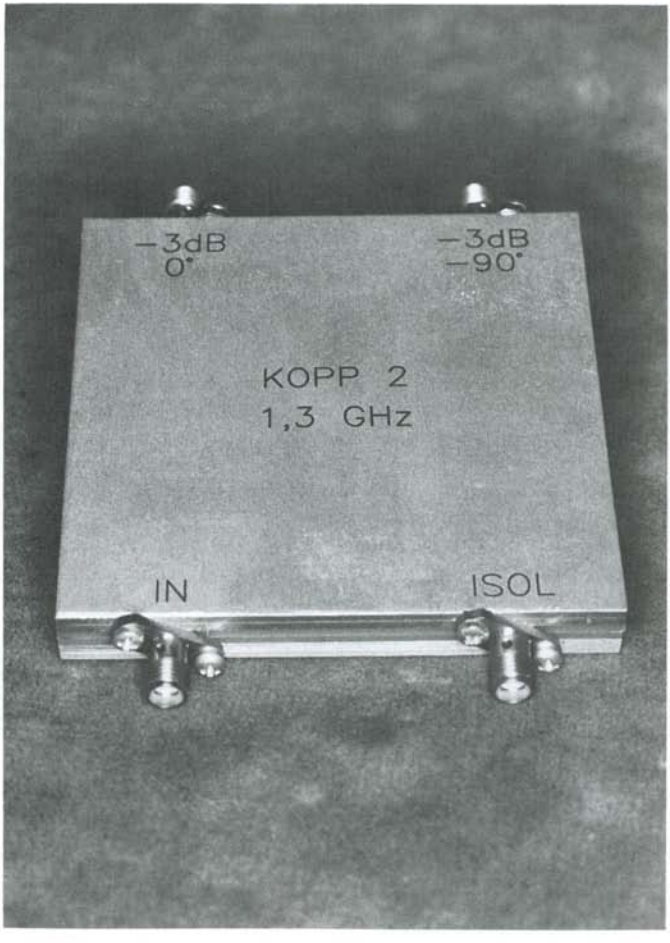
The transferable power of the triplate line is limited by the ohmic loss of the strip line and the heating-up resulting from that.

In practice a power of 25 W was transferred at a frequency of 2.3 Ghz without any problems. An polyguid reinforced with aluminium was used as substrate. Its thickness is 1.57 mm.

Summary

With branch-line-couplers realised in triplate technology power up to 100 Watt can be transferred due to the low attenuation. Thus power amplifiers of 10 Watts at 2.3 Ghz each, e.g. described by DK2DB in DUBUS 2/94, can be interconnected resulting in 20 Watts.

1.3 GHZ Triplate Branchline Coupler



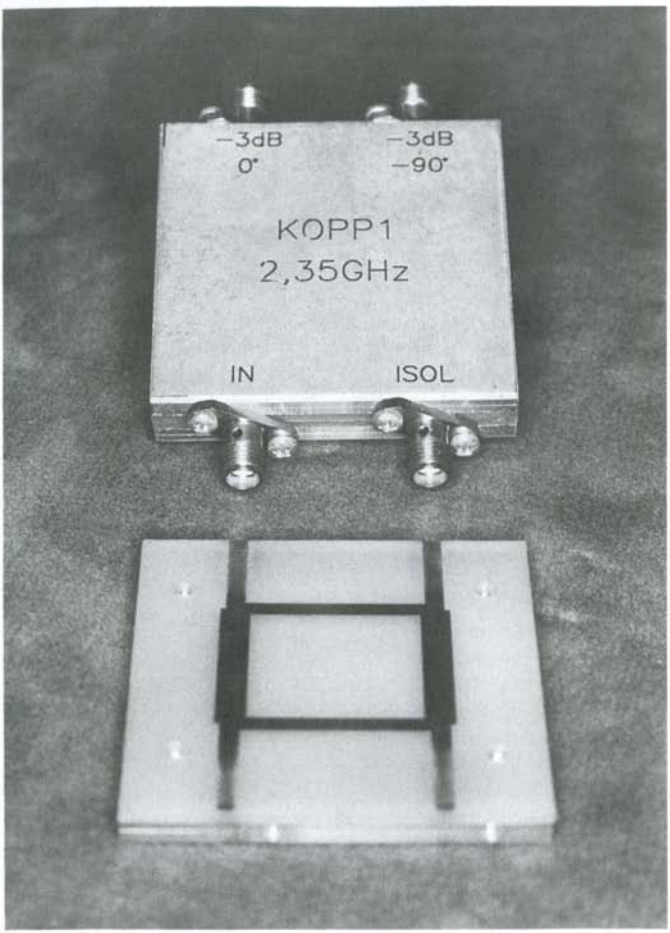
It has to be respected that the line amplifiers are interconnected in phase.

The individual branch-line-couplers were optimized with the programme TOUCHSTONE from Eesof's, now from HP. The width of the conducting path w, and the length of the line for 50 and 35.35 Ω respectively, as well as the size A can be taken from following table.

Theoretically the length of the line is equal for 50 and 35,35 Ω . However, parasitic characteristic of the T-junction have been considered for the optimization with TOUCHSTONE and resulted in slight deviations.

With the help of the described triplate technology couplers with $^6/_4\,\lambda$-lines and also directional coupler with selectable coupler attenuation can be realised with the same specifications -3dB/180°

2.3 GHZ Triplate Branchline Coupler



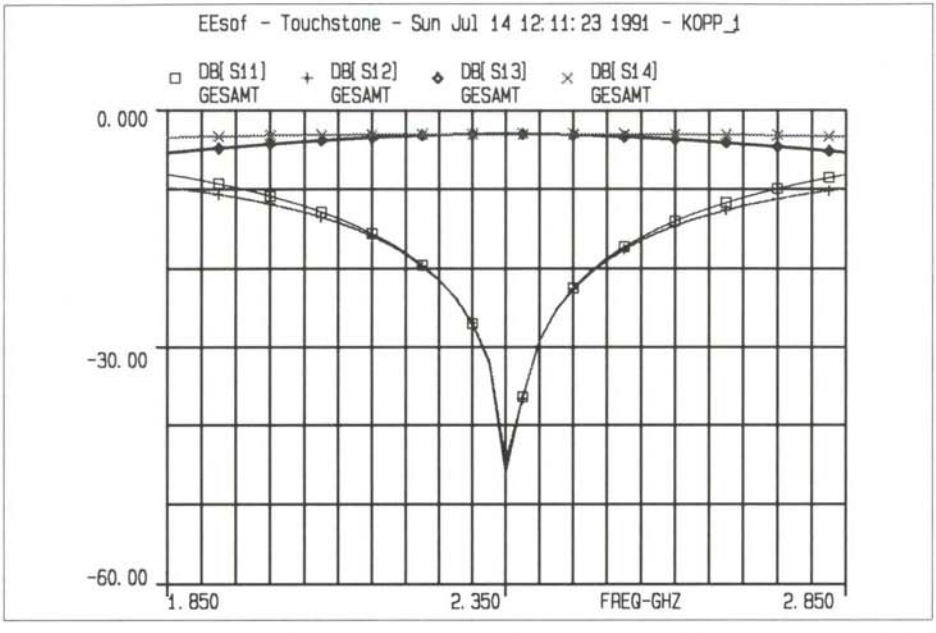
Comparison of Simulation and Measurement

The branch-line-couplers optimized with TOUCHSTONE were realised and measured with the network analyser HP8510C.

Technical Data:	1.3 GHz	2.35 GHz
Line Width w for 50Ω in mm	2,441	2,441
Line Width w for 35Ω in mm	4,031	4,031

Technical Data:	1.3 GHz	2.35 GHz
Length of Line for 50Ω in mm	38,09506	21,36571
Length of Line for 35Ω in mm	35,62702	18,49329
Size of print A * B in mm	75 * 75	50 * 50

Fig. 5: Simulation of 1.3GHz Coupler



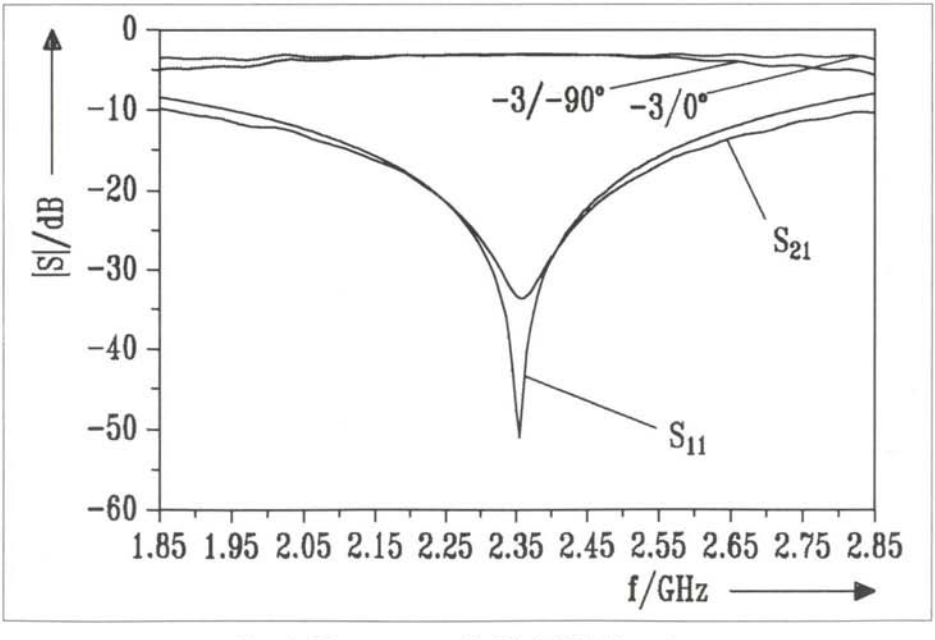


Fig. 4: Measurement of 1.3GHZ Coupler

The simulated curves are shown in figure 2 and 4 in the particular frequency band for reflection, isolation and transmission at port 2 and 3. The figures 3 and 5 include the corresponding measurements with the HP8510C.

At the frequencies of interest for amateur radio, an isolation of more than 25 dB and a symmetry better than 0.1 dB is achieved.

Power Generation in Ka-BAND

Daniel Orban, ON4AOD

Introduction

AMSAT, the international Amateur Satellite Organisation, has the opportunity to launch some 400 Kg on board of the second flight of ARIANE 5. The launch is to take place on May 29, 1996 (planning as of July 1995).

Since 1987, AMSAT DL has been leading the efforts to construct a satellite that fills the available space. Till date, this craft is the biggest, heaviest and most complex piece of space hardware the amateur community ever has constructed. Adding to the project are contributions from the following countries: Germany, UK, Belgium, USA, Japan, Argentina, CSFR, Finland, Hungary and South Africa.

In April 1993 we started with the development of a 24 Ghz transponder and beacon. This article reports about the efforts to generate the needed power for this purpose. As an introduction we give some specifications about the spacecraft and describe what influence they have on what we try to achieve. From there on we explain what we need to do and obviously how we have done it.

Right now we have built a protype and a flight version of the transponder.

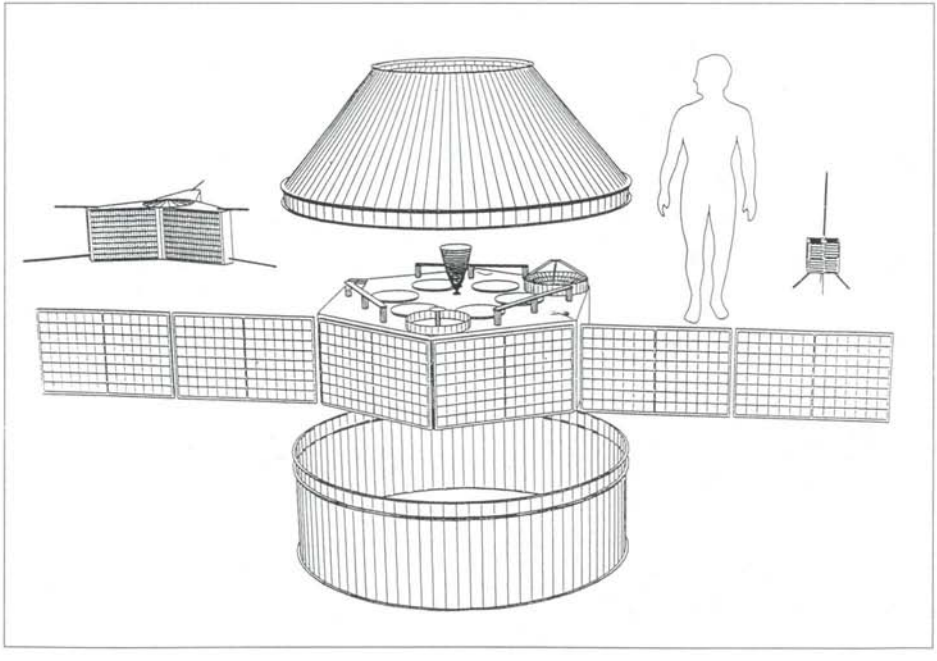


Fig. 1: Spacecraft Drawing

The Spacecraft

What makes this craft different from all previous ones are size and mass. The total weight is 400 Kg. Fuel accounts for roughly half of this. This amount of fuel means a much longer lifetime than, for example, OSCAR 10 and 13.

The shape of the craft is hexagonal, and it has a diameter of about 2.5 m and a height of about 0.75 m. Obviously, with these dimensions comes a large surface. This creates lots of room for solar panels: PHASE-3D has over 1 KW of solar power. This in turn means we can use high power transmitters: 300 W (solid state) on 2 m and 60 W (TWTA) on 3 cm, to name a couple. There is also a lot of room for antennas. See figure 1 for details.

The large volume allows us to fly a large number of transponders, or rather receivers and transmitters that are coupled together through an IF matrix. There are receivers in the 15 m, 2 m, 70 cm, 23 cm 13 cm and 6 cm bands and transmitters in the 10 m, 2 m, 70 cm, 13 cm, 3 cm and 1.5 cm bands.

The large volume will also store multiple systems to control the craft's position. We have two motors: a kick motor to go into the right orbit, and an ammonia motor to fine-tune the orbit. The latter will last many years, and is partly responsible for PHASE-3D's long life. Last there is a three-axis stabilisation system with fly wheels to keep the antennas pointed to the earth at all times. This system is highly accurate and gives us the possibility to use high gain antennas.

How much power do we really need ?

Calculating the link budget is not easy because only a few publications are available on Ka-Band propagation. These are the parameters we have taken into account:

- Because of Doppler shift, the transponder will be switched on at apogeum only. So the path loss needs to be calculated for 47000 km.
- From the above distance and the diameter of the earth we know that we need an antenna

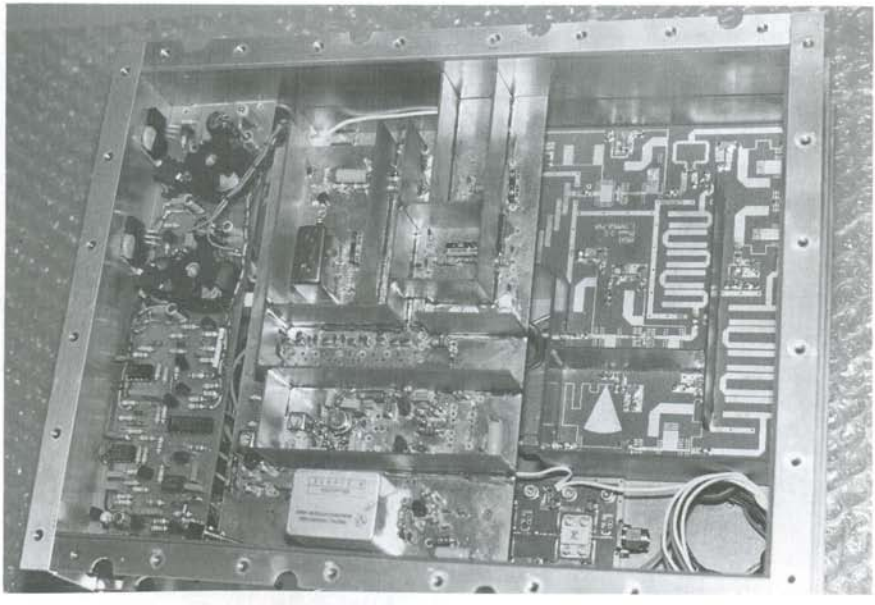


Fig. 2: Transponder

with a -3 dB beam width of 13.7 degrees. Converted into gain, this gives us 23 dB.

- We assume a receiver system noise figure of 2 dB. By the time this project will be operational, we will be able to get a noise figure well below 2 dB with amateur means: 1.7 dB has been achieved recently.
- The receiver bandwidth was assumed to be 2400 Hz. This can -has to- be reduced to suit CW requirements. Reducing the receiver's bandwidth to 1 kHz reduces noise power by 3.8 dB.
- The sky temperature is assumed to be 50 Kelvin. Some documents claim a sky temperature of 10 Kelvin at Ka-Band. This would result in 0.9 dB less noise power.
- The calculations were done for a receiver antenna gain of 35 dB. One could easily achieve 40 dB or more.

Calculating a link budget with these parameters tells us we need 800 mW of power.

On top of the calculated link budget, we have a number of parameters that will further weaken the signal. We know they exist, but it seems pointless to attempt to calculate them with our means. Let's look at a couple of them.

The atmosphere has two main components: nitrogen and oxygen. Their proportions are fixed and so are their effects on our link. It's a third component, water vapour, with its varying proportions, that accounts for the biggest and rather unpredictable part of atmospheric losses.

Specific losses are an estimated 0.15 dB/km for water vapour and 0.01 dB/km for oxygen. Rain is obviously another major cause of loss; it absorbs radio waves and scatters them. A good estimate for absorption on 24 Ghz is 1 dB/km in the case of 5 mm/h rainfall, and approaching 10 dB/km in the case of 30 mm/h.

Faraday rotation, according to a JPL publication, is 1.1° at 10 Ghz and 0.12° at 30 Ghz.

Atmospheric losses in general will, at times, be huge and make reception impossible. Remember that the point of maximum absorption of water vapour lays around 22 GHz. This was one mayor reason why we got the band in the first place. I would say we have to add 3 dB to our path loss to compensate for atmospheric losses.

This budget is valid with one user on the downlink. As the number of users increases, the available power per user will be less. Actually it would be 3 dB less every time the number of users doubles if it weren't for intermod. In real life one can say that with two users they both would get 4 dB less signal compared to when there would just be one station on the downlink.

From there on the degradation is less dramatic. Since the bandwidth of the transponder is limited to 25 KHz, we don't expect many more users.

Transponder

This part (Fig. 2) is fed with 469 MHz IF and 1179 MHz LO. The output delivers 800mW on 24.048 GHz into the antenna. The circuit is partly built on pcb and partly in waveguide. The part from 469/1179 MHz to 7074 MHz LO and 2827 MHz IF is done on 0.79 mm Teflon. All filters are microstrip edge coupled type. The ones for the lower frequencies are folded to save space. The tripler from 7 GHz to 21 GHz is partly microstrip partly waveguide, and the mixer is waveguide.

Both the 21 GHz LO and 24 GHz output filters are waveguide. The final stages are again in microstrip: 0.25 mm Teflon with 6 mm aluminum on the back side to facilitate the mounting of the connectors and to allow sufficient cooling for the power transistors. All connectors at 24 Ghz are SUHNER 3.5 mm. All others are SMA.

The mixer delivers about -10dBm. From there we amplify with HEMT's to 11 dBm. This signal is amplified by two modules to 26 dBm and by the final to 30dBm.

Power generation on Ka Band

We calculated that we need 800 mW of transmitter power to overcome 213 dB of path and other system losses. We assumed a 35 dB antenna and 2 dB NF preamp on the receiver side.

When we started building the transponder at the beginning of 1993, there were no 30 dBm devices on the market. The major problem appeared to be that there were no real good housings for this type

of device. Also, commercial interest in Ka band has only recently been growing. We considered using FLR026's, but putting a number of them parallel did not work out all that well.

The drivers are HEMT's from Toshiba. They are actually specified up to 18 GHz but work well at 24 GHz. Depending on the device, they give between 5 and 10 dB of gain.

Good news came from Raytheon when they introduced a new type of transistor: a 1 Watt PsHEMT. The device has a typical gain of 7.0 dB (at 2 dBc) from 20 to 25 Ghz. The device is special in two ways. First, the chip is fixed to a carrier with alumina substrates -matching networks- at gate and drain. The manufacturer bonds from the chip to the aluminas. All the user has to do is to bond from the aluminas to the substrate. This greatly simplifies mounting and avoids the risk of cracking the chip while bonding. We mounted the devices on standard 5880 Rogers substrate and obtained very good results. Multiple bonding wires were put in parallel to increase reliability. Secondly, the carrier is left open. In other words, there is no housing. This reduces the cost of the device. The cost for the housing is usually multiple times the cost of the semiconductor; plus, there are no real good devices packages for this frequency anyway. We decided to use this device as our final stage.

Another new product that appeared last year is Fujitsu's power modules for Ka-band. The modules are FMC2223P1-02 and FMC2223P5-01 from FUJITSU. They are internally matched devices that have internal power supply and biasing networks. They will deliver 21 dBm at 12 dB gain and 28 dBm at 9 dB gain. Since they are matched for the 22.4 to 23.6 GHz region, we lose some of the performance. Fuji was so nice to test a batch at our band for us, and have come up with an actual decrease in gain of 3 dB. This can be partly compensated by external tuning. We are using these as the drivers.

Construction of the driver

Constructing the driver (Fig. 3) is really simple because the power lines are decoupled inside the

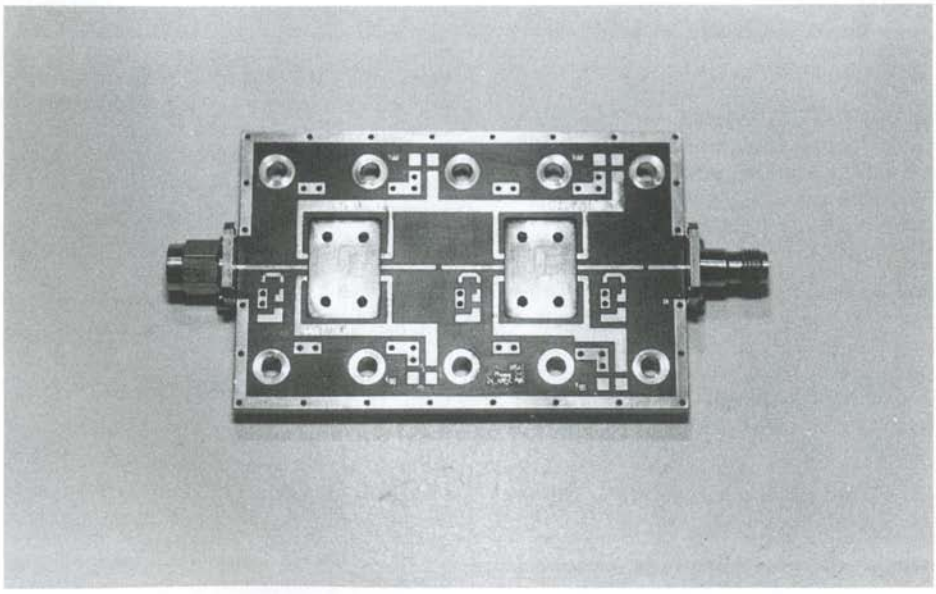


Fig. 3: Driver

module. By connecting -5 V to the gate pins and 8 V to the drain pins, all the work is done, except for the additionnal tuning. The pcb holds a P1 in the first and a P5 in the second stage. We have quarter wave directional couplers edged on the pcb. The measured values will go into the telemetry.

The PCB is 0.25 mm Teflon with 6 mm aluminum backing. This way the connectors can be mounted easily and the heat flow from the transistors is ideal. The layout is straightforward with decoupled quarter wave lines for gate and drain voltages.

The connectors are Suhner 3.5 mm. They are interesting for the experimenter because the pins are separate from the connector body and can be bought for different line widths. Once a pin is soldered, the body can be removed and plugged onto another pin.

The amplifier delivers 400 mW with no great difficulties. We did not try to get higher output powers.

Construction of the final amplifier

The real challenge was getting the devices. They were specially made for us by Raytheon and were donated. Note that this is still an experimental device that is not for sale.

The PCB is the same material as the driver. Tuning is done by bonding gold foil on the alumina at the gate side and soldering additional copper strips at the microstrip lines on the Teflon board.

The results are as expected with 800 mW of output power. The amplification is down to 4 dB versus a predicted 7 dB.

I want to thank Peter Pauwels -ON1BPS- and Philip Sanders -ON7IZ- for bonding and tuning the device. Without the use of proper bonding equipment and a network analyser, this amplifier could not have been constructed.

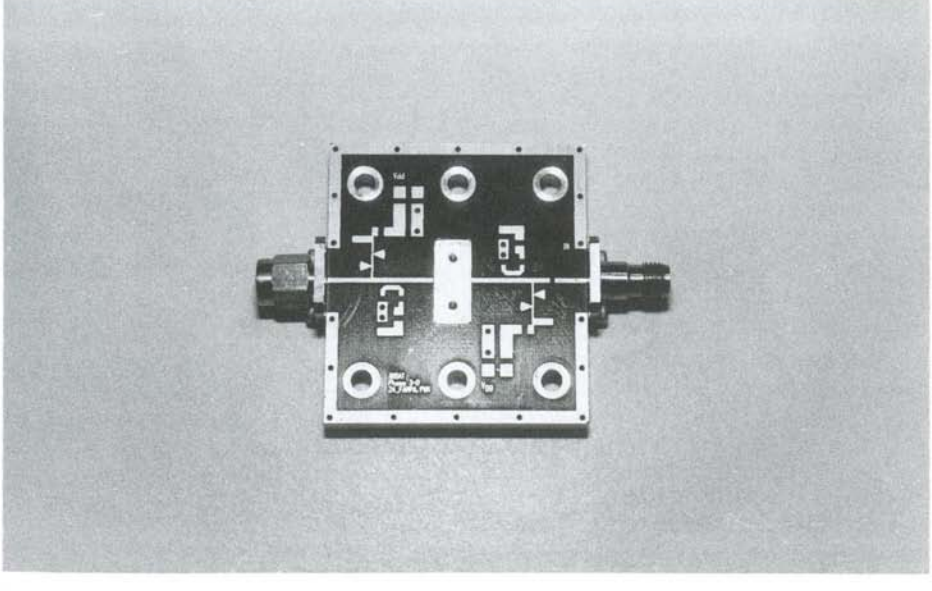


Fig. 4: Final

Deutsch

Einführung

AMSAT hat die Möglichkeit, eine Nutzlast von ca. 400 kg auf dem zweiten Flug der Ariane 5 unterzubringen. Der Start ist für den 29 Mai 1996 vorgesehen.

Der neue Satellit ist der größte und technisch anspruchsvollste, der jemals von Amateuren gebaut wurde. An dem Projekt sind die folgenden Länder beteiligt: Deutschland, Großbritannien, Belgien, USA, Japan, Argentinien, Tschechische Republik, Finnland, Ungarn und Südafrika.

Im April 93 begannen wir mit der Entwicklung des 24 GHZ Transponders und der Bake. Wir haben gerade die Flugversion dieser Baugruppen fertiggestellt.

Der Satellit

Die Unterschiede zu bisherigen Satelliten liegen in der großem Masse (400 kg), von der die Hälfte aus Treibstoff besteht und der verfügbaren Leistung von 1 kW. Das führt zu einer wesentlich größeren Lebensdauer als bei OSCAR 10 oder 13. Wegen der hohen Solarzellenleistung ist eine Leistung von 200 W auf 144 MHz, 60 W auf 10 GHz und ca. 1 W auf 24 GHz möglich. Abb. zeigt den Phase 3D Satelliten. Das große Volumen erlaubt eine Vielzahl von Transponder. Es gibt Empfänger auf 15 m, 2 m, 70 cm, 23 cm, 13 cm und 6 cm. Sender sind vorgesehen auf 10m, 2m, 70 cm, 13 cm, 3 cm und 1,5 cm. Die Sender und Empfänger sind über eine ZF-Matrix verbunden, so daß beinahe jede Kombination möglich ist.

Mehrere Motoren erlauben eine exakte Stabilisierung der Bahn. Weiterhin gibt es ein 3-Achsen Lagesteuerungssystem. Daher kann man den Satelliten immer genau auf die Erde ausrichten. Deswegen ist der Einsatz von Antennen mit hohem Gewinn möglich.

Leistungsbedarf auf 24 GHz

Um die Streckendämpfung und das 'Linkbudget' zu bestimmen, sind leider nur ungefähre Daten vorhanden. Folgende Einflüsse sind bei einer 24 GHz-Strecke maßgebend:

- Wegen der Dopplerverschiebung wird der 24 GHz Sender nur im Apogäum eingeschaltet. Die Entfernung ist dann 47000 km.
- Um die Erde auszuleuchten, muß der Öffnungswinkel 13,7° betragen. Das entspricht einem Gewinn von ca. 23 dB
- Die Empfängerrauschzahl wird unter 2 dB betragen.
- Die Empfängerbandbreite wird mit 2400 HZ angenommen. Eine Verringerung der Bandbreite auf 100 HZ bringt 3,8 dB Gewinn.
- Die Temperatur des kalten Himmels wird mit 50 K angenommen.
- Der Gewinn der terrestrischen Antenne wird mit 35 dB angenommen. Doch sind 40 dB ohne weiteres erreichbar.

Berechnet man die Leistungsbilanz, folgt eine Mindestleistung von 800 mW auf 24 GHz. Weiter Einflüsse können die Signale schwächen. Durch Wasserdampf ergibt sich ein Verlust von 0,15dB pro km, Sauerstoff führt zu 0,01dB pro km. Regen dämpft um zusätzliche 1dB/km bei 5 mm /h und um 10dB/km bei 30mm/h.

Die Faraday-Rotation beträgt 0,12° bei 30 GHz. Bei ungünstigen Verhältnissen kann also der Empfang unmöglich werden.

Das Budget gilt für einen Nutzer im Durchlaßbereich. Jeder Verdopplung der Zahl der Nutzer vermindert die verfügbare Leistung pro Nutzer um 3 dB. Da die Bandbreite nur 25 kHZ beträgt, erwarten nicht sehr viele Benutzer gleichzeitig.

Transponder

Dieser Teil mischt eine 469 MHZ ZF mit einem 2358 MHZ (2x1179 MHz) LO auf 2827 MHz. Der zweite Mischer mischt 3x7073,666=21221 MHz mit 2827 MHz auf 24048 MHz. Der Ausgang auf 24,048 GHz beträgt 800 mW. Alle Filter und Mischer für die niedrigen Frequenzen sind in Microstripline aufgebaut. Nur der Endmischer und der Ausgang des Verdreifachers sind als Hohlleiter-Baugruppen ausgeführt.

Die Endstufen sind wieder in Microstripline auf 0,25 mm Duroid mit einer 6 mm dicken Alurückseite. Damit wird eine gute Kühlung möglich. Alle Steckverbindungen auf 24 GHz sind Suhner

3,5 mm. Die Mischen liefern ungefähr -10 dBm Ausgangsleistung. Dann wird mit HEMT's auf 11 dBm weiterverstärkt. Zwei Leistungsmodule verstärken auf 26 dbm und schließlich auf 30 dBm.

Leistungsverstärker im Ka-Band

Als wir mit der Konstruktion des Transponders im Jahr 1993 begannen, gab es keinen Transistor, der 1W Ausgangsleistung auf 24 GHz schaffte. Das war durch des geringe Interesse am 24 GHz bedingt und die Schwierigkeit, vernünftige gehäuste Transistoren zu bauen. Die Möglichkeit, ganz viele FLR026 zusammenzuschalten, wurde verworfen.

Gute Neuigkeiten kamen von Raytheon: Sie stellten einen 1 W PsHEMT vor, der 7 dB gain bei 30 dBm Ausgangsleistung von 20...25 GHz machen sollte. Der Transistor ist ohne Gehäuse. Stattdessen ist der Chip auf einem Träger aus Aluminiumoxid befestigt. Dort sind auch Anpaßnetzwerke angebondet. Der Benutzer muß nur noch vom Aluminium-Substrat auf seine Leiterplatte bonden. Damit kann man den Chip praktisch nicht zerstören. Wir haben diese FET's auf Duroid 5880 montiert. Dabei wurden sehr gute Resultate erzielt. Der Chip-Träger ist oben offen. Das erniedrigt die Kosten beträchtlich.

Für den Treiber haben wir die Leistungsmodule FMC2223P1-02 und FMC2223P5-01 von Fujitsu verwendet. Diese sind intern angepaßt und haben alle Vorspannungsnetzwerke. Sie sind für den Bereich von 22,4 bis 23,6 GHZ vorgesehen und leisten 21 dBm bei 12 dB Verstärkung beziehungsweise 28 dBm bei 9 dB Verstärkung. Fujitsu war so kooperativ, daß sie für uns diese Module bis 24 GHz charakterisiert haben. Betreibt man sie auf 24,048 GHz verlieren sie ca. 3 dB an Verstärkung. Das kann man teilweise durch externe Anpaßschaltungen kompensieren.

Konstruktion des Treibers

Die Konstruktion des Treibers (Abb. 3) ist relativ einfach, da bereits alle Stromversorgungsleitungen im Modul abgeblockt sind. Man braucht nur 50 Ohm Streifenleitungen, -5 V für die Gateversorgung und 8 V für die Drainversorgung anschließen. Die Leiterplatte hat noch Richtkoppler im Ein- und Ausgang. Die Meßwerte werden in die Telemetrie eingespeist. In der ersten Stufe wird ein P1-Typ und in der zweiten Stufe ein P5-Typ verwendet.

Die Leiterplatte ist aus 0,25 mm dickem Duroid, das auf der Rückseite mit 6 mm Aluminium verstärkt ist. Daher können die APC 3,5 Buchsen einfach montiert werden. Außerdem ist die Wärmeabfuhr optimal.

Die Buchsen sind Suhner 3,5 mm. Der Mittelstift und das Gehäuse sind demontierbar. Der Verstärker liefert 400 mW.

Konstruktion des Endverstärkers

Die größte Schwierigkeit war, die Transistoren zu bekommen. Sie wurden von Raytheon für uns angefertigt und als Spende gegeben. Die Transistoren sind Labormuster und nicht frei erhältlich.

Die Leiterplatte is genauso wie beim Treiber gestaltet. Die Abstimmung erfolgte durch Bonden von kleinen Goldfolien auf das Aluminiumsubstrat auf der Gateseite und durch Anbringen von Kupferfolien auf der Platine auf der Drainseite.

Wir haben 800 mW Ausgangsleistung erreicht. Die Verstärkung beträgt 4 dB.

Mein Dank gilt Peter Bauwels, ON1BPS und Philip Sanders, ON7IZ, die das Bonden und die Abstimmung des Endtransistors bewerkstelligt haben. Ohne deren Hilfe wäre der Bau dieses Verstärkers nicht möglich gewesen.

Microwave Parts

Editor: Rainer Bertelsmeier, DJ9BV

Product Review: 22 W GaAs-FET Power on 5.7 GHz

R. Bertelsmeier, DJ9BV

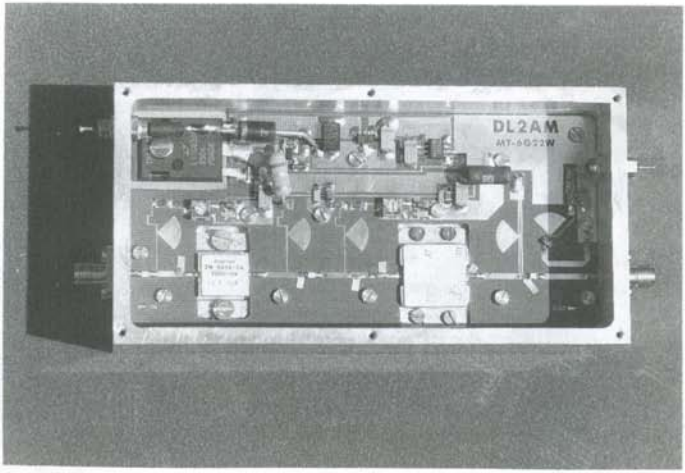
Kurzfassung: Der Leistungsverstärker MT5.6GZ22W von Philipp Prinz, DL2AM, ist mit den GaAs-FET's IM5964-3 und TIM5964-16L bestückt. Er erreicht eine Ausgangsleistung von 22 W bei 1 dB Kompression und 21 dB Verstärkung. Der Verstärker benötigt eine Betriebsspannung von 12 V und ist in einem gefrästen Aluminiumgehäuse untergebracht.

Abstract: The power Amplifier MT5.6 GZ22W made by Philipp Prinz, DL2AM, provides a 1 dB compression output power of 22 W on 5.76 GHz with a supply voltage of 12 V and 11 dB gain. It uses the IM5964-3 and TIM 5964-16L Power GaAs FETs. It is constructed on Teflon board in a machined aluminum box.

Schaltungsbeschreibung

Zwei Verstärkerstufen mit den GaAs-FET's IM5964-3 und TIM5964-16L sind in 50Ohm Streifenleitungen eingebettet und können eine Ausgangsleistung von 22 W auf 5.76 GHz erzeugen.

Die Platine ist aus 0,79 mm starkem RT-5870 Duroid und ist mit Silberleitkleber sowie M2 Schrauben kontaktiert. Ein Ausgangsrichtkoppler liefert eine Gleichspannung als relative Leistungsanzeige. Die Versorgungsspannung beträgt 11,5...15 V.



6 cm Poweramplifier MT5.6G-Z22W

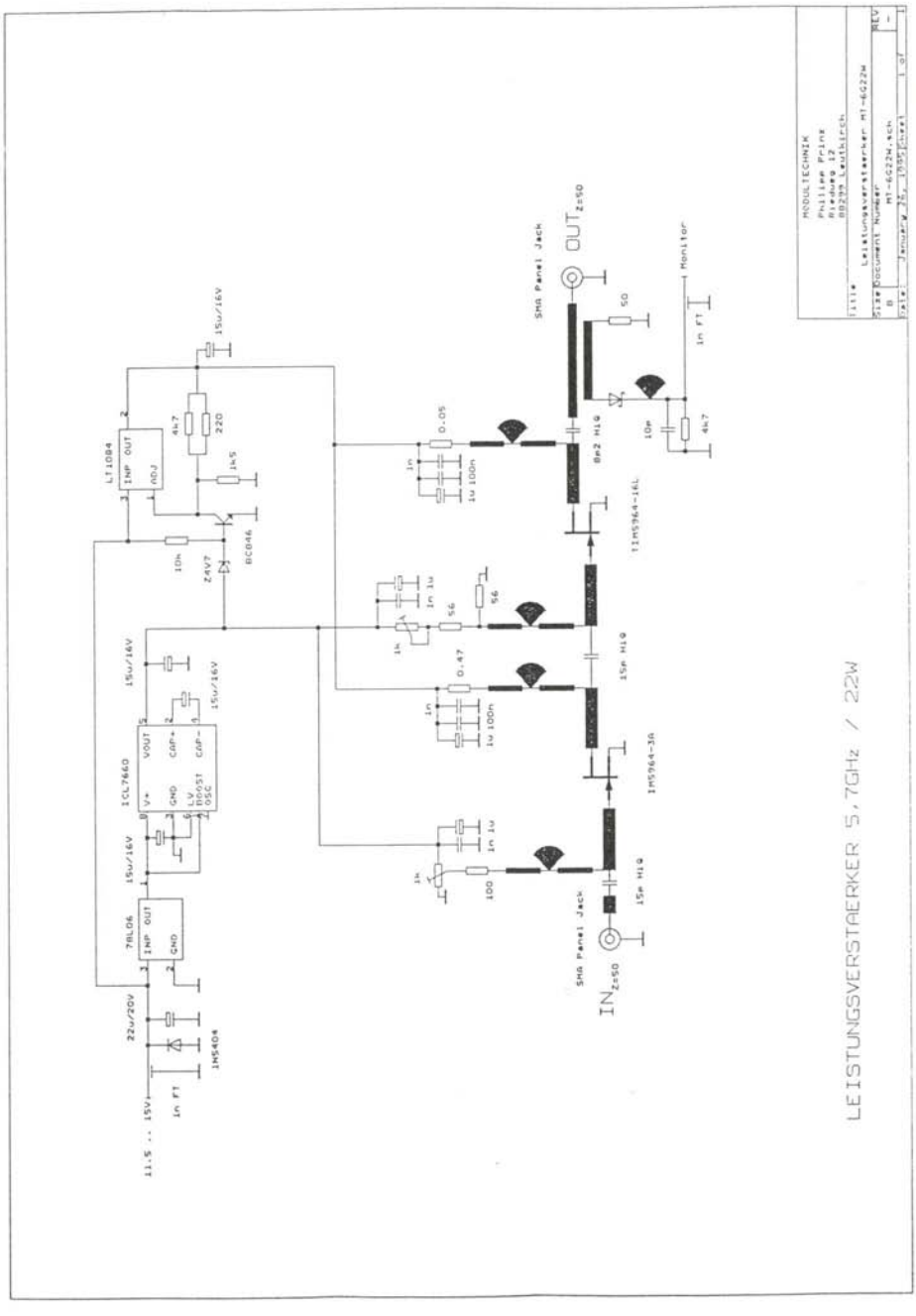
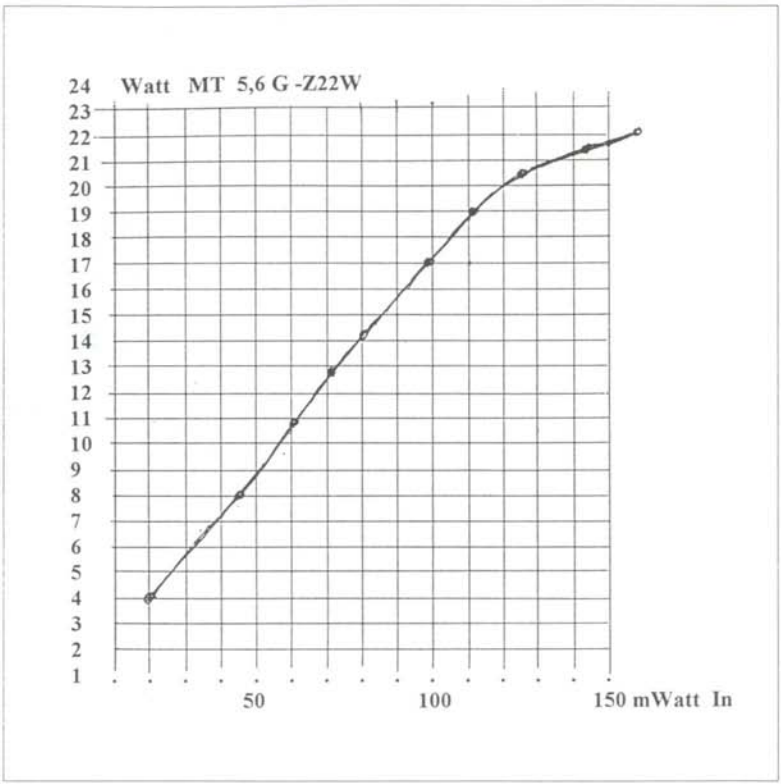


Fig. 1: 6 cm Poweramplifier - Circuit Diagram

Sie wird intern stabilisiert. Ebenso wird die negative Vorspannung intern erzeugt. Die Schaltung regelt bei Ausfall der negativen Vorspannung herunter[1]. Der Ruhestrom beträgt 4,8 A. Die Abmessungen sind 126x64x28 mm.

Figure 2: Output vs Input Power



Description

The amplifier is constructed around power GaAs-FETs IM5964-3 and TIM5964-16L. It provides an output power of 22 W at 1 dB compression.

The PCB is made from 0.79 mm RT-5870 duroid. An integrated directional coupler delivers a power monitoring DC-voltage. Size of the enclosure is 126x64x28 mm. Supply voltage is 11.5...15 V. Supply current is 4.8 A.. All voltages are stabilised internally. A fail-safe circuit[1] for a missing negative gate supply is provided.

6 cm Power Amplifier

Devices:	**IM5964-3/TIM5964-16L**
Supply Voltage:	**11.5...15 V**
DC-Current:	**5.5 A**
Gain:	**21 dB**
Output Power:	**22 W**

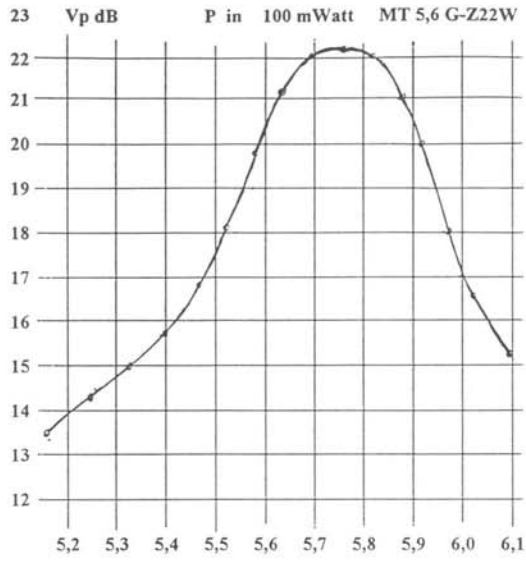
Parts/Teile

Ready made units and parts can be ordered from Philip Prinz, DL2AM, Riedweg 12, D-88299 Leutkirch 3, Tel.: (++49)-7567-294/Fax: (++49)-7567-1200.

Komplette Verstärker und Teile sind bei Philip Prinz, DL2AM, Riedweg 12, D-88299 Leutkirch 3, Tel.: (++49)-7567-294/Fax: (++49-7567-1200 zu haben.

1 *M. Kuhne, DB6NT, "High Power GaAs-FET Amplifier for 9 cm", DUBUS 2/1991, p.7*

Figure 3: Gain Versus Freq.



Microwave Europe

Editor: John Sørensen, OZ1IPU

Dear readers I hope all have had a good holiday! You can now also FAX the reports to me on FAX nr. ++45 98467877

1296 MHz

CT1WW wkd: 2.7.95 0755 EA1BLA IN53UM 59 59, 0845 EB1CPS IN70ES 55 59, 0955 EA1DKV IN53TJ 59 59, 1053 CT1DMK 51 51, 23.7.95 0825 F5ADT IN94WG 52 52 First CT/F on 23 cm. Tks fer info Tiago.

DJ8ES JO43SXwkd: 6.5.95 G4IEV/p JO02, G0VHF JO01, PE0MAR/p JO21, 26.6.95 G8GXP IO93, G4AEQ IO93, G3APY IO93, G8ADM IO91, G3MEH IO91. Tks fer info Wolfgang.

DL7AKL/p JO73AD wkd: 02.07.95 g4oqr/p jo02, g8spe io91, g3ohm/p io82, g4iev/p jo02, g3ckr/p io93, g4nkc/p io82 (1135km), pa0rdy jo22, g0vhf/p jo01, g3xdy jo02. Rig: 100m asl, 4 x 21 LY, MGF1302, 50 W DX 600 km. tnx fer info, Wolfgang

OK1KIR/p JO60LJ wkd: 1.7.95 OZ6OL JO65, PA3FPQ JO21, PA0EZ JO22, PA3BLS JO22, SO3EP JO81, PA0AWN JO33, G4CCH/p IO94, G0SWL IO93, GM0USI/p IO85 1196km first GM/OK, PA0BAT JO31, 2.7.95 PA6C JO33, PI4GN JO33, SP9FG JN99, HG5FMV JN97, OZ9EDR/p JO64, HA5KKU/p JN97, SP9EWU JO90, G4EIV/p IO92, OK3KHE/p JN98, OK3KMY JN88. Tks fer info Tonda.

OZ1IPU JO57GH wkd: 27.6.95 GM0USI/p IO76, GM6VIU IO85, GM4LBV IO75, GM4DMA IO97, 28.6.95 DL8VU JO54, 27.7.95 ES0SM/0 KO17, 28,7,95 SP5CCC/1 JO84, SP1UJU/1 JO84, DC7BJ/p JO62, DL2NUD JO63, 29.7.95 LY95BDX KO05, SK7QJ JO76. John.

PA0BAT JO31FX wkd: 26.6.95 GM4LBV IO75,28.6.95 SM6FHZ JO57, SM6ESG JO67. Tks fer info Gerard.

SM7ECM JO65NQ wkd: 29.4.95 SO1NVI/p JO73, 6.5.95 G0VHF JO01, G4IEV/p JO02, PI4GN JO33, PI4NYV JO32, PE0MAR/p JO21, 28.6.95 SM0LCB/5 JO78, 1.7.95 PI4GN JO33, OK5VHF/p JO70, PA3BLS JO22, G0VHF/p JO01, 2.7.95 PA6C JO33, PI5OZI JO32. Tks fer info Anders.

2320 MHz

DL7AKL/p JO73AD wkd: dl0rcw jo60, db6nt/a jo50, dl0mi jo42, pi4gn jo33. Rig: , 100m asl, 13 cm rig: 2 x 43 LY, MGF1402, 3 W DX 300 km. tnx fer info, Wolfgang

OK1KIR/p JO60LJ wkd: 1.7.95 SO3EP JO81, 2.7.95 PA6C JO33, PI4GN JO33, OL7Q/p JN99, PI4NYV JO32, OZ9EDR/p JO64, OK2KIS/p JN99. Tks fer info Tonda.

PA0BAT JO31FX wkd: 26.6.95 G4LRT IO92, GM4LBV IO75 833km. first PA/GM, 28.6.95 SM6ESG JO67, 30.6.95 LX/PA3FPS/p JO30, 2.7.95 DK2GR JN59. Tks fer info Gerard.

SM7ECM JO67NQ wkd: 17.1.95 SM6ESG JO67, OZ2TG JO65, OZ2OE JO45, 21.2.95 OZ2OE JO45, SM6ESG JO67, OZ2TG JO65, 21.3.95 OZ2TG JO65, 18.4.95 OZ1DOQ JO65, OZ7IS JO65, OZ2OE JO45, SM6ESG JO67, 29.4.95 SO1NVC/p JO73, 6.5.95 PE0MAR/p JO21, 16.5.95 DL6NVC/p JO73, OZ2OE JO45, OZ2TG JO65, SM6ESG JO67, 20.6.95 SO1NVC/p JO73, SM7EAN/7 JO86, LA6LCA JO59, LA8AV JO59, OZ2OE JO45, 1.7.95 OZ7IS JO65, 2.7.95 PI4GN JO33, DL7AKL/p JO73, 18.7.95 SM6ESG JO67, SM7EAN/7 JO87. Tks fer info Anders.

3400MHz

PA0BAT JO31FX wkd: 7.5.95 G3LQR JO02, DL6NAQ/p JO40, DC9BU/a JO40, 26.6.95 G4LRT IO92. Tks fer info Gerard.

OZ1IPU/p JO56 wkd: 7.4.95 OZ1DOQ JO56 first OZ/OZ on 9cm. John.

5760 MHz

DG1VL/p JO61XE wkd: DB6NT/a JO50. DG1VL/p JO70CX wkd: DL5KVD/p JO71, DL1VAA JO61, DL4DTU/p JO61, DL1VFL JO61, DB6NT/a JO50, DB0KI JO50. DG1VL/p JO61XF wkd: DL4DTU JO60, DL5DSY JO61, DL6NCI JO50. Tks fer info Henry.

OK1KIR/p JO60LJ wkd: 1.7.95 OK1AIY/p JO70, OK1UFL/p JO70, OK5VHF/p JO70, DF0CI JO51. Tks fer info Tonda.

PA0BAT JO31FX wkd: 7.5.95 PA6C JO33, 28.6.95 SM6ESG JO67, 30.6.95 LX/PA3FPS/p JO30 first PA/LX. Tks fer info Gerard.

SM7ECM JO65NQ wkd: 17.1.95 SM6EAN JO57, SM6ESG JO67, 21.2.95 SM6EAN JO57, SM6ESG JO67, 18.4.95 OZ1DOQ JO65, OZ7IS JO65, SM6ESG JO67, 6.5.95 PE0MAR/p JO21, 16.5.95 SM6ESG JO67, 20.6.95 SM7EAN/7 JO67, 18.7.95 SM6ESG JO67, SM7EAN/7 JO87. Tks fer info Anders.

10368 MHz

DG1VL/p JO61XE wkd: DL1VAA JO61, DL4DTU/p, DG0JS/p, DL3JSW/p, DB6NT/a JO50. DG1VL/p JO71DB wkd: DL5KVD/p JO70, DL1VFL/p JO60, DH3JSW/p, DL4DTU/p, DF0JS/p, DG0JAG/p JO60, OK1AIY/p JO60.Tks fer info Henry.

DL3NQ in JN49IN wkd: Rainscatter Observations. Period from 1.Jan to 31.Mar: 46 Days (50%) with RS, QRB max. 250 km. Period from 1.Apr to 31.June: 43 Days (47%) with RS, QRB max 380 km. Period from 1.Jul to 31.Jul: 18 Days (58%) with RS, QRB max 620 km. Tnx fer infor Dieter.

F6KVP/p (op. F1OIH) JN18DT wkd: 7.5.95 F6DWG/p JN19, F6CGB JN18, F6DKW JN18, F1GHB/p JN17. Rig: TX 250mW, 48cm Dish. Tks fer info Vincent.

F5HRY/p YI34j wkd: 7.5.95 G3JVL ZK, G3FYX YL, G3GNR XK, F6DKW BI, G4PCS/p AK, G4FCD ZL, G4MAP/p YM. Rig: TX 650mW, RX 1,7dB, 60cm Dish. Tks fer info Hervé.

OK1KIR/p JO60LJ wkd: 1.7.95 OK5VHF JO70, OK1AIK/p JO70, DF0RB JO51, DK3UC JO42, DF0OL/p JO41, DL6NAQ JO40, OE5VRL/5 JN78, SO3EP JO81, PA0AWN JO33 553km ODX, 2.7.95 DF0CI JO51, DC9BU/a JO40, OE2JG/2 JN67, DK0OG JN68, OE5BKL/5 JN78.Tks fer info Tonda.

PA0BAT JO31FX wkd: 26.4.95 DG9NBT JN49 via RS, 6.5.95 G0VHF JO01, 7.5.95 G3LQR JO02, G4XUM/p JO02, DL6NAQ/p JO40, G4PCS/p JO00, 26.6.95 G8APZ JO01, G4BRK IO91, G4FCD IO91, 28.6.95 SM6ESG JO67 679km. ODX, DC6UW JO44, 1.7.95 DK0FLT JN49, 2.7.95 ON4CP/a JO20, ON7WR JO20, DF9IL/p JN48 via RS, DB1VY/p via RS, DF6IY JN49 via RS, DL3NQ JN49 via RS, DL6NAQ/p JO40 via RS. Tks fer info Gerard.

OZ1IPU JO57GH wkd: 27.6.95 Hrd. GM4ISMs beacon on 10368,080 from 20,43-00,55GMT op to 559, 11.7.95 DL5KVD JO64, 28.7.95 DL5KVA/p JO74, DL2NUD JO63. John.

SM7ECM JO65NQ wkd: 17.1.95 SM6ESG JO67, OZ2TG JO65, 21.2.95 DL5KVD JO64, OZ1FDH JO65, SM6ESG JO67, OZ2TG JO65, 21.3.95 OZ1FDH JO65, OZ2TG JO65, 18.4.95 OZ1DOQ JO65, 6.5.95 DL5KVD JO64, PE0MAR/p JO21, 16.5.95 OZ2TG JO65, DL5KVD JO64, SM6ESG JO67, 20.6.95 SM7EAN/7 JO86, DL5KVD JO64, 26.6.95 OZ1UM JO65, 1.7.95 DL5KVD JO64, 12.7.95 DJ5BV JO30, DL5KVA JO64, DL9LW JO52, 18.7.95 SK6YH JO57, SM6ESG JO67, SM7EAN/7 JO87, 20.7.95 DL5KVA/p JO73. Tks fer info Anders.

24192 MHz

PA0BAT JO31FX wkd: 12.3.95 PA3AOH/p JO31FX 3km. my first QSO on 24GHz. Tks fer info Gerard.

47 GHz

F6KVP/p (op.F1OIH) JN18DT wkd: 7.5.95 F5ORF JN18, F5LTB/p JN18. Rig: DB6NT Transverter, 25cm Dish. Tks fer info Vincent.

F1OIH/p JN18DT wkd: 4.3.95 F5ORF JN18DV 4km, F5LTB/p JN18CX 18km. Tks fer info Vincent.

Weltrekord auf 241 GHz.

Zum Millimeterwellenteil des Sommer-BBT am 28.6.95 gelang eine Weitverbindung im 76 GHz Band über eine Distanz von 98 km. DL1JIN/p arbeitete vom Fichtelberg JO60LK 1214m ASL mit DB6NT/p auf dem Döbraberg in JO50TH 800m ASL. Zum Test der Strecke und zur besseren Ausrichtung der Antennen wurden zunächst QSOs auf 24 und 47 GHz gefahren. von 5/2 mit leichtem QSB ausgetauscht werden. Die Wetterbedingungen waren bei sommerlichen 25C und einer Fernsicht von ca. 60km bei wenig Luftbewegung als sehr "Portabelfreundlich" zu bezeichnen. Die Sendeleistung der verwendeten Transverter lag bei ca. 0,1 mW bei SSB und 2mW in CW. Die Empfänger hatten Rauschzahlen von 13 bzw. 9 dB NF. Als Antennen wurden Spiegel mit einem Durchmesser von 30 bzw. 40 cm Durchmesser verwendet. Nach weiteren Verbindungen auf 47GHz mit DG0EB/P und OK1ATY/P sowie DF2CA/P mit dem auch auf 76 GHz gearbeitet werden konnte, wechselte DB6NT seinen Standort auf das Gelände von DK0NA in JO50TI, um mit DF9LN/p in JO50UI zu testen. Dabei gelangen Qsos auf 145 und 241 GHz. Die Signale im 145 GHz Band lagen bei ca. 20 dB, im 241 GHz Band bei ca. 6 dB. Die eingesetzten Transverter arbeiteten mit GaAs- Schottkydioden als Oberwellenmischer. Die Antennen waren 25 cm Procomspiegel mit Subreflektor. Die Entfernung lag bei 2,1km.

Record breaking QSOs on 76 GHZ and 241 GHz

During the Summer-BBT Microwave contest on June 26th, 1995, DX-QSOs were possible on 76 GHZ, 145 GHZ and 241 GHz. First a 98 km QSO was established between DL1JIN/p at "Fichtelberg" in JO60LK, 1214m ASL and DB6NT/p on "Döbraberg" in JO50TH, 800m ASL. This was a new world record but was topped on July 7th by HB9MIO and DK4GD. Weather conditions were temperature at 25°C and still air. Power output of the transverters were 0.1 mW on SSB and 2 mW in CW. Noise figure of the RX were below 13 dB. Antennas used were dishes with 40 and 30 cm diameter. The necessary adjustment of direction was established by previous QSOs on 24 and 47 GHz. On 47 GHZ also DG0EB/P, OK1ATY/P and DF2CA/P could be worked easily. Encouraged by the success on 24 to 76 GHz, Michael, DB6NT and Uve, DF9LN moved to new locations in JO50TI and JO50UI. From these locations a distance of 2.1 km could be achieved on 145 and 241 GHz. Signal level was S3 on 145 and S1 on 241GHz. The QSO on 241 GHz is the new world record on 241 GHz. Equipment used were DB6NT transvertesr feeding 25 cm diameter dishes with Cassegrain feed.

Tks fer info Michael DB6NT.

Microwave: World Firsts and World Records

Band [GHz]	World First QSO			World Record		
	Date	Calls	QRB [km]	Date	Calls	QRB [km]
10	6.V.1946	W2JRM-W2JN	3.3	30.12.1994	VK6KZ-VK5NY	1991
24	14.IX.1975	G3BNL/P-G3EEZ/p	150	3.II.1993	HB9MIN/p-DH6FAE/p	396
47	3.X.1984	HB9AMH-HB9MIN	1	5.X.1994	HB9MIN/p-DF7FJ/p	184
76	30.12.1985	HB9MIN-HB9AGE	0.5	7.VII.1995	HB9MIO/p-DK4GD/p	114
145	12.VII.1992	DB6NT/p-DL1JIN/p	1	2.VII.1994	OZ1UM/p-OZ9ZI/p	11
241	23.V.1993	DB6NT/p-DL1JIN/p	0.1	26.VI.1995	DB6NT/p-DDF9LN/p	2.1

If you have an update or a correction, please write to:
John Sørensen, OZ1IPU, Rosenvej 49, DK-9300 Sæby, Denmark.Tel.: (++45)9846-3311

24GHz Tests at G4KGC/G3WDG

Since installing our 1W "Beacon" we have had a number of successful 1 way tests from home on 24192GHz. The beacon is now installed permantly on the mast, and can be activated on request. The first test was with G3UYM/p at Therfield, who heard the beacon very well over the 45km. path with no problems at all. We also did a test with DB6NT multiplier on its own, throttled back to about 2mW and Harold heard this too, at good strength. Since that test, we optimised the feed position in the dish, winning about 6dB more gain, and have done a number of tests with G3LQR and later with G4DDK, both operating from home. Neither station can detect us under normal conditions, but recent tropo did open up the paths, with signals copied up to 20dB above noise. Also, G3LQR has copied us via rainscatter (with rain in between us). Signals were up to 25dBabove noise. G4DDK has heard us once, by tropo. On all these occasions we were able to copy GB3MHX on 10GHz, which is located quite close of them. We are not able to hear this beacon under normal conditions. We are quite encouraged by these initial tests. Path lengths to G4DDK and G3LQR are in the order of 130-140km. They show that 24GHz operation from home is possible, given the right conditions. The rain scatter results are quite encouraging, as signal levels were good enough for lower power to have been successful also. The 50-100mW optainable from DB6NT technology should be sufficient to make contacts. We have also been heard over a 40km. path with very strong signals, by G3UYM/p, G3PYB/p and G8DKK/p, operating near Letchworth. Things are really starting to happen on 24GHz locally. Tks fer info Charly.

OZ on 9 cm now!!!!

OZ stations can get on 9cm now, with special permission from PTT, to operate on 3400-3410MHz with 50W output, and there are already several stations QRV!!!

New World Record on 76 GHz

HB9MIO/p made an new world record on 76GHZ. After they made a record distance of 80km they looked for a landscape profile to make it better. At last they decided JN36VR 190m asl. to JN47BR 1100m asl. They awaited the right weather and started on 07.07.1995 at 08:00 UTC. DK4GD/p JN47br wkd HB9MIO/o JN36vr 5/1 5/1 **in SSB 114KM !!** After they optimized the antennas on 47GHZ it was no problem to run on 76GHZ. rig HB9MIO/p db6nt transverter 0,1mW, NF 13dB, 50cm dish; DK4GD same rig. wx sunshine sight 20-30km. tnx fer info Ferdinand

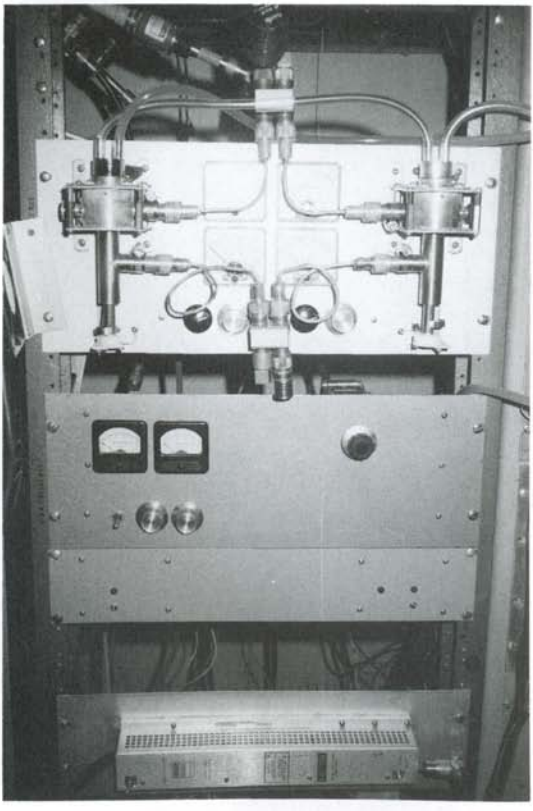
73 John OZ1IPU

Microwave USA

Editor: Kent Britain, WA5VJB

North American 9 cm record.

The mid summer High Pressure ridge that brought 43 deg. C daytime temperatures also brought a new 3456 MHz overland record. WB5LUA worked WA0BWE at a distance of 1354 km. Early morning of July 12th, WB5LUA (near Dallas, Texas) worked WA0BWE (near Minneapolis, Minnesota) on 432 MHz with 59 signals. They quickly went to 2304 MHz for the first Texas/Minnesota 2304 QSO, then to 3456 MHz exchanging 59/449 signals. WA0BWE was running 5 watts, while WB5LUA had 100 watts and a 1.7m dish at 20m.



VE4MA 3456 MHZ PA for EME

9 cm EME Activity

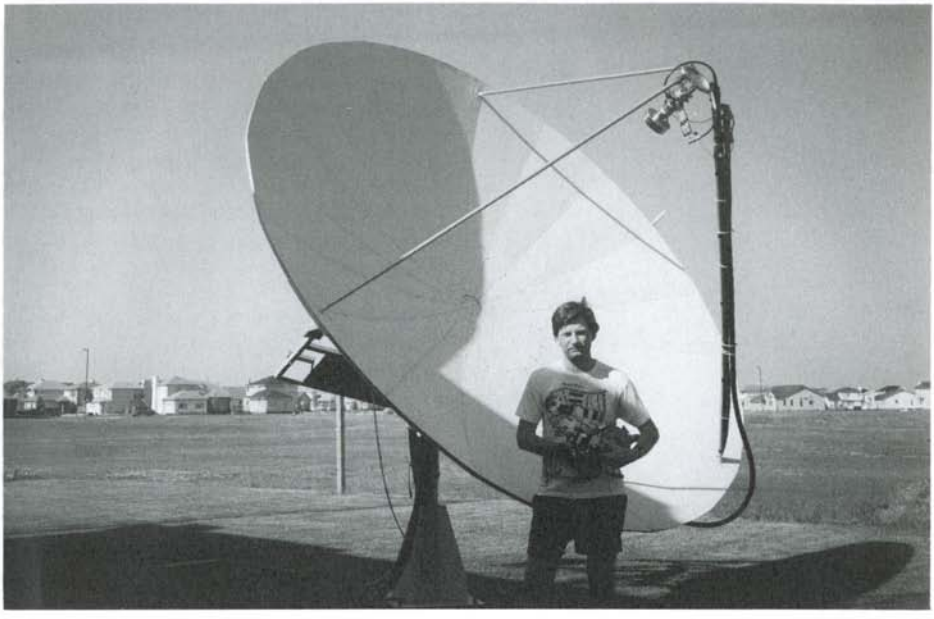
VE4MA and WB5LUA have been conducting EME tests on 3456 MHz and 5760 MHz. Early attempts with circular polarization gave poor results and both have now gone to Horizontal Linear.

June 2nd, VE4MA worked DL9EBL O/O for the first 9 cm EME QSO in 8 years. June 4th, WB5LUA worked DL9EBL M/M and June 18th WB5LUA and VE4MA finally QSO'ed on 9 cm with linear polarization O/O. All three stations are now waiting unit someone else comes on the air, possibly KD5RO or NU7Z.

6 cm EME has been very active. On May 6th, VE4MA QSO'ed DL2GSG, OE9PMJ, and OE9ERC all within one hour! May10 th VE4MA worked OK1KIR for 6cm initial #4. Barry was using a 3.7m dish and a 22 watt solid state amp. WB5LUA has been using a 3.7m dish, 100 watts and a MGA-86576 GaAs MMIC. After upgrading his LNA to a ATF-36077 HEMT, he QSO'ed OE9PMJ July 16th 44/44 on SSB and VE4MA O/O on the 17th. On the 22nd SM4DHN answered a CQ, 449/539 and a sked with OK1KIR was O/O.

10 GHZ in VK

From VK VK5NY reports that there are now 6 SSB/CW 3 cm stations along the west coast of Australia. Paths out to 3000 km have be identified and they are "Hot to Trot" for new records. Several Stations are building 24 GHz narrowband stations and are interested in trying out the High Pressure ridges along Australia's "Great Bight" next summer.



VE4MA 3.7m dish with 3456 feed

MGA-86563

The last issue of DUBUS featured this fantastic "Little" GaAs MMIC. I have personally used this GaAs MMIC in a commercial project and the drawings just don't show how small this device is. The part is about 2/3rd the size of a MGF1302 with 6 leads about a mm long. (I am giving Rainer a sample part). The average amateur will not be able to install this small a device. I suggest using the "larger" MGA-86576.

Microwave Update 1995

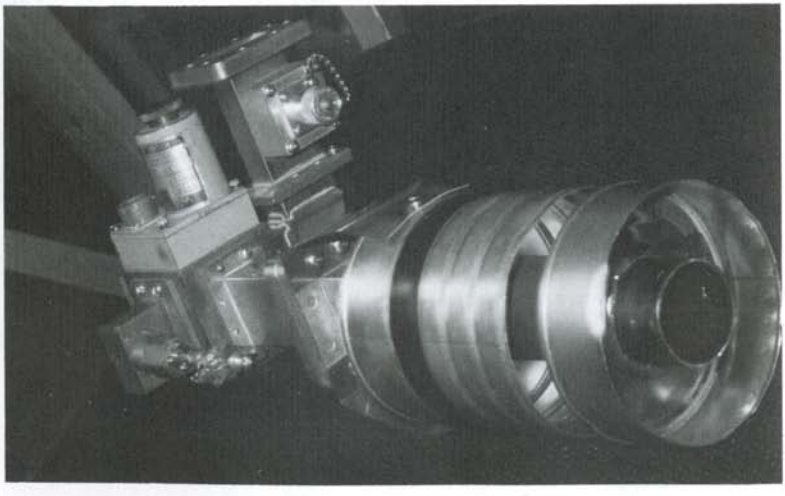
The North Texas Microwave Society is hosting Microwave Update. Speakers will be attending from all over the world covering microwave EME, 10/24 GHz equipment, and many other topics. La Quinta Inn, Arlington, Texas (8 km from the Dallas Airport) October 26, 27, 28, and 29. Contact WB5LUA for registration information.

VE3ONT

The Toronto VHF Society will again activate the 46m Algonquin dish.

Aug 19 1200-1836 UTC 10368.100
Aug 20 0615-1925 10368.100
Oct 7-8 0000-0607 144.100 2306-1013 50.100 and 1296.050
Nov 4-5 0000-0804 432.050 and 144.100

WB5LUA 5 m dish with 3456 feed



WB5LUA: Close View on 5760 MHz Feed and WG Switch

EME News

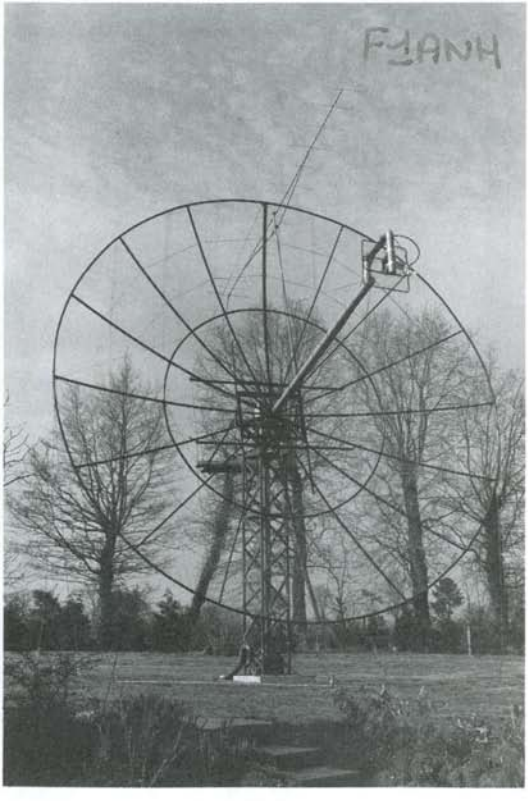
Editor: Bernd Wilde, DL7APV

Intro: Through the summer time not many reports arrived, let your reports and photos come. ARRL EME contest is next, but most europeans will participate IARU Region 1 contest during this time??

144MHz

HB9CRQ wkd : since nov.'94 LU7DZ, JA7BMB, KC4/K6MYC, S52LM, VE1VAS, W6JKV/V2, K9CA, SM7AED, KN6M, PY5ZBU, AH6LE, V31RD, CT3/DL6RAI, I3DLI, G4ASR, IV3GBO, ZF2OC/ZF8 #672 all on random. He is very busy due to qrl, but will be qrv at ARRL all days. tnx fer info Dan

HB9DFG wkd : 17.02. S57TW s, 07.05. I5JUX r, 12.05. JL1ZCG r, 02.07. WA1JXN r, 06.07. DK9ZY #14 r. rig 4x7el 10° fixed el. 3SK97, 550W at feed. Packet: @HB9EAS. CHE.EU. tnx fer info Christian



F1ANH 8m dish for 432-2304MHz

JW0BY wkd : at his final weekend, June 6th IK5UBM and LA9NEA in a, by mistake, dobblesked and last EI4DQ in the final hour. Stefan found it was an interesting experience to make EME in the far north. The conditionswere unfavourable on most weekends in '95, high absorption often kept the signals, particularly from smaller US stations, within the noise. Following new stations were wkd in '95 : W0RWH, JA9BOH, VK3AMZ, DK9OY, DF7KF, LU7DZ, W7HAH, WG8Q, ZS6ALE, W9QXP, UT4EQ, IK1FJI, DK4TG, HB9JAW, F6IRF, W4ZD, K9MRI, N7BNJ, S52LM, K7CA, S51ZO, EA2AGZ, N4GJV, W8WN, UT5EC, SV1BTR, OZ1HNE, WP4G, VE3BQN, JL1ZCG, 9H1BT, JA2JRJ, HB9SUL, WA2GSX, W2CRS, WA2PNW, K2LME, HB9DGX, WA6PEV, CT1WW, DK2PH, KN6M, F9HS, W0HP, PA3CEG, PA3EPD, LA8KV, N0AKC, AF9Y, AA4FQ, W9HLY, K8BHZ, LA9NEA, IK5UBM and EI4DQ. Final score #125, 100 smal, 25 grids, 33 dxcc and 22US States. The 4-yagi system survived the harsh environmental conditions, with not more than a few elements blown off. Stefan has no determined plans to get back on 2m EME in the near future. tnx fer info Stefan

EME-TOPLIST

144MHz

Call	small	SQR	DXCC	States	WASWAC	
I2FAK	393	54	89	50	1993	1988
HB9CRQ	358	53	84	50	1994	1987
DL3BWW	352	52	78	50	1992	1983
UA9FAD	202	37	56	35	--	Yes
SM5BSZ	199	40	63	39	--	Yes
F6IRF	171	29	41	32	--	Yes
UA4NM	111	23	32	21	--	--
EA6VQ	84	22	26	0	--	--
LA0BY	83	27	29	20	--	--
SM0PYP	76	19	28	15	--	--
JW0BY	58	18	23	8	--	--
DL5DTA	37	15	19	7	--	--
DL7AKA	32	14	12	10	--	--
F5HRY	20	0	8	7	--	--
HB9DFG	9	7	6	2	--	--
DL3YEE	6	3	5	1	--	--
OK1KJT/p	3	3	3	1	--	--
DF8LC	?	?	20	0	--	--

432MHz

DL9KR	343	48	76	50	1987	1978
SM0PYP	290	40	50	42	--	1989
DJ6MB	231	34	56	39	--	1984
OK1KIR	224	40	58	43	--	1982
DL3BWW	201	38	59	38	--	1991
OE9ERC	126	0	0	0	--	1993
OK1CA	108	22	25	21	--	--
UA9FAD	104	24	34	26	--	--
YO2IS	99	19	31	21	--	--
SP5CJT	94	24	28	26	--	--
DL3YEE	90	22	32	15	--	--
EA6/DF5JJ	37	15	14	0	--	--
HB9CRQ	20	13	12	9	--	--
UA4NM	12	8	10	4	--	--
DF8LC	9	5	7	0	--	--
F5HRY	4	0	3	2	--	--
ON4KNG	?	?	21	0	--	--

1296MHz

OE9XXI	165	28	33	25	--	1989
OE9ERC	142	23	25	21	--	1993
OK1KIR	101	26	28	19	--	1989
SM0PYP	100	21	26	15	--	1989
EA6/DF5JJ	50	15	18	9	--	--
HB9BBD	49	41	21	5	--	1994
OE9FKI	48	9	17	10	--	--
DF5JJ	13	6	7	2	--	--
DL3YEE	9	6	6	1	--	--

2300MHz

OE9XXI	39	14	16	9	--	--
OE9ERC	30	12	15	7	--	--
OK1KIR	26	10	12	8	--	--
SM0PYP	21	9	11	7	--	--
OE9FKI	3	3	3	1	--	--

5760MHz

OE9PMJ	7	4	6	0	--	--
OE9ERC	4	2	4	0	--	--
OE9YTV	3	2	3	0	--	--
OE9FKI	1	1	1	0	--	--
OK1KIR	1	1	1	0	--	--

10368MHz

DJ7FJ	16	0	13	5	--	--
G3WDG	14	0	11	4	--	--
OE9ERC	11	8	7	3	--	--
G4KGC	9	0	9	2	--	--
OK1KIR	8	5	8	1	--	--

144MHz news

SV9/SV1BTR was active in KM15vg 09.-11.08. on 144 and 432. **K2GAL** had an heard attack and was in hospital, but feels better now. A spanish group will activate **EA9** (IM75hv) in august, 11th to 16th on 144, 432 & 1296, calls will be EA9VHF/EA9UHF EA9SHF. rig : 2m 4x10m y 1K, 432 4 38el 1KW, 23cm 3.1m dish 500w.

432 MHz

OK1KIR wkd : 06.05. JR9NWC #, UR5LX, G0RUZ #, 03.06. K6HXW #304. tnx fer info Tonda

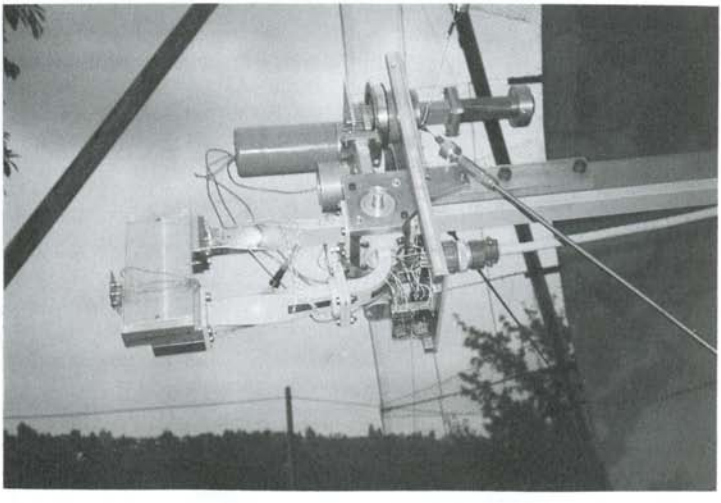
432&up news

EA9 expedition see 2m news.

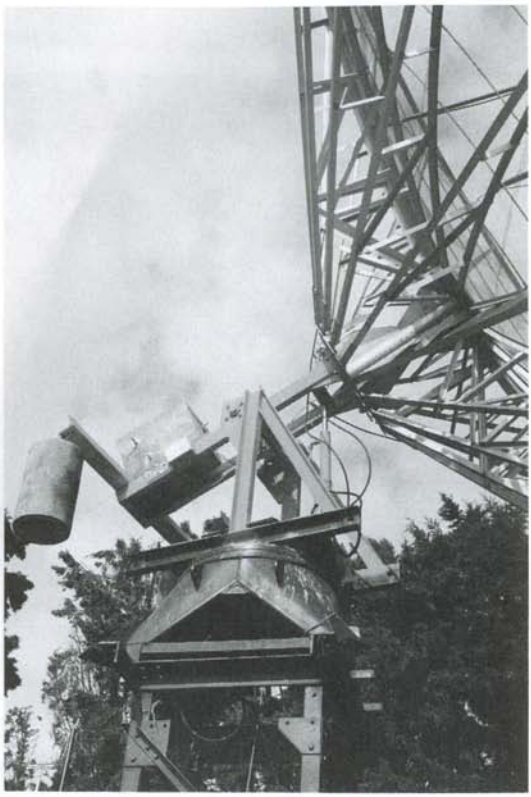
1296 MHz

JW0BY in action

EA6/DF5JJ wkd : 30.04. F1ANH 539/439, 06.05. SM5DGX M/O, DL0SHF 559/549, ZS6AXT O/O, DL9EBL 579/569, KB2AH 569/559, DD1XF M/O, KD5RO M/O, G3LTF O/O, OE9XXI 579/559, 07.05. JA4BLC 539/539, OE9FKI O/O, LX1DB 559/559, KD5RO O/O, HB9SV 569/449, DF3RU M/O, W2UHI M/O, 27.05. W2UHI O/O, KB2AH 55/559, DJ9YW 339/449, DL6YDH 339/449, W7GBI O/O, 28.05. OE9XXI 579/559, 03.06. DL9EBL 57/55, IK3COJ O/O, DD1XF 349/O, ZS6AXT 449/439, KB2AH 579/559, EA3UM 559/559, AA4TJ O/O, DJ9YW 449/449, W2UHI 539/539, OK1CA M/O, OE9ERC 56/44, OZ4MM 559/549, OE9XXI 589/559, W7GBI 339/539, 04.06. DL9EBL 56/55, Dl0SHF 559/449, IK3GHY 449/549, G3LTF 449/549, VE3BQN 339/559, W7GBI 549/549, WA4NJP M/O, 07.06. OZ4MM 559/549, 24.06. KB2AH 579/559, AA6WI 539/539, K2UYH 559/559, 25.06. IK3COJ O/339, DD1XF 539/O, G3LTF 549/539, DF9QX 549/O, ZS6AXT 539/539, HB9SV 569/569, OE9XXI 55/54, AA4TJ 339/539, KD5RO 339/449, G3LQR O/339, WD5AGO 559/439, AA6WI 539/539, W0RAP O/O, W2UHI 449/449, VE4MA O/O, OZ4MM 559/559, 30.06. KB2AH 569/559 & 53/53, 22.07. AA6WI 449/449, KB2AH 579/569, K2UYH 549/559, HB9BBD 539/539, F1ANH 559/559, W2UHI 449/449, 23.07. IK3COJ 329/449, OK1CA



OK1KIR 10GHz rig at feedpoint



F5PL: Dish Construction

O/O, OK1KIR 339/449, OZ4MM 559/559, HB9SV 559/559, DF3RU O/M, SM3AKW 449/559, VE6TA RO/O, VE4MA 339/449. Peters new tel/fax is : ++34-71-534498. He is looking for skeds with stations >= 30KW ERP+elevation. tnx fer info Peter

OE9ERC wkd : 11.03. ZS6AXT, DF3RU #, OK1KIR, OE9XXI, K2UYH, KB2AH, DJ7FJ, AA6WI, F6CGJ, N2IQU, 02.04. NU7Z #, 08.04. KD5RO 549/579 & 43/57 #146, 13.05. S59DCD nil (3m 70watts), OE9XXI 579/579. tnx fer info Erich

OE9XXI wkd: 28.05. EA6/DF5JJ 559/579, DJ9YW 449/559, 03./04.06. JA4BLC 44/56, DL9EBL 57/57, IK3COJ 449/55, KB2AH 57/57, W2UHI 559589, VE6TA 449/449, OK1CA 449/559, EA6/DF5JJ 559/589, W7GBI 559/559, G3LTF 559/579, WA4NJP 449/599, DJ9YW 549/559, VE3BQN 449/559, ZS6AXT 549/579. tnx fer info Peter

OK1KIR wkd : 07.05. G3LTF, SM5DGX #, OK1CA #, DF3RU #, 24.06. OE9XXI, ZS6AXT, KB2AH, 23.06. EA6/DF5JJ, NU7Z #, KB3PD #124. tnx fer info Tonda

2304/2320 MHz

EA6/DF5JJ (JM19lu) wkd : 02.04.95 OE9ERC 559/439, 05.05. OE9XXI 559/549, 06.05. OK1KIR M/O, OE9XXI 449/449, 20.06. IK6EIW 539/O, 24.06. OZ4MM M/O, VE4MA M/M, WB5LUA O/M. tnx fer info Peter

OE9ERC wkd : 02.04. EA6/DF5JJ 439/559 #, 08.04. I6PNN 43/55, OE9XXI 55/54, IK6EIW 449/559 #32, I6PNN 449/O, GW3XYW 549/549, and DF3RU nil. hrd were JA4BLC, JH3EAO and IN3HER. fer skeds Phone 43-5574-7905, Fax 43-5574-79771. tnx fer info Erich

OE9XXI wkd : 03./04.06 IK6EIW 549/449, DL9EBL 569/569 & 56/55 and OZ4MM 559/439 #42. tnx fer info Peter

OK1KIR wkd : 06.05. EA6/DF5JJ #28, OE9XXI, EA3UM #29, hrd JA4BLC on 2424 MHz; nil in sked with JH3EAO. tnx fer info Tonda

5760 MHz

OE9ERC wkd : 06.05. DL2GSG 539/539 #5, OE9PMJ 549/549, VE4MA 339/O, 11.05. SM4DHN 449/549 & 33/34 #6, OE9PMJ 44/44 & OE9YZV 44/44, 12.05. SM4DHN 449/539, OE9PMJ 549/549, I6PNN O/O #7 (3m 25 watts),, OE9YTV 549/549. tnx fer info Erich

OE9PMJ wkd: 03.06. OZ1IPU O/O #8, DM4DHN (549/549, I6PNN O/O #5 and OK1KIR 439/449 #6.

OE9YTV *wkd :* 23.05. DL2GSG 449/549 #4, 03.06. OZ1IPU O/O #5 and OK1KIR 439/449 #6. tnx fer info Peter & Rheinhilde

OK1KIR *wkd :* 06.05. DL2GSG O/O #2, OE9PMJ 449/439 #3, partial VE4MA M/Nil. 10.05. VE4MA #4, 03.06. OE9YTV 449/439, partial I6PMN M/M n cfmd, hrd were OZ1IPU M, SM4DHN O, OE9ERC O, 06.06. SM4DHN 549/519 #5, 22.06. WB5LUA 449/O #6 DXCC 5, hrd OE9PMJ 449, SM4DHN 439 and own echoes "O". tnx fer info Tonda

EA2BK 10GHz feedpoint

European EME Contest 95

Because of a mistake the following results were omitted in last DUBUS. Sri.

10 GHz

Pos.	Call	Points	QSO	Multi	QRO	Sin/Mul
1	**DJ7FJ**	**8000**	10	8	-	S
2	OK1KIR	100	1	1	-	M
3	EA2BK	100	1	1	-	M
	F6KSX	Checklog				

Multiband

Pos.	Call	Points	QSO-Points	Multiplier	Sin/Mul
1	**OE9XXI**	**150400**	4700	32	S
2	JA4BLC	86400	3200	27	S
3	OK1KIR	61820	2810	22	M
4	DJ7FJ	54600	2600	21	S
5	UT5EC	33600	2100	16	S
6	UT1PA	29900	2300	13	S

10 GHz

DJ7FJ wkd : in DUBUS contest 08.04. F6KSX, SM4DHN, I4CHY, G4RFR, EA2BK, OK1KIR, GM4ISM, G3WDG, G4KGC, WA7CJO. tnx fer info Joe. VE3ONT will be qrv 19. & 20. august. 19.08. 12:00-18:36 UTC, qrg 10.368,1. 20.08. 6:15-19:25 UTC.

Last:

Because of my heavy qrl and reconstraction of my house, Klaus, DL4EBY took over the 432&up adress list. So please send your changes to him.

73 Bernd DL7APV

Tropo News

Editor: Joachim Kraft, DL8HCZ

2m > 700 km

CT1WW, IN61, wkd >500km : 1.7.95 EA5CMP IM98LQ. 2.7.95 EA6IB JM09SC, F6HRE IN93LA, EA5DIT IM99CD, EA5GRP IM97FV, EA5DGC IM97FV. 26.7.95 F6HYE JN35BT 1200km, F5UGW JN35BT, F5FLN IN94SR, F9HS JN04GL, F5ADT IN94WO, F1BPK JN03AX, F/G8MBI JN04FT, F1AGL JN14MN. tnx for info, Tiago

DD0BI, JO33RL wkd >700km: 6.5.95 HB9DGX/p JN47. 7.5.95 HB9BHW JN47. 26.6.95 GM4IPK IO99, 26.6.95 OY9JD IP62. 30.7.95 SP2SCH/p JO94, 30.7.95 SP2SCF/p JO94. Rig: FT726 modifiz. nach DD0BI, 4 x 17 ele. tnx for info, Thomas

DD0VF, JO61, wkd: 4.7.95 1520 T72EB. tnx for info, Steffen

DF0NF (Op DK8LV) JO44OJ wkd >800km: 1./2.7.95 HB9FAP/P JN46EW 831, G8LNC/P IO90JO 820, G3ZME/P IO82NN 824, G3NSY IO82NP 821, GW0PZT IO72PT 933, G4GXP/P IO82RJ 809, G8WOX/P IO82RJ 809, G3RHH IO82UB 807, G3NJA/P IO80FP 956, G0IVR/P IO90DV 832, GM0FRG/P IO75DH 958, G6JJP IO82SG 809, G0FYD IO83LS 801, GW3SRT/P IO82LQ 830, G7KEP IO81SF 858, G6GMW/P IO83LU 800, G4OQG IO81XK 822, G4GFX IO82UC 805, EI3GE IO63XD 1010, G7RAU IO90IR 817, G4VPM IO80OW 894, GW6NLP IO83KB 824, G0SUR IO81IR 885, GM7STJ IO66JX 1065, G0EHP/P IO70PP 1028, GW5NF IO81KQ 876, G3TAD/P IO81TJ 844, G4ASR IO81MX 853, G4WSM/P IO81PH 869, G0DRX/P IO71QD 996, G4CQM IO70SK 1024, EI7M/P IO62SQ 1050, G8LJU IO82TC 811, OM3RRC/P KN09CE 951, OM7A KN08BV 968, OK2KYC/P JN99BM 816, SP9YDG/P JO90RM 816, OK2KZT/P JN99GN 834, OK2KCN/P JN89VJ 809, OK2KHF/P JN99EM 829, OL7Q/P JN99FN 830, G8IUB/P IO82LB 854, G7ANB IO81TJ 844, GW0VJS/P IO81EO 912, G4YCE IO81TJ 844km. tnx for info, Stephan

DF0OL/p, Op DK9TF u.a., JO41GD, wkd >700km: 6./7.5.95 OZ6ABA JO57AJ 701, G1FYN IO95FN 814, S57O JN86DT 742, GM4YXI IO87WI 976, OL7Q/P JN99FN 724, G1JKX/P IO85WI 848, IK4MWX/4 JN64CB 834, S53M JN86BS 736, S50C JN76JG 709, SP5BPE KO02MF 868, SP7DSP JO91QI 753, OM3TGE/P JN98DV 739, SN9K JN99JR 742, SP7EBM JO91QR 753, 9A3NI JN65TF 757, S59DZO JN75FO 755, I5PVA/4 JN54II 772, IW3QPL JN65VO 727, IK1HWG JN44DS 709. Rig: FT726R + 2x4CX250 +3x9 ele 835 asl. tnx for info, Jürgen

DJ8ES, JO43SX, wkd: 26.6.95 21.35 GM4IPK IO99IW 930km. 29.6.95 06.12 GM0JCN IO87WA 807km. 7.7.95 21.43 F6IFR JN09TT 713km. tnx for info, Wolfgang

DK8LV, JO44SJ, EO48D wkd: 24.6.95 530-09UT G3KEQ JO01BH 718, G7RAU IO90IR 836, G3LNR IO92JE 754, G6PAA IO92SC 711, G4EHD IO93BS 747, G4DFN IO92GK 759, G0CUZ IO82WM 799, G4AJC IO91VJ 733, G1WPF IO91RP 739, G0RRJ IO91FE 825, G6YAY IO80EF 1005, GU3EJL IN89VR 954, G4VPM IO80OW 914, G3GNR IO70 hrd. Rig: 300w + 17 Ele. tnx for info, Stephan

DK0ALK, (Op DL1GNM etc.) JN38TD, wkd: 6.5.95 DK0PC/P JO54DG 705km, DK5HQ JO53CO 633km. 7.5.95 DF0NF JO44OJ 703km, DL9GJW JO54VC 723, DF0TEC/P JO73CF 730, DL3LBK JO54BJ 716, DL0EO JO44UK 714, DF4YD JO54HF 708, SP3SUX JO72OR 739. 1.7.95 DF0TX JO53CN 629, DL8VU JO54EG 707, OM3KJF/P JN88OI 709. 2.7.95 DF0NF JO44OJ 703, DA0WCY JO44TP 736, G0EMG/P JO02QV 688, G0CDA/P IO93AD 873, DF0TEC/P JO73CF 730, OK1KDD/P JO80FE 680, OM3RMM/P JN88RI 728, LZ6R/P KN33FL

1544, OM7M/P JN98HP 813, DL9GJW JO54VC 723. tnx for info, Mike

DL8BDU, JO43AA wkd >700km: 13.10.94 SP2IQW JO94GM 709. 14.10.94 SP7NJX JO91RR 787, SP5XMU KO02LG 874, SP5TAT/5 KO02RE 909, GW6ZMN IO81HJ 797, SP2RS JO94GK 707. 6.2.95 EB1EHO IN73DM 1461, F1HNF IN97XF 863, F5FLN IN94SR 1110, EA1YY IN73AO 1467. Rig: FT221R, PA 350W, 2X15 Element, VV DJ9BV, 23m asl tnx for info, Klaus

DL8EBW, DL66a/JO31NF, wkd: 1.7.95 1002 OE3XTU/3 JN77kr. 9.7.95 0900 IK4WLV JN54. 15.7.95 1010 HB0/DF0CB JN47tg. 25.7.95 2112 G7ANV IO95ch. Rig: 11 Ele, 350W. tnx for info, Guy

DL0FTG, JO53AP, wkd: 6.8.95 LA/DL7YS/p JO37XS.

DL0UL/p, JN48UO, wkd: 6./7.5.95 DD1LF JO54GE 624 km, HG5FMV JN97KR 687 km, HA5EA/4 JN97HE 684 km, HA7KXI JN96TW 764 km, HG7B/P JN97KW 683 km, 9A3B JN95FQ 737 km, 9A5Y JN85OO 659 km, DK4LI JO44WQ 677 km, OZ6HY JO45WA 714 km, OK2KDJ/P JN99BM 622 km, G0VHF JO01PU 700 km, DF0NF JO44OJ 646 km, PA/DH8KV/P JO23IB 608 km, OK2BPN/P JN99BM 622 km, SP9EWU JO90NH 707 km, SP9YBT JO90NH 707 km, G4CLA/P JO00HV 701 km, DL8VU JO54EG 633 km. tnx for info

I4YNO, JN54KP, wkd: 28.5.95 DF7KF JO30GU. 5.7.95 DK2PH JO41GV. 9.7.95 ON4QQ JO20FS, SV8/IV3CWI JM99VQ Corfu, 884km, his rig: 25w + 17 ele. 16.7.95 IW9DRY JM67LX, DL1KDA JO30FQ, DF7KF JO30GU. 20.7.95 EA7/DL3MGL IM96AX 1374km 579, new Tropo-ODX, EB5MS IM99RK 1105km, EB3DYS Jn11CK 789km, EA5/F1NGP JM09BF 1073km. 21.7.95 EB5IFI IM99WU 59 1050km, EA5IC JM98VX 599 1113km, EA5GIW JM08AU 1105km. 22.7.95 DL3BWW JO72 899km, DK8ZJ JO30IX, ON4ANT JO20AR 848km. Rig: 3CX800 + 20 ele Shark. Grazie Della!

I8/IK8TOY, JM89AG wkd >700km: 8.1.95 I5/IK5ORS JN54BC 728km. 22.4.95 I5/IK5OJB JN54NP 723km. 23.4.95 I5GBZ JN54VV 717km. Rig: 100w + 17 ele. tnx for info, Antonio. IK8TOY, JM89CH wkd 700km 2m: 13.12.94 IW1AZJ JN35UB 948km, I1JTQ JN35UB 948, F6HTJ JN12KQ 1181, EA3GHU JN12KA 1165, EA3GFB JN12KA 1165km. tnx for info, Antonio.

IT9VDQ/IT9, JM68QE, wkd >700k: 6.5.95 IW1PDP JN44WC, IK2CFR JN45PR, I1BPU/I1 JN45DR, I5PVA/I4 JN54IE, I1MXI/I1 JN44SN, IW1QNQ JN44HJ, IW1PNJ JN33VT, F1BAV JN33OQ, IW5BHU/I5 JN54BC, IK1DBM JN33UT, IK1IXF/I1 JN44VC, IK1LGV JN44JK, S59DGO JN75FO, 9A1HST JN75BA. 7.5.95 I1AXE/I1 JN34QM, IN3AYO/I3 JN55NQ, IK1PCA/I1 JN44SN, IW1AVF/I1 JN44IX, IW1ECL/I1 JN35TK, EB5BGS/P IM98TL, EA5FD IM99UL, EA6VC JM19NI, EA6IB JM09SC, IT9AAI JN67LX, IW1ECO/IX1 JN35ST, EA5FWS/5 IM99MH, EA5KB IM99TL, EB6YY JM19IM, EB5BSC IM99SL, IX1IJL/IX1 JN35LU, IW1DDK JN45HA, I1SCL JN33UT, IW1QM JN44WC. tnx fr info Gius

KH6HME, Mauna Loa volcano, Hawaii wkd 2m: 1.7.95 W7FI, Woodinville, Washington, near Seattle, distance 4333 kilometers. NEW WORLD RECORD! The previous record was set between KH6HME and XE2GXQ, on Baja California, a distance of 4276 km, on July 13, 1989. This tropospheric ducting opening began June 28 when the 144.170 MHz beacon on Mauna Loa, 13,680 feet (4170 meters) above sea level, was heard on the West Coast. In the early evening of June 30, KH6HME worked WI7Z and N7KSI, both near the coast of Washington, the first ever 144-MHz contacts from that state to Hawaii, and then worked N7AVK, in Oregon. The breakthrough came the next day, at 0600, when KH6HME worked several Seattle-area stations, beginning with W7FI, and was heard by VE7SKA, who could not make himself heard in Hawaii. Unfortunately, the conditions did not extend to higher bands; KH6HME made 432 MHz contacts with K6QXY and W6SYA, but no others were completed.

LZ1KWT, (Op LZ1DP) KN32AS, 1530m asl wkd >700km: 6.5.95 HA5MTV/4 JN97HV 764km, HG6V KN07AV 737, 9A2KI JN95AD 701, S50C JN76JG 971, HB7B/p JN97KW 801, S53M JN86HS 865. 7.5.95 S59DGO JN75FO 974, HA5DKQ JN97LN 769, S57C JN76PB 927, S51WC JN75PS 917, S51WV JN76PO 949, HA1VHF JN87GF 895, 9A1EZA JN86HF 839,

HA1VHF JN87GF 895, 9A1EZA JN86HF 839, HG7KLF JN97WW 749, S57O JN86DT 890, S51TJ JN86TN 924, 9A1CAH JN85JO 801, HA5PT JN97MK 755, HG1Z JN986KU 853, PA3BGM JO22EK 1935km (may be MS?), IK7UXY JN90DC 710, I7FFE/7 JN80OW 759, 9A1CHB JN95AE 700, I7IWN JN90DE 706, X5IC JN84ST 718, we heard: 0515 DL1SDN, 0528 DF9US/p, 0630 9H1BT. EUs pse turn ur beams to LZ during contests from time to time! tnx for info, Christo

OE1XTU/3, JN77KR, wkd >700km: (Ops OE1TKW, OE1REC, OE3LHC, PE0WGA, OE1MCU, Rig: 1kw, 18 Ele) 7.5.95 DK0VH JO31HB 702 DG3YGV JO31NP 707, DL0WWG JO31GF 716, DF0FJ JO42FS 722, DG1BA JO43LB 726, DL0KM/P JO31HL 726, DL9GJW JO54VC 741, PI4NYV JO32FI 790, PE1PRG/A JO21RK 793, PA0JED JO22WA 801, PA6C JO33FB 840, PI50RCG JO22PE 845, PI4GN JO33KK 849, PI4ZN JO33KK 849, PI45KGL JO22GE 889, PA3BIX/P JO23OK 931. 1.7.95 ON8JC/P JO20XL 717, DL0LNP/P JO31PW 717, OZ9EDR JO64GX 822. PE1NIE JO22LJ 876. 2.7.95 DK0VH JO31HB 702, DD0EM JO31HB 702, DB4ES JO31HC 704, DL1EJD JO31JG 704, DG3YGV JO31NP 707, DL0WWG JO31GF 716, DJ6XV JO31LQ 719, DL0GL/P JO31KP 721, DC6SN JO30BU 723, DJ3XK JO53AN 732, DL9GJW JO54VC 741, DL3EBM JO31CQ 762, ON6NL JO21UE 765, SP2JXN/P JO94DK 783, PE1PRG/A JO21RK 793, PE1OGF JO21QJ 796, PA3BUT JO21VX 804, PE1AHX JO21OS 826, PI50RCG JO22PE 845, PA3CNX JO22MC 855, OZ5BAL/P JO55KR 931, SM5BSZ JO89IJ 1303. tnx for info, Michael

SM6USS, JO67AT wkd: 28.6.95 ON2AKC JO10TX 935km, ON4AFO JO10PV 956km, ON4AIQ JO20 866km, PA3GEM JO11WH 895km, PA3FPQ JO21UX 765km, PA0PVW JO21VX 763km, PA3FTX JO21DN 856km, PE1OGF JO21QJ 833km, PE1NHA JO21SS 791km, PA0QC JO22QD 761km, PE1MZE JO22OQ 716km, PE1NTE JO22OG 755km, PE1PMM JO22OG 755km, PE1OOY JO22IH 770km, PA0JUS JO22OO 724km, PA3EFC JO22HA 800km, PE1PIY JO23TD 659km, PA3GWF JO23TE 655km, PE1OPK JO23VD 652km, PA3GTL JO23VE 648km, PA0BVD JO23TF 651km, PE1PNS JO23VE 648km, PB0ANS JO32KG 699km, PE1PQV JO32KG 699km, PA3EAP JO32FO 680km, PA3FJY JO32EH 711km, PA3GFB JO32FM 688km, PA0JIM JO32HD 719km, PE1PJG JO33NA 617km, PE1NSM JO33EJ 607km, PE1OID JO33KI 593km, DB1OM JO42UN 603km, DB8WJ JO43TH 524km, DJ2OQ JO43BN 533km, DL9ST JO43UQ 482km, DG7LAZ JO43UR 478km, DG3XA JO43XK 504km, DG5BD JO43HM 524km, DG8BCM JO43PM 508km, DJ8FR JO44WG 417km, DJ7OF JO51HQ 688km, DC3XH JO53AI 512km, DL3SWS JO53SG 507km, G4RKV JO01OI 1001km. 29.6.95 G0BPS JO01OC 1023km, G6TTL JO01NI 1005km, G4SWX JO02PB 938km, ON4QQ JO20FS 925km, PA3EQK JO22HG 777km, PE1NTE JO22OE 763km. Rig: 15w +6 Ele, 95m asl. tnx for info, Dennis

SP2IQW, JO94GM, 17-el., 50W, 100m asl,, wkd SSB: 23.9.94 LA2PHA JO38IB 827 13.10.94 DH6DAO JO41BN 769, G4RRA IO91OF 1342, PE1NTE JO22OE 920, DG5DBV/P JO41DM 761, G4WOX JO01OI 1209, G1AWF IO91UN 1296, G7ANV IO95CH 1297, DL8BDU JO43AA 709, PA3BRJ JO32LF 808. 14.10.94 G4UDE IO82KT 1433!, G8GXP IO93FQ 1307, G4KUX IO94BP 1310, DB6BX JO32OK 783, DL1BCT JO32MK 794, DG9DBV JO33PE 751, PA3AJG JO32ON 778, DG9BDV JO33PE 751, LA4YGA JO48AE 763, G4KUX IO94BP 1310, DB8WK JO33EN 800, LA4YGA JO48AE 763, UT3BW KN29UA 784. 2.12.94 SM2UVK KP03DT 1037. 3.12.94 OH2TI KP02KE 862, OH1CO KP10BN 704, OH3LWP KP11WK 830, OH1AYQ KP12MA 873, OH1LEU KP01VF 769, OH3KVZ KP12LA 872, SM4UKC JP70GL 703, SM2PDN KP03CT 1037, OH3MFT KP11RK 821, OH6WP KP23WC 1041, OH3XA KP20DT 777, OH2KKP KP20MH 751, OH1AU KP10DL 699, SM3UZS JP92FW 935, OH1AYQ KP12JB 873, OH1NNW KP11EU 845, OH1XT KP01UL 795, OH6MTE KP02XC 865, OH4YA KP42GJ 1048. tnx for info

SP9ZDN/7, KO00GM, wkd: QSO 1000 km: GW3SRT/p IN82LQ 1639km, G3ZME/p IO82NN 1628km, G0CDA/p IO93AD 1567km, G4FKA/p IO93AC 1566km, G8FCQ/p IO92MO 1498km, G0EMG/p JO02QV 1343km, PA6C JO33FD 1007km.Everybody who need SP9ZDN/7 QSL pse send your QSL via:SP9TCE, P.O. BOX 246, 44-122 Gliwice 22, POLAND

UA3TCF, LO26IU wkd: 1.7.95 UR4EZM/UU5J KN74EU 1517km, UU2JWA KN64XX 1518km. Hrd: UR3EE, UT1E, UR4QWE, UX7LT. tnx for info Alex

70cm >500km

CT1WW, IN61 wkd: 1.7.95 EA1DDO IN62RJ, EB4TT IN70XJ, EA1YV IN52QF, EA1ANJ IN52QF, EA4CAV IN90BT. 2.7.95 EA1BCB IN63IF, EB1EVP IN63LD, EA6IB JM09SC **(FIRST CT/EA6!)**, EA1BLA IN53UM, EA2BL IN92PU, EB1CPS IN70ES, EA1TA IN53, EA1DKV IN53TJ. 23.7.95 F5FLN IN94SR, F/G8MBI JN04FT, F5ADT IN94WG. tnx for info, Tiago

DD0BI, JO33RL wkd >500km: 24.6.95 G8GXP IO93. tnx for info, Thomas

DF1IAZ/P, JN49RB, wkd >500km: 6./7.5.95 DC2XG JO53CN 503km, DL0LH 51 006 55 006 JO43XO 506 DK5HQ 53 008 56 006 JO53CO 508 DK0FFO/P 53 205 55 098 JO72BO 512 DL3BWW 59 208 58 049 JO72GI 512 DK6HA/P 53 030 55 007 JO43UQ 515 PA3BLS 53 013 57 010 JO22NT 516 OE3JPC 539 136 599 050 JN88ED 518 PI4GN 53 147 55 197 JO33KK 519 OL7M 55 127 59 097 JO80FG 521 OK2PWY/P 519 051 559 031 JN89IW 532 DJ8ES 53 108 57 013 JO43SX 547 S57C 559 151 599 086 JN76PB 550 PA/DH8KV/P 41 173 53 033 JO23IB 555 S53M 59 128 59 062 JN86BS 558 OM3LQ/P 599 249 599 069 JN88OP 569 DF0NF 59 137 59 182 JO44OJ 593 OM3KEE 559 248 529 126 JN88UU 602 G4CAL/P 55 120 54 145 JO00HV 663 HG5FMV 419 247 559 081 JN97CN 668 G3CKR 55 217 51 197 IO93AD 916 rig: 400W, 4x 21ele F9FT, 580 m..NN tnx for info

DJ8ES, JO43SX, wkd: 26.6.95 19.12 G4NPH JO02BI 652km. 29.6.95 06.22 G6URX IO95EA 729km. 11.7.95 18.15 SK7CA JO86DQ 522km, 18.18 SM7EAN JO86FJ 514km, 20.00 LA8AV JO59MA 568km. tnx for info, Wolfgang

DL4KG, JO31MB, wkd: 5.2.95 G3WHK IO91 514, G4NPH JO02 504, G3NNG IO91 614, G0TDF IO92 635, G3PIA IO91 590, G4UDE IO82 730, G8XVJ IO83 711, G3OHM IO92 643. 6.2.95 EA1NU IN73 1272 ODX, F6APE IN97 694, F6CRP IN96 811. 4.3.95 G1MDG/p IO91 544, OE5VRL/5 JN78 598, OE5XDL JN78 578, G1DSP/p JO03 524. 19.3.95 OZ2OE JO45 568. 22.3.95 G3GNR IO70 785, G3JHM IO91 566, G0GMS IO91 514. 23.3.95 G3GNR IO70 785, G3LNR IO92 603, G2CIW IO81 677. 2.4.95 I4JED/4 JN54 799. 27.4.95 G7RRD IO92 525, G8GXP IO93 653. 30.4.95 G0RUZ IO93 638. 6.5.95 G1HWY IO90 524, G4DSP/p JO03 524, G4SIV/p IO92 543, OE5MKM JN78 596, OE5VHL JN68 557, OE5VRL/5 JN78 598, OK1VMS/p JO70 527, G3CKR/p IO93 659. 7.5.95 OL7M JO80 672, DF0TEC/p JO73 547. 9.5.95 OZ9EDR/p JO55 584, OZ7AMG JO65 628. 20.5.95 G8KGI/p IO90 562. 31.5.95 G3KPV IO91 566. 4.6.95 F8KCF/p JN25 581, F6APE IN97 694. Rig: 100 W + 2x20 Ele. tnx for info, Gerald

DL4MDQ in JN58rp wkd >500km: 13.6.95 OZ1DOQ/p JO64. 17.6.95 PI4KGL JO22. 18.6.95 mni HA,9A,S5,OK,OM and HG5FMV JN97, 9A6A JN74, 9A3B JN95. Die 70cm-Aktivität in 9A scheint sich wieder zu normalisieren. Auch von der Küste sind wieder mehr Stationen zu hören. Hoffentlich ist in T9 auch bald Ruhe, damit die T9-stn auf 70cm gearbeitet werden können... 20.6.95 SO1NVC JO73, DL8BDU JO43. 27.6.95 DL6NVC/p JO73. 2.7.95 DF0NF JO44, ON4CP/a JO20, PA6C JO33, PI4GN JO33, HG5FMV JN97, PA3BPC JO21, OM3KHE/p JN99, SP9EML/p JN99, DL7AFB/p JO73, DL8BDU JO43, PI4NYV JO32, PE1PRG JO21, SO3EP JO81, SP9EWU JO90. 8.7.95 DL6NVC/p JO73. 9.7.95 PA6VHF JO33. 11.7.95 OZ9EDR JO55ul 760km. tnx for info, Max

DL7AFB/p, JO73AD wkd: 01.07.95 g4gcm/p jo02, g0nhr/p io93 02.07.95 g8xvj/p io93, g6zme/p io82 (1135km), g3sdc/p jo02, g0roc/p io83, g4bbu/p jo02, g7sac/p io93, g0tiw/p io91, g8ohm/p io82, g0vhf/p jo01, g6apz/p io94, g0jrb/p io94, g4tvr/p io92, g4age io93, g3iub/p io82 (1157km), g7fox/p io92, g6krc/p io82, g3ral/p io92, g4caa/p io92. Rig: , 100m asl, 70 cm rig: 3 x 19 LY, 3SK97, 200W DX 800 km. tnx fer info, Bodo.

DL8BDU, JO43AA wkd >600Km: 21.9.94 DL1MBV JN57UX 617. 1.10.94 DJ5MN JN68DG 607, HB9SUL/P JN47PH 641, DF7ZZ/P JN57GN 632, OK1OEA JO80FG 655, SP6MLK/P JO80JG 676, SP2DDV JO93AC 667. 13.10.94 F5NS IN99TH, SM6GXV JO58RG. 14.10.94 SP9EWU JO90NH 820, SP5XML JO92UN, G3KPU IO93MN 600, SP1NQN JO84ML 613.

15.10.94 G3RHH IO82UB 706, G8HUY IO90MW. 6.2.95 F6CRP IN96KE 1005, F6APE IN97QI 881, F1HNF IN97XF 863, F5FLN IN94SR 1110. 4.3.95 DK0OG JN68GI 607. 5.3.95 G1MDG/P IO91PQ 612, HB9/IW2DVK/P JN47PH 641, OE9HHV JN47UJ 636. Rig: FT790R, PA 200W, 8x20 Element, VV DJ9BV, 23m asl. tnx for info, Klaus.

G4GCM/p, JO02QV wkd >800km: 6./7.5.95 OK1KRQ/p Jo60 844, DF0TEC/p JO73 856, SMM7PI JO65 801, SM7ECM JO65 821, SM7CSJ JO65 827, SP1NQN/1 JO84 1055, DL1KUS JO63 813, SM7BCX JO65 845, DH8BQA/p JO73 856, SP1UJU/1 JO84 1055, SP2DDV JO93 1112, DK0FFO/p JO72 857, DL7VBW JO62 807, DL2JDX Jo60 806, DL1BWW JO72 889, DF0BT JO62 807, SP3BRF JO71 958, SP3DRT JO91 1149, OM3KEE JN88 1226 (ODX), OK2KKW/p JO60 833, DL3JIN JO60 820. Rig: 400w + 4x28 ele + 4 x 21 ele. tnx for ino, Bob

I4YNO/4, JN54OK, 440 m asl, Monte Capra wkd >600km: 6.5.95 DK0FLT Jn49WS 602, OM3KEE JN88UU 698, OL7Q/p JN99FN 792, DL6NAA JO50VF 646, OK1KPA JN79US 684, DF1VW/p JN39NR 665, DG3FK/p JO40XL 679, OK2KKW/p JO60JJ 674. 7.5.95 OK2BPN/p JN99BM 771, OK2WDC JN89PO 737, OK2KDJ/p JN99BM 771, OM3LQ/p JN88OP 656, OK2ZZ/p JN89DE 655, DF0SO JO60BE 644. 3.6.95 OM3KRN/p JN98BI 686, DH0JAK/p JO50XL 675, SP9EWU JO90NH 884km (ODX), OK2KFM JN99FN 792. 4.6.95 Ok2UFB/p JN89OU 754, DF0CI JO51CH 769, DL6NCI JO50VI 660, OM3CQF/p JN88RT 682, F1BRV/p JN16MS 686. 1.7.95 OM5MX/p JN98CG 686, OM5M/p JN88SS 683, F6KCI/p JN07JO 878, F1CYB JN17XT 673, OK2PWY/p JN89NX 761. 2.7.95 HG7B/p JN97KW 707, OM3RMW/p Jn98GJ 714, DL5FN JO40FB 659, OL7M JO80FG 760, F1DRO JN29XK 684, F6CTJ JN06XO 760, F5DQK JN18OR 775. Rig: 3CX800 + 8 x 25 ele Shark, 4 x 21 ele Tonna. I am qrv for skeds on weekends and contests via PR: I4YNO via I4EUM or phone: ++39 59 236243 after 19z. tnx for info, Alex

PA0WWM, CM63g, JO22, wkd >500km: 26.6.95 GM0/PA0HTV/P YQ08G, GM4LBV XP03G, GM1TDU YR70G, LA1ZE CS29F, OY6FRA WW77F, GM0USI/P XQ71. 27.6.95 OY9JD WW77F, GM4TXX YQ37G, G8PWX ZP73E, G1HXH ZP63G, G4RST ZP62B, LA6LCA FT63G. tnx for info, Wim

SP9EWU, JO90NH wkd: 1./2.7.95 9A3LN JN95CS 509, S51S JN76GB 581, S52KD JN76EK 555, S50D JN76QK 512, YU7ECD KN05FT 510, PI4GN JO33KK 908, G4GCM/p JO02QV 1255, PA6C JO33FB 923km, G6ZME/p IO82NN 1538, DF0OL/p JO41GD 750, G6APZ/p IO94WC 1372, YU1BFG KN04OO 653, 9A2SB JN95GM 534, 9A1CBE JN86BE 509, YT7G JN94SG 672, S50C JN76JG 552, 9A3B JN95FQ 516, S59DGO JN75FO 628, S57C JN76PB 551, 9A1W JN75RS 573, DL4MDQ JN58RP 583, I4YNO/4 JN54OK 883. tnx for info, Wojtek

UA3TCF, LO26IU, hrd via tropo: 1.7.95 UR4EZM/UU5J KN74EU 1517km, sorry no QSO. tnx for info, Alex

6m News

Editor: Joachim Kraft, DL8HCZ

D44BC (Op GJ4ICD) wkd: 6.6.95 1935-2000 DK2PR, DJ9KG, DJ8ZJ, DL1NTC, DL5BAC, DL8HCZ, DJ9YE.

DF9CY, JO54AL, wkd: 19.6. ER5OK, ER1LW, CT1, HB9, F, UX0FF, LZ, EW7IM, GW. 1.7. EH1, Sued-DL, HB9, OE, I, IS0, F, EH5, YO7, LZ. 2.7. R3VHF, ER5, T97V, OY, 9A1, CT1, EH1. 6.7. 2115 VE1ZZ, 2135 VE1YX SSB. 7.7. 1303 VE3RM, -- QRL now; missed THE opening --- 2136 VE9AA, hrd: K8OO. 8.7. 1105 Band opens to USA on 28 MHz first sigs hrd, 1108 W3JO hrd with QRZ, 1130-1228 wkd: WA3HMK FN10, K3ZO FM18, W4DR FM17, W4MYR FM07, N3AHI EM74, WA2FYA FN20, WB4WTC EM95, K1DAT FN42, WA4VCC EM94, K8MFO EN90, K2ZRJ FM92, WA2UDT FN20, W3JO FM29, W3IWU, no sigs then hrd and QRT because QRL on weekend. ALL wkd in CW. Sorry I missed the other openings because of QRL ... So far 350 QSOs on 6m this year. tnx for info, Christoph

DJ2XS, JO53 wkd: 19.6.95 1407-2135 ER1LW KN46, LZ2FT KN34, UX1MF KN98, HA8BE KN06, ER5OK KN46, CT1DDW IN60, EI4DIB IO63, LZ2UU KN12, UX0FF KN45, LZ2FT KN34, ES2RW KO29. 20.6. 1335-2027 YO9IE KN34, UT8AL KO61, SP9HWY JO90, UX1MF KN98, ES2RW KO29. 30.6. 1030 C31HK JN02. 1.7. 0530-1217 4K6D LN40, EH7FTH IM87, EH5/F1NGP JM08. 2.7. 1920-2015 5T6E IL30, F6DKP IN97, SV1AHX KM18. 3.7. 0850-1930 ES5QA KO38, EH8BPX IL18, EH8ACW IL28. 21.7. 1340-1450 T72EB/A JN63, YO9IE KN34, SP6GVU/8 KN19. tnx for info, Mat

DJ6TK, JO53FG, wkd: 8.7.95 1206-1212UT K3GJ FM17 hrd, K8MFO EN90, WA8DXB EN91. tnx for info, Wilf

DL1OY, JO31, wkd: 6.7.95 S55ZRS, 50.013 MHz, JN76MC hrd. 7.7.95 1825-2115 UT: K8ZES FN02, K3ZO FM18, K8MD EN82, WA1OUB FN45, W3ZZ FM19, VE1ZZ FN84. tnx for info, Helmut

DL3AMA, JO51ND wkd: 10.6.955 1304-1930 9A17ST JN83, EH1NV IN73EM, EH2BUF IN93, 4X1IF KM72AN, R3VHF LO16, ES5DE KO38, OH2LXY KP20KE, ES2RW KO29NI, OH3BNP KP20KR, OH1AJ KP10. 11.6. 0812-1818 EH7KW IM67, YU1ABA KN04, I2WSG JN45PB, IK1LLD JN44CG, I4YNO JN54KP, UX1VT KN68RV, IT9LYF JM68QC, OY9JD IP62AO, G1IOV IO91KI, IK7LMX JN80XP, 16.6. 1800-1858 GW4LXO IO81, GM3JFG IO77XR, G3RDQ IO91GD, G0PZO IO83LJ, G4ALY IO70UL, G3GIQ IO91UM, G4FUF JO01GN, G1TMD IO91XJ, G7GKD IO91CE, G1UKG JO01AL, G0LAM IO91SK, G8DCJ IO92DA, F1DLJ JO10HA, F1CNB JN09DM, F1EZA IN99TD, F1OYB JN19BF, F5IL JN09NF 17.6. 1656-1818 IK5RLP JN52LR, I4CIL JN64, I5CZP JN53PN, IK8AUC JN71EB, 18.6. 0957-1134 IT9IPQ/p JM78, IS0AKP JN61, IS0QDV JM49PF, IW9BTB JM77, IT9KSS JM68, IT9EWG JM68, IK7FBE JN71, EH3EM JN11CM. 5.7. DF6NW JN59LL. 6.7. EH3DUW JN12LG, YT1AU KN04CP, S59A JN76XP. 7.7. EH5DY JM08. 9.7. EH6VQ JM19. 10.7. GI6FHD IO64SJ. 11.7. YO9IE KN34AW, S59D JN75SW, 9A2WM JN74OC, GM4WJA IO87IP, GM4IGS IO75QM. 14.7. GM4ILS IO87IP. 15.7. IK0OZD JN61, SV7CO KN20WU, IK8EVE JN71HN, YU1RK KN??, T93M JN93EU, PA2VST JO21UL, SV1CER KM17, S52QR JN75OO, 4X1IF KM72, SV2AOK KN10LO, ON7YD JO20OA, 9A3AQ JN75WS, 9A7D JN95FH, OD5SIX KM74, 5B4CY, EH3EM JN11CM, EH3AYQ JN11BJ. 16.7. OK2BGW JN89CH, SM7AED JO66, SP4MPB KO03, EH2JG IN83MC, F1HWJ IN94PV, F1PPT JN06JR, EH3CN JN11BI, F5PIG JN06FQ, F5LUW IN86TQ. 19.7. OH5LK KP30ON, OH6KG KP13PT, 20.7. OH3NQW KP21. SV2TX KN10LU, LZ1KQ KN32DP, EH5BIF IM99XX.

21.7. UT8AL KO61WP, ER5WU KN45, SP6GVU/8 KN19, YO9IE KN34AW, EH3BTD JN12OA. tnx for info, Sigi

DL7ARM, JO61 wkd 6m: 19.6.95 1330-2100 UX1MF KN98, 4K6D LN40, ER1LW KN46, UX0FF KN45. 20.6.95 1400-2000 9A2DI JN95, HA8BE KN06, YO4DCF KN35, EW7IM KO53, SM3NRY JP82, Z34XMA KN02, SV9ANK KM25, LZ2UU KN12, UT8AL KO61, GS7UEG/p IO66, OH9NDD KP17. tnx for info, Christian

DL7QY, JN59BD, wkd: 13.5.95 1815 7Q7RM KH74. 10.6.95 1058 S07URC IL56. 17.6. hrd beacon FY7THF GJ36 from 1740-1957 UT NO QSO-NO ACTIVITY, wkd: CU3AC and CU1CB HM68. 18.6.95 wkd 1124 4U/KC0PA IL46. 19.6.95 wkd 1900 4K6D LN40 as well as on 20.6. 0707 wit 59+ 5T6E IL30 was heard on 20 days between 1.6. and 10.7.95 mostly S9 in JN59BD. 19.6.95 2042-0024 UT: W3JO FM29, KM1H FN42, W4EQM EM72, N4NM FM09, W2TQ FN20, N4VA FM18, W3EP FN31, W2CAP FN31, WA1OUB FN43, W4MYA FM07, WA1EKv FN42, VE1YX FN74, WZ1V FN31, W4DR/1 FN54WA2TEO FN31, WA3HMK FN10, WB4WTC EM95, WA1T FN43, W1JRW FN32, WA3TBG FN42, K3TRM FN21, VE1ZZ FN84. 27.6.95 1640-1850 UT wkd: WB4WTC EM95, VE1ZZ FN84. 3.7.95 1604-1645 UT wkd: WB4WTC EM95, W4MYA FM07, W4DR FM17. 4.7.95 1116-2343 UT wkd: K1TOL, W1GCI FN42, K5MA FN41, VE1YX FN74, WA1EKV FN42, W1RJA FN31, W1EJ FN42, VY2KX FN86, VE9AA FN85, KM1H FN42, WA1AYS FN42, W1NU FN31, W2CAP/1 FN41. 5.7.95 2110-2125 UT hrd: VE1ZZ, VE9AA. 6.7.95 1928 wkd KP4EIT 55 55 FK58 SSB 7686km. 7.7.95 1748-2331 wkd: K8WW EN91,W1AJR EN91, WA8DXB EN91, K8ZES FN02, K8MFO EN90,VE9AA FN85, VY2KX FN86, K8MD EN82 N9QX EN61, WA8FTA EN52, K0FF EM49, W3ZZ FM19, K8OOK EN73, WA3MHK FN10, W3JFM FM19, KD4UPF FM08, W1GCI FN42, KD4CAN FM18, K4CKS EM74 7527km, W3HML FM19, N1KAT FN44, N3JON FM19. 8.7.95 1105-1152 UT wkd: K1DAT FN42, K3ZO FM18, WB3F FM19, WA1OUB FN43, N3AHI EM74, W4MYA FM07, W1JR FN42, WA3HFK FN10,W1RJA FN31, W1ENQ FN32, KA1ICR FN42, K1MUC FN42, KB3QM FM28, KB4TEQ EM73, WB4DBB FM07, WZ1V FN31. 10.7.95 19:00-19:50 VO1ZA GN37 579, 21:40 KJ4E EL98 7736km. tnx for info, Claus

DL0FTG, (Op DL8HCZ) JO53AP, wkd: 31.5.95 1B/PA3DWD KM65. 1.6.95 CT3FT IM13. 2.6.95 4K6D LN40, 1B/PA3DWD KM65, 4Z4TT KM72, UX1MF KN98, R3VHF LO16, 4U0ITU JN36, 4X1IF KM72, HA6ZB JN97, C31HK JN02, UX0FF KN45, UR5AGX KO60, G0VHF/p IN79, OH6KG KP13, OY3JE IP62, OY9JD IP62, SV2AOK KN10. 4.6.94 EH8BPX IL18. 6.6.95 HA8BE KN06, T97V JN84. 9.6.95 EH9IE IM75. 10.6.95 I2ADN/8 JM89, 4X1IF, IA5/OE5D JN52, HV4NAC JN61, HV3SJ JN61, S07URE. 11.6.95 ER2GF KN46, T93M JN93, IA5S JN52, HB9JAW 47, HB9FAR 46, SM2HTM KP07. 19.6.95 UT8AL KO61, EH8ACW IL28, 4K4D LN40. 20.6.95 YO4DCF KN35, EW7IM KO53. 21.6.95 YL2DX + YL3AG KO26. 27.6.95 UT6X KO40. 30.6.95 5T6E IL30, SV7/OE3DJL KN20. 1.7.95 UT6X KO41. 7.7.95 2054 VE1ZZ. 19.7.95 G4AFJ/TF/m IP03. 21.7.95 T72EB/A JN63, T97V JN84.

F1GTU, JN05IF, wkd: 24.6.95 0855 4X6ON KM72 3267km. 25.6.95 0757 EH7AH IM67, 1155 SV8CS KM07, 1642 9A2WM JN74, 1837 UX0FF KN45 DXCC 110, 1858 LZ1WR KN22. 1.7.95 1004 RV6HF LN34 DXCC 111, 1013-2015: G,ON,GW, HB, S5, 9A, F, SP, DL, OE, I, PA, OM, OZ, YU, OK, UT, 2.7.95 1035 EU1AA KO33, 2133 W2MPK FN23, 2137 N1GDP hrd, 2152 W2VO FN23.

HB0/DK0FTG, JN47TC, hrd: 13.7.95 1410-2110 HB9WCI JN47, HB9QQ, DL8SET JN48, HB9LBX JN47, DL5GAC JN47. 15.7.95 0836-1908 HB9RUZ JN47, YU1EU KN04, YU7FU KN04, OM3PC JN98, OM3TPG JN99, SV2TX KN10, LZ1WR KN22, OM3KFO JN98, SV8QG KN39, SV1CER KM17, SV1OH KM18, SV1EN KM18, SV2AOK KN10, SP9HWY JO90, SP9DSD JO90, 9H1BT, SP7HT KO00, OK2PVF JN99, SP9SDF JO90, IK7IMO JN90, 9H5DM JM75, SP8UFT KO11, I0AMU JN61, YU1QC KN04, SP8MMZ KO11, IK5NTE JN52, I0OEU JN61, DL6EW JN47, OM3OM KN08, Z32BU KN01, IK0OZD JN61, IK5OIY JN52, YU1ABA KN04, GM4WJA, YO2IS KN05, IK5RLP JN52, HB9BFG JN47, YU1RK, 5T6E IL30, EH3IH JN11. 16.7.95 0715-1900 UX0FF KN45, ER5OK KN46, EH6SA JM19, CS0RCL IM56, G4ORC

IO80, GU2HML IN89, G4ALY IO70, EH1EBJ IN73, G0RPA IO80, G1GVM IO90, G7EXO IO91, F5BYM IN94, EI7GL IO51, G6HCV IO82, G7RVM, G0OFE IO90, G6RAF IO92, G6GN IO81, G8YYB IO91, 2E1AIU JO01, G4AJC IO91, G7AWE IO83, G1HRD IO91, G0NCS IO70, GW7LHI IO81, G4IFX IO94, G8CDW JO02, G3GIQ IO91, G0RUZ IO93, G3IKR IO82, GW6VZW IO81, G4NHO/m IO91, G4BWP JO02, G7NFO IO92, G4DCJ JO02, G4SEU IO92, G0NYL IO93, GW8TBG IO81, GD3UMW IO74, 2E1AXJ JO01, PE1EWR JO11, G7UHW JO01, G3KNU IO93, G0VKY IO70, 2E0AFK IO70, G3WZR IO91, G1WUU IO80, G4FUF JO01, G6ION IO70, G7PVG IO81, G4GEE IO92, G4ROX IO81, G1KTZ IO70, G8GXP IO93, G1YPD IO70, G7BXS IO70, G7ART IO70, G3KPT IO92, G3IBI IO90, G3RDQ IO91, G7TGK IO82, G1HXH IO95, G7PNP IO92, G1XWD JO03, G8VOI IO90, G8IFU IO90, PA0FRE JO21, G3VPS IO91, G4XAQ IO92, G8BFL IO92, G0UEH IO93, GC4RAF IO83, GW4ALT/p IO72, G4LRT IO92, G6URX, G6DAY IO91, PE1FEI JO22, PA3GML JO22, G3WZT IO90, PA0JMH JO22, G1ITE JO00, G6YPU IO83, G0GMS IO91, G3HBR IO91, GW1PJP IO81, G7IGY JO02, G7RVE IO83, G7NBE IO92, PA0RDY JO22, G1LJT IO81, G1EFL JO01, G8ECI JO03, PE1MCD JO23, G1WYC JO01, G7RUY JO01, CT1BH IN51, G3LTF IO91, PE1MJV JO21, G3EDD JO02, G7SMA IO93, PE1LAU JO33, G3SYC IO93, F6HRP IN88, GJ7UIT IN89, F5NHO IN87, G8EQZ IO93, G7RPY JO02, GW4LXO IO81, G6STD, GW3XYW IO71. 17.7.95 1215 I8TWK JN70. OPs: DD3XN, DG3XA, DJ2XS and DL1XAQ. Rig: TS690s + HB9CV. QTH: Sareis-erjoch 2000m asl. tnx for info, Matt

OX3LX Op OZ1DJJ, hrd/wkd: 24.4.95 0030 TV from VE/USA, 0030 VE2TWO/bcn FO13 599. 25.4. 0010 VE2TWO/bcn FO13 599. 28.4. 0130 VE2TWO/bcn FO13 599. 4.5. 1930 TV from EU, 2015 SM3EQY JP81 59, 2016 SM6FHZ 559, 2023 SM3JGG JP71 559, 2030 SM6CMU 559, 2048 SM0?M?? 519/QRM no qso, 2107 OZ7DX JO66 559cw 55ssb. 6.5. 1930 TV from EU, 2118 SM4POB JP70 579. 7.5. 1445 TV probely from TF/EU, 2230 VE2TWO/bcn 599. 8.5. 2200 VE2TWO/bcn 599. 9.5. 0130 VE2TWO/bcn 599. 11.5. 0030 VE2TWO/bcn 599. 15.5. 0200 VE2TWO/bcn 599. 16.5. 0100 VE2TWO/bcn 599. 17.5. 0030 VE2TWO/bcn 599, 0130 VO1ZA/bcn GN37 559. 23.5. 2300 W3VD/bcn FM19 559. 24.5. 1900 TV from EU/la,sm,tf, 2000 vy week probably JW7SIX/bcn 319. 2205 TF3SIX/bcn 579. 25.5. 1900 TV from EU. 27.6. 2217 DF5LQ JO44. RIG: FT690+PA/100W ant 5 elm. tnx fr info, Bo

SM2HTM, KP07IE hrd: 27.5.95 1905-14 JW7SIX JQ88AD 599 1231km.

SM4POB, JP70FK wkd: 14.6. 22-23 OX3LX GP36, VE8HL FP53.

4U0ITU JN36BF wkd 6m: 7.7.95 1701-1810 EH7CD IN86, 5T6E IL30, EH7DUW IM76, SM0KAK JO89, OH1AJK, EH7KW IM67, EH7KF IM67, SM5FJE JO65, SM3MXR JP80, SM3QA JP81, SM6CMU JO57. OPs: DL1XAQ and DJ2XS, Rig: TS690s tnx for info, Matt

Meteor Scatter

Editor: Norbert Göttsche, DL8LAQ

DD0VF (JO61VB) wkd on 144Mhz:

950313
0725 0800 G0CUZ IO82 27 26 33 5 1 c r
950414
2150 2250 GET/BCN JN01 46 hrd 17 10
950416
0600 0617 EA6VQ JM19 27 27 44 m 7 c
0712 0742 G0CUZ IO82 27 27 15 10 3 c r
950420
0827 0900 LY2BIL KO25 27 26 16 7 0.3 c r
950422
0600 0640 SM3BIU JP73 27 27 26 4 3 c
0700 0717 EA2AGZ IN91 27 27 40 1 c
950430
0700 0732 IK5UBM JN53 27 26 67 0.5 c
950501
0600 0620 EA2LU IN92 27 27 14 7 3 c
950506
0942 0955 EI5HN IO61 27 27 15 2 c r
950602
0450 0605 GJ0CUZ/P IN89 26 27 17 6 2 c r
950606
0500 0600 F5VBW JN03 26 27 30 20 1.5 c
0600 0625 F/G8MBI JN04 26 27 13 6 1.5 c
1122 F1CCM IN93 59 59 1 c r
1122 F/G8MBI JN04 59 59 1 c r *4
1123 F1JG JN23 59 59 1 c r
1123 F5VBW JN03 59 59 1 c r *4
950608
0300 0345 OH6MAZ KP22 27 27 19 10 2 c
0500 0530 SM6UMO JO68 27 27 24 7 3 c
950609
0700 0744 LY2BIL KO24 27 27 12 10 1.5 c
950611
0655 0720 IK1LGV JN44 27 37 19 4 4 c r
0730 0825 I5YDI JN52 27 27 8 9 0.3 nc r
950614
1227 1242 LY2BIL KO35 27 27 10 4 0.5 c r
950617
0500 0600 EB4TT IN70 26 26 10 5 0.5 nc *5
1849 F1JG JN23 59 59 1 20 c .300
950624
0600 0700 GM0HBK IO77 27 5 3 0.2 nc
950625
0400 0500 YO3DMU KN34 27 1 0.5 nc
0535 0555 LA7DFA JP33 27 10 0.8 nc t
0710 0746 IK1LGV JN44 29 28 22 1 1.5 c r
950626
2108 2145 GB3LER IP90 27 27 2 2 bcn
950628
2140 2200 UT2X KO40 27 1 3 0.3 nc r
2200 2300 UT2X KO40 27 18 6 0.7 hrd
950629
0345 0500 UT2X KO40 37 19 15 7 hrd
0500 0600 UT2X KO40 39 hrd 24 8 6
0600 0700 UT2X KO40 26 hrd 8 9 0.5
0700 0800 UT2X KO40 28 hrd 13 10 4
950629
2000 2032 UT2X KO41 28 hrd 22 17 1
2035 2047 UT2X KO41 27 27 9 3 0.5 c t
950708
0600 0650 OM9AAW JN98 nil *6
2000 2011 SM/DL7VBW JP81 28 27 13 0.5 c fb*1
950709
0430 0500 EA1EW/4 IM79 26 2 2 0.2 nc t *5
0637 0700 LY2BIL KO14 27 27 12 2 1 c r

F/DD0VF (JN05DP) wkd on 144MHz:

950514
0400 0505 DL4DTU JO61 27 27 8 1 c *1
0505 0540 DF8AA JO60 27 26 23 1 c *1
0605 0620 DL2DXA JO61 26 26 5 1.5 c r *1

F/DD0VF (IN86XR) wkd on 144MHz:

950515
2100 2150 DL9GJW JO54 27 27 9 2 c *1
950516
0330 0422 DF8AA JO60 27 27 12 1.5 c *1
0522 0542 DL9GJW JO54 27 13 0.5 nc r
0600 0612 DL2DXA JO61 27 26 11 2.2 c *1
0617 0700 DJ7OF JO51 27 38 200!m 2 c r
950517
0300 0500 DL1EAP JO31 26 26 51 0.5 nc r*1
0500 0532 DK2PH JO41 27 26 50 1.5 c r
0532 0600 DL1EAP JO31 27 26 7 1 c r *3

F/DD0VF (JN05DP) wkd on 144MHz:

950519
0500 0600 DL9GJW JO54 27 27 14 0.5 c *1

F/DD0VF (JN14HQ) wkd on 144MHz:

950521
0330 0447 DF8AA JO60 26 27 12 0.2 c *2
0447 0630 DL2DXA JO61 27 27 14 0.3 c *2
950523
0300 0335 DH6JT JO31 27 27 18 2 0.4 c
0335 0435 DH6JL JO31 nil
0500 0600 DL9GJW JO54 27 1 0.2 nc *1
950524
0600 0700 DL9GJW JO54 26 4 0.1 nc *1
950525
0500 0700 S53VV JN65 27 26 11 5 0.3 nc
950527
0600 0720 DL9GJW JO54 26 27 4 0.3 nc *1

F/DD0VF (JN14LO - 1400m asl) wkd on 144MHz:

Date? (ed.)
0455 0525 DL9GJW JO54 26 27 11 0,3 c *1

OK/DD0VF (JO70DU) wkd on 144MHz:

950604

0600 0642 F5JRX JN25 26 26 6 17 4 c s

Remarks: *1 2000 lpm *2 3000lpm *3 now complete! *4 crazy to work this stations again-hrd also some G-stations in this burst *5 I did not send R26 but I rcvd RRR! *6 Sidescattertest. Equipment in F and OK: 9 ele F9FT and 100W. I'm qrv on random every sunday around 0700UTC. Thanks for report, Steffen.

DL1KDA (JO30FQ) wkd on 144MHz:

(complete QSOs)

950213
2300 0015 LY2BIL KO05NS 26 26 27 19 1 c *1
950423
0730 0750 LY3BF KO25OL 26 26 11 15 8 c
950430
0530 0610 SM3JGG JP71WJ 26 26 7 15 3 c
950502
0400 0437 CT/DF7KF IN50XX 26 26 11 19 1 c
950504
0400 0452 IK0OKY JN61GT 26 37 11 20 42! c *2
950506
0352 0407 CT/DL8EBW IN51XA 26 26 3 7 5 c
950514
0500 0545 EA6FB JM09SC 26 26 5 12 3 c
0700 0735 LY2BIL KO24PQ 26 27 28 33 2 c
950515
0427 0442 EI5HN IO53MW 27 27 4 7 3 c t
950521
0527 0550 OH0/SK3SN JP90UF 26 26 m m 5 c *1
950602
0400 0435 LA8KV JP52QQ 26 26 17 26 1 c
950616
0220 0300 LY2BIL KO35MM 27 27 4 19 5 c t
950617
0700 0805 OH9NYW KP25GR 26 27 4 6 2 c
950628
0400 0415 UT2X KO40BW 26 26 5 7 5 c
950629
0400 0440 IK5UBM JN53GT 27 27 22 m 3 c
950630
0322 0355 UT2X KO41AA 27 29 12 19 2 c t
950703
0400 0432 LA4XGA JP65 26 26 15 18 1 c
950706
2158 2215 SM/DL7VBW JP81 37 27 m m 5 c
950708
0000 0032 LY2BIL KO14LL 26 27 23 m 3 c
950714
0905 0945 SM/DL7VBW JP84 26 27 20 20 5 c
950715
0500 0522 SM/DL9GJW JO98AX 26 26 6 17 2 c
950719
0600 0630 ES/DL9GJW KO17AW 26 26 17 15 1 c
950720
1900 1925 LA/DL7VBW JP66SM 26 26 8 6 2 c
2200 2247 EA3KU JN00JV 27 26 15 16 7 c r

Remarks: *1 New DXCC *2 Amazing Bursts for only 25watts !! Every QSO here was a new square for me! Equipment: Kenwood TS-790E, 3CX800, 17ele M, preamp. For MS: TX OH5IY MS compact Soft (4.2f) + DTR-MS NF keying; for RX DTR-MS. Thanks for your report, Alex.

DL2IAN (JN49BC) wkd on 144MHz:

940419
2100 2200 LY2BIL KO25OL 26 2 3 1 nc
940420
0300 0400 LY2BIL KO25OL 26 4 10 2 nc
940421
1200 1300 LY2BIL KO25OL 36 27 9 16 2 nc
940502
0922 0950 CT/DL8EBW IN50XX 27 3 7 2 nc r
940503
0720 0747 CT/DL8EBW IN50XX 27 26 19 10 2 c
940505
0300 0400 OH6MAZ KP22WF 26 2 1 1 nc
940508
0300 0400 CT/DH0LS IN51XA 26 26 33 46 8 c
940629
0000 0100 UT2X KO40BW 27 10 18 2 nc
940630
1220 1320 LA7DFA JP33VC 27 26 9 10 3 nc
940702
0600 0700 LA7DFA JP33VC 26 26 6 10 4 c
940707
1135 1212 SM/DL7VBW JP81 26 26 10 14 1.5 c
940708
0300 0400 LY2BIL KO14LL 27 27 7 10 2 c
0500 0600 OH8UV KP34VJ nil
0600 0700 EA/DL3MGL JN01ME 27 27 8 15 2 nc
940715
2300 2330 I6WJB JN72AL 26 26 8 15 14 nc
940716
0500 0547 SM/DL7VBW JP84JK 26 26 13 19 2 c
0600 0647 SM/DL9GJW JO98AX 26 26 7 16 1 c
940719
0440 0510 ES/DL9GJW KO17 26 1 2 nc *1
2000 2100 LA/DL3DTS JP21NV 26 2 4 1 nc
0000 0017 ES/DL9GJW KO17 26 26 8 6 3 c
940723
1800 1900 LA/DL7VBW JP66PM 26 1 nc *2
940726
1800 1900 LA/DL7VBW JP64 26 26 8 2 3 nc

Remarks: *1 Sorry, Joe. *2 too long distance. Thanks for report, Thomas.

DL5GAC (JN47SS) wkd on 144MHz:

950627
2200 UT2X KO40BW 26 27
950630
2315 UT2X KO41 27 27

Thanks for report, Robert.

DL8EBW (JO31NF) wkd on 144MHz:

950519
0400 0447 LA4XGA JP33VC 28 27 13 29 2 c *1
950520
2300 2358 OH0/SK3SN JP90UF 27 26 15 17 1.5 c
950526
0400 0422 LA4XGA JP33VC 26 27 5 11 2 c *1
950528
0710 0732 SM5MIX JO78JG 26 26 11 26 1.5 c

950529
0400 0500 ES2RW/4 KO39ET nil
950602
0400 0431 LA4XGA JP33VC 26 27 12 17 0.5 c *1
950609
0400 0426 LA4XGA JP33VC 28 27 15 19 8 c *1
950610
0500 0652 EA9AI IM75IV 26 26 9 5 0.6 nc *2
950615
0400 0416 LA4XGA JP33VC 27 27 10 10 1 c *1
0600 0615 LY2BIL KO35 28 28 14 m 3 c
0700 0800 UA3PC KO84PC nil
950623
0400 0420 LA4XGA JP33VC 27 27 6 12 7 c *1
950627
0145 0221 UT2X KO40BW 26 27 14 m 1 c r
950630
0300 0322 UT2X KO41AA 27 27 11 15 8 c *1
0400 0421 LA4XGA JP33VC 27 27 15 20 1 c
950701
0400 0500 UT1E/P KN57 26 26 3 4 1 nc
950702
1955 2022 LA4XGA/p JP65 26 26 5 11 1 c
950704
0400 0515 LA4XGA/p JP76 26 27 11 11 1 c
950708
0200 0211 LY2BIL/P KO14LL 27 27 13 22 0.7 c
0500 0600 OM9AAW KN09 26 27 3 7 0.5 nc
950709
0000 0016 SM/DL7VBW
JP81NH 27 37 13 23 1 c
0100 0116 EA1EW IM79WS 27 27 11 17 3 c
950715
0400 0420 SM/DL7VBW
JP84JK 26 27 12 13 2 c
0500 0520 OM9AAW JN98 26 27 7 11 1 c
0629 0636 SM/DL9GJW JO98BW 27 27 5
0720 0755 EA3KU JN00JV 28 26 7 6 1 nc
950716
0600 0700 EA3GIQ JN01ME nil
950719
0400 0435 ES/DL9GJW KO17 28 28 28 51 1 c
950722
0600 0646 LA/DL7VBW
JP66SM 27 27 8 14 1 c
950728
0405 0425 LA4XGA JP33VC 27 27 19 32 18 c *1
0427 0441 LA7DFA JP33VC 26 27 15 16 0.8 c
2255 2306 EA5/DJ3MY
IN90XU 28 26 9 13 1 c
950729
0600 0635 9A3JH JN75AD 27 27 18 51 0.8 c

Remarks: *1 Regular sked to geir (1320km), to test MS-condx. *2 I txed 15 min RRR, but Javi not copied, shit! (1970km).

Equipment: FT726r modified (CF300), 4CX250b abt 350Wtts, 11el Flexa, RX-Ampl. MGF 1302, DTR-MS tape recorder (made by DF7KF) RX max 5000lpm, OH5IY Compact-MS-Soft Version 4.2f. Every sked for MS, also with stn wkd before is very welcome!!! Skeds via VHFNET,or PR (BBS DK0MWX), or telephone ++202/781170. Thanks for report, Guido.

EA9AI (IM75IV) wkd on 144MHz:

940917
0600 0700 11DMP JN35UB 26 1 4 0.5 nc
941021
0100 0300 DL8EBW JO31NF 26 1 3 1 nc
941213
0600 0700 EA3DXU JN11CM 26 26 12 9 2 c
950104
0500 0600 PA3BIY JO22EB 26 26 9 2 3 c
1122 1200 IK1LGV JN44JK 26 37 5 4 3 c
1200 1300 DL1KDA JO30FQ 26 26 5 4 3 c
950507
0700 0800 IW1AZJ JN35UB 26 26 22 14 10 c
950604
0700 0740 EA2LU IN92ET 26 26 25 9 7 c
0740 0815 EA2AGZ IN91DV 26 26 21 13 4 c
950609
0500 0600 F/G8MBI JN04FT 26 26 11 8 3 c r *1
950610
0500 0600 F9HS JN03GL 26 26 6 2 c
0600 0630 G4YTL IO92MB 26 27 6 4 2 c
0630 0700 F6DRO JN03 26 27 17 5 3 c
950713
0400 0500 EA3KU JN00JV 26 26 9 4 5 c *2
950715
0300 0400 IK1PAG JN35SB 26 26 15 7 2 c
0400 0500 F5GHP IN96LE 26 26 20 13 6 c
950716
0000 0100 HB9FAP JN47GJ R26 27 5 5 1 c *3

Remarks: *1 I announced my activity in the dx-cluster, then I was calling cq on 144.070, random? (Yes! ed.) *2 He called me one hour before our sked *3 We made a sked in the cluster and confirmed later the qso. Equipment: 9 el. Tonna (3.30 m boom) all qso but on 13th, 15th and 16th of July with 2x9 el. vertical stacked, Preamp MV-144S, Kewood TR-751E, Daiwa LA-2090H (110W). I want to modify my TR-751E to Tx up to 1200 lpm. Somebody knows the modification? Thanks in advance. If you are interested in sked with me, send a msg via @ZB2BL.#GIB.GIB.EU or my address. I have the possibility to be QRV at the weekends, I will be qrv Sunday morning calling cq on 144.070 (preferably). 73 and good reflections. Thanks for report, Javi.

I4YNO (JN54KP) wkd on 144MHz:

941120
0500 0605 UR3EE KN88 26 26 4 20 nc
941211
0500 0530 OZ8ZS JO55 nil
0600 0700 DL1SUN JO53 26 26 2 6 nc
941214
2203 2218 DG1VL JO61 27 nc r

Heard on the evening of the 14th Dec. 94 on 144.200 on random the following stations: DK2PH, ON4GG (also via tropo), G4RKV, DL3LBK, DJ3LE and DL9DBJ.

950103
2300 2317 LA2PHA JO38 26 37 3 11 c
0021 0025 OZ9FW JO65 28 27 c? r

Heard during Quadrantids on .200: SM6CEN, SM0EJY, SP2NJI, G4RKV and DL9DBJ.

950129
0700 0735 DL8EBW JO31 2 nc
950506
0500 0530 SP2OFW JO93 28 27 4 8 c
0627 0705 CT/DL8EBW IN51 36 38 c r
950511
0400 0437 DL7VBW JO61 26 26 8 m c
950605
0400 0428 DL2DXA JO61 26 27 4 14 c
950708
0400 0420 LY2BIL KO14 26 27 8 m c
950709

0500 0600 SM/DL7VBW	JP81		26	2	4		nc
2100 2130 SP2SGZ	JO82	27	27	4	10		c
950715							
1100 1200 SM/DL9GJW	JO98	26	26	5	9		c

Thanks for report, Alex.

IK1LGV (JN44EE) wkd on 144MHz:

950505							
0900 0945 CT1/DL8EBW	IN50	27	26	10	m	15	c
950507							
0640 0700 CT1/DL8EBW	IN51	27	26	5	4	3	c *1
950521							
0500 0547 DL7VBW	JO62	27	27	12	30	2	c
950529							
0600 0700 GJ0CUZ/P	IM89	26	37	4	6	2	nc *2

Remarks: *1 Tail end; *2 What kind of PA was using Colin? Very weak and unreadable reflections. Thanks for report, Gabriel.

MS on holiday in Sweden and Norway

Hello OMs, now I'm back from my holidays operation in Sweden and Norway. I hope, some stations are satisfied with 3 ore more new squares. It was a lot of fun for me - sometimes also hard work. On JP84 and JP64 this year millions of moscitos. JP75 was impossible for me, nice QTH but ONLY moscitos. I hope to be there next year and can stay longer as 30 min. I had 206 MS-contacts, 163 C, 27 NC and 16 NIL. Thanks to all stations and sorry abt the bad CONDX on 20m sometimes - listen more on RANDOM!

SM3/DL7VBW (JP81NH)

QTH: Soederhamn, 15m asl

950706							
1730 1745 G3IMV	IO91	27	26	9		12	c r
1750 1800 G4YTL	IO92	27	27	7		6	c r
2000 2045 9A4FW	JN76	26	26	5		10	c
2050 2100 OE3JPC	JN88	27	27	7		6	c r
2100 2125 DK0UB	JO31	28	27	6		3	c
2130 2200 PA2TAB	JO32	27	27	11		2	c t
2200 2220 DL1KDA	JO30	27	37	11		3	c t
2220 2235 DF7KF	JO30	37	27	15		7	c t
2240 2250 DF9KT	JO30	37	38	11		8	c r
2300 2325 I4XCC	JN63	27	27	8		3	c
2330 0000 IK1PAG	JN35						nil t
950707							
0000 0100 F/G8MBI	JN03						nil
0700 0730 DK8EL	JO31	27	27	13		3	c
0800 0815 DL1EAP	JO31	27	26	14		4	c
0835 0850 DH8NAA		27	37	11		3	c r
0900 1000 YU7EW	KN05	26		3		1.5	nc
1135 1220 DL2IAN	JN49	26	26	11		2	c
1600 1620 DL9GJW	JO54	27	27	7		2	c
1800 1900 LY2BIL	KO14	26	26	14		1.5	c
2000 2020 YU7EW	KN05	26	26	10		4	c
2020 2040 DL2DXA	JO61	47	26	12		20	c r
2100 2130 YU7MS	KN05	26	27	9		1	c *1
2200 2300 IK1PAG	JN35						nil
2300 2310 PA3EFC	JO22	37	26	7		8	c
950708							
0600 0620 DL3YEL	JO41	38	27	8		8	c
0700 0720 G0FIG	IO90	27	26	8		5	c
0730 0755 G0CUZ	IO82	26	26	11		5	c r
0800 0845 DC7OH	JO62	26	26	10		1.5	c
0945 1005 DC8YD		27	26	12		2	c r
1100 1200 DF1SO	JN48	26		1		1	nc
1600 1620 ON4QQ	JO20	27	27	12		2	c
1800 1900 I1DMP	JN35	26	26	6		2	nc
1900 1930 SP2OFW	JO93	27	27	9		2	c
1930 2000 SP2SGZ	JO82	26	27	8		3	c r
2000 2015 DD0VF	JO61	27	28	8		2	c
2025 2055 DH2OAA	JO42	27	27	11		3	c r
2100 2145 G4AEP	IO91	27	26	12		2	c
2200 2230 ON4KHG	JO10	37	26	16		6	c
2300 2320 DL8CMM	JO52	38	28	14		9	c
2325 2340 DK8LV	JO44	27	28	11		3	c r
950709							
0000 0015 DL8EBW	JO31	37	27	11		8	c
0500 0600 I4YNO	JN54	26		4		40	nc
0600 0700 DF1SO	JN48						nil
0700 0800 S51AT	JN75	26	26	11		5	c
1800 1835 DJ1OJ	JN58	26	26	12		2.5	c
1900 1940 G0JUR	IO92	26	26	7		2	c
2000 2100 YU7BCL	KN05	26	26	4		3	c
2100 2200 I1DMP	JN35	26	26	5		2.5	c
2200 2220 ON4ASL	JO20	26	26	11		2	c
950710							
1545 1610 DK8ZJ	JO30	27	27	22		3	c r
2200 2300 F/G8MBI	JN03						nil
2300 2355 F5GHP	IN96	26		1		2	nc
950711							
0800 0830 DL3IAE	JN49	26	26	11		30	c
0945 1010 SM2CEW	KP15	26	26	6		1.5	c
1145 1250 DF1SO	JN48	26	26	4		2	c
1600 1705 EI4DQ	IO51	26	26	7		2	c
1710 1730 G6RAF	IO92	26		2		0.5	nc s
2100 2200 F/G8MBI	JN03	26		1		1	nc
950712							
1300 1400 9A3JH	JN75	26	27	4		3	c
1430 1500 DL9NDD	JN59	27	26	12		2	c
1500 1510 DL9YEY	JO41	28	28	6		8	c
1525 1600 DJ2JA	JO40	26	26	13		2.5	c

Remarks: *1 3000lpm!

QSO total: 80 - Tropo: 17 - MS: 63 (C=51, NC=7, NIL=5)

SM2/DL7VBW (JP84JK) wkd on 144MHz:

QTH: Meselefors, 345m asl

950714							
0830 0910 DL1EAP	JO31	27	26	12		4	c
0915 0940 DL1KDA	JO30	27	26	12		11	c r
1300 1320 DL8GP	JN39	26	26	9		4	c
1400 1440 EI4DQ	IO51						nil
1500 1515 SP2OFW	JO93	27	27	14		3	c
1520 1530 SP2SGZ	JO82	26	27	9		2	c r
2020 2040 DK2PH	JO41	27	27	10		3	c r
2100 2200 G3IMV	IO91	27	26	9		4	nc
950715							
0200 0240 PA2TAB	JO32	27	26	8		11	c
0300 0320 DK9OY	JO52	28	27	11		16	c
0325 0335 DJ7OF	JO51	38	38	7		12	c r
0335 0345 DL9YEY	JO41	28	38	9		4	c r
0400 0425 DL8EBW	JO31	27	26	8		2	c
0500 0600 I4XCC	JN63	26		1		1	nc
0700 0715 DF7KF	JO30	38	27	16		6	c *2
0740 0800 DL3LBK	JO54	26		4		2	nc r
0800 0830 DD0VF	JO61	27	28	8		1.5	c
0835 0850 DK8LV	JO44	27	26	13		2	c r
0900 0945 RX1AS	KO59	27	26	8		18	c
1000 1025 PA3FOC	JO21	26	27	11		3	c
1030 1110 PA2DWH	JO22	27	27	13		2	c r
1330 1400 DL8CMM	JO52	27	27	12		16	c
1420 1435 DF5BN	JN49	27	26	12		4	c r
1450 1515 GM4YXI	IO87	26	26	22		3	c r

2200 2300	9A4EW	JN95				nil
2300 2340	9A1CCY	JN85	26	26	6	6 c
2345 0010	DH2OAA	JO42	26	27	7	2 c r
950716						
0200 0300	G0FIG	IO90				nil
0300 0350	G0GMS	IO91	26	26	7	5 c
0400 0420	OE3JPC	JN88	27	26	12	12 c
0500 0600	DL2IAN	JN49	26	26	8	2 c
0600 0640	G4YTL	IO92	26	26	9	2 c
0640 0710	G3IMV	IO91	26	26	6	2.5 nc r
0710 0730	DL3IAE	JN49	27	26	9	1.5 c
0730 0800	G4FUF	JO01	26	26	13	2 c r
0800 0820	DL7UTS	JO62	27	28	17	2.5 c *2
0900 1000	G4AEP	IO91	26		3	1.5 nc
1000 1030	G3WZT	IO90	26	26	8	3 c
1045 1100	ON4ANT	JO20	37	27	17	6 c r
1105 1125	ON4GG	JO20	27	27	12	3 c r
1150 1210	ON4QQ	JO20	26	26	14	2.5 c r
1330 1350	DJ2QV	JO41	27	26	11	2 c r
1400 1500	DK2BV		27	26	8	2 nc
1800 1910	G3IMV	IO91	26	26	9	3 nc

Remarks: *2 Aurora-E!
QSO total: 48 - Tropo: 5 - MS: 43 (C=33, NC=7, NIL=3)

LA/DL7VBW (JP66MM) wkd on 144MHz
QTH: Tonnes, 8m asl

950719						
1610 1645	DL8LAQ	JO43	27	27	14	2 c r
1730 1805	DK2AM	JO43	27	27	16	2 c r
1815 1845	DL7UTS	JO62	26	27	11	1.5 c r
1845 1915	DJ7OF	JO51	27	27	10	4 c r
2000 2020	PA0JMV	JO21	27	28	15	2 c
2020 2040	DK2PH	JO41	27	27	11	2.5 c r
2100 2140	EI4DQ	IO51				nil
2140 2200	G3IMV	IO91	26	26	7	1.5 nc r
2200 2210	DL7AKA	JO62	28	27	8	2.5 c
2220 2235	DF8LC	JO53	28	27	10	3 c r
2245 2300	PA3BIY	JO22	27	27	9	2.5 c r
2300 2345	G4ZHI	IO91	26		1	1.5 nc
950720						
0600 0630	DL8CME	JO52	27	26	9	2 c
0720 0800	G3IMV	IO91	26	26	10	1.5 c r
1000 1100	RX1AS	KO59	26	26	8	5 c
1335 1430	G4YTL	IO92	26	26	6	2 c r
1500 1515	ON4GG	JO20	27	27	11	1.5 c
1515 1530	ON4ANT	JO20	27	27	10	6 c t
1640 1650	SM6KJX	JO67	27	27	10	2 c r
1900 1925	DL1KDA	JO30	26	26	10	1.5 c
1930 1950	DF7KF	JO30	26	26	12	1.5 c t
2000 2025	GM4YXI	IO87	27	26	15	2 c
2035 2100	DL9YEY	JO41	27	27	13	1.5 nc r
2100 2145	DL5MAE	JN58	26	26	7	2 c
2200 2310	G0CUZ	IO82	26	26	4	2.5 c
950721						
0600 0615	DK9OY	JO52	28	27	11	2 c
0625 0640	DL9YEY	JO41	27	27	10	2 c t
0800 0820	G4FUF	JO01	26	26	6	11 c
0850 0940	DL1EAP	JO31	27	27	9	3 c
1500 1520	DL5BCU	JO43	27	27	8	3 c
1600 1645	ON4AMX	JO20	28	26	9	12 c
1740 1820	DK8ZJ	JO30	27	26	7	3 c r
2000 2100	G4ZHI	IO91	26	26	7	2 nc
2100 2200	DH8NAA	JN49	26		3	1 nc
2200 2300	DL1SDN	JN48				nil
950722						
0400 0425	OH5IY/4	KP31	27	26	6	1.5 c
0500 0520	DL1SUN	JO53	26	26	7	2 c
0600 0700	DL8EBW	JO31	26	27	5	1.5 c
0700 0730	DF5BN	JN49	26	26	7	15 c
0800 0830	PA3FOC	JO21	26	26	8	2 c
0900 0930	PA2DWH	JO22	27	28	17	1.5 c
1000 1110	DL3YEL	JO41	27	27	11	1.5 nc
1500 1530	PA3FJY	JO32	26	26	11	4 c
1600 1700	G0FIG	IO90	26	26	3	3 nc
1700 1725	PA3BZO		27	37	12	2 c
1800 1840	DL8CMM	JO52	27	27	8	2 c
2000 2030	DL1SDN	JN48				nil
2040 2100	DJ3LE	JO44	26	36	16	2 c r
2100 2125	SK6HD	JO68	26	27	6	1.5 c
2125 2200	DL3LBK	JO54	27	27	15	2.5 c r
2200 2245	PA3EFC	JO22	26	36	6	2 c
950723						
0700 0800	ON4FI	JO20	26	26	4	2 c
0800 0820	PA0CIS		47	26	18	25 c
1400 1430	DK0UB	JO31	26	26	11	2.5 c
1435 1500	DL5BBW	JO32	27	27	14	4 c r
1500 1535	DJ5RE	JN59	26	27	7	1.5 c 4000lpm
1535 1600	DL9RCI		27		1	1 nc r
1600 1700	ON4ASL	JO20	27	26	11	5 nc
1700 1800	DL8GP	JN39	26		9	1 nc
1800 1845	DL2IAN	JN49				nil
1900 1945	DL3IAE	JN49				nil
2000 2030	SP2OFW	JO93	27	27	7	3 c
2035 2100	PA0RDY	JO22	26	26	11	7 c r
2100 2200	DL3YEL	JO41	26	26	6	1.5 nc
2200 2245	G0GMS	IO91				nil

Remarks: QSO total: 65 - Tropo: 0 - MS: 65 (C=48, NC=11, NIL=6)

LA/DL7VBW (JP64UK)
QTH: Holand, 480m asl

950726						
1140 1205	DL8OBU	JO42	28	27	13	1 c r
1220 1245	PA3FJY	JO32	27	27	12	1.5 c r
1620 1630	DK2PH	JO41	27	27	8	3 c r
1645 1655	DK9OY	JO52	28	28	11	2.5 c r
1800 1900	DL2IAN	JN49	26		1	1.5 nc
1900 1915	ON4ANT	JO20	27	27	7	1.5 c
1915 1945	ON4GG	JO20	27	27	9	3 c
1945 2005	DD0VF	JO61	49	36	8	22 c r
2100 2145	DL8LAQ	JO43	26	26	17	1.5 c
2200 2240	DL3IAE	JN49	26	26	11	1 c
2245 2255	DJ7OF	JO51	38	27	14	7 c r
2255 2315	DK0OG	JN68	27	27	10	3 c r
2320 2330	DH2OAA		27	27	9	2 c r
950727						
0500 0520	DF7KF	JO30	28	27	17	2.5 c
0525 0550	DL1KDA	JO30	26	27	15	2.5 c
0735 0750	DL9YEY	JO41	27	27	11	3 c
0800 0830	OH5IY/4	KP31	37	26	8	7 c
1715 1735	RX1AS	KO59	27	26	9	2 c r
1800 1825	DL5BBW	JO32	27	27	11	2.5 c
1840 1900	DL1SUN	JO53	26	26	7	1.5 c r
1900 1925	DL2ARD	JO60	26	27	10	1.5 c
1930 1955	DL9GJW	JO54	26	26	7	1 c r
2000 2050	DJ9YE	JO43	27	27	15	1 c
2130 2145	DJ3LE	JO44	26	26	11	1.5 c r
2150 2200	SP2OFW	JO93	27	27	6	2 c r
2200 2220	OE3JPC	JN88	26	26	8	2.5 c
2300 2345	DL5GAC	JN47	26		2	1 nc
950728						
0600 0625	DJ2QV	JO41	27	26	14	2 c
1050 1125	DL7AKA	JO62	28	27	18	15 c
1405 1420	DK8ZJ	JO30	27	26	17	4 c

1515 1535 G3IMV	IO91	26	26	8		3	c
2000 2025 S51AT	JN75						nil
2100 2145 DL1SDN	JN48	26	26	7		4	c
2200 2230 DL3YEL	JO41	26	27	9		2	c
950729							
0600 0700 9A1CCY	JN85						nil

QSO total: 37 - Tropo: 2 - MS: 35 (C=31, NC=2, NIL=2) QSL-cards will be o.k. in some weeks. Address: W. Bedrich, Muehlenstr. 31, 13187 Berlin. 73, Wolf, DL7VBW. (Many thanks for the new squares. ed.)

LA7DFA (JP33VC) wkd on 144MHz:

950601							
0330 0400 OH9NDD	KP26	26	26	10	20	1	c
1200 1225 PA3FJY	JO32EH	27	27	6	25	3	c
950602							
0330 0500 OH9NYW	KP25GR	26	26	7	25	1	c
950606							
0459 0516 DJ9YE	JO43HV	26	28	17	31	3	c
950609							
0730 0755 DL7VBW	JO62ST	27	27	7	18	3	c
1000 1008 G4YTL	IO92MB	27	26	6	16	3	c
1050 1058 LY2BIL	KO24PQ	37	28	27	19	7	c
950610							
0600 0613 G0CUZ	IO82WM	28	27	25	15	5	c *1
0730 0745 DL3BWW	JO72GI	27	27	10	m	1	c
950611							
0600 0625 DJ3MY	JN58QD	27	28	12	16	2	c
1200 1218 DJ2QV	JO41EV	27	27	16	30	7	c
950613							
0500 0530 DK0UB	JO31	27	27	13	34	1	c
0900 0922 PA3BIY	JO22EB	27	27	6	13	1	c
950614							
0500 0610 PE1IKX	JO22EB	26	26	10	38	2	c
1200 1210 LY2BIL	KP35DP	28	28	24	70	5	c *1
1300 1330 SP2OFW	JO93AC	27	27	13	35	5	c
950624							
0500 0513 DJ7OF	JO51	27	38	44	14	3	c
950625							
0400 0440 DC7OH	JO62	27	38	12	99	5	c
0500 0530 DF8AA	JO60	27	27	7	11	3	c
0700 0745 G0GMS	IO91UB	26	27	7	19	3	nc
950626							
0700 0740 GW4VVX	IO81JP	26			5		nc
950628							
1310 1347 PA3FJY	JO32EH	27	27	11	11	1	c *2
2015 2100 UT2X	KO40BW	26		1	2	0.2	nc
950629							
0900 0955 GM7ASN	IO78TA	27	26	10	17	1	c *3
2200 2230 SP6GVU	JO81LC						nil
950630							
1220 1315 DL2IAN	JN49BC	26		3	2	0.5	nc
950701							
0800 0852 UT2X	KO41AA	26	26	10	5	0.6	c
950702							
0600 0640 DL2IAN	JN49BC	26	26	4	8	18	c
0810 0822 OH5IY	KP30	27	26	m	m	5	c
0822 0825 OH5IY	KP30	529	429				c *4
950703							
0902 0912 SM2CEW	KP15	27	27	40	20	3	c
1147 1210 PA2DWH	JO22GD	27	26	60	15	5	c
950704							
0600 0630 DL9GJW	JO54WC	27	27	30	5	4	c *5
950706							
0500 0512 DJ5RE	JN59	37	29	50	m	103	c *1*6
950707							
0400 0427 G4RKV	JO01OI	26	26	45	30	4	c
1230 1255 LY2BIL	KO14LL	26	27	4	4	2	c *7

Remarks: *1 Also copy via IONOscatter *2 First QSO with DTR. O'boy!! *3 Op: GW4VVX *4 My first Ionoscatter QSO. Copied OH5IY fm 0810. *5 3000, 4000 & 5000 lpm test; worked fine both ways. *6 S9 for nearly 2 minutes; *73 TNX* in slowspeed. *7 LY2BIL used 20W due to PA problem and I lost 60% of RX time due to S9 QRN. Equipment: 2*4CX250B + 15ele CueDee + MGF1302 + mostly 1200lpm. I can now TX/RX 5000lpm. LA7DFA@LA6K.KSU.T. NOR. EU. Phone ++47 71525269. Thanks for report.

LA8KV (JP52QQ) wkd on 144MHz:

950525							
0400 0440 DL1KDA	JO30						nil
0500 0600 DL5GAC	JN47	26	26	7	4	4	c
950526							
0500 0540 9A4FW							nil
0600 0640 DJ2JA	JO40	27	26	17	35	2	c
0800 0830 LY2BIL	KO24	27	26	11	28	6	c
950527							
0500 0540 IK1PAG	JN35						nil
0600 0630 OK1KF	JO60	27	37	6	20	2	c
0700 0730 DL7VBW	JO62	26	27	11	26	2	c
950528							
0500 0535 DH6JT	JO31	27	27	7	16	1	c
0600 0640 IK1PAG	JN35						nil
950529							
0500 0540 IW2BNA	JN45						nil
950601							
0500 0520 DH0LS	JO50	27	27	6	11	2	c
0600 0655 DF1SO	JN48	27	2?	1	1	1	nc
950602							
0400 0430 DL1KDA	JO30	26	26	27	45	1	c
0700 0740 GM4CXM	IO75	27	27	15	30	1	c
950603							
0400 0450 9A4FW	JN95						nil
0500 0550 LA4YGA	JO48	27	26	4	6	1	nc

Found condition not that good. Stn with qrb 1900-2000 km where absolute NIL. Random act where also low. (NIL) Aurora where present on several days, with good copy of DL0PR. No station active but DL9GJW (JO54) . hpe to activate JP52 in persids this year also. 73 and gl on MS, Ken. Thanks for report.

MS-activity from Lithuania

LY2BIL (KO35DP) wkd on 144 MHz:

950613							
2100 2130 ON4KHG	JO10WK	27	26	8	6	0.5	c
2200 2300 IK1PAG	JN35SB	26	26	12	6	1	c
2300 2350 HA6NQ	JN98WA	27	27	9	4	1	c
950614							
0000 0012 9A1CCY	JN85OO	27	27	14	4	2	c
0225 0255 PA3FOC	JO21FW	27	27	16	6	8	c
0300 0400 OH9NDD		27	27	7	10	1	c
0400 0445 OH9NYW	KP25GR	26	26	15	16	0.5	c
0500 0525 DK9OY	JO52CK	27	27	m	m	1	c
0525 0540 DJ7OF	JO51	27	38	m	m	5	c
0700 0720 I4XCC	JN63GV	28	37	m	m	1	c
0800 0900 DL7VBW		26	27	11	m	0.5	c
0900 1000 IW1AZJ	JN35UB	26	26	8	5	1	c
1000 1105 DL9GJW	JO54WC	27	27	6	14	1	c
1105 1127 9A4EW	JN95JG	27	26	m	m	1	c
1200 1215 LA7DFA	JP33VC	28	28	m	m	3	c
1230 1242 DD0VF	JO61VB	27	27	7	5	2	c r
1300 1320 9A4FW	JN95JG	28	28	15	5	2	c
1335 1400 9A1CHI		27	27	18	9	3	c r
1430 1440 DL2DXA	JO61GL	27	27	9	8	3	c r

1500 1525	LA4XGA	JP33VC	28	39	18	10	2	c
2100 2135	I2FAK	JN45OB	27	26	33	18	2	c
2145 2225	DH2OAA	JO42	27	27	5	6	1	c r
2300 2342	IW2BNA	JN45ON	27	26	12	10	1	c
950615								
0300 0330	DH0LS	JO50SV	27	27	14	5	1	c
0435 0500	DF5BN	JN49	27	27	16	8	3	c r
0500 0600	G4YTL	IO92MB	26	26	13	11	1	c
0600 0620	DL8EBW	JO31NF	28	28	m	m	5	c
0620 0640	DH6JT	JO31JO	27	27	18	m	5	c r
0745 0802	DL5GAC	JN47	27	38	m	m	10	c r
0850 0910	DL8GP	JN39LH	26	27	8	3	2	c
0910 0945	DF6NA	JN49XS	27	26	14	m	4	c
1000 1017	DJ3MY	JN58QD	28	27	11	10	3	c r
1050 1120	UA4AQL	LO20QB	27	27	22	m	1	c
1510 1525	DL7AKA	JO62QO	27	26	8	4	3	c
1550 1645	DF8AA		27	27	7	7	1	c r
950616								
0100 0125	PA2DWH	JO22GD	26	26	11	8	0.5	c
0200 0215	DF7KF	JO30GU	29	27	m	m	3	c
0230 0302	DL1KDA	JO30FQ	27	27	17	m	1	c r
0640 0710	DK8ZJ	JO30IX	26	27	10	16	5	c r
2300 2337	DL1EAP	JO31IK	26	26	18	14	1	c r
950617								
0200 0300	IK0BZY	JN61GW	26	27	16	28	1	c
0300 0400	IK0SMG	JN61FS	26	27	17	12	1	c

LY2BIL (KO14LL) wkd on 144 MHz in CW:

950706							
1835 1905	SM2CEW	KP15CR	27	27	5	20	3	c
950707							
0500 0545	DJ5RE	JN59WI	27	26	3	10	3	c
1200 1300	LA7DFA	JP33VC	27	26	10	20	3	c *
1605 1650	S53VV	JN65UM	27	28	5	5	3	c
1800 1900	SM/DL7VBW	JP81						c
2100 2125	IK0BZY	JN61GW	26	26	7	4	1	c
2140 2152	DH2OAA	JO42TU	27	27	8	4	1	c r
2200 2235	PA3EFC	JO22HA	27	26	11	6	1	c
2300 2320	9A1CCY	JN85OO	27	27	14	24	1	c
2320 2335	IK1PAG	JN35SB	27	27	m	m	2	c
950708								
0000 0032	DL1KDA	JO30FQ	26	27	m	m	2	c
0032 0042	DF7KF	JO30FU	27	27	m	m	1	c
0042 0100	DF9KT	JO30GU	27	27	m	m	1	c r
0200 0220	DL8EBW	JO31NF	27	27	9	6	1	c
0220 0300	9A4FW	JN95JG	27	37	12	8	8	c
0300 0325	DL2IAN	JN49PC	27	27	8	10	0.5	c
0325 0337	DL3IAE	JN49DE	27	26	6	4	1	c
0340 0402	DL8SCQ		27	27	15	m	1	c
0405 0427	I4YNO	JN54KP	26	27	m	m	2	c
0430 0455	PA3BIY	JO22FA	27	27	11	8	0.5	c r
0600 0640	I4XCC	JN63GV	27	27	m	m	2	c *
0700 0800	DK0UB	JO31PK	26	26	4	3	0.5	c
0800 0845	IK2DDR	JN55GN	27	27	18	10	1	c
0850 0910	DL9YEY	JO41GV	37	27	13	m	1	c r
0910 0930	PA3FOC	JO21FW	27	27	18	6	3	c
0932 0950	DL8GP	JN39LH	27	26	m	5	12	c r
0955 1012	PA2DWH	JO22EB	28	26	13	2	1	c r
1015 1126	S51AT	JN75GW	27	26	6	4	0.5	c
2200 2217	I2FAK	JN45OB	27	27	10	m	1	c
2217 2300	IW1AZJ	JN35UB	37	27	10	10	1	c?
950709								
0055 0120	DL1EAP	JO31IK	27	27	m	m	4	c

Active VHF-Amateurs: Vladimir, UT5AO and Alex, UT8AL

0120	0150	DL3YEL	JO41EV	27	26	10	6	2	c
0150	0222	DK8LV	JO44SJ	27	27	13	4	3	c r
0225	0300	DK8EL	JO31JO	27	28	m	m	1	c
0500	0535	I1DMP	JN35UB	26	26	8	14	3	c
0545	0610	DJ7OF	JO51	28	28	18	m	2	c r
0610	0627	DK9ZY	JO40BE	26	28	m	m	1.5	c
0630	0655	DD0VF	JO61VB	27	27	7	4	1	c r
0740	0800	DF5BN	JN49GU	26	26	m	m	1	c r
0800	0835	G4YTL	IO92MB	27	26	10	5	13	c
0900	0937	G4AEP	IO91NJ	27	26	9	10	1	c
1000	1022	DF6NA	JN49XS	26	27	10	15	1	c
1030	1042	HB9DBM	JN47CD	27	27	4	5	3	c r
1100	1130	ON4ASL	JO20GX	27	26	8	10	1	c
1700	1727	PA0JMV	JO21PM	27	26	6	7	1	c
1900	2005	9A1EZA	JN86HG	28	26	14	10	2	c
2005	2035	DL9NDD	JN59KN	27	27	7	11	1	c
2035	2055	DK0OG	JN68GI	28	28	15	20	1	c r
2127	2147	DL5MAE	JN58VF	29	29	m	m	1	c r
2200	2245	IC8FAX	JN70CN	27	27	14	8	1	c
2300	2315	ON4QQ	JO20	26	28	30	12	1	c
2315	2342	DL8LAQ	JO43XU	26	26	14	9	1	c

950710

0000	0025	ON4KHG	JO10WK	26	27	16	4	0.5	c
0100	0135	F5GHP	IN96LE	26	26	9	3	1	c
0200	0245	YU7BCL	KN05FW	26	27	4	4	1	c
0400	0445	G0JUR	IO92WS	26	26	11	6	1	c
0500	0700	F/G8MBI	JN04FT	26	26	18	13	1	c
0700	0722	GM4CXM	IO75TW	27	26	12	4	1	c
0755	0825	YU7EW	KN05HP	26	27	12	5	2	c
0825	0840	YU7MS	KN05FJ	26	26	8	6	1	c

NC: OH9NYW, HB9BQU, 9A4EW, G0FIG, G6RAF, PA2TAB, DF1SO, G0GMS, UA3T, I5YDI/5, I5MZY. Remarks: * We were running 20 watts only. Operators were: LY1DW, LY2BKF, LY2BIL, LY3BF. Thanks go to LY2SA and LY3CW, for all support, especially beer on sunday morning. Equipment: FT-736R, PA 800W, 13el., OH5IY v4.2, UHER. 73 Rytis.

LY2BW wkd on 144 MHz MS CW:

950616

0500	0525	9A1EZA	JN86HG	27	27	m	m	2	c
0600	0612	DK9ZY	JO40BE	27	26	28	4	3	c

NC: F/G8MBI (2200km), G0JUR (too slow), G0GMS (static). NIL: PE1IKX, I4YNO, IK1LGV, DL1EJA, PA2TAB, G0CUZ. Rig: FT-736R, PA 800W, 11el., OH5IY v4.2, UHER 4000. Comments: Thanks to Algis/LY2BW for finding nice place near his home and my friend Darius Miseikis for all help during expedition. 73 Rytis LY2BIL@LY1BZB. Thanks for all reports, Rytis.

MS-Address-List

Please don't forget your update!

The next list will be published soon in the Packet-Radio-Network and in the DUBUS-BBS Berlin!

VHFer Meeting: First Row, l. to r. DG1BA, DF8LC, UT5AO, DL5BAC, UT8AL, DJ1JD, DJ9YE, DK1KO, DL5BCO; 2 nd Row, l. to r. DL8EBW, DL8LAQ, DK9OY, DG3BCU

FAI News

Editor: Georges Vialet, F8OP

Only one QSL was received as a result of my comments in DUBUS 2/95: Stefan LA0BY has kindly send us a very interesting report regarding his experience about the Ionoscatter contacts.

Thanks Stephan. Georges VIALET F8OP

Ionoscatter Report (LA0BY)

Living in Northern Norway since a few years, I am very interested to learn more about Ionoscatter which I have myself frequently used from various locations.

Please find attached a list of my contacts via Ionoscatter. For those, I always used 200 W RF into a single 16 elements Yagi, 5m above the ground. The ERP is only about 5 KW.

I am not quite sure about the difference between Aurora-E and Ionoscatter if there is any. I believe, that everything I have experienced, is probably what you call "Ionoscatter". According to my observations, Ionoscatter seems to be very frequent between May and August, peaking in June and July.

Because of the at least on 144 Mhz significant signal audio characteristics and diurnal variations of observations, I suspect that Ionoscatter is identical with that scientists call Polar-Mesosphere-Summer-Echoes (PMSE).

Although, several research programmes have been executed, the phenomena is still not understood in all details. Ionoscatter is one of the few remaining subjects where amateur observations may well contribute to Ionospheric science. The amount and distribution of possible monitoring stations is large compared to scientific installations, and reports from radio amateurs will certainly help, to improve statistics. Informations on azimuth and elevation beaming, unusual modulation, possible correlation to other propagation is of interest.

Ionoscatter occurs most likely before, during or after strong Aurora, from 08 to 10, and 22 to 00 UTC, but openings in the early afternoon have also been noticed. Probably caused by reflections on rapidly moving thin sloping layers at heights around 85 Km, the signal shows fast fading and often appears weak even though the S Meter reading may be quite reasonable. The position of the reflective layers may follow that of auroral oval. A location above Oslo at 58 degrees North will allow for contacts between Northern Scandinavia and Central Europe.

In a spectacular event in June 89, I managed to work SM2EKM and OH5LK with 2x10 el yagi and 200 W RF power, while I was DF9PY/P located in JO30JF. On the very same day, propagation via Aurora and also Sporadic-E occurred. This was probably the most southern extension propagation via Ionoscatter noticed so far.

73, Stefan (LA0BY)

LA0BY/p in JP89LB wkd via Ionoscatter on 144 MHz: 160690 0603 DK1KO JO54 439 319

LA0BY/p in JP68JC wkd via Ionoscatter on 144 MHz: 280790 2044 SM5MIX JO78 519 429 2053 SM0ERR 519 529 2057 SM4KYN JO79 529 529 2103 OH2TI KP20 429 429 strange sound 290790 0901 DK1KO JO54 529 319 I had my beam to OH first!

LA0BY/p in KQ00BC wkd via Ionoscatter on 144 MHz: 070691 2322 LA6HL JO28 519 519 080691 0023 SK4MPI JP70 519 hrd

OH9/DF9PY/p in KP38RK wkd via Ionoscatter on 144 MHz: 150691 0831 SM5DCX JO78 529 539 0837 SM5MIX JO78 519 429 0842 SM0HAX JO89 519 419 0850 SM0KAK JO89 519 419 0854 OZ3GW JO56 419 539 0858 SM5IOT JO99 529 549 0900 SK4MPI JP70 529 hrd 0920 OZ4VV JO46 539 469 0928 SM6AFH JO66 529 559 0942 SM0/ES5MC JO89 529 429 0950 SM4POB JP70

529 439 1010 SM5MIX JO78 529 439 1025 SM1BSA JO97 519 439 1630 SK4MPI JP70 519 hrd

LA0BY/p in KQ31QB wkd via Ionoscatter on 144 MHz: 140891 2310 SM5DCX JO89 519 329 2338 SM5DCX JO89 539 539 2343 SK4MPI JP70 419 hrd 150891 0002 SM5BSZ JO89 529 539 0019 SM0HAX JO99 519 429 0050 SK4MPI JP70 519 hrd

LA0BY/p in KQ41BC wkd via Ionoscatter on 144 MHz: 160891 0435 GM4IPK IO99 529 429 ca. 1800 km

LA0BY/p in JQ90JA wkd via Ionoscatter on 144 MHz: 100793 1015 GM4IPK IO99 529 439 1027 GM4YXI IO87 529 529 1410 GM4IPK IO99 559 539 1550 OH5IY KP30 529 529 1600 OH7PI/4 KP42 419 429 1627 GB3LER IP90 419 1635 SK6HD JO68 319 1656 LA2AB JO59 529 529 110793 0650 GM4IPK IO99 539 539 0850 SK4MPI JP70 519 0910 GB3LER IP90 419

CT1WW in IN61 wkd via FAI on 144 MHz: 050695 1615 TK5JJ JN42OR 58 59, 1616 TK/F8EL JN41KW 57 55, 210695 0955 I4XCC 55 55, 0956 IW4CYM 55 55, 250695 1350 I5JUX 55 53. Tnx fer Info, Tiago.

I4YNO in IN61 wkd via FAI on 144 MHz: 020695 2010 F5SOH IN93OI 57 59, 2019 EB4TT IN70XJ 53 52, 2026 F9HS JN03GL 57 57, 2032 EA2AGZ IN91DV 53 52, 2050 IK1LLD JN44CG 529 539, 2104 EA2LP IN93AH 51 51, 060695 2027 F/G8MBI, 2047 F6TER JN03BG 55 54, 2055 F5PL JN03XI 569 559, 2130 F5FMW JN13BV 52 52, 2134 EB4TT IN70XJ 52 51. Tnx fer Info, Alex.

Call for Reports

Thanks to LA0BY, CT1WW and I4YNO for their reports.

Some DUBUS readers may be not aware that we have a new column, which is dedicated to scatter phenomena like FAI or Ionoscatter. I try hard, to set this new column after several years of absence in the DUBUS magazine. I think we will publish QSO-reports, but also technical features, propagation theory and reports should be of high interest to our readers. Also phenomena like Ionoscatter need to be investigated. !

There is also a request from IARU, Region 1, Propagation Studies, to participate in propagation studies. DUBUS will take part in those programs and your reports besides being printed in DUBUS will have a second use for these scientific studies. This may help to defend our bands by showing that we support public interests.

Conclusion:

- Send your reports via mail, email, packet
- Send your photographs
- Send articles, if you wish.
- Be active: For active amateurs by active amateurs, that's the motto DUBUS stands for.

/3

Georges Vialet, F8OP

ES News

Editor: Edmund Ramm, DK3UZ

950602

DD0VF (GL79c) wkd: 1208 9H1GB HV13a, 1208 9H5L HV03f, 1209 9H5CL HV03f, 1212 9H1BN HV, 1214 IW8AOK HA12h, 1215 IC8FAX HA32g, 1224 IW9BCU HX, 1225 9H1CD HV03e, 1448 F9HS AD43a, 1449 F5SJP ZD, 1451 F6ITD AD, 1453 F6DRO AD38d, 1500 EB4EUB YA42e, 1509 EB4EQZ YA42j, 1513 EA6VQ BZ26f.

DH3YAK (DL18f) wkd: 1436 LZ2FO LD05a, 1446 YO7VJ LE59d.

DH6JT (DL34b) wkd: 1213 IK7MCJ IA47d.

DK8EL (DL34b) wkd: 1213 IK7MCJ IA47d.

DL1GNM (DI80j) wkd: 1148 SV1BTR LX09b, 1157 SV1EN LY79d, 1204 SV1AHX LY79e, 1210 SV1AKX LY09e, 1232 SV6CZQ KY04j.

DL2FDX (EK55d) wkd: 1452 EA3DUY BC65d.

DL3ARK (FK12g) wkd: 1208 I8KRO IY03g, 1453 EA3DXU BB32f, 1505 EA3CRI BB42h.

DL5GAC (EH18d) wkd: 1231 SV1BTR LX09b.

DL8EBW (DL66a) wkd: 1451 YO3DMU NE41e, 1452 YO3JW NE42g, 1452 LZ3FT NE77a, 1453 YO3ACX NE41a, 1453 YO3FBL NE41e, 1651 YO8BSE NG, 1705 LY2BIL MO27j.

F1GTU (AF64a) wkd: 1120 9H5CL HV63g, 1120 9H1CD HV03f, 1139 LZ2FO LD05a, 1145 LZ2AB ND78b, 1146 LZ2WY MD44d, 1147 LZ1UH LB18b, 1150 LZ3BD LC27c, 1157 LZ1QB LC08f, 1202 LZ1ZB LC27a, 1205 Z32AM LB33c, 1208 LZ5FM LC10d, 1209 LZ5GB, 1217 LZ3UF LC27c, 1219 LZ2KHM LD47f, 1231 YU1HFG KC10b, 1232 LZ2CW LD63d, 1235 YO7VJ LE59d.

G6RAF (ZM27e) wkd: 1440 YO3DMU NE41e, 1440 YO7VJ LE59d, 1443 YO2KCB KF, 1444 YO2BBT KF56e, 1450 LZ2FT NE77a,1454 YO3ACX NE41a, 1455 YO5BLA LG29g, 1455 YO3JW NE41h, 1457 IW5DAN FD13b, 1458 IK0OKY GB13c, 1502 IC8FAX HA32g, 1504 I8MPO HA23f, 1507 I5JUX FD02g.

HB9JAW (EH62g) wkd: 1137 SV1BTR LX, 1138 SV1EN LY79d, 1157 SV1AKX LY19b, 1158 SV1AHX LY, 1202 SV0KG, 1212 SV2CNB, 1215 SV2DFA, 1231 SV2CWW LA35a.

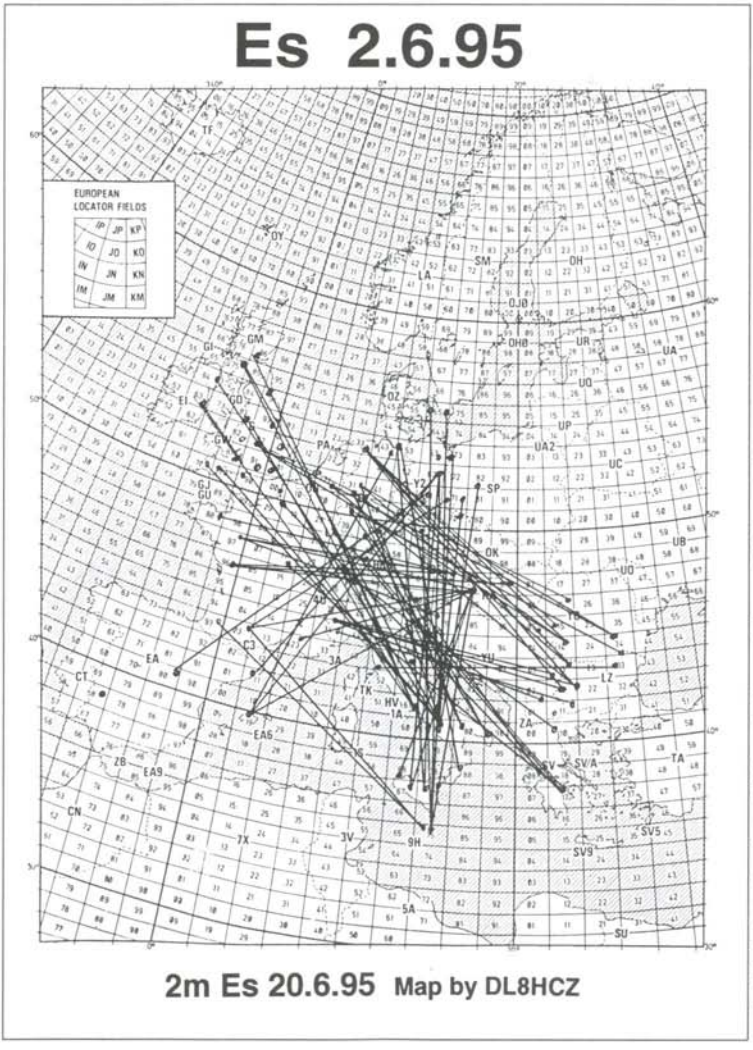
HG7JAL (JH45j) wkd: 1449 F5GHP ZG65c.

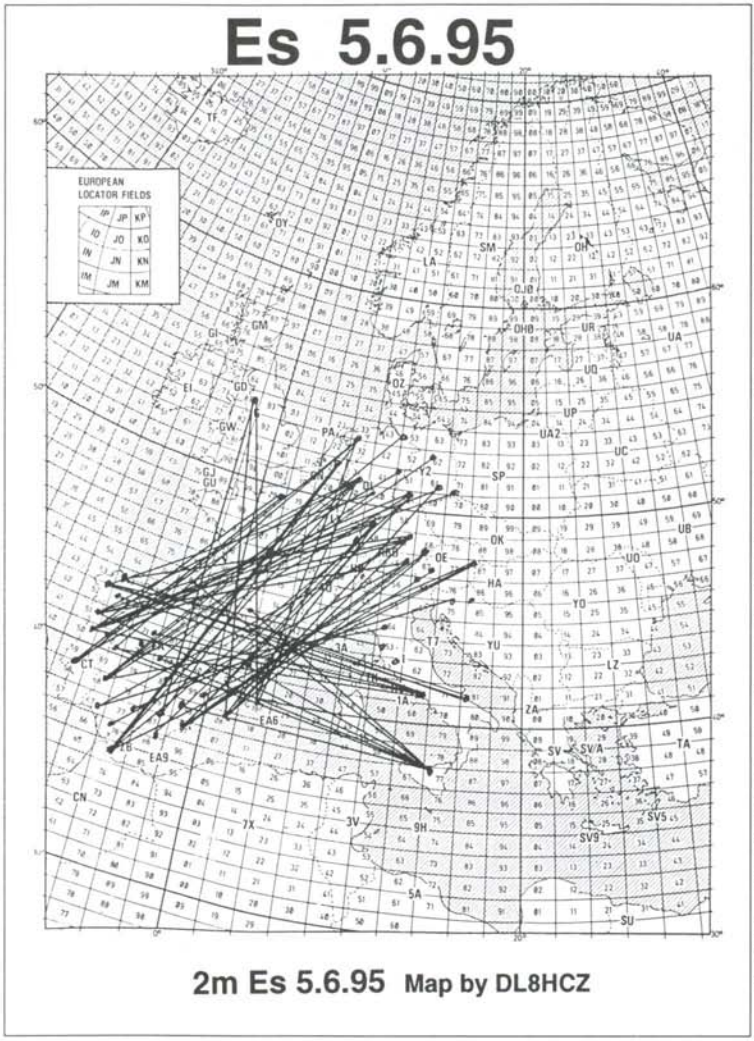
IC8FAX (HA32g) wkd: 1149SP2SGZ IM19a, 1200 OK1UAK HK76g, 1200 SP6VGP HL66f, 1205 DL7UTS GM49f, 1206 SM6JUQ GP37a, 1207 DL1VAA GL80j, 1208 DL3BWW HM53b, 1209 OZ6OL GP42e, 1210 DH8BQA HN72j, 1211 DL3BQA HN62h, 1211 DL1KUS GN08b, 1212 OK1AXH GJ28h, 1212 DL0PCK HN72j, 1213 DL1VAA GL80j, 1214 DL6NVC/p HN41h, 1215 DD0VF GL79c, 1414 DL2DXA GL79b, 1416 DL9UAA, 1418 DK1KO FN12g, 1423 OK1VQ GK29j, 1427 DL7AKA GM37b, 1431 G3GNR XK20j, 1431 G4DOL YK28d, 1432 G3YAY YK62b, 1433 G8JDY XK60e, 1434 G6DZH ZM, 1435 G8MYK ZM41e, 1435 G4MKF ZL44f, 1438 GW0VWD YL33d, 1438 G3ILO YL29c, 1439 GW4VEQ XN58d, 1439 G2CIW YL17c, 1440 G8VOI ZK15b, 1440 EI4DQ VL20a, 1441 G4RRA ZL67h, 1441 G4MKF ZL44f, 1443 GW0TAU YL31a, 1443 GW4ZQV YL25c, 1444 G4JCC ZK16f, 1445 G3UKV YM, 1445 GW6NLP YN75j, 1448 G4FBZ YM, 1448 GW4UWR YL25d, 1449 GW4VEQ XN58d, 1449 EI3GE WN70d, 1450 G6FZV YK69c, 1452 GI6ATZ WO50c, 1455 GI4OPH XO22d, 1456 G3BNE AL11e, 1456 G7PKG ZL08d, 1458 G3IMV ZL07h,x1458 G4IJE, 1459 G4SCJ ZM56e, 1459 G8XVJ YN48f, 1500 G6HKM AL13g, 1501 G4JZF YM40b, 1501 G6RAF ZM27d, 1502 G1GFQ YN57j, 1503 G8TIC YM69b, 1503 G4FBZ YM, 1504 G0EVT ZN23b, 1505 G4YHF ZM39c, 1505

G7NPG YN27f, 1506 G3KEQ AL51j, 1506 G8GXP ZN23g, 1507 G3LNR ZM04d, 1508 G2CZS AL24g, 1508 G1YFA ZM54f, 1509 G7THU ZM65j, 1509 G6YIN ZN12c, 1510 G1EUV ZL30e, 1511 G0HWK ZL09f, 1512 G4KLX, 1513 G3YHC ZO, 1514 G0LBY ZN22b, 1514 G0JUR ZM20j, 1515 G4KIY ZM40j, 1515 G8NWM ZM19g, 1515 G1SVW AL15b, 1516 G8UAQ ZN55j, 1517 G3ZXZ ZN21e, 1517 G4AES/p ZN11f, 1518 G4AWU ZN45c, 1519 G4OWF ZN12b, 1520 G3EKL ZO52a, 1520 G1FAM ZN55j, 1522 G1VOC, 1541 GM4CXM XP09g, 1542 G4AWU ZN45c, 1543 G1HEW ZN.

IK0OKY (GB13c) wkd: 1454 GW4ZQV YL25c, 1455 G6DZH ZM51f, 1457 EI3GE WN70d, 1457 G6HKM AL13g, 1658 G8MYK ZM41e, 1500 G6RAF ZM27d, 1500 G3LNR ZM04d, 1501 G4RUW ZL44e, 1501 G4MKF ZL44f, 1502 G8XVJ YN45e, 1502 G0KAS ZL59a, 1503 G3ZXZ ZN21e, 1503 G7NPG YN27f, 1504 G4IJE, 1505 G4KIY ZM40j, 1505 GM7CXM XP09g, 1505 G4AWU ZN45c, 1506 G0EVT ZN23b, 1506 G8UAQ ZN55j, 1507 G4YHF ZM39c, 1507 G1FAM ZN55j, 1508 G0MZZ ZN22b, 1509 G8GXP ZN23g, 1510 G0LBY ZN22b, 1510 G1GFQ YN57j, 1511 G6YIN ZN12c, 1511 G0JUR ZM20j, 1512 G8NWM ZM19g, 1513 G7PQT ZN57f, 1516 G3LQR AM67b, 1516 G4SWX AM77j, 1517 G3WQM ZN05a, 1518 G0EAT ZN17g, 1518 G3YHC ZN03h, 1518 G0UYC AM27f, 1535 GM4JJJ YQ73c, 1541 G1PXA ZO02a.

IK1LGV (EE44c) wkd: 1147 LZ1UH LB18b, 1150 LZ1ZB LC27a,





2m Es 5.6.95 Map by DL8HCZ

1155 LZ3BD LC68f, 1159 LZ1RK MC62b, 1205 YU1HFG KC.

IW1AZJ (DF79j) wkd: 1203 LZ1ZB LC27a, 1204 LZ1RK MC62b, 1205 LZ1UH LB18b, 1208 LZ3UF LC27c, 1212 LZ3BP LC27c, 1215 LZ1YB, 1219 YU1WU LD73g, 1222 YU1HFG KC10b, 1226 YU1INO, 1229 YO7VJ LE59d, 1230 YO7VS LE59c.

LY2BIL (MO27j) wkd: 1705 DL1KDA DK23g, 1705 DL8EBW DL66a, 1705 DF7KF DK13b.

OE3OKS (IH21h) wkd: 1124 9H1GB HV13h, 1125 9H5CL HV03f, 1127 9H1CD HF03f, 1129 IT9GSV GX18c, 1139 IW1CGB/9 GY, 1141 9H5L HV03f, 1142 IT9SGO GY73d, 1149 IT9VXS GX03b, 1457 F9HS AD43b, 1503 EA6VQ BZ, 1518 F1JG CD24g, 1520 F5GHP ZG65c, 1522 F6ETI YH24c, 1526 F1BBU ZH63g.

OE6IWG (HH47j) wkd: 1522 F5GHP ZG65c, 1530 F1BBU ZH63g, 1537 F6HRP YI35j.

PA3BIY (CM72c) wkd: 1712 UA3XFA RN12a.

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DD0VF (GL79c) wkd: 1627 CT1CLR VA22g, 1814 EA1AEN VC77c, 1820 CT1DYX VB67j, 1838 EA1YV VC67a, 1839 EA1AU VC67a.

DF1CF (FH23j) wkd: 1514EB1FCP VB26j, 1546 EA5CHT ZX42c, 1558 EA7BHO YX62c, 1601 EB7FLW XW, 1606EB1EVP WD, 1609 EA7ZM XW28b, 1614 EA1DIH VB06j, 1631 EA1DAV WD43g, 1632EB1OL VD, 1754 EB5JNA AY, 1758 EA5FKW ZY57e, 1801

EA5GIY ZY, 1807 EA5FIL ZY, 1810 EA5DGC ZX48a.

DG0OPK (FK23c) wkd: 1455 EA4EHI WY16h, 1500 EA9AI XV04e, 1522 CT1DQU YA, 1515 CT1CLR VA27d, 1550 EA6FB AY07e, 1600 EA5CHT ZX42c, 1610 EA5FKW ZY27j, 1624 CT1CJJ VA18h, 1625 CT1FAK VA37b, 1629 CT1DMK VA27d, 1823 CT1EEB VA, 1824 CT1DMK VA27d.

DH6JT (DL34b) wkd: 1459 EA9AI XV04e, 1518 EB4TT XA50d, 1605 EA6ACJ BZ, 1607 EB6YY BZ34e, 1614 EA6FB AY07e, 1626 EA4EHI/p WY06f, 1634 CT1CLR VA27d, 1637 CT1DMK VA27d, 1638 CT1FAK VA, 1641 CT1DYX VB, 1643 CT1EKF VA.

DK1VI (EJ54f) wkd: 1458 EA4EHI WY16h, 1459 EA9AI XV04e, 1506 CT1DQM WA, 1520 CT1EKF VA18b, 1525 CT1DMK VA27d, 1527 CT1CLR VA27d, 1550 EA6FB AY07e, 1558 EA5GIW AY11h, 1559 EA5CHT ZX42c, 1605 EA5FKW ZY27a, 1609 EA7CU YW, 1613 EB7NK YW28g, 1637 EA1FCP, 1820 EA1AEN VC77c.

DK8EL (DL34b) wkd: 1459 EA9AI XV04e, 1518 EB4TT XA50d, 1614 EA6FB AY07e, 1626 EA4EHI WZ44d, 1634 CT1CLR VA27d, 1637 CT1DMK VA27d, 1638 CT1FAK VA37b, 1641 CT1DYX VB67j, 1643 CT1EKF VA18b.

DL1BKK (EN76e) wkd: 1458 EA9AI XV04e, 1516 EB4EQZ YA42j, 1634 EA4EHI WY16h, 1644 CT1EKF VA18b.

DL1EJA (DL12e) wkd: 1514 EB4TT XA50d, 1555 EA6SA BZ06j, 1558 EB6YY BZ34e, 1602 EA6XQ BZ, 1617 EA6FB AY07e, 1640 CT1CLR VA22g, 1645 CT1EKF VA, 1647 CT1DMK VA27d.

DL1GFH (EH29h) wkd: 1457 CT1DQM WA, 1504 CT1DMK VA27d, 1505 CT1CLR VA22g, 1517 EA1DIA VB06j, 1518 EB1FCH VB06j, 1522 EA1AEN VC77c, 1549 EA5CHT ZX42c, 1556 EA5GIW AY11h, 1600 EA7BHO YX62c, 1604 EA5ABE ZZ49g, 1608 EB7NK YX58f, 1616 EA7ALJ YX12f, 1626 EA1DAV VD59g, 1631 EA1TA VD58b, 1800 EB6YY BZ34e, 1805 EA5GIY ZY40b, 1839 EB5JNA AY, 1841 EA5FIL ZY.

DL1GI (DI60a) wkd: 1457 EA4EHI WZ44d, 1508 CT1DQM WA, 1522 CT1CLR VA22g, 1559 CT1FAK VA, 1602 EA6FB AY07e, 1610 EB7NK YW, 1615 EA5FKW ZY57e, 1617 EA5CHT ZX42c, 1631 EB1FCP VB26j.

DL1GNM (DI80j) wkd: 1503 CT1EKF VA18b, 1509 CT1CLR VA22g, 1511 CT1DQM WA, 1513 CT1DMK VA27d, 1524 EB1FCP VB06e, 1525 EA1DIH VB06j, 1526 EA1AEN VC77c, 1600 EA6FB AY07e, 1601 EA5CHT ZX42c, 1610 EA5KFW ZY27a.

DL2FDX (EK55d) wkd: 1500 EB4TT XA50d, 1512 CT1DQM WA34e, 1535 CT1CLR VA27d, 1606 EA6FB AY07e, 1617 EA5GIW AY11h, 1624 CT1WW WB63b, 1630 CT1FAK VA37b, 1647 CT1DMK VA27d, 1829 CT1DDW WA21e.

DL2IAN (EJ71a) wkd: 1633 CT1WW WB63b.

DL3ARK (FK12g) wkd: 1511 CT1DQM WA, 1625 CT1WW WB63b, 1815 CT1DYX VB67j.

DL3NCR (EI07b) wkd: 1550 EA6FB AY07e, 1558 CT4KQ WA21e, 1600 EA7CU YW, 1601 EA5FKW ZY57e, 1607 EA5CHT ZX42c, 1610 EA5ABE ZZ49g, 1757 EA5GIY ZY40b.

DL8EBW (DL66a) wkd: 1452 EA9AI XV04e, 1514 EB4EQZ YA42j, 1515 EA4CHI WY16h, 1555 EB6YY BZ34e, 1606 EA6ACJ BZ34g, 1631 CT1CLR VA22g, 1632 CT1FAK VA37b, 1636 CT1DYX VB67j, 1635 CT1EDB VB68g.

EA9AI (XV04e) wkd: 1445 DL8OBU EM60b, 1446 DH2OAA EM19h, 1446 DL9YEK EM55c, 1447 DJ2QV EL02d, 1447 DH2YAU, 1448 DF9QT EM64f, 1448 PE0RKI, 1449 DG6YHT EM, 1449 DL6YBJ DK, 1449 DB0CGS, 1450 DL0AFS EL, 1450 DH3YGT EL, 1450 DC3DQB EL, 1451 DF7VO DM66h,1452 DL5BCU EN65d, 1452 DL8YEV, 1452 DL5BBW DM56j, 1453 DL8EBW DL66a, 1453 DK3RV DL52e, 1454 DB8KJ DK32f, 1454 DL6YCY EL12h, 1454 DL6BCT EN, 1455 PI4NYV, 1455 DL8BAB EN77g, 1455 DF7KF DK13b, 1455 DL6EBV DL55j, 1455 DF9KT DK13b, 1455 DL8EAY, 1455 DL8BDC, 1456 DG3YGV DL26e, 1456 DL5YEE EM, 1456 DL3KBK DK13b, 1456 DB0HC DK32f, 1456 DG3KCE DK13g, 1457 DJ0VZ DK43b, 1500 DL1BKK EN76e, 1501 DL6EAS/p DL56j, 1501 DG0OPK FK23c, 1501 DH6JT DL34b, 1501 DL2EAA DL45a, 1502 DL1BKI EN76e, 1502 DK1YO

DL09e, 1502 DG7EAI/a DL56j, 1503 PE1LAU DN66f, 1503 DL8KBJ DK04j, 1503 DG2DCI, 1504 DL5EBS DL45d, 1504 PA3FBN DN64g, 1504 DL0VO DL, 1504 DK0HH DK43b, 1504 DD7KE DK13b, 1505 PA3FFX DM03b,1505 DG6JF/p DN, 1505 DH6JL DL56h, 1505 PE0RKI, 1505 DL6YEH DL09h,1506 PA3CEG DN73g, 1506 PE1OGF CL47d, 1507 PA3FVG DN73g, 1515 PA3FBP DN73c, 1516 PA3FFX DM03b, 1517 PA3FER DN, 1517 PA3BIY CM72c, 1518 PA3RLS CM53d,1518 ON1AEN BK09e, 1519 PA2DWH CM63d, 1519 ON4AVJ BL79j, 1520 PA3AGS CM, 1837 OK2XTE HJ70a, 1839 OK2ZZ IJ32j, 1840 OE5OLL GI58b, 1840 DL1SDN EI27e,1841 DL5MEV GI74d, 1841 DG1MKE GH11a, 1842 DG3MKW GI74e, 1844 OE6IWG HH47j, 1845 OE3OKS IH21h, 1846 OM3CQF II18g, 1848 DJ9KV GI47g, 1849 DK0OG GI53b.

F1GTU (AF64a) wkd: 1123 9H1CD HV03f, 1126 9H1AL HV.

F1JKJ (BD30e) wkd: 1120 9H1AX HV03f, 1125 9H1AL HV.

G7HUD (YN45e) wkd: 1455 EA6XQ BZ, 1457 EA6SA BZ06j, 1502 EA6/DF5JJ BZ, 1517 EA6FB AY07e, 1605 EA7BHO YX62c.

HB9JAW (EH62g) wkd: 1502 CT1CLR VA22g, 1513 EA1DIH VB06j, 1514 EB1FCP VB06e, 1516 EA1AEN VC77c, 1525 EB1ENP WC12b, 1559 EA7CU YW18b, 1603 EA6FB AY07e, 1606 EA5CHT ZX12d, 1608 EB5JBC/m ZY42h, 1611 EA5BQT, 1615 EA7FLW XW28b, 1616 EA7ZM XW78c.

I7FFE (IB53f) wkd: 1609 EA1AEN VC77c, 1611 EA1DIH VB06j, 1613 F5CXF ZD43b, 1615 F5SOH ZD57h, 1616 F8RL ZD63c, 1748 EB1EVP WD65d, 1755 EB1OL VD59h, 1800 EA1BLA VD49b, 1815 EA1YO XD60b, 1828 EA1BCB WD64a.

IK0OKY (GB13c) wkd: 1535 CT1WW WB63c, 1545 EA1NJ XB77j,1544 CT1KF VA18b, 1548 CT1CLR VA27d, 1550 EA1DIH VB06j, 1553 EB1FCP VB06j, 1556 CT1DMK VA27d, 1559 CT1FAK VA37b, 1601 EA1EAN VC77c, 1606 EA1EPM XB08g,1608 CT4KQ WA21e, 1615 EB1ENP WC12b, 1620 EA1DAV VD59g, 1749 EB1EVP WD65d, 1750 EB1OL VD59h, 1752 EB1BVO VD59h, 1757 EB1BLA WD43g, 1824 EB1EHO XD32e.

IW0CVK (GB03d) wkd: 1555 CT1WW WB63b, 1556 EA1NJ XB27e, 1600 EA1AEN VC77c, 1606 EA1DIH VB06e, 1611 CT4KQ WA21e.

IW1AZJ (DF79j) wkd: 1610 EA7BVD XX07f, 1630 EA7UH WX.

OE3OKS (IH21h) wkd: 1615 EA5ABE ZZ49g, 1616 EA5GQN/m Valencia, 1619 EB5IFI ZZ20a, 1620 EB5BSC ZZ48b, 1746 EA5FKW ZY57e, 1749 EB5IJA YY10e, 1750 EA7ALL YX12f, 1805 EB7ALS XX44h, 1838 EB5HRX ZZ49h, 1842 EA9AI XV04e.

OE6IWG (HH47j) wkd: 1453 EB1FCP YY10e, 1548 EA5IJA, 1553 EH7BVD XX07f, 1555 EB5IFI ZZ20a, 1559 EA7ALL YX12f, 1612 EA5ABE ZZ49g, 1616 EB7ALS XX44h, 1623 EA5FKW ZY57e, 1627 EB5BSC ZZ48b, 1743 EA5FKW ZY57e, 1749 EB5IJA YY10e, 1753 EB7ALS XX44h, 1755 EB5JNA AI21a, 1801 EA5GIY ZY40b, 1808 EB7ALS XX44h, 1842 EA9AI XV04e.

OK2XTE (HJ70a) wkd: 1749 EA5GIY ZY40b, 1834 EB5JNA AY21a, 1835 EA9AI XV04e.
ON4KHG (BK50j) wkd: 1525 EA4KD YA41g, 1636 CT1EKF VA18b.

PA0WWM (CM63g) wkd: 1528 EA7BVD XX17h, 1145 EA4EHI WY16h, 1155 CT1DQM WA34e.

PA3BIY (CM72c) wkd: 1513 EA9AI XV04e, 1515 EA7AJ YX12f, 1522 EA7BVD XX07f, 1519 EA7ZM XW28b, 1630 EA7UH WX, 1633 CT4QP VZ67a, 1635 CT1CRR VY15j, 1636 CT4PI VZ48b, 1639 CT1DQM WA, 1645 CT1DRB VY, 1648 CT4KQ WA21e.

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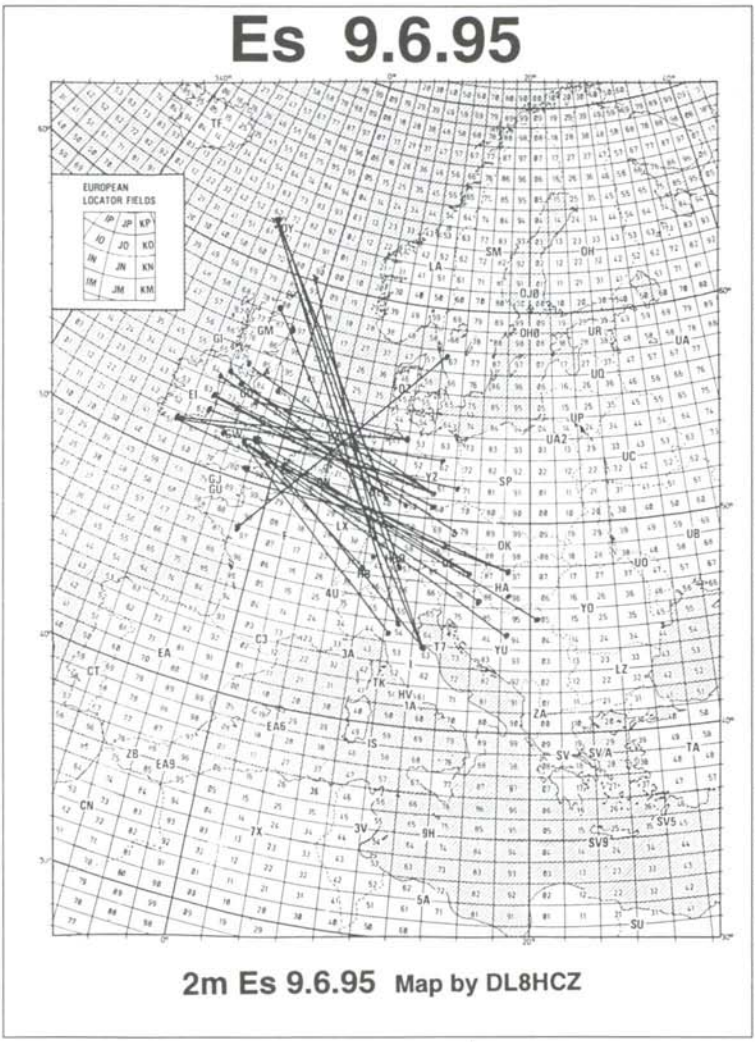
DD0VF (GL79c) wkd: 1044 EB6YY BZ34e.

DF1CF (FH23j) wkd: 1044 EA9AI XV04e, 1149 EA1FGJ WD, 1152 EA1WZ VD, 1154 EA1BCB WD64a, 1201 EB1EOO VC.

DF1SO (EI37a) wkd: 1138 EA1DIH VB06j, 1156 EB1FCP VB26j.

DG7EAI/a (DL56j) wkd: 1505 EA9AI XV04e, 1529 EA4EHI WY16h, 1603 EB6YY BZ34e.



2m Es 9.6.95 Map by DL8HCZ

DH3YAK (DL18f) wkd: 1151 CT1FAK VA37b, 1155 CT1CLR VA27d.

DH6JT (DL34b) wkd: 1147 CT1DDW WA21e, 1156 CT1DQM WA34e.

DK8EL (DL34b) wkd: 1147 CT1DDW WA21e, 1156 CT1DQM WA34e.

DL1BKK (EN76e) wkd: 1049 EA6SA BZ06j.

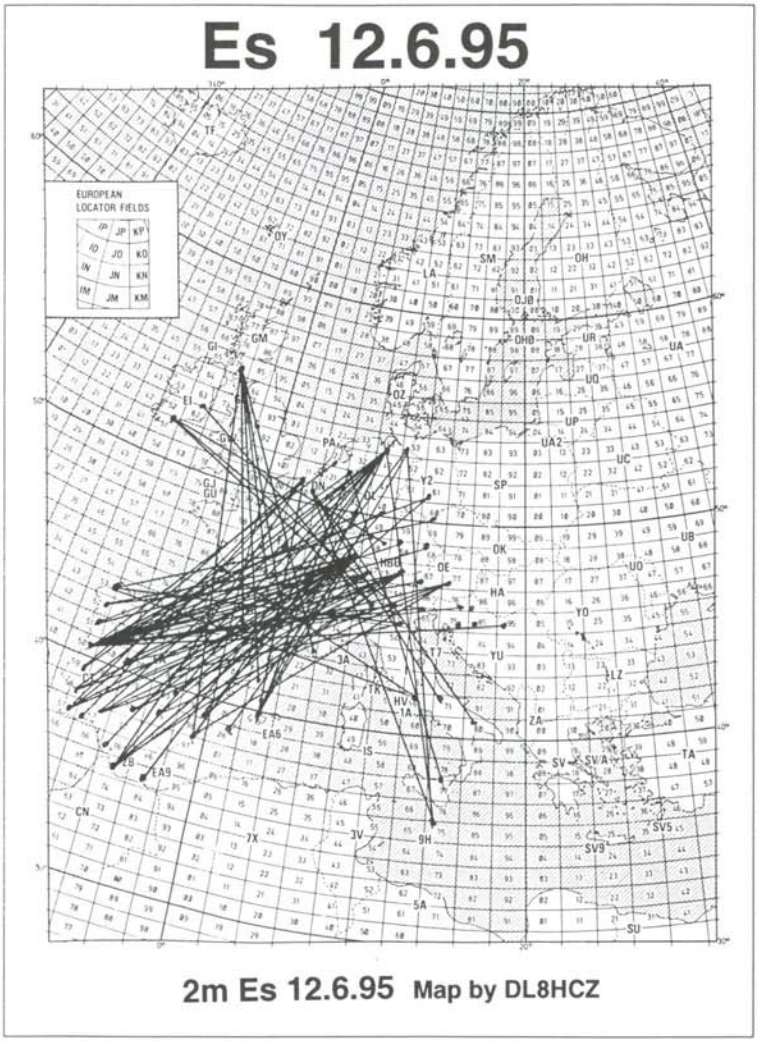
DL1EJA (DL12e) wkd: 1125 EA6SA BZ06j, 1133 CT1DDW WA21e, 1136 CT1DIN WA34e, 1138 CT1AUW , 1147 CT1DNM WA, 1205 EA4EHI WZ44d, 1207 CT1FAK VA.

DL1GNM (DI80j) wkd: 1118 EB1FCP VB06e, 1128 EA1DIH VB06j, 1144 EA1DIH VB06j, 1147 EB1EVP WD65d, 1151 EB1DNV, 1157 EB1EOO VC07e, 1203 EA1DAV WD43g.

DL2FDX (EK55d) wkd: 1155 CT1CLR VA27d.

DL2IAN (EJ71a) wkd: 1147 EA1DIH VB06j, 1149 CT1AIF WB67d, 1151 EB1FCP VB06e.

EA9AI (XV04e) wkd: 1035 IW2BNA EF37g 1043 OE3OKS IH21h, 1044 DL2MEM GI, 1044 DJ3MY FI67d, 1045 DG5MIB FI, 1045 DF1CF FH23j, 1046 DB3RT GI38h, 1048 DJ3MY FI67d, 1049 DF1CF FH23j, 1052 OE5OLL GI58b, 1117 GW4EAI YL24d, 1117 GW4UWR YL25d, 1118 G0HCE YO23e, 1118 GW3ZTH YL33f, 1119 G8XVJ YN48f, 1119 G4IQP ZM, 1120 G4VPD ZM41e, 1121 GW5NF YL, 1121 G4CQM XK18c, 1122 G4SWH YN37b, 1123 G4JPV, 1123 GW3KJW



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G4RKV (AL57h) wkd: 1625 IS0OZK EZ56g, 1628 IS0QDV EZ67a, 1643 EA4EHI WY16h, 1743 9H5L HV03f.

G7HUD (YN45e) wkd: 1125 EA7DBH XW, 1130 EA9AI XV04e, 1134 EA7TL XW, 1144 CT1EKF VA, 1155 EA7AG YW18b, 1215 CT1CLR

VA22g, 1216 CT1CRR VY15j, 1224 EA4EHI WY16h, 1250 CT4QP VZ67a, 1306 CT1DYX VB.

IW1AZJ (DF79j) wkd: 1047 EB7ALS XX44h, 1122 EA5EMM ZZ49h, 1123 EA9AI XV04e, 1158 EA1WZ VD49a.

OE3OKS (IH21h) wkd: 1035 EB5HEA YX05a,1042 EA9AI XV04e.

OE6IWG (HH47j) hrd: 0925 EB6YY BZ34e, 1036 EB5HEA ZX05a, 1039 EB7ALS XX44h, 1040 EA9AI XV04e.

PA3BIY (CM72c) wkd: 1128 CT1DIN WA34e, 1130 CT1DDW WA21e, 1142 EA4EHI WY16h, 1145 CT1DQM WA34e, 1150 EA1AYP/m, 1200 CT4RP VZ67a, 1203 CT4QP VZ67a, 1216 CT1EEB VA, 1215 CT1CLR VA22g.

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DD0VF (GL79c) wkd: 1630 GM4ZMK XP09g, 1632 GM0CLN YP17h, 1632 G0EHV ZO03g, 1638 GI4OPH XO33j, 1646 GM6LNM XP07e, 1750 GD7HEJ XO68d, 1750 EI3GE WN60d, 1753 EI9HW WN26f, 1754 GW4VEQ XN58d, 1801 EI6HP WM65a, 1840 EI6AS WN59b.

DL1BKK (EN76e) wkd: 1830 EI5FK VL08f, 1832 EI4DQ VL20a.

DL1GFH (EH29h) wkd: 1755 OY9JD WW77f.

DL2FDX (EK55d) wkd: 1635 OY9JD WW77f, 1844 GI4OPH XO22d, 1846 GI4CMC XO31j.
EA9AI (XV04e) wkd: 0925 IW0FMA GB14j, 0927 IK0WGW GB03d, 0930 IW0DHV GC42b.

GM4CXM (XP09g) wkd: 1758 HA1YA IH63b, 1759 OK1UBR GJ.

OE3OKS (IH21h) wkd: 1619 G4IGO YK06j, 1626 G4AEP ZL46e, 1628 GW6RBZ YL25d, 1629 G0KAS ZL59a, 1632 G4RRA ZL67h, 1634 G4RUW ZL44e, 1635 G0IOM YL50b, 1636 GW4HDF YL34b, 1636 G1WPF ZL28f, 1637 G4RGK ZL37g, 1637 GW0VWD YL33f.

OE6IWG (HH47j) wkd: 1625 G4ASR YL06h, 1626 G1WPF ZL28f, 1628 G4FUF AL33c, 1628 G3IMV ZL07h, 1628 G6JJP YM58d, 1629 G4MKF ZL44f, 1630 G8MYK ZM41e, 1631 G4VPD ZM41e, 1632 G4TIF ZM53g, 1633 G0KAS ZL59a, 1635 GW1PJP YL24c, 1635 G4RGK ZL37g, 1635 G1AWF ZL39j, 1635 G6XLL ZL39a, 1636 G8XTJ ZL27j, 1637 G4PCS ZL09f, 1637 G3TGL ZM41f, 1638 G4BRK ZL22e, 1638 G3COJ ZL37a, 1639 G1WPF ZL28f, 1640 G4AEP ZL46e, 1640 GW4HDF YL34b. It was a pleasant change from the usual chaos to work all these G/GW stns on 144.290, tnx folks!

OK2XTE (HJ70a) wkd: 1750 GI4OWA WO04a, 1754 GI4OPH XO22d, 1850 EI3FI WO48f.

950611

DH6JT (DL34b) wkd: 1938 SV1BTR LX09b.

DH8NAA (EJ06a) wkd: 1842 SV8CS KX15e, 1931 SV1BTR LX09b.

DL2FDX (EK55d) wkd: 2006 SV1BTR LX09b.

DL8EBW (DL66a) wkd: 1929 SV1BTR LX09b.

EA9AI (XV04e) wkd: 1456 I7IWN JA62j, 1505 IW1CGB/IT9 GY74f, 1507 IK7FGE HB, 1509 I8WES HA02e, 1510 IK7VXY JA72a, 1511 IK0RWX GB23c, 1511 I0JX, 1511 IW0DEI GB, 1512 I0LWO GB01j, 1512 I0YLI GB13h, 1512 IW0BET GB13f, 1513 IK0BZY GB03c, 1513 I6BQI GC41h, 1514 IK0SMG GB13f, 1514 I7CSB HA, 1515 IW0DHV GC42b, 1515 IW0QNX GC24j, 1516 I0DPM, 1518 IW5AUR FC34d, 1519 IW5BML FC04c, 1519 I4XCC GD03d, 1520 I0KYF GB03d, 1522 IW0AVG, 1523 I0KHY GB, 1526 IK4DEY, 1527 IK4DCO GE73f, 1528 I6CTJ GD38b, 1529 IK5UAL FD32j, 1529 IW5DAN FD13b, 1529 IK5YLY FD24e, 1531 I5OYY FD16j, 1531 IK5VHU FD17h, 1532 IK5BRJ FD16a, 1533 IK4DRY GE42f, 1534 I3VWK FF29b, 1535 I3FCS GF, 1537 I2PY FF76j, 1538 I5YDI FE71j, 1538 IK5UBM FD13c, 1539 I5EUS FE71f, 1539 IK4PMB, 1540 IK4IEE FE35d, 1540 I4YNO FE25e, 1541 IK5FTQ FD05c 1541 I4LUI FE41g, 1542 IK3WRD GF, 1542 9A2RD GF69h, 1542 I4MES FE25e, 1542 S52LM, 1543 I4PWL FE60e, 1543 IW3QPL GF39b, 1543 9A3NI GF59d, 1544 I4GBZ FE09d, 1544 IK4DRY GE42f, 1545 S59ABL GF30a, 1545 S51WX HF, 1546 IW3RI GF18h, 1547 IW3QPL GF39b, 1547 I1FNX EE45c, 1547 IW1PDP EE80a, 1547 IW3RKD GF29d, 1548 IV3LNQ HF, 1548 9A1CCY IF37h, 1549 I4JED/4, 1549 I4MKN GE73b, 1549 IK5EHR FD13j, 1550 IW5CRT FD32j, 1550

S51AG, 1551 S56CDN, 1558 9A2YF IF, 1600 9A1CCY IF37h, 1622 I5PGB FD25d.

IK4PMB wkd: 1517 EA9MH YV56e, 1519 EB7NK YW28g, 1539 EA9AI XV04e, 1541 EA7TL XW73b, 2133 SV1BTR LX09b, 2149 F6TER AC51e, 2155 EA2ARD ZD51g.

IW1AZJ (DF79j) wkd: 1545 EA9MH YV56e, 2004 LZ2HV MD79g, 2012 LZ2ZX NC, 2135 SV1BTR LX09b.

950612

DD0VF (GL79c) wkd: 1009 EA9AI XV04e.

DF1IAZ (EJ65d) wkd: 0955 EA5CHT ZX42c, 1014 EA6XQ BZ55c, 1019 EA9AI XV04e, 1053 EA7PZ WX50d, 1113 EA5FKW ZY57e, 1148 CT1FAK VA37b.

DG1YHQ (DM75j) wkd: 1030 EA5GIW AY11h, 1040 EA5CHT ZX42c, 1050 EA6XQ BZ55c, 1055 EB6YY BZ34j, 1100 EA5EIL ZZ72f, 1107 EA9AI XV04e, 1108 EA5FKW ZY57e, 1215 CT4RK VX06j, 1230 CT1CRR VY15j, 1230 EA7DLD XX17h, 1233 EA7GDD XY80d, 1236 EA4CBV XY62a, 1243 EB7BIH YX12f.

DG7FEQ (EK17b) wkd: 1032 EA5EIL ZZ72f, 1112 EB4BK YA42f,1128 EA5BCX ZZ48b, 1130 EA5CHT ZX42c, 1142 EA1FDI VC28b, 1153 CT1CAD WX64f, 1212 CT1ASM WA21j, 1221 CT1BCP VA57g.

DH3IAJ (EI64f) wkd: 1016 EA9AI XV04e, 1034 EA4CBV XY62a, 1045 EA4ACS XY53f, 1131 EA7DLD XX17h, 1144 CT1DQM WA34e, 1148 CT1DYX VB67j, 1202 CT1ASM WA21j, 1210 EA1AU VC67a, 1218 EA1DIH VB06j, 1219 CT1EKF VA18b, 1513 EI4HT VL09d.

DH3YAK (DL18f) wkd: 1039 EA6XQ BZ55c, 1046 EB6YY BZ34e, 1048 EA5EIL ZZ72f, 1058 EA9AI XV04e, 1103 EA7LA YY42b, 1112 EA4ACS XY53f, 1113 EA7AFZ XY, 1120 EA7GDD XY80d, 1134 EA4IA YA52a, 1136 EA7DLD XX17h, 1139 EA4CBV XY62a, 1221 CT1CRR VI15j.

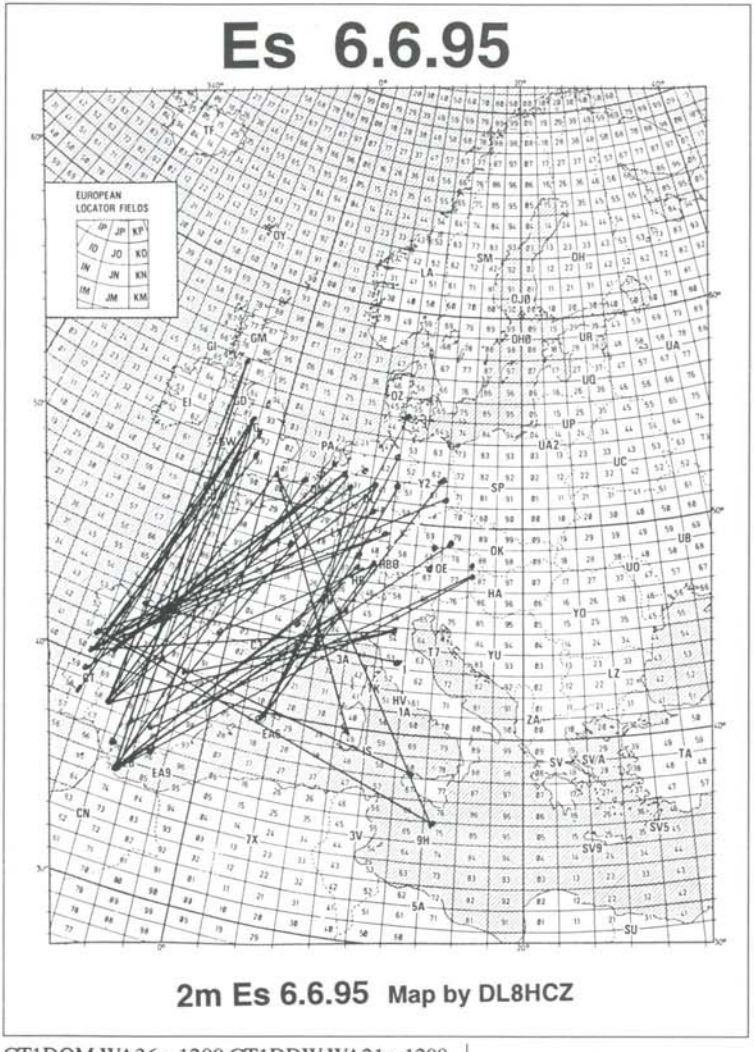
DH6JT (DL34b) wkd: 1014 I8SUD HY79a, 1020 IW9CER HY67b, 1030 IW9CBU HX55c, 1038 EA6XQ BZ55c, 1044 EA5CHT ZX42c, 1059 EA5EIL ZZ72f, 1106 EB6YY BZ34e, 1122 EA7CL XW, 1124 EB4AFK YA42c, 1131 EB4BPJ YA, 1132 EA9AI XV04e, 1134 EA4APW YY01a, 1137 EA4CBV XY62a, 1142 CT1CAD WX64f, 1147 EA7TL XW73b, 1148 EA7DLD XX17h, 1152 EA5BY ZY57e, 1211 CT4RK VX06j, 1217 CT1CRR VY15j, 1228 CT4QP VZ67a.

DK8EL (DL34b) wkd: 1014 I8SUD HY79a, 1020 IW9CER HY67b, 1030 IW9CBU HX55c, 1038 EA6XQ BZ55c, 1044 EA5CHT ZX42c, 1059 EA5EIL ZZ72f, 1106 EB6YY BZ34e, 1122 EA7CL XW, 1124 EB4AFK YA42c, 1131 EB4BPJ YA, 1132 EA9AI XV04e, 1134 EA4APW YY01a, 1137 EA4CBV XY62a, 1142 CT1CAD WX64f, 1147 EA7TL XW73b, 1148 EA7DLD XX17h, 1152 EA5BY ZY57e, 1211 CT4RK VX06j, 1217 CT1CRR VY15j, 1228 CT4QP VZ67a.

DL1BKK (EN76e) wkd: 1015 9H1GB HV13h, 1024 EA5FKW ZY57e, 1034 EB6YY BZ34e, 1040 EA5CHT ZX42c, 1043 EA5EIL ZZ72f, 1103 EA7RO XW37c, 1110 EA7LA YY72b, 1115 EA9AI XV04e, 1120 EA7DBH XW63d, 1124 EA4APW YY01a, 1132 EA9MH YV56e, 1140 EA4AKH XA79e, 1154 CT1CAD WX64f.

DL1GNM (DI80j) wkd: 0954 EA5CHT ZX42c, 1004 CT1CLR VA22g, 1010 EA9AI XV04e, 1036 EA4APW YY01a, 1040 EB6YY BZ34e, 1044 EA5FKW ZY57e, 1051 EA4ACS XY53f, 1055 EA4CBV XY62a, 1101 EB4AFK YA42c, 1104 EB4EUB YA42e, 1111 CT4RK VX06j, 1114 CT1CRR VY15j, 1115 EA5AAJ ZZ48b, 1126 CT1FAK VA37b, 1128 CT1DYX VB67j, 1133 EB1CPS XA02b, 1136 EA1MO XB27e, 1143 CT1DNF VA27d, 1148 CT1EKF VA18b, 1157 CT1AIF VB67d, 1204 EA1CNO VC67g, 1205 EB1FCP VB06e, 1210 EA1AU VC67a, 1220 CT1EEB VA.

DL2FDX (EK55d) wkd: 1005 EA5FKW ZY57e, 1015 9H1CD HV03f, 1015 9H1CG HV13b, 1016 9H5CL HV03f, 1019 EA6XQ BZ55c, 1023 EA9AI XV04e, 1024 EA5EIL ZZ72f, 1030 EB6YY BZ34j, 1052 EA4APW YY01a, 1055 EA5CHT ZX42c, 1059 EA4ACS XY53f, 1100 EA7GDD XY80d, 1107 EB4BK YA42f, 1108 EB4AGJ YA52j, 1111 EB4AFK YA42c, 1113 EA5FKW ZY57e, 1115 EA7DBH XW47b, 1116 EA4QE YA42f, 1117 EA4IA YA52a, 1120 EB4EUB YA42e, 1125 EB5BRA ZZ48b, 1130 EA9MH YV56e, 1134 CT1CAD WX64f, 1137 CT4RK VX06j, 1150 CT1CRR VY15j, 1155



EA4APW YY01a, 1057 EA4CBV XY62a, 1102 EA4ACS XY53f, 1110 EA4AFK YA42c, 1121 CT4RK VX06j, 1124 EB5BRA ZZ48b, 1155 EA7TL XW73b, 1159 CT1ASM WA21j, 1201 CT1EKF VA18b, 1203 CT1EEB VA, 1203 CT1ENF VA27d, 1210 CT1DYX VB67j.

DL5GAC (EH18d) wkd: 1042 EA9AI XV04e, 1049 EA5ABP ZY, 1053 EA5FKW ZY57e, 1057 CT1CRR VY15j, 1100 EA1MO XB27e, 1103 EA4DSJ YZ44d, 1105 EB1CPS XA02b, 1118 CT1DYX VB67j, 1120 EB4AFK YA42c, 1120 CT4RK VX06j, 1124 CT1FAK VA37b, 1126 CT1DDW WA21e, 1130 CT1EKF VA18b, 1134 EA4AKS XY, 1134 EB4FOG WY06e, 1135 EB4FJH, 1138 CT1ASM WA21j, 1144 CT1JVM/m, 1203 EA1AU VC67a.

CT1DQM WA36e, 1200 CT1DDW WA21e, 1208 CT1ASM WA21j, 1208 CT1EKF VA18b, 1214. CT1FAK VA37b, 1215 CT1DYX VB67j, 1338 CT1BCP VA57g, 1341 CT1DQM WA21e.

DL2IAN (EJ71a) wkd: 0958 EA5FKW ZY77j, 1001 EA5CHT ZX42c, 1007 EA9AI XV04e, 1016 EA6XQ BZ55c, 1016 EA7BA YW, 1023 EA5EIL ZZ72f, 1027 EB6YY BZ34e, 1034 EA7GDD XY80d, 1036 EA7DMP XW, 1051

EA9AI (XV04e) wkd: 0000 DL1VFL GL80a, 0944 IW3RKB GG77a, 0945 S51EA GH64g, 0947 DL1MAJ/HA IH, 0948 OK1AJY HK36a, 0948 OK1DX GJ, 0948 DJ6GK EK14c, 0949 DL7AKA GM37b, 0950 OK1PG HK30a, 0950 DG1RAW, 0951 OK1MG HK61e, 0951

DG1MDN FI, 0951 OK1KQJ GJ36a, 0952 DK5RV GI, 0953 DJ1OJ FI68c, 0954 DG7SBY, 0955 DJ6GK EK14c, 0955 HB9JAW EH62g, 0956 DH4SBO EK14c, 0956 DL9USA HL32c, 0957 DJ7OF FL24g, 0957 DL5SBM HL, 0958 DL7ARM GM48f, 0958 DG5MIA FI, 0959 DL2RTU, 0959 DL4RU, 0959 DL7UKW GM, 0959 HB9MFW, 0959 DF9UX EH, 1000 DJ1NY EJ32d, 1000 DL8SCQ EI08f, 1000 DL9UDS HL, 1000 DL4DWA GL57c, 1001 OE5VRL/5 HI42j, 1001 DC1ZN EK, 1001 DJ9EV EJ77g, 1001 DJ6WD EK11g, 1002 DD0VF GL79c, 1002 OK1VYR HK, 1002 DH8SBT EI08f, 1002 DL9DAR EK11g, 1003 DL7PR EH02d, 1003 DF1CF FH23j, 1003 DL0BIG, 1004 DG1KBY DK, 1004 DK0IG FI68d, 1004 DL2JA FI, 1005 DG5HWA FL49d, 1005 DH8SBT EI08b, 1005 DG1GAN, 1006 DK1KO FN12g, 1006 HB9CMS, 1006 DJ1MDN, 1007 DF6NA EJ20d, 1007 DL4RU, 1007 DL2IAN EJ71a, 1008 DG1IU EJ73f, 1008 HB9SQN, 1009 DD0VF GL79c, 1009 DL9DBJ DL59c, 1010 DK8SG EI13c, 1010 DH8SBT EI08b, 1010 DG1RAW GJ62f, 1011 DJ9EV EJ77g, 1011 DG2IAJ, 1012 DL9NDW, 1012 DL1GNM DI80j, 1012 DK0ALK DI80j, 1013 DG8GBF, 1013 HB9QR EH, 1013 DL4DWA GL57c, 1014 DL2CIA, 1014 HB9IN EH54j, 1015 DG0ER GK17a, 1015 DG7SBY EI51e, 1015 DG3GAQ EI63c, 1016 DH3IAJ EI64f, 1016 DC1UR GK, 1017 DF0SB EI, 1017 DG4GAN EI76a, 1017 DK9NA, 1018 DH2RAL, 1018 OM3CQF II18g, 1018 DF1IAZ EJ65d, 1019 OM3LQ II46g, 1019 DL5DSM, 1020 DL9RBI, 1021 DF5BN EJ13b, 1021 DG7SF EI28h, 1022 DL2FDX EK55d, 1023 DG9NCX EH02d, 1024 DL2HQ, 1025 DF0ANR GL80a, 1025 DL3NCR EI07b, 1026 DL4DTU GL79e, 1026 DL1HTT GL23h, 1027 DG0LDE, 1027 DL9NDW FK, 1027 DL1KFL, 1028 DH0GHU DI39c, 1028 DL1HRA FL60b, 1028 DB3RT GI38h, 1029 DL3HRM FL, 1030 DL3DN EI, 1030 DK5MV FI, 1030 OK1AY, 1030 DF2UU, 1031 DG0ER GK17a, 1031 OK1VBN GJ74e, 1032 DJ5CL, 1032 DL2HQ EI03h, 1033 DG9NF, 1033 DG5MIB FI60j, 1034 SP6FUN IL53c, 1034 DL0DYW FI69b, 1034 DL3MGK FI07f, 1035 DL6CIA, 1035 DG7FBU DK60j, 1036 DF6NA EJ20d, 1036 DG1IU EJ73f, 1036 DG5CH, 1037 DJ3OS EJ, 1037 DL3ZAE EK39j, 1037 DL4FCS EK54f, 1038 SP6GZZ IL54h, 1038 DG5CH, 1038 DL2KP, 1039 DG0OHA FL, 1039 DL9ZFG FM69e, 1040 HB9JAW EH62g, 1040 OK1KIR GK, 1041 DL7AKA GM37b, 1041 HB9CRQ EH62h, 1042 DL/OM9AEM FI, 1042 DF7WD DJ09b, 1042 DL5GAC EH18d, 1043 DL2MHW GH, 1043 DL5IO EJ56a, 1043 HB9SNR DG26h, 1044 OK1DVN, 1044 DB8AT FL, 1044 DF0TAU EK37b, 1045 OE7GHJ GH31e, 1045 DL4VS DJ65b, 1046 DF5NW FJ20e, 1046 DL2ALI FN03b, 1047 DG6FCP EK62j, 1047 DF2GZ, 1047 DJ7WF, 1048 DJ5JK EJ72e, 1049 DC9ZZ EK34b, 1049 DK9OY FM42g, 1050 F1SRK, 1050 F1AKK BJ, 1050 DL5RDP FJ39c, 1051 DH8SBT EI08b, 1051 DL5RDO FJ39c, 1052 DL3AWE FK49j, 1052 DL5YET EL, 1052 F5LRL CH56g, 1053 DJ2TI, 1053 DG9NBT EJ20e, 1053 F8CS CH46f, 1053 DL6WT DJ, 1054 DH0GHN, 1054 DL0DET FM, 1054 DJ6WD EK11g, 1054 DG5NEX EJ20e, 1055 DC8OM, 1055 PE1GNP, 1056 DL1EJA DL12e, 1056 DF3AR FM53d, 1057 OK1UWA GJ, 1057 HB9RKO DG, 1057 PA3FJY DM53g, 1058 DC9KZ DK04j, 1058 DL6KR Dk26j, 1059 DB9KM DK, 1059 DL2KAS DK, 1059 DH3YAK DL18f, 1100 DG3KCE DK13g, 1100 DL0CQ DK, 1101 DL1VAA GL80j, 1101 OK1AXH HK29a, 1102 DK8KL DL37g, 1102 DF5DP DL37f, 1103 DB9IY EJ56a, 1103 DK2BJ DK11e, 1103 DK5WO DK11f, 1104 DC4OH FM43b, 1104 DJ6NI, 1105 DB6BX DM47g, 1105 DL1YDD DL, 1105 DF0DB EJ20e, 1106 DL6EBV DL55j, 1106 DL1YDK DM67h, 1106 DF2JQ DL44h, 1106 DK4TG DL63h, 1107 DG2KBC DL71a, 1107 DG6DCZ, 1107 DG1YHQ DM75j, 1108 DK9UV/m, 1108 DL1JJ DL74e, 1109 DF9KX DK23g, 1109 DF2IAQ/m EJ44g, 1110 DL1KDA DK23g, 1110 DG1EIS DL22a, 1111 DL9BDJ DN50d, 1111 DL3IAC EJ64a, 1112 OK1FM GJ27c, 1112 DH1YAE EL24b, 1112 DD3DJ DL47h, 1113 PA3ENU DM05b, 1113 PA3FBN DN64g, 1114 DD2KR DK, 1114 DC4VO DJ54c, 1114 PA0PVW CL09b, 1115 DC1JAL, 1115 ON4KST CK22d, 1115 DL1BKK EN76e, 1116 DG7EBK DL53d, 1116 DG5OAF FL22d, 1116 DC4QI DL35c, 1117 DG9BJA EM31a, 1117 ON1CIM DK15c, 1117 DF7KF DK13b, 1118 ON6DP CK38d, 1118 PE1MCD CN70c, 1119 ON4AMX CK05e, 1119 DL6BF DM57c, 1120 ON4PS CK25j, 1120 PA3DOL CM15b, 1121 PE1ACB DM65a, 1121 DK0UB DL47j, 1122 DF6XD DL08c, 1122 DG5DBQ DL47g, 1123 DL4EEC, 1123

DL8NBE, 1124 ON4YZ CK53d, 1124 ON1KVL CK54b, 1125 PA3GWF, 1126 DL6WH, 1126 DL0NY DM, 1127 DL3YEI DL26j, 1127 DF3NU FJ15a, 1127 PA0EAP CL, 1128 LX1JX DK71g, 1128 DD1US, 1128 F5JMI BJ, 1129 DL2SEW EI09h, 1129 DG1VL GL80a, 1130 DG6IBS, 1130 PA3GFY CN78b, 1130 DK0SHF, 1131 DC6DE DL37f, 1131 DG8IG HL, 1131 DH8YHR EL03d, 1132 DL8NEC FK57f, 1132 DH6YT, 1133 DL8YEV DL08b, 1133 PA2CHR CL10h, 1133 DL0WX DK23g, 1134 PA3DII CN69c, 1134 ON7EF BL79d, 1135 DD0WN, 1135 DK0MD, 1135 DD9JH, 1136 F1LYV/m DI, 1136 DJ7UD EJ, 1137 PA3EQK CM54f, 1137 DK9TF DL66a, 1138 F6ICX BI16j, 1138 PA3EAP DM, 1138 F6FLV BI11g, 1139 DL3IW, 1139 DG0OCW FK12g, 1140 PE1IKX CM72d, 1140 DC6SN DK11a, 1140 DG0OV FK22b, 1141 PA3BIY CM72c, 1141 PA3GGN CL, 1142 PA3CEE DN64h, 1142 PA3FXW CM67d, 1142 PI5EHV CL, 1143 PE1NDB CK09b, 1143 PE1NTE CM67g, 1144 DF3IE, 1144 DG9BDT, 1145 PE1OIX CL15c, 1146 ON4KHG BK50j, 1147 PE1PJA, 1147 PE1OOY CM, 1148 G7LIJ, 1148 G4FUF AL33c, 1149 G8HGN AL, 1149 DJ9YE EN04f, 1150 G4HTZ EJ04b, 1150 DL8FCL CK, 1151 ON1LHU, 1151 ON7BU, 1151 PA0FHG CM74e, 1152 PE1LCH CN70a, 1152 DD6GI GM, 1152 PE1IVU DN64c, 1153 PA0WWM CM63g, 1153 G0JUR ZM20j, 1153 G4JCC ZK16f, 1154 PE1IJX CM, 1154 PE1PFW CM, 1155 PA3EXB DM05b, 1155 PA/DL1EAP BL49h, 1156 DD0UM EJ31j, 1156 G4RGK ZL37g, 1157 G3YVR ZL80h, 1157 PE1PRB CM, 1158 G3IBI ZK, 1159 G4RRA ZL67h, 1159 DL9ZFG FM69e, 1200 G6DZR ZM66j, 1202 DK7ZB FL67j, 1203 G4ZFJ AL34c, 1204 G1PVT, 1205 G0BPS AL, 1207 G3EDD AM62j, 1208 G3BNE AL41e, 1208 PE1PSW DN64h, 1209 G6IJJ ZL04f, 1212 G1EUV ZL30e, 1214 G/DF2ZC ZL, 1215 PA3BMC CL14c, 1217 G4AJC ZL49d, 1221 G2CZS AL24g, 1222 G0GCI AL62d, 1223 G2MT ZL29e, 1223 G7GPF ZM, 1224 G8ONX AN62e, 1225 G4KIY ZM40j, 1226 G7IYK, 1227 G7FBB ZL, 1233 G4YHF ZM20j, 1455 DB1DI DL07b.

F5HRY/p (XI59c) wkd: 0937 IT9VDQ GY67e, 0942 I8SUD HY79a, 0943 IW9CER HY67b, 0946 T9BCC GX25a, 0955 I8WES HA02c, 0957 IW0DEI GB, 0959 9H1CD HV03e, 1005 IK0OKY GB13j, 1009 IT9GSF GX, 1020 9H5DM HV03f, 1022 IT9KSS GY, 1024 9H5SN HV, 1027 9H1CG HV13b, 1033 IS0QDV EZ67a, 1035 9H4AC HW, 1036 9H1ES HV, 1041 IT9BLB/9 GY67c, 1043 9H1GB HV13a, 1106 IW1CGB/9 GY, 1139 EA6XQ BZ55c.

GM4CXM (XP09g) wkd: 1112 EA5EIL ZZ72f, 1204 EA5BY ZY57e, 1223 EA5CHT ZX42c, 1437 F6TER AD51e, 1440 EA3DXU BB32f, 1442 EA5YB/P AB60d, 1442 F5QT AD34f, 1443 EA3EAU AB69a, 1449 EB3FFF AB, 1450 EB3EDT AB39g, 1453 F5JGY AE47b, 1455 F/G8MBI AE13g, 1458 F6DRO AD38d, 1504 F/PA0RDY/m AG, 1507 EA3DUY BC65d, 1515 F6KZN BF26h, 1528 F1EYB CD45j, 1529 F6EPE CD04c, 1530 F5ANT CE44e, 1530 F6CVQ CD35d.

I4YNO (FE25e) wkd: 1033 EA1BCB WD64a, 1036 CT1DQM WA34e, 1037 EB1CPS XA02b, 1038 CT1BCP VA67f, 1039 EA1BJW YB15c, 1040 EA1CNO VC67a, 1041 EA1CBY VC67g, 1042 EA1DIH VB06j, 1043 CT1DNF VA27d, 1045 EA1MO XB27e, 1047 EA1BZZ XC33d, 1047 CT1EKF VA18b, 1049 CT1DQM WA34e, 1051 EA1FGJ WD63b, 1052 CT1DYX VB67j, 1052 EA1DAV VD59g, 1054 CT1AIF VB67d, 1058 EB1EOO VC07e, 1059 EA1AXQ WC37c, 1100 EB1BVO VD59h, 1110 EA1FDI VC28b, 1114 EB1EHO XD32e, 1116 EB1EVP WD65d, 1120 EA1AU VC67a, 1124 EA1WZ VD39d, 1128 EB1FIF WD74j.

IK0LZR (FC79b) wkd: 1024 F6FRR ZF67h, 1034 EA1FGJ WD63b, 1038 EB1EVP WD65d.

IK0OKY (GB13c) wkd: 1004 F5HRY/p XI59c, 1013 F1UJS ZE35a, 1022 F5SOH ZD57h, 1026 F6CRP ZG65j, 1027 F6FRR ZF67h, 1038 EA1DKV VD49f, 1039 EB1BVO VD59h, 1041 EA1EVF XD31g.

IK4PMB wkd: 0956 EB4AFK YA42c, 0958 EB4EUB YJ43f, 1003 EA1BZZ WC33d, 1005 EB1EVP WD65d, 1005 EB1EHO XD32j, 1009 EB1ENP XC12b, 1011 EB1CPS XA02b, 1015 EB1DMS XD73c, 1016 EA1MO XB27e, 1021 EB4AGJ YA52j, 1023 EB1BVO VD59h, 1024 EA1CBY VC67g, 1025 EA1CNO VC67a, 1026 EB1EHO XD32e, 1030 EA1EVF XD31g, 1031 EA1AU VC67a, 1032 CT1CLR VA27d, 1034 EA1FGJ WD63b, 1038 EA1MO XB27e, 1038 CT1DYX VB07a, 1047 CT1DNF VA27d, 1049 EA1BCB WD64a, 1052 CT1AIF VB67d, 1053 EA1DKV VD49f, 1056 CT1EKF VA18b, 1104

EB1FCP VB06e, 1106 EA1FDI VC28b, 1108 EA1DAV VD59g, 1111 EA1WZ VD39d, 1122 EB1EHO XD32e, 1138 EB1FIF WD74j.

IW1AZJ (DF79j) wkd: 1006 EB1CPS XA02b, 1015 EA1BZZ WC33d, 1016 CT1DYX VB67j, 1018 EA1MO XB27e, 1021 EA1DIH VB06j, 1022 EA1BZZ WC33d, 1031 EA1AU VC67a, 1038 EA1BJW YB15c, 1043 EB4AGJ YA52j, 1053 EB4AFK YA42c, 1054 EB1FCP VB06e, 1055 EA1CBY VC07h, 1056 EA1CNO VC67a, 1058 EA1BNB WD64a, 1100 EB1EHO XD32e, 1135 EB1BVO VD59h, 1106 EB1ENP WC12b, 1107 EA1BNB WD64a, 1110 EA1FGJ WD63b, 1111 EA1DAV VD59g, 1112 EA1AXQ WC37c, 1121 EA1FDI VC28b, 1121 EB1EVP WD65d, 1125 EA1WZ VD39d, 1131 EA1DAV VD59g, 1138 EB1EHO VD58b, 1145 EB1FIF WD74j, 1458 EI6AS WN59g, 1507 EI6HP WO71f, 1510 EI4CL WN60g.

IW1DMC (EF73c) wkd: 1011 EA1BZZ WC33d, 1022 EA1DIH VB06j, 1025 CT1DYX VB67j, 1057 EB1EVP WD65d, 1059 EA1FGJ WD63b, 1101 EA1DKV VD49f, 1113 EB1BVO VD59h, 1118 EA1BCB WD64a, 1120 EB1FIF WD74j, 1122 EA1WZ VD39d, 1149 EA1DAV VD59g, 1442 EI7GL VL19h, 1443 EI4HT VL09d, 1450 EI2GT/p VM27j, 1505 EI6HP WM71f, 1511 EI6AS WN59g.

OE6IWG (HH47j) wkd: 0957 EA5FKW ZY57e, 0959 EA5CHT ZX42c.

ON4KHG (BK50j) wkd: 0841 9H1GB HV13h, 0842 9H5L HV03f, 0843 9H1CD HV03f, 1008 IK7MCJ IA47d, 1011 IW7DAL HB27c, 1045 EA6VQ BZ55c, 1057 EB5CYB YZ09b, 1100 EB5BRA ZZ48b, 1103 EA5FKW ZY57e, 1120 EA5DIT/m ZZ, 1123 EA7GDD XY80d, 1137 EA4BPJ YA42d, 1140 EA4CSJ YA42d, 1146 EA9AI XV04e, 1150 EA7TL XW73b, 1200 CT4RK VX06j, 1204 CT1CAD WX64f, 1208 CT1ERY WX71e, 1217 CT1DSH WX71f, 1230 CT1CRR VY15j.

PA0WWM (CM63g) wkd: 1054 EA5GIW AY11h, 1153 EA9AI XV04e, 1155 EA7TL XW73b, 1214 CT1CAD WX64f, 1339 EA5EER ZY58b.

PA3BIY (CM72c) wkd: 0830 9H1GB HV13a, 0833 9H5SN HV, 0835 9H1CD HV03e, 1008 EA5FKW ZY21h, 1014 EA6FG BZ24e, 1023 I8KRO IY03g, 1025 I8XGB HB, 1029 IW8QEL, 1048 EA5GIW AY11h, 1053 EA5EOI/m, 1059 EA5CHT ZX42c, 1104 EA5CCG ZY75d, 1105 EA5SP ZY09b, 1115 EA5EIL ZZ72f, 1116 EA6XQ BZ55c, 1122 EA7LA YY72b, 1125 EA9MH YV56e, 1130 EA7DLD XX17h, 1138 EA7TL XW73b, 1140 EA9AI XV04e, 1200 EB5BYL, 1212 CT1CAD WX64f, 1215 CT1ERY WX71e, 1220 EA7DBH XW63d, 1450 EA1BLA VD49b.

950616

DL2FDL (EK35c) wkd: 1458 EH7CD YW28g, 1511 EH7KW WX60b, 1537 EH7KW WX60b.

950619

DD0VF (GL79c) wkd: 1724 UR3GS QG, 1727 UT7GA QG24f, 1728 UY5HF QG24f, 1732 RZ6BY SE07e, 1740 RZ6BU SE07e.

DH0LS (FK08d) wkd: 1728 UY5HF QG24f, 1730 RZ6BY SE07e, 1734 UT7GA QG24f, 1735 RZ6BU SE07e, 1757 UR3GS QG.

DL1BKK (EN76e) wkd: 1727 UY5HF QG24f, 1729 UT7GA QG24f, 1731 UR5LLW SJ22d, 1736 RZ6BU SE07e.

DL1EAP (DL44j) wkd: 1557 UR5LLW SJ22c.

DL2FDX (EK55d) wkd: 1730 UX7IR SH39h, 1736 UA6AG, 1742 RA3QTT UL23c.

EA9AI (XV04e) wkd: 1253 I4XCC GD03d, 1255 IK5FTQ FD05c, 1256 IK5EHR FD13j.

LY2BIL (MO27j) wkd: 1547 4K6D YA49c, 1618 RZ6BU SE07e, 1622 RZ6BY SE07e, 1636 UA6AEC UE06a, 1645 RA6EAG VE61a, 1649 RA6AX SE29b, 1728 SV7APS MB77b, 1728 LZ2HV MD79g, 1728 SV7AII MA20a, 1730 LZ1AG MC64e, 1731 SV7CO MA20a, 1732 SV7APQ MB77b.

OE6IWG (HH47j) wkd: 1740 UR3EE SI72a, 1745 UX7IR SH39h, 1747 UA6MA TH69c.

950620

DD0VF (GL79c) wkd: 1601 SV4LD LZ23f, 1606 SV9ANK MV, 1611 SV1OH LY79d, 1613 SV1WE LY79d, 1616 SV1BKE LX, 1619 Z31DX LB63d, 1622 SV2BNL LA.

DG9MAQ (FI45d) wkd: 1608 LZ1UH LB18b, 1617 LZ1AG MC64e.

DH3IAJ (EI64f) wkd: 1055 EA1NV XD32d.

DH8NAA (EJ06a) wkd: 1514 UX0FF OF

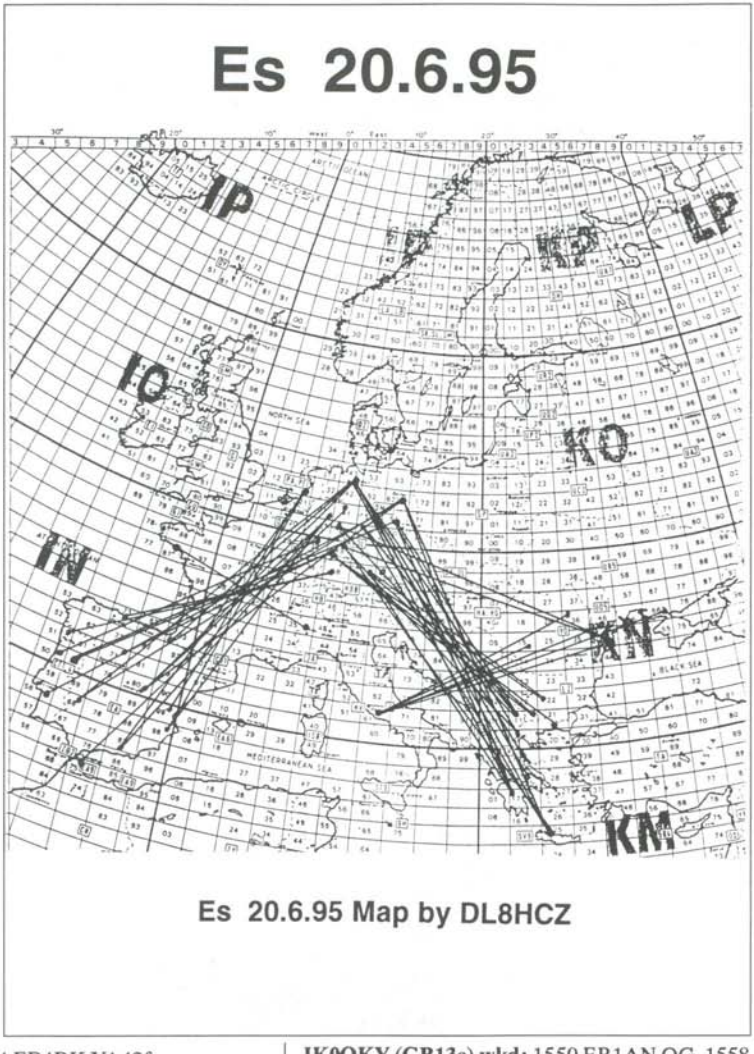
DK8EL (DL34b) wkd: 1046 EA7ALL YX12f, 1050 EA5CD ZY01a, 1053 EA4IA YA52a, 1055 EB4BK YA42f.

DL1BKK (EN76e) wkd: 1050 EA4IA YA52a, 1052 F1CCM ZD49f, 1059 EB4BK YA42f, 1107 EA4EHI WY16h, 1558 SV9ANK MV, 1603 SV1OH LY79d, 1606 SV1BTR LX09b, 1610 SV4LD LZ23f, 1612 Z31DX LB63d.

DL1EAP (DL44j) wkd: 1044 EA7ALL YX12f, 1046 EA5CD ZY01a, 1053 EA4IA YA52a, 1054 EB4BK YA42f.

DL2FDX (EK55d) wkd: 1617 LZ1UH LB18b.

DL2IAN (EJ71a) wkd: 1047 CT4KQ WA21e, 1048 CT1DQM WA34e, 1053 EA1MO XB27e, 1605 LZ1UH LB18b, 1014 SV7APS MB77b, 1020 LZ1ZG MC62f.



Es 20.6.95 Map by DL8HCZ

IK0OKY (GB13c) wkd: 1550 ER1AN OG, 1558 UX0FF OF, 1559 ER5AA OF, 1602 YO7BSN LF77j, 1608 UY5HF QG24f, 1610 YO8BSE NG.

IW0CVK (GB03d) wkd: 1559 ER5AA OF, 1612 UY5HF QG24f.

PA3BIY (CM72c) wkd: 1053 EA5CD ZY01a, 1100 EA5ZI ZZ17c, 1103 EA7ALL YX12f.

950621

DH3IAJ (EI64f) wkd: 0939 EA1FGJ WD63b, 0941 EA1KI XD32d, 0942 EA1NV XD32d, 0943 EB1EHO XD32e.

DH8NAA (EJ06a) wkd: 0915 EA4EHI WY16h, 0936 CT1ASM WA21e, 0936 CT1EKF VA18b, 0937 CT4KQ WA21e, 0938 CT1WW WB63b, 0940 CT1EKF VA18b, 0942 CT1DNF WA67b, 0944 CT1DQM WA34e, 0949 CT1EEB VA, 0953 EA1NV XD32d, 0954 EA1MO XB27e.

DK8EL (DL34b) wkd: 0935 EA4EHI WY16h, 0945 EA1MO XB27e, 0953 EA1AHM XB37e.

DL1EJA (DL12e) wkd: 0946 EA1AMA XA04e

DL8BDU (EN71f) wkd: 0948 EA4EHI WY16h, 0952 EA1MO XB27e.

PA0WWM (CM63g) wkd: 0938 EB7ALS XX44h, 0941 EB4EQZ YA02e, 0944 EA4IA YA52a.

950625

DF1SO (EI37a) wkd: 1130 EA5EIL ZZ72f.

DK8EL (DL34b) wkd: 1644 9H5L HV03f, 1644 9H1CD HV03f, 1706 IT9IPQ/9 HY.

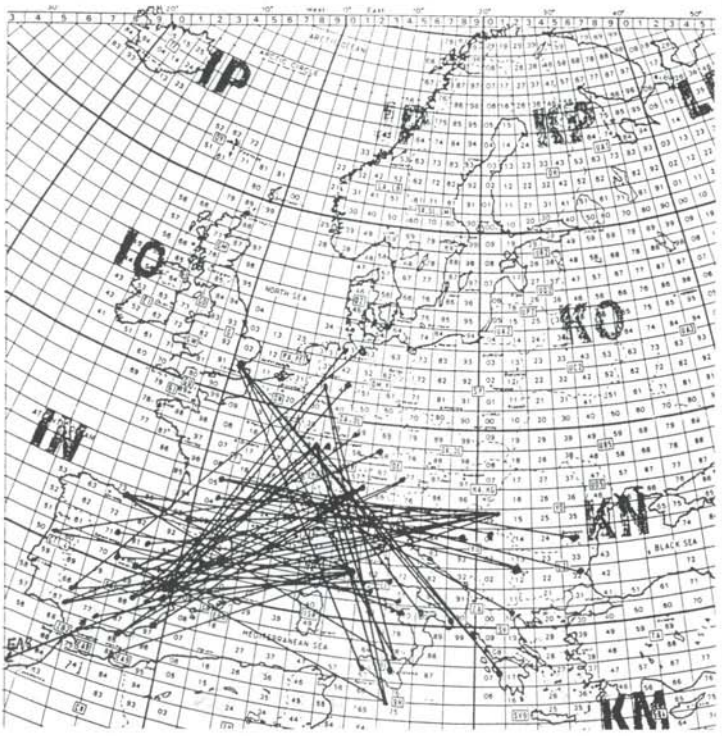
DL1GNM (DI80j) wkd: 1623 9H5L HV03f, 1636 IW9BTB HX36a, 1638 IT9NAN HX36a, 1658 SV3KH KX28g.

DL8EBW (DL66a) wkd: 1133 EA5IC ZY09b.

EA9AI (XV04e) wkd: 1144 IW8DUL HA23f, 1144 I8MPO HA23f, 1301 IV3BBR GF09g, 1302 IV3GBO GG77f, 1305 IK3WUX GF41j, 1307 S57CA HG64h, 1310 IV3GBO GG77f, 1312 IK3UNA FF45c, 1328 I2MCD FF61f.

IK0LZR (FC79b) wkd: 1244 EB4FQB WY09f, 1251 EA4EHI WY16h, 1255 EB7ALS XX44h, 1256

Es 25.6.95



2m Es 25.6.95 Map by DL8HCZ

EB5IFI ZZ20a, 1302 EB4GIA WY52f, 1304 EB4AOS WY41g, 1316 EA4EEK XA40b, 1323 EB1CPS XA02b, 1327 EA1MO XB27e, 1651 EA3DUY BC65d.

F1GTU (AF64a) wkd: 1649 LZ1KDP LC27d, 1655 LZ2UU LC27d, 1658 LZ1ZX NC34a, 1701 LZ2CM LD47f, 1714 9A2DG JE34j, 1715 YO3DMU NE41e, 1716 YU7ON KE, 1717 9A3GL JF61f, 1720 YU7EW KF24f, 1721 9A1KDE JF23g, 1722 YU1WP JE37f, 1722 YU7MS KF43f, 1723 YU1EV KE23h, 1724 YO3FWL NE41a, 1725 9A1CRJ JF34g, 1756 9A3SO JF34g.

IW0EGN (GB03f) wkd: 0846 EA7ZM XW38b, 1121 EA1BLA VD49b, 1249 EA4EHI WY16h, 1310 EB4FQP WX09f, 1314 EB1CPS XA02b, 1325 EA1BYC XA02a, 1326 EA1MO XB27e, 1329 EB1FCJ XB27e, 1332 CT1DYX VB07a, 1333 CT1WW WB63b, 1339 EA1AEN VC77c

IW1AZJ (DF79j) wkd: 1305 CT1FAK VA37h, 1634 SV2DGA LA.

OE6IWG (HH47j) wkd: 1629 EB5IJA YY10e, 1632 EA5DIT ZZ62f.

950629

EA9AI (XV04e) wkd: 1555 IK0SMG GB13f, 1555 I0AKP HB13h, 1556 IW0FMA GB14j, 1557 I7CSB HA, 1558 I0KIB GB01h, 1559 IS0QDV EZ67a, 1559 IW0QNX GC24j, 1601 I0NLK GC74g, 1607 IW5DAN FD13b, 1609 IW5AVM FC16e, 1609 IK5WWF FD02e, 1618 F6FNG CD, 1619 IW2DAK EF47h, 1619 IW1DMC EF73c, 1623 F6FNG CD.

I0NLK (GC74g) wkd: 1551 EA7ZM XW28b, 1553 EA7EBO XW21j, 1555 EA7DBH XW63d, 1550 EA9AI XV04e, 1600 EA7DUW XW28c, 1604 EA7ABW XW28d, 1608 EB7FLW XW28b.

IW1AZJ (DF79j) wkd: 1603 EA9MH YV56e.

950701

DD0VF (GL79c) wkd: 1725 EA2BL YC17a, 1729 EB1CPS XA02b, 1736 EB4GIA WY42f, 1748 EA4AKH XA79e, 1820 EA4EHI WZ44d, 1827 EA1KV VC67a, 1827 EB1EVP WD65d, 1836 EA1KI XD32d, 1843 EA1ACT/p WC, 1846 EA1DO XD, 1849 CT1WW WB63b.

DF1IAZ (EJ65d) wkd: 1729 EA2BL YC17a, 1734 EA1DVY/p YB35c, 1850 EB1CTQ XD33f, 1837 EB1EHO XD32e, 1738 EA4EKP/p XB79h, 1727 EB1CPS XA02b, 1833 EA1DKV VD49f, 1835 EB1BVO VD59h, 1839 EB1OL VD59h, 1831 EA1TA VD58b, 1842 EA1CNO VC67a, 1843 EA1CBY VC67g.

DF1SO (EI37a) wkd: 1730 EB1RJ/p, 1819 EA1BLA VD39e, 1844 EA1BVO VD, 1853 EA1KV VC67a, 1856 EA1DDO/p WC48f.

DK0ALK (DI69f) wkd: 1728 EB1CPS XA02b, 1735 CT1DQM WA34e, 1828 EB1OL VD59h, 1837 EA1BLA VD39e.

DL1GI (DI60a) wkd: 1735 EA1CRS XA, 1735 EA1BL VD39e, 1736 EA1TA VD58a, 1818 EA1DKV VD49f, 1853 EA1AEN VC77c.

DL2FDL (EK35c) wkd: 1834 EA1DDO/p WC48f.

DL2IAN (EJ71a) wkd: 1723 EA4AKH XA79e, 1726 EB1BPF YB15j, 1728 EA2CNH ZC, 1732 EA1BJW YB15c, 1736 ED2URP ZC25e, 1814 EA1BL VD59h, 1815 EA1TA VD58b, 1817 EB1BVO VD59h, 1825 EA1KV VC67a, 1827 CT1FAK VA37b, 1838 EB1BVP VD65d.

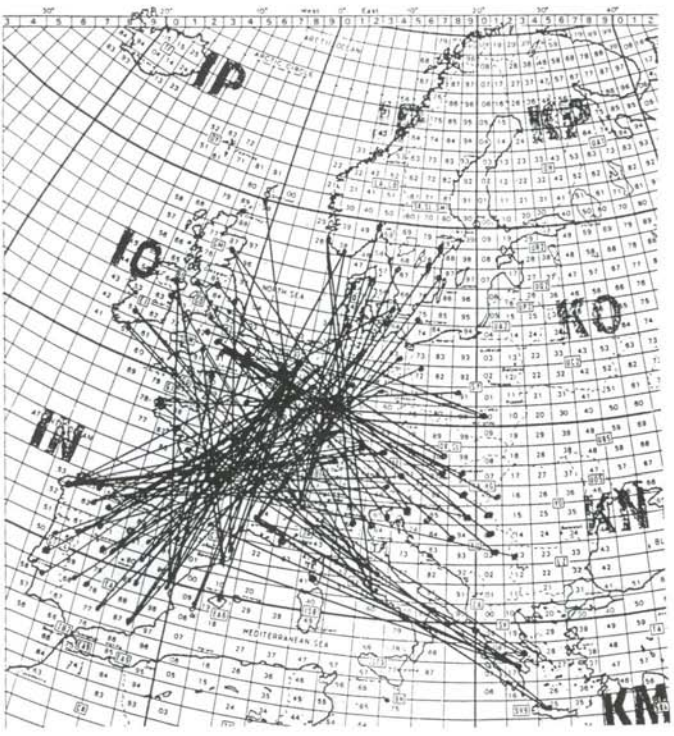
DL5GAC (EH18d) wkd: 1840 CT1WW WB63b, 1850 EA1TA VD58b, 1854 EA1CBY VC67g, 1854 EA1CNO VC67a, 1855 EB1OL VD59h, 1856 EA1BLA VD39e.

DL8BDU (EN71f) wkd: 1203 EA4EEK XA40b, 1737 EA3/DL3MGL AB66g, 1831 EA1MO XB27e, 1837 EA2BL YC17a, 1838 EB4CIA YX53d, 1843 EB4TT XA50d.

DL8EBW (DL66a) wkd: 1818 CT1CLR VA27d, 1830 EB1AYI/p XC53c, 1832 EA1BYC XB02a, 1833 EA1MO XB27e, 1834 CT1BGE VY.

EA9AI (XV04e) wkd: 1132 IK7XWJ JA42g, 1557 IT9XDJ HX, 1848 G1AWF ZK39j, 1848 G6XLL ZL39a.

F1BBI (CE71a) wkd: 0926 OZ1CSI/a HP, 0928 SM7SCJ GP47d, 0929 DG0KW GO56g, 0929 SM7TUG HQ48d, 0931 SM7VHS HQ35c, 0933 SM7UZD IR, 0934 SM5MIX HS64b, 0937 SM5DIC IT14c, 0944 SM7GHD IS34g, 0956 SM7RME HR25d, 0957 OZ1IEP GP22b, 1012 SM6KJX HEARD, 1029 SM6CMU FR50c, 1033



2m Es 1.7.95 **Map by DL8HCZ**

OZ1ELF EP49h, 1300 SV9/DG3FK/p MV57g, 1302 SV1BTR LX09b, 1305 SV1EN LY79d.

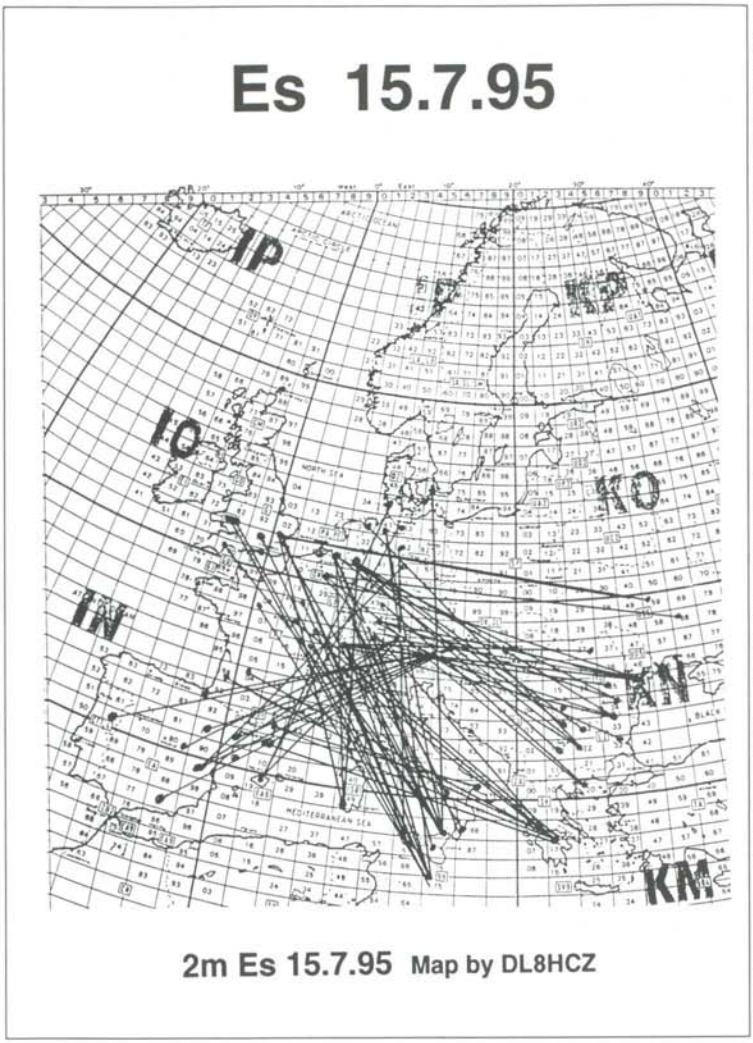
F1GTU (AF64a) wkd: 1926 YU1BFG KE37h, 1931 YZ1VB LD02j, 1931 YU1DKL KD33g.

G6RAF (ZM27e) wkd: 0925 YO2LIO KF47j, 0952 YU7EU KP28d, 0925 YO2LFP KG26f, 0926 4N7FK KF77a, 0926 HA1VQ IH43d, 0927 HA8ET KG22j, 0930 HA8CE/3 JG72h, 0932 4N1S KE71h, 0932 HA1KSQ IH, 0932 YU1IO AE24j, 0933 YU1LA KE23h, 0934 OE3OKS IH21h, 0935 YT50S JE38h, 0936 OE3KRC IH, 0937 YZ7NOU JF78c, 0945 9A1KDE JF25j, 0950 9A3SO JF34g, 0955 9A2SB JF, 0953 DJ9KV FI47g, 0953 YU1BFG KE37h, 1012 9A2HM HF, 1015 9A1CCY IF37h, 1053 IK4DIY GE.

I0NLK (GC74g) wkd: 1723 F6CGJ XI48g, 1726 F5PAU YI72g, 1728 F6HRP YI35j, 1736 EI5CRC/p VM77g, 1846 F6KPQ/p YH05j.

IK0OKY (GB13c) wkd: 0920 LA8OJ CS09d, 1034 GM4YXI YR60a, 1045 GM4JJJ YQ73c, 1047 G4IJD YN, 1054 GM4CXM XP09g, 1154 EI5FK VL08f.

IW1AZJ (DF79j) wkd: 0929 OZ1AZZ FR43b, 0930 OZ1IPU FR53c, 0931 OZ3GO FQ21a, 0932 OZ1OF EQ68b, 0933 OZ4VV EQ17a, 0934 OZ9CLN FQ62g, 0936 LA2AB FT03f, 0940 LA3BO FT62f, 0943 OZ1JVX EQ12e, 0955 OZ1BUR EQ54h, 1015 LA2PHA DS74j, 1045 GM4IPK ZT04j, 1110 EI3GE WN70d, 1112 GW6EOL YL32h, 1113 GW3ZTH YL33f, 1114 GW3EJR YL, 1146 EI5FK VL08f, 1147 EI4DQ VL20a,



2m Es 15.7.95 Map by DL8HCZ

1156 EI9EJ VM43g, 1330 SV1EN LY79d, 1336 SV9/DG3FK MV.

OE1XTU/3 (HH25a) wkd: 1732 EA1KC XD31f, 1733 EA1BC VD59h, 1737 EA1DKV VD49f, 1741 EA1BCB WD64a.

OE5XKO/5 (GI60b) wkd: 1743 EA1YV VC67a, 1743 EA1ANJ VC67b, 1830 EA1WZ VD39d, 1835 EA1CNO VC67a, 1843 ED1OL VD59h, 1854 EA1BLA VD39e.

PA3BIY (CM72c) wkd: 0929 YU1WP JE34b, 0930 YT50S JF, 1200 EA4DK YA42d, 1208 EB4CKI, 1211 EA7AJ YX12f, 1724 EA6IB AZ78b, 1725 EB3DYS BB42g, 1727 EB3FFF/p BC54e, 1728 EA3ADW BB22g, 1729 EA3TI/p BC44j, 1731 EA6SA BZ44j, 1822 EA4AMX YZ11g, 1823 EB4EUB YA42e, 1825 EA4AKH XA79e, 1826 EA4AFI YA52g, 1828 EB4AOS YA41h, 1830 EB7ALS XX44h, 1845 EA5IZI ZZ20a.

950702

DL2FDL (EK35c) wkd: 1355 EB1CPS XA02b, 1524 CT1BGE VY.

DL2IAN (EJ71a) wkd: 1518 CT1DMK VA27d, 1519 CT1FAK VA37b, 1520 CT4KQ WA21e, 1521 CT1WW WB63b, 1531 CT1BGE VY.

DL8EBW (DL66a) wkd: 1515 EA4EHI WY16h, 1523 CT1BGE VY.

EA9AI (XV04e) wkd: 1456 F5HRY BI22c, 1456 PA3CNX CM76h, 1456 PA0JMV CL47a, 1458 PA3FOC CL03g, 1459 ON1IM BL79j, 1459 PA3ANZ CM46h, 1500 PA3BIY CM72c, 1500 PA0WHZ CM02b, 1501 PA3EPD CL02c, 1502

PA3FWN, 1504 PA3FIV CL02e, 1504 PE1AHX CL, 1508 ON4ANT CK21h, 1508 PA3EQK CM54f, 1509 PA3FTX CL32j, 1510 PA0CIS CM63f, 1510 F6FLV BI11g, 1511 PE1DAB CN68f, 1511 PA3DOL CM15b, 1512 PA3ELV, 1513 F6CBH BK74f, 1513 G4ZFJ AL34c, 1513 PA0RLS CM53d, 1514 F1DBN AK19c, 1515 ON5NY BK05d, 1515 F6BFH AJ, 1516 F6IFR AJ19g, 1517 G1UZD AL14e, 1518 G4SWX AM77j, 1519 G0GMS ZL79j, 1520 F5KAR, 1521 EB7EVV/p XX38c, 1521 EA7OC/p XX38c, 1522 G1HWY ZK09e, 1522 G0GMS ZL79j, 1522 G3WZT ZK09a, 1524 G3WZT ZK09a, 1524 G0GMS ZL79j, 1525 G3LTF ZL78g, 1525 G0FIG ZK19a, 1527 G4DHF ZM19f, 1528 ON4GG CK21h, 1528 G0JUR ZM20j, 1528 G0GPE, 1529 PA3EPD CL02c, 1529 PA0RDY CM45e, 1530 PA3GPE CL34f, 1530 F1DXH AI30b, 1531 PA3BYI CM27g, 1531 G4AEP ZL46e, 1535 PA0CIS CM63f, 1539 PA3BIY CM72c, 1540 PA3BGM DN12g.

PA3BIY (CM72c) wkd: 1450 CT1DYX VB67j, 1500 EA9AI XV04e, 1502 EA7TL XW43b, 1508 EB7EFA WX60a, 1513 EA7DBH XW63d, 1515 EA7KW WX, 1516 EA7GCF XX31g, 1540 EA9AI XV04e, 1551 EA9CW XV04e, 1554 EA7OC XX38c.

950715

DK8EL (DL34b) wkd: 1654 LZ1AG MC64e.

DL5GAC (EH18d) wkd: 1730 LZ2AB ND78b.
PA0JMV (CL47a) wkd: 1800 IT9IPQ/9 HY, 1850 IS0OZK EZ56g, 1912 9H5L HV03f, 1914 I8KRO IY03g.

950716

DL5GAC (EH18d) wkd: 0922 UU2JI QF34f, 0933 UT7GW QG.

950720

DL1GFH (EH29h) wkd: 1518 EA7GTF YX12f, 1521 EA7KW WX, 1530 EA7BVD XX07f, 1548 EA7WM WX64j.

DL2IAN (EJ71a) wkd: 1514 EA7/DL3MGLZW, 1516 EA7GHJ XW, 1522 EA7TL XW73b, 1533 EA9AI XV04e, 1536 CN8NS WU.

950721

DL2IAN (EJ71a) wkd: 1358 RZ6BY SE07e.

950725

DB3VE (DJ45j) wkd: 1120 4X4ZZ RS.

Please submit your Es reports preferably in machine readable form. You may do so using the following **magnetic media:**

5 1/4" or 3 1/2" 720K TOS or MS-DOS (please no HD coating)

Further you can report to me by **E-Mail:** ehramm@dk3uz.hanse.de

or via **Packet Radio:** DK3UZ @ DB0HHT.#HH.GER.EU

vy 73, Eddi

Aurora News

Editor: Edmund Ramm, DK3UZ

DK8LV (EO48d) wkd via Aurora on 144MHz in CW:

950630					2130	GM4YXI	YR60a	55a	53a	355
2115	GB3LER	ZU65f	55a	B 0	2134	SM3TRV	IW67c	52a	53a	355
2116	SK4MPI	HU46d	55a	B 0	vln dk fr info, Stephan					

DL8BDU (EN71f) wkd via Aurora on 144MHz in CW:

					950118					
950103					0545	GB3LER	ZU65f	41a	B	
1625	GB3LER	ZU65f	41a	B 0	0547	SK4MPI	HU46d	41a	B	350
950117										
1725	SK4MPI	HU46d	51a	B 0	1930	SM7EBI	HR12f	55a	55a	345
1727	GB3LER	ZU65f	51a	B 0	1953	LA9WF	FT03d	55a	55a	10
1914	ES2RW	MT56a	52a	59a 10	2003	YL3AG	MQ01g			10
950304					2304	OH2BNH	MU55d	59a	59a	0
1840	SM5BSZ	IT44e	59a	58a 0	2313	LA2PHA	DS74j	31a	58a	0
2255	LA3BO	FT62f	55a	59a 0	vln dk fr info, Klaus					

G4RGK (ZL37g) wkd via Aurora on 144MHz in CW:

950326					1645	YL3AG	MQ01g	53a	hrd	10
1642	SM5BSZ	IT44e	57a	55a 10	1702	LA4YGA	ES61g	55a	hrd	10
950407										
1620	PI5EHV		58a	58a 50	1718	HA4ZZ	JH72c	55a	559	65
1639	DL1EJA	DL12e	55a	55a 50	1727	IK4WLV	FE50c	55a	55a	65
1642	FB1NZQ	BI12j	55a	55a 55	1735	HB9DBM	EH62f	54a	52a	70
1643	DL8EBW	DL66a	59a	57a 55	1736	HB9DFG	DH38d	56a	53a	70
1645	F6APE	ZH57b	59a	59a 55	1754	F6CRP	ZG65j	57a	55a	70
1647	DL9YEY	EL03d	57a	55a 55	tks fr info					

HB9DFG (DH38d) wkd via Aurora on 144MHz in CW:

950407					1704	DL8EBW	DL66a	55a	57a	030
1600	GM0CLN	YP06h	54a	53a 000	1710	DL1EJA	DL12e	54a	55a	030
1619	DL0FTG	FN71g	59a	59a 025	1712	PA3CNX	CM79b	55a	52a	030
1627	G1SWH	YN27d	*56a*	*57a* 010	1715	DF5DE	DK02h	52a	53a	030
1635	PA3BGM	DN62g	55a	55a 020	1723	DF7KF	DK13b	57a	55a	030
1638	G4RKV	AL57h	55a	55a 025	1731	DF1CF	FH23f	55a	59a	030
1643	DL0WAE	EM73g	55a	55a 025	1736	DL1CS	EI65a	559	55a	

HB9DFG (DH38d) contd.:

950407

1651	G4KUX	ZO31a	53a	55a	030	1737	G4RGK	ZL37g	53a	56a	030
1653	G4RRA	ZL67h	57a	59a	030	1756	DL7VBW	GM37c	52a	55a	030
1655	DL9YEY	EL03d	59a	59a	030	vln dk fr info, Christian					

PA3FJY (DM52c) wkd via Aurora on 144MHz in CW:

950117

1906	LA3DV	ET20e	55a	42a	10	2017	SK6HD	GS68d	57a	57a	335
1933	GM0USI	XP09e	42a	55a	330	2023	SK4IL	GT56a	54a	55a	334
1935	SM7EBI	HR12f	55a	55a	332	2047	GM4ILS	YR24e	59a	57a	335
1957	GM0GMD	YQ61g	42a	42a	338	2053	PA2DWH	CM63d	57a	55a	300
2005	GM0CLN	YP06h	55a	51a	329	2055	G0CUZ	YM40e	55a	53a	298

950129

1817	LA4YGA	ES61g	54a	53a	335	1751	SM5BSZ	IT44e	57a	55a	340

950313

950326

1554	GM4YXI	YR60a	59a	55a	340	1644	DL0FTG	FN21f	55a	55a	35
1600	LA4YGA	ES61g	57a	55a	0	1715	LA8SJ	FT24g	58a	57a	340
1621	LA2AB	FT03f	57a	53a	0	1720	SK6HD	GS68d	58a	58a	335
1624	SM5BSZ	IT44e	59a	59a	350	1738	SM5PRE	HS48c	55a	52a	340

950407

1453	DL9GJW	FO80a	59a	57a	40	1531	DL5MAM	FI79j	55a	55a	70
1502	G3LNR	ZM04d	57a	59a	40	1538	DL9YEY	EL03d	59a	59a	30
1507	OE2UKL	GH05b	55a	55a	70	1547	DK6AQ	FL33h	56a	55a	50
1510	HA0HO	KH18b	55a	55a	70	1548	DL8EBW	DL66a	55a	57a	50
1512	DL8MFL	FI77f	57a	57a	73	1553	F5POJ	BJ10b	55a	55a	50
1520	HB9JAW	EH62g	59a	55a	70	1607	DF1CF	FH23f	57a	55a	65
1523	DL4FCH	EK64e	55a	55a	65	1618	DL3BWW	HM53b	59a	59a	320
1526	HB9LEH	EH43c	55a	55a	65	1623	DJ5CL	FI60j	53a	55a	70

950502

1643	GM4CXM	XP09g	55a	53a	322	1726	OZ4EDR/p	EP64c	59a	59a	315
1700	SK5EW	HT80c	56a	55a	340	bedankt voor info, Dick					

PI4NYV (DM53h) wkd via Aurora on 144MHz in CW:

950304

1659	GM4VVX/p	YR79j	59a	59a	1832	SM5BSZ	IT44e	59a	58a
1704	LA2AB	FT03f	59a	45a	1843	SM4HFI	HU39h	59a	55a
1714	LA3BO	FT12g	59a	55a	1845	LA3EDA	FU52f	55a	55a
1827	OH2BNH	MU55d	55a	55a	1910	GM3JFG	XR30b	55a	52a
1828	SK5CG	IU69j	55a	55a	2310	GM4YXI	YR60a	59a	52a

My thanks to the keepers of DK0WCY! I listen to the beacon daily. It helps me predicting Aurora openings. bedankt voor info, Dick (PA3FJY)

70cm 70cm 70cm 70cm 70cm 70cm 70cm 70cm 70cm 70cm 70cm

G4RGK (ZL37g) wkd via Aurora on 432MHz in CW:

950407		1659 PA3FPC	55a lost
1654 UT1PA	ML73h 55a 55a 48	tks for info	

Please submit your Aurora reports preferably in machine readable form. You may do so using the following **magnetic media:**

5 1/4" or 3 1/2" 720K TOS or MS-DOS (please no HD coating)

Further you can report to me by **E-Mail:** ehramm@dk3uz.hanse.de

or via **Packet Radio:** DK3UZ @ DB0HHT.#HH.GER.EU

vy 73, Eddi

News & Comments

Editor: Klaus Tiedemann, DL4EBY

Proposals for Changes to European VHF / UHF Bands

The European Radiocommunications Committee (ERC), a body of CEPT, recently published the results of their Detailed Spectrum Investigation (DSI) Phase II, which was launched in March 1993. Authorities, manufacturers and organisations were asked to submit thoughts about the usage of the frequencies in question. Phase 2 is dealing with the frequency range from **29.7 to 960MHz**. The aim of this study mainly is a harmonised frequency usage plan for all CEPT countries, aspired for the year 2008.

For the radio amateurs, the IARU, the amateur radio organisations of Germany, Austria and Great Britain and the UK Six Meter Group have submitted their papers with wishes. Unfortunately, the amateur radio organisations of the other countries missed to contribute their interests and needs to this important process of decisions.

Section 10.4 of the DSI study, which deals with Amateur Services, is reprinted below (the full document contains about 220 pages..). These proposuals may change significantly until then, as a result of the public consultation process.

Results of the DSI Study

10.4.1 Introduction

The ITU Radio Regulations define the Amateur Service and the Amateur Satellite Service seperately. Their objectives are, however, essentially the same and the same users are involved who use terrestrial and/or satellite means of communication according to their needs and possibilities.

In approximately 170 countries worldwide there are over three million licensed amateur stations. This number is growing at a steady rate of 7% per annum which will lead to a total of 7.5 million in the year 2008. The amateur population varies from country to country and is related to a large degree to the standard of living, political freedom, and availability of equipment. There are at the present time over one million amateurs in Japan and half a million in the USA. In the most advanced CEPT countries the average amateur population density is one amateur per 600 inhabitants.

The ITU Radio Regulations define the Amateur Services to be used for self-training, intercommunication and technical investigations, that is by duly authorised persons interested in radio techniques solely with a personal aim and without pecuniary interest. These services have many objectives which include, providing essential communications in the event of natural disasters, training of operators and technicians in radiocommunication and telecomunication technology at no cost to the State and community; contributing to the technical advancement of radiocommunications and the enhancement of international understanding and goodwill.

Contributions were received from the IARU and a number of national amateur organisations. In addition, several administrations included text covering the Amateur Service.

10.4.2 Propagation Factors

Practically all propagation modes are used by amateurs in the range 27.5 - 960MHz. In the lower part of the DSI Phase II range mostly ionised modes are utilised, whilst in the upper part non-ionised modes are employed. Use of mixed modes is also common. The following are the most attractive:

- Sporadic-E 'clouds' (noted up to 225MHz)
- E and F2 mutil-hop (up to 70MHz)
- Trans-Equatorial spread-F (TE, so far contacts made up to 225MHz with advanced experiment in the 430MHz band)
- E-layer FAI (field aligned ionisation irregularities; so far up to 225MHz)

- Aurora Backscatter (all DSI Phase II bands with increasing difficulty above 225MHz)
- Meteor Scatter (50-148MHz optimum)
- Earth-Moon-Earth (using the moon surface as a passive reflector, 144MHz and up)
- Tropospheric super-refraction and ducting (results improving with frequency)
- Tropospheric Scatter (50 - 450MHz)

10.4.3 Spectrum Issues

Even recognising the relatively high population of amateur radio operators, many in remote areas of the world, it is still possible that propagation paths go unnoticed much of the time. In order to enhance knowledge of the way the radio spectrum can be utilised it seems that the amateur observation and beacon programme should be given every encouragement to extend and improve.

29.7 - 30MHz

In view of the increasing population of radio amateurs which is expected to triple in numbers, a number of contributors requested that the band 29.7 - 30MHz be reallocated to the amateur service. The DSI Management Team was not fully convinced of the need for this allocation, even on a secondary basis and suggests that this question be readdressed when this frequency range is reviewed in a future DSI.

30 - 50MHz

Currently there is no allocation to the amateur service in this part of the spectrum in any of the ITU Regions. However, in propagation study terms, the absence of reliable continuous and identifiable signals in this range causes problems and means that the progress of a propagation event starting in the HF range and identified using beacons at 28MHz cannot be reliably tracked as it progresses towards 50MHz.

It has been suggested that the DSI Management Team consider the feasibility of identifying a small sub-band or individual frequencies in the vicinity of 40MHz where beacons could be established in Europe. These could be located at appropriate geographical sites, choosen in order to minimise the possibility of interference to other radio services. The beacons would operate with an ERP of around 10dBW and would utilise FSK Morse identity signals with low deviation and minimal bandwidth. The DSI Management Team is generally sympathetic to this proposual, the ISM band centered on 40.68MHz would seem appropriate, the beacons posibly using frequencies interleaved with on-site paging. A secondary allocation to the amateur service would also seem appropriate, alternatively these stations could be considered as operating in the fixed service.

50 - 54MHz

The band 50 - 54MHz is allocated in Article 8 of the Radio Regulations to the amateur service on a primary basis in Regions 2 and 3. In addition, No 559 of the Radio Regulations allocates the band to the amateur service in a number of African countries in Region 1. For CEPT countries Recommendation T/R 02-01 provides a mechanism to allocate all or part of the band 50 - 52MHz to the amateur service in accordance with No 342 of the Radio Regulations and a large number of CEPT administrations have provided facilities for the amateur service in this band.

It is beleived that these arrangements should now be confirmed with the band 50 - 51MHz being allocated on a primary and exclusive basis and the band 51 - 52MHz allocated on a shared primary basis with the mobile service. It is noted that the amateur service succsessfully shares with defence users in a number of VHF / UHF bands.

54 - 70MHz

In common with the concept of propagation beacons outlined for 40MHz, a similar allocation at 60MHz may prove to be of scientific value. It is beleived that this possibility should be re-assessed when television broadcasting is no longer operating below 68MHz. Arrangements could be considered in the overall planning of the band 51 - 61MHz for the fixed and mobile services.

70 - 70.5MHz

In several CEPT countries the amateur service operates in this band on a secondary basis whilst in others it is used for sound broadcasting or mobile applications. From a propagation standpoint, 70MHz is understood to be at the currently known extent of F2 ionospheric porpagation. Sound broadcasting in eastern Europe is likely to cease in this band within the next 15 years, and it is hoped the plan outlined in this document for the mobile services in the range 68 - 87.5MHz will be

acceptable to these administrations. This plan is based on a 9.8MHz transmitter-receiver spacing. The radio astronomy requirement at 79.75 - 80.25MHz is also recognised and the band together with its 9.8MHz complement 69.95 - 70.45MHz are considered most appropriate for single frequency mobile apllications, perhaps optimum for defence users with arrangements to protect radio astronomy. It would therefore seem possible to agree to a limited amateur transmitting facility of at least 100kHz centered on 70.2MHz in the band 70 - 70.45MHz. It is also hoped that the existing beacon network between 70 and 70.15MHz can be maintained and extended.

144 - 148MHz

As the only exclusive amateur band in the VHF and UHF range it is heavily used throughout the world for both terrestrial and satellite amateur communication. A wide variety of modes of emission are in use. Various terrestrial voice and data networks are complemented by a number of amateur satellites.

In addition to popular propagation mechanisms like tropospheric scatter or super-refraction, amateurs make use of communication by reflection from the surface of the moon, meteor trails and auroral scatter. Sporadic-E communication events appear much more frequently than was beleived to be possible; amateurs have observed other propagation phenomena either previously unknown or beleived to be extremely rare at these frequencies. Many amateur beacons support monitoring of propagation conditions.

In many areas the already heavy occupancy does not allow for the accomodation of any additional activity despite the rapid growth of the amateur population. Therefore, the IARU has requested the retention of the existing exclusive worldwide allocation of 144 - 146MHz and suggests consideration of global harmonisation by allocating the 146 - 148MHz segment to the amateur service in CEPT countries.

The DSI Management Team could not agree to this latter suggestion in view of the current and foreseen extensive use of the band 146 - 148MHz by the land mobile service.

220 - 225MHz

This primary shared allocation in Region 2 is actively used by amateurs providing communication opportunities complementary to that of the overcrowded 144MHz band. Ideally access to the band in CEPT countries was considered desirable by the IARU.

This band falls within the band 216 - 240MHz proposed for terrestrial digital audio broadcasting (T-DAB). The DSI Management Team agrees with the IARU that such an allocation woud be generally impractical in CEPT countries.

430 - 440MHz

This band is of particular importance to the amateur service. Propagation properties at 430MHz allow for interesting combinations of popagation modes to be used. The educational aspect of amateur radio is again fully explored, eg. amateurs predict tropospheric ducting from meteorological maps; similarly they learn astronomy to establish a position of the moon in a cloudy sky when attempting to communicate by reflection of waves from its surface and / or by means of meteor scatter. This the only band below 1GHz where amateurs may use conventional C3F TV and emissions of similar bandwidth.

The amateur satellite service relies on the sub band 435 - 438MHz (RR664) which presently is *the only allocation between 146MHz and 2.4GHz allowing amateur space-to-earth emissions.*

Amateurs in CEPT countries, particularly suffer from ISM interference in the 433.92MHz ISM band. Similarly manufacturers of low power systems using this band are concerned at the interference potential of amateur emissions.

The DSI Management Team were concerned with this situation and it is hoped that the recommendation (see section 10.10.1) to open up the band 403 - 404.5MHz for low power devices and establish the band 915 - 920MHz as a low power and ISM band will, after an appropriate transition period, render the ISM band at 433MHz obsolete in the very long term.

On the other hand, additional spectrum in the low UHF range is urgently required for land mobile services in the major European cities. As a consequence the DSI Management Team has determined

that the band 432 - 438MHz and the band 435 - 438MHz be allocated to the amateur and amateur satellite services respectively on a primary basis. It is beleived that amateur television activities should be transferred to bands above 1GHz, unless modern digital processing technologies can facilitate such emissions in the available bandwidth.

It is hoped that the loss of 4MHz, 430 - 432MHz and 438 - 440MHz will be balanced by the improved status of the remaining 6MHz together with a gain of 2.95MHz *[i.e. 50, 70 and 920MHz bands, the Editor]* to the amateur service from other parts of the DSI range.

902 - 928MHz

Several contributers requested consideration of a secondary amateur allocation in the range 902 - 928MHz to align with the situation in the ITU Region 2. If the recommendation to introduce ISM to the band 915 - 920MHz is accepted it would seem feasible to allocate the band 919.5 - 920MHz to the amateur service on a secondary basis.

10.4.4 Other Matters

The DSI Management Team have been asked to deliberate on two other matters, the first concerns a current problem with regard to Recommendation T/R 61-01, the CEPT amateur licence. It has been requested that amateurs, which are licensed to operate in the 50MHz band be able to use their equipment when travelling to other countries that authorize 50MHz, under the same conditions that apply to nationals of that country.

The second is also a regulatory matter where it appears that some amateur operators are unable to participate in propagation research, because they are not authorized to listen to amateur beacons in a band which they are not licensed to transmit.

Both issues would not seem to the DSI Management Team to be insurmountable problems and it is hoped that administrations can solve these short term difficulties within the normal work of the ERC.

10.4.5 Recommendations

The DSI Management Team recommended in the context of the Europan Table of Allocations and in accordance with the foregoing, that:

- the band 50 - 52MHz be allocated to the amateur service on a primary basis, the band 51 - 52MHz additionally to be allocated to the mobile service;
- frequencies in the vicinity of 40.68MHz be considered for amateur propagation beacons;
- a minimum of 100kHz in the band 70 - 70.45MHz be allocated to the amateur service on a secondary basis according to national considerations, if feasible, centered on 70.2MHz;
- the band 144 - 146MHz be maintained with its current status;
- the band 430 - 440MHz be reduced to 432 - 438MHz with primary status for the amateur service. The band 435 - 438MHz to be allocated to the amateur satellite service on a primary basis. It is additionally recommended that the 433MHz ISM and low power band be reviewed after an appropriate time period to ascertain whether alternative arrangements for ISM and low power render its retention unnecessary;
- the band 919.5 - 920MHz be allocated to the amateur service on a secondary basis.

It is further recommended that the regulatory issues outlined in section 10.4.4 be addressed by the appropriate constituent body of the ERC.
[End of DSI Study text]

Comments

In Germany, the DSI plans were discussed in an open hearing June 20th, 1995. One got the impression, that decisions about harmonising plans are made by very few people only. All participants were asked to submit their comments to the plans of the DSI **until end of September** to the European Radiocommunications Office in Copenhagen *[I have the details, Klaus]*.

It is interesting to see, that only countries with a small level of population, like in Skandinavia, have already cut the 70cm band to 432 - 438MHz. For hams in the other countries it is difficult to understand, that they shall give away these 4MHz as well, especially because it is expected that the services, who were the reason for this reduction, will be ceasing until the year 2008.

The ISM frequency, once defined as 433.92MHz +-0.2% (i.e. 433.050 - 434.790), is more and more used for so called low power devices, like garage

openers, warning systems, which were originally excluded, and also for the transmission of music at home and **10mW handies for everbody** (!). The frequency originally was allocated for industry, research and medical applications.

The amateur satellite service, defined seperately on the WARC conference 1979, has another problem with the reduction on 70cm. All kind of repeaters, digipeters etc. in addition to the new ISM applications will flood the (presently) protected satellite band 435 - 438MHz, making any serious operation impossible, there. But this band is particularly important to the amateur satellite service, because it is the only range, where uplinks *and* downlinks are allowed. The 23cm band is not allowed for downlinks, and 145.8 - 146MHz is too small for about 30 satellites in operation.

Several professional mobile radio services have never reached the level of usage as planned by the manufacturers here in Germany. The announced requirements for mobile radio with 115MHz as an average of the national conceptions is an estimate only. It is questionable whether the frequencies must be taken from the already small portion (1.3 %) of the amateur service within the DSI Phase II range (28.7 - 960MHz).

The DSI Management Team assumes, that after the year 2008 the analog TV systems on 47 - 68MHz and 174 - 230MHz will be out of interest and make space for other (e.g. mobile) services. The same applies for the analog mobile telephone networks, although it might be questionable, whether some eastern countries will want to replace the still new systems.

The promising compensations planned by the DSI (allocations for 6m, 4m, 30cm, beacons on 40MHz) would not at all be sufficient for the demand of frequencies needed for DX, analog and digital ATV, Packet Radio, FM channels etc. For all hams in the European countries it is important, that they become active and represent the arguments against the cut on 70cm in discussions with the national authorities.

[I would like to thank Ulli, DK4VW, for providing the additional material and comments.]

Deutsch:

Vorschläge für Änderungen auf den VHF / UHF Bändern

Das *European Radiocommunication Commitee* (ERC), ein Organ der CEPT, hat kürzlich die Ergebnisse der Detaillierten Frequenznutzungs-Untersuchung, *DSI Phase II (Detailed Spectrum Investigation)*, bekanntegegeben. Im März 1993 wurden Verwaltungen, Firmen und Organisationen aufgefordert, sich an den Überlegungen zur zukünftigen Frequenznutzung in Europa zu beteiligen. Phase II beschäftigt sich mit den Frequenzen von **29.7 - 960MHz**. Ziel der Studie ist ein harmonisierter Frequenzbelegungsplan für alle CEPT-Länder ab dem Jahre 2008.

Für die Funkamateure haben die IARU, der DARC die Amateurfunkverbände Österreichs und Großbritanniens und die UK Six Meter Group Papiere mit ihren Wünschen eingereicht. Leider haben die Amateurfunkverbände anderer europäischer Länder versäumt, die Interessen ihrer Funkamateure bei diesem äußerst wichtigen Entscheidungsprozeß einzubringen.

Das Kapitel 10.4 der DSI Phase 2 -Studie, das sich mit dem Amateurfunk befaßt, ist oben (Originaltext in Englisch) abgedruckt.

Am 20. Juni hat im BAPT in Mainz eine öffentliche Anhörung stattgefunden, bei der alle Interessenten die Möglichkeit hatten, gegenüber den Vertretern des BAPT / BMPT und dem ebenfalls anwesenden Vorsitzenden des ERO (European Radiocommunication Office, Kopenhagen) ihre Meinung zu äußern. Das BMPT, befragt über die geplante Beschneidung des 70cm-Bandes, äußerte, daß man interessiert ist, für alle Gebiete zu einer Harmonisierung zu kommen, andererseits aber der Bundespostminister Dr. Bötsch gegenüber dem DARC-Vorsitzenden eine **Bestandsgarantie** gegeben habe. Als aufmerksamer Zuhörer mußte man den Eindruck gewinnen, daß die Entscheidungen über die Harmonisierungspläne in den Händen nur weniger Personen liegt.

Alle Beteiligten wurden aufgefordert, ihre Kommentierungen zu den DSI-Vorstellungen **bis Ende September** an das ERO in Kopenhagen, sowie an das zuständige Referat 311 im BAPT zu senden *[weitere Details bei mir]*. Ende dieses Jahres / Anfang nächsten Jahres will man dann in Zusam-

menarbeit mit den bisher Beteiligten bei einer ähnlichen Veranstaltung eine nationale Bestandsaufnahme der Frequenzforderungen machen. Wie diese dann für Deutschland aussieht, wird auch von der Entwicklung auf internationaler Ebene abhängig gemacht.

Es ist schwierig, bei Überlegungen zur Harmonisierung der Frequenznutzung aller Europäischer Länder diese gleich zu behandeln. So ist z.B. interessant, daß *nur bevölkerungsarme Länder* bisher schon das 70cm-Band auf 432 - 438MHz begrenzt haben (im wesentlichen die Skandinavischen Länder). Für Funkamateure in anderen Ländern ist nicht nachzuvollziehen, daß sie sich ebenfalls auf diesen engen Bereich beschränken sollen, wo doch der Funkdienst, der z.B. in den Skandinavischen Ländern der Grund für die Beschränkung war, auch dort eigentlich nach dem Jahre 2008 eingestellt werden soll.

Die **ISM-Frequenz**, ursprünglich mal als 433.92MHz +-0.2% (d.h. 433.050 - 434.790MHz) benannt, wird neben den ursprünglichen Anwendungen für Industrie, Wissenschaft und Medizin mehr und mehr für sogenannte *Low Power Devices* zugelassen, wie Garagentor-Öffner, Auto-Wegfahrsperren etc., die ursprünglich ausgeschlossen waren, aber auch für Einrichtungen zur Musikübertragung zu Hause und sogar für **10mW Sprechfunkgeräte mit allgemeiner Freigabe** (!). Eine störungsfreie Nutzung dieses Bereiches durch Funkamateure ist in naher Zukunft nicht mehr möglich. Ausserdem baut sich dadurch ein Konfliktpotential mit den Benutzern solcher neuer ISM-Anwendungen in der Nachbarschaft auf, wenn Funkamateure trotzdem in diesem Bereich senden würden.

Der Amateurfunk-Satelliten-Dienst, der auf der WARC Konferenz 1979 separat vom Amateurfunkdienst definiert wurde, hat ein weiteres Problem durch die Beschneidung des 70cm-Bandes. Neben den eben erwähnten ISM-Anwendungen wird der fehlende Bereich unzählige FM-Repeater, Digipeater etc. in den verbleibenden Bereich drängen, und damit auch in den eigentlich als separaten Funkdienst geschützten Satellitenbereich, was einen ernsthaften Betrieb dort unmöglich macht.

Dieses Band aber ist das einzige, welches Downlinks (Satellit-Erde) zuläßt. Auf 23cm sind nur Uplinks zulässig und auf 2m ist wohl kaum Platz fuer Uplinks und Downlinks von rund 30 zur Zeit aktiven Satelliten.

Einige mobile Funkdienste, wie zum Beispiel der Bündelfunk in Deutschland, haben nie die von der Industrie vorhergesagte Verbreitung erfahren. Die Bedarfsannahmen für den Mobilfunk mit 115MHz als Mittelwert der verschiedenen nationalen Vorstellungen ist nur geschätzt. Es muß erlaubt sein, warum gerade aus dem schon sehr kleinen Frequenzspektrumsanteil der Funkamateure (1.3% im Bereich 29.7 - 960MHz) dafür freigemacht werden sollen.

Das DSI Team nimmt an, daß nach dem Jahre 2008 das analoge Fernsehen aus dem Bereichen 47 - 68MHz und 174 - 230MHz verschwunden ist, und damit Platz geschaffen wird für andere Funkdienste, wie zum Beispiel den genannten Mobilfunkdienst. Ähnliches gilt wohl für die analogen Mobiltelefon-Netze, obgleich es fraglich ist, ob einige östliche Länder die Infrastruktur besitzen werden, ihr gerade aufgebautes Netz im Jahre 2008 schon wieder durch ein neues zu ersetzen.

Die von der DSI-Arbeitsgruppe in Aussicht gestellten Kompensationen wären für den Frequenzbedarf des Amateurfunkdienstes keinesfalls ausreichend. Um die Verluste allein für die Betriebsarten Packet Radio, ATV und das geplante Digitale Amateurfunk-Fernsehen auszugleichen, hätte man im 30cm-Band mindestens 4MHz gebraucht. Ob aber dieses Band mit 500kHz auf nur sekundärer Basis überhaupt Wirklichkeit wird, hat die Arbeitsgruppe davon abhängig gemacht, daß der Frequenzbereich 915 - 920MHz zu einem ISM-Band gemacht wird.

Für die Funkamatere selbst kommt es darauf an, daß sie nun in allen europäischen Ländern aktiv werden, und gegenüber ihren nationalen bzw. den neugeschaffenen europäischen Frequenzkoordinierungsstellen die berechtigten Gegenargumente vertreten.

[Dank an Ulli, DK4VW, für die zur Verfügungstellung von zusätzlichem Material und Kommentaren.]

G4LRT schreibt: Es hat wieder Diskussionen gegeben, die DX-Arbeitsfrequenz auf dem 6cm-Band von 5760 in den Bereich 5660 - 5670MHz zu verschieben. Die am besten dafür geeignete Frequenz wäre 5664 - 5666MHz.

Wird eine ZF von 144MHz benutzt, wäre der benötigte Quarz 92MHz für einen x60 Multiplizierer (ersetzt 93.6MHz). Es wurde vorgeschlagen, daß eine höhere ZF auf 6cm eingesetzt werden sollte. Das würde für eine 432MHz ZF einen Quarz mit der Frequenz 109MHz (x48) bedeuten, oder 87.2MHz (x60). Und für eine ZF bei 1296MHz wären das 91MHz (x48) oder 72.8MHz (x60).

All diese Frequenzen ergeben nette runde Zahlen, die sich leicht auf ein Frequenznormal rasten lassen.

Ich denke, der Hauptvorteil auf den auf den Microwellenbändern hat, ist die Möglichkeit, die Oszillatoren an einen Frequenzstandard aus der Luft zu koppeln, sodaß eine schwache Station in einem schmalen Bereich gesucht werden kann, ohne Zeit zu verschwenden, um einen großen Bereich abzusuchen. Nimmt man eine andere Frequenz als 5664MHz, würde das bedeuten, daß dieses Unterfangen wesentlich schwieriger wird.

Übrigens ist die 5664MHz die 59. Oberwelle von 96MHz, es wäre also kein Problem, ein schwaches Signal zur Überprüfung des eigenen Empfängers bereitzustellen.

Viele Stationen werden auch noch einen 92MHz Quarz in ihrem alten 3456MHz Konverter übrig haben.

Sollte es nötig werden, auf den Bereich 5660 - 5670MHz auszuweichen, kann man auf 5664MHz gehen; es gibt aber keinen Grund, einen 92.06666MHz Quarz schleifen zu lassen, um auf 5668MHz arbeiten zu können.

73 de Steve Berry, G4LRT

G4LRT writes: There has been talk again about moving frequency on the 6cm band from 5760 to 5660-5670MHz.

The most suitable frequency in this range would be 5664-5666MHz.

When using an IF of 144MHz, the chrystal required will be 92MHz for x60 mutilpiers (replaces 93.6MHz), or 115MHz in a x48 chain (replaces 117MHz). It has been suggested that a higher IF would be used on 6cm. So for 432MHz IF use 109MHz for x48, or 87.2MHz for x60. And for 1296MHz IF use 91MHz in a x48 chain, or 72.8MHz chrystal for x60.

All these frequencies come out to nice round figures which are very easy to lock to a station standard.

I think a most useful advance that could be made on the microwave bands is to lock oscillators to an off air standard, so a weak station could be searched for in a narrow band-width without the need to tune around to find the right frequency. Settling on another frequency than 5664MHz would mean that this was more difficult.

Also, 5664MHz is the 59th harmonic of 96MHz so it could be easy to provide a weak signal source that the receiver is still working.

Many stations will already have a 92MHz chrystal of course left over from the 3456MHz converter.

If there is a need to operate in the sub-band 5660-5670MHz then I can switch to 5664-5666MHz but I can not see any point in buying a 92.06666MHz chrystal to operate on 5668MHz.

73 de Steve Berry, G4LRT.

Noise Figure Results

Central States VHF Society Conference, Colorado Springs, 1995

The following is a summary of the preamp measurements on the CSVHFS conference in Colorado Springs at 28 th of July, 1995. The conference used HP 8970B Noise Figure Meters. The noise heads were 346A's. The noise heads were powered up for some time before the measurements so all measurements would be made at the same temperature. The head temperature was compensated for. If the head is not powered up for 20 or 30 minutes, the first preamp measured has an unfair advantage. Tested were by WB5LUA, WA8WZG, WA7CJO.

73s, WA5VJB

(C = commercial, kommerziell; H = home brew, Selbstbau). Design: Type of Input Circuit (Cavity, L/C, Wire-Loop, Microstrip (MS) or Name of Company.

144MHz

NF	Gain	Call	C/H	Device	Design
0.16	14.0	WA5VJB	H	MGF1801	Tapped L
0.17	22.0	WA8WZG	C	AT8250	MCM
0.18	23.6	K7CA	C	MGF1302	MCM
0.19	22.0	WA8WZG	H	MGF1302	L/C
0.20	22.7	WA5VJB	H	MGF2116	Cavity
0.21	22.7	AA4FQ	H	MGF1302	L/C
0.21	18.3	WA5VJB	H	MGF2116	Cavity
0.29	21.0	VE7BQH	H		Cavity
0.30	25.5	VE7BQH	H		L/C
0.36	16.1	KH6CP/1	H	MGF1801	L/C
0.40	19.6	KN4SM	C	LNA145	SSB
0.56	25.3	N0JEQ	H	MGF1302	L/C
0.58	19.3	N5SVP	C		COMM
0.70	18.0	W0PPF	H	MGF1302	L/C
0.70	19.2	W0PPF	H	MGF1302	L/C
0.73	21.4	KB5ZUD	H	MGF1302	L/C
0.80	17.7	WQ0P	H	MGF1302	L/C
0.85	21.7	N0AKC	H	MGF1302	L/C
1.0	31.4	K0FQA	H	NE251	
2.0	21,7	WW4T	C		ICOM

222MHz

NF	Gain	Call	C/H	Device	Design
0.16	22.4	KH6CP/1	H	MGF1801	L/C
0.16	22.4	WA5VJB	H	MGF1801	L/C
0.80	22.7	N0HJC	C		ARR
0.83	23.3	KB6IGC	C		SSB
0.86	25.8	WA0BWE	C		SSB

432MHz

NF	Gain	Call	C/H	Device	Design
0.19	17.4	DJ9BV	H	MGF1302	Cavity
0.24	19.9	KD4LT	H	MGF1302	Cavity
0.28	49.0	KD4LT	H	2x1302	Cavity
0.40	45.4	WA4NJP	H	2x1302	Cavity
0.43	18.4	KN4SM	C	MGF1302	TELETEC
0.47	21.6	W8TN	H	MGF1302	Cavity
0.47	15.6	KN4SM	C	LNA435	SSB
0.58	17.4	N0HJZ	C		ARR
0.62	17.3	WQ0P	H	MGF1302	Cavity
0.68	18.2	N0HJZ	C		ARR
0.73	19.9	WA0BWE	C	1302	ARR
0.75	17.3	K0FQA	H		
1.15	18.6	WA0BWE	C		SSB
0.59	28,1	N2CEI	C	Transverter	DEM

902MHz

NF	Gain	Call	C/H	Device	Design
0.33	15.5	KH6CP	H	NE32684	L/C
0.40	18.1	KH6CP	H	ATF10135	Cavity
0.53	18.5	WB5IGF	H	ATF10135	L/C
0.75	10.8	W0BJH	H	ATF10135	L/C
1.0	14.6	K0QFA	H	MRF966	Cavity
3.1	15.5	W0PHD	H	MG86576	L/C
0.9	18.1	N2CEI	Transverter		

1296MHz

NF	Gain	Call	C/H	Device	Design
0.25	39.5	AA6WI	H	FHX	Cavity
0.28	18.12	KH6CP	H	NE326	L/C
0.29	35.0	AA6WI	H	NE321/1302	L/C
0.30	19.0	DJ9BV	H	FHX35	Wire
0.33	18.0	WB5LUA	H	ATF36077	L/C
0.42	16.2	DJ9BV	H	FHX35	Wire
0.43	16.1	WA8WZG	C		COMM
0.54	13.7	WB5LUA	H	ATF10135	L/C
0.58	15.4	K5MAT	H	MGF1412	L/C
0.61	13.8	WB0TEM	H	ATF20135	L/C
0.66	17.9	WB0TEM	H	NE321	L/C
0.70	14.0	WB0TEM	H		L/C
0.76	25.3	WA4NJP	H	MGF1302	L/C
0.78	23.4	WA4NJP	H	2x1302	L/C
0.85	12.5	WA0QII	H	ATF10735	L/C
0.94	14.5	WQ0P	H	ATF10135	L/C
1.03	14.2	K0FQA	H	ATF12535	L/C
1.79	16.3	N8ZM	C		ICOM
2.32	18.4	W0PHD	H	MGA86576	L/C

2304MHz

NF	Gain	Call	C/H	Device	Design
0.38	15.2	KH6CP	H	NE326	L/C
0.39	14.3	WB5IGF	H	ATF35076	Wire
0.40	16.8	WB5LUA	H	ATF36077	Wire
0.41	39.9	DJ9BV	H	NE424/865	Wire
0.41	18.7	DJ9BV	H	NE424	Wire
0.42	16.9	DJ9BV	H	NE424	Wire
0.58	13.6	WB5LUA	H	ATF10135	MS
0.78	13.0	WA8WZG	H	ATF10135	L/C
1.34	15.7	W0QFA	H		L/C
1.43	17.0	W2CRS	C		SSB
2.0	12.6	WB5LUA	H	MGA87563	L/C
2.28	23.8	WA5TKU	H	MGA86576	L/C
1.2	31.5	N2CEI	C	Transverter	DEM
1.7		WA6WZG	C	Transverter	SSB

3456MHz

NF	Gain	Call	C/H	Device	Design
0.55	14.4	DJ9BV	H	NE424	Wire
0.55	12.8	KH6CP	H	NE326	Wire
0.58	25.6	WB5LUA	H	2xATF360	Wire
1.02	25.3	WA8WZG	H	2xATF101	L/C
1.19	22.7	K0FQA	H		L/C
2.1	15.2	WB5LUA	H	MGA86563	MS
2.23	25.0	WA5TKU	H	MGA86576	Wire
1.7	22.4	N2CEI	C	Transverter	DEM

5760MHz

NF	Gain	Call	C/H	Device	Design
0.60	13.5	DJ9BV	H	NE326	MS
0.70	23.2	KH6CP	H	2xNE326	MS
0.76	13.4	WB5LUA	H	ATF36077	MS
1.02	18.3	WA8WZG	H	2xATF101	MS
3.60	21.1	WD4MUO/0	C		JCA

10GHz

NF	Gain	Call	C/H	Device	Design
0.57	11.6	KH6CP	H	NE326	MS
0.60	11.4	KH6CP	H	NE326	MS
0.7	12.9	N0UGY	C	NE326	DEM
0.89	12.1	DJ9BV	H	NE326	MS
1.68	18.0	WA8WZG	H	2xATF135	MS
2.1	14.3	W0KJY	H	2xATF135	MS

DUBUS DXer Meeting in Weinheim

During the annual Weinheim VHF/UHF meeting DUBUS invites all VHF/UHF/SHF DXers to attend our get-together in the private brewery 'Zehntscheuer' in Hemsbach, 3km north of Weinheim. It will begin at Saturday, September 16th, 1900 local time and can last to 2400. There is food, lots of beer, and fun. ***Address: Restaurant Zehntscheuer, Hildastr. 3, D-69502 Hemsbach. Tel. 06201-7711***. You will find Hemsbach by driving the B3 north in direction towards Heppenheim. When getting into Hemsbach after 3km you should seek the parking place of the mayors house. Hildastraße is quite nearby. Hope to see you all!

Während der Weinheim UKW-Tagung veranstaltet der DUBUS Verlag das jährliche DXer Treffen in der Privatbrauerei 'Zehntscheuer' in der Hildastr. 3, D-69502 Hemsbach, Tel.: 06201-7711. Es beginnt am Samstag, den 16.9.95, abends ab 1900 Uhr. Hemsbach liegt 3 km nördlich von Weinheim an der B3 Richtung Heppenheim. Die Hildastraße ist in der Nähe des Parkplatzes am Rathaus. Bier, Essen und Spaß sind angesagt. Auf Wiedersehen im 'Zehntscheuer'!

DL3NQ weist auf den Mikrowellentreff ab 18 Uhr im Nebenzimmer des Restaurants im "Rolf-Engelbrecht-Haus" hin.

You are invited to send in your reports and articles for the columns **Hints & Kinks**, **Computer News**, **EME News**, and **News & Comments** via EMail or disk, or upload to the DUBUS BBS...

- EMail (Internet): klaus@netmbx@netmbx.de or klaus@afutub.extern.tu-berlin.de
- DUBUS Mailbox at +49-30-4557625

Thanks, Klaus.

DUBUS Toplist

Editor: Norbert Goettsche, DL8LAQ

50 MHz Top List

NR	CALL	WW	EU	WK	TR	AU	MS	ES	F2
1	PA0RDY	JO22	CM	628	725	1617	1597	****	16320
2	ON4KST	JO20	CK	604	729	1415	1509	7920	16498
3	G4UPS	IO80	YK	603	0	0	0	0	0
4	G4IGO	IO80	YK	583	577	1308	2528	6970	16188
5	ON4ANT	JO20	CK	556	710	1757	1695	7243	16547
6	ON4GG	JO20	CK	538	710	1757	1695	7243	16547
7	DL7QY	JN59	FJ	532	741	1665	2186	6900	16353
8	GW4LXO	IO81	YL	500	300	650	1200	7500	10000
9	G6HKM	JO01	AL	481	347	1883	780	5674	16112
10	SM6CMU	JO57	FR	424	762	1452	1642	5922	0
11	F1GTU	JN05	AF	418	699	815	1421	3268	16400
12	DL8HCZ	JO53	FN	412	365	1250	1356	3350	0
13	I4XCC	JN63	GD	394	492	0	1427	3349	18627
14	PA2TAB	JO32	DM	387	610	1370	1809	5797	15339
15	PA3FYM	JO22	CM	375	1238	2019	0	****	16373
16	G8VR	JO01	AL	365	760	2154	1290	8470	16416
17	F8OP	JN26	CG	348	631	1023	1369	5508	13547
18	OK1MAC	JN79	HJ	336	0	0	0	0	0
19	DL9GU	JN49	EJ	327	721	450	0	8500	15625
20	OK1DDO	JO60	GK	325	620	1423	1340	6100	13300
21	OK1IBL	JO60	GK	317	530	1320	1717	6941	11816
22	DL7ARM	JO62	GM	315	909	1189	1245	8324	15817
23	OK1FAV	JO60	GK	272	0	579	1093	6250	10366
24	SP6GZZ	JO81	IL	268	515	0	1826	7619	0
25	DL3YEE	JO42	EM	244	540	1056	1300	2700	13053
26	OZ7IS	JO65	GP	228	410	1294	850	3100	0
27	DL8LAQ	JO43	EN	228	0	0	0	0	0
28	SP6GWB	JO80	IK	225	696	629	1880	6384	0
29	CT1BGE	IM58	VY	215	0	0	0	0	0
30	G6LEU	IO70	XK	214	700	750	0	0	0
31	DL3AMA	JO51	FL	214	436	0	1600	4001	0
32	DL7YS	JO62	GM	208	342	461	969	3547	8767
33	SP5HEJ	KO02	KM	206	568	0	1838	4699	0
34	ES1CW	KO29	MT	201	1052	1726	2841	3311	4343
35	OK1VBN	JN78	HI	200	455	0	0	4010	0
36	DL5BBL	JO42	EM	199	414	1008	0	3165	5863
37	OK1FFD	JO60	GK	195	550	1247	0	6060	13300
38	DL8EBW	JO31	DL	186	247	1050	1150	5800	13300
39	9A2EY	JN85	IF	182	438	0	0	0	0
40	HB9AOF	JN36	DG	156	100	0	0	5400	10663
41	DL5GAC	JN47	EH	147	129	690	0	5100	11900
42	SP5EFO	KO02	KM	147	0	0	0	0	0
43	OK1VQ	142	245	539	0	2002	2755		
44	OK2PPP	JN99	JJ	122	0	0	0	3200	0
45	DL5IO	JN49	EJ	119	113	340	900	3100	12995
46	I2FUM/2	JN45	EF	107	137	0	0	2023	0
47	IN3TWX	JN56	FG	95	396	0	0	1890	8100
48	DL6BF	JO32	DM	94	0	0	0	0	0

144 MHz Top List

NR	CALL	WW	EU	WK	TR	AU	MS	ES
1	DK1KO	JO53	FN	633	2124	2057	2210	3285
2	DL3BWW	JO72	HM	627	2243	2034	2295	2782
3	DL8HCZ	JO53	FN	554	1615	1976	2096	3527
4	PA0RDY	JO22	CM	547	1582	1979	2272	2819
5	SM6CMU	JO57	FR	534	1760	1928	2280	2540
6	SM6AFH	JO66	GQ	531	1730	1554	2010	2330
7	PA3BIY	JO22	CM	530	1550	2026	2205	3143
8	DK9OY	JO52	FM	529	1651	1947	2208	2434
9	DK6AS	JO52	FM	516	1460	1885	2510	2260
10	OH5LK	KP30	NU	515	1962	2041	2235	2891
11	DF8LC	JO53	FN	514	2105	2045	2202	3291
12	SP6GZZ	JO81	IL	506	1670	1794	2017	2717
13	SP9EWU	JO90	JK	493	1710	1927	2154	2531
14	OE3JPC	JN88	II	472	1584	1821	2128	2769
15	DL8EBW	JO31	DL	470	1454	1918	2029	2214
16	I2FAK	JN45	EF	469	1750	1508	2405	2995
17	OZ1DOQ	JO65	GP	466	1885	1940	1981	2888
18	DL8LAQ	JO43	EN	443	1376	1806	1934	3302
19	DL2NWK	JO63	GN	441	1819	1956	1991	2251
20	DL7UTS	JO62	GM	430	1516	1379	2057	2312
21	UV1AS	KN59	PT	427	1709	1905	2271	2547
22	DL5BCU	JO43	EN	421	1479	1928	2010	2538
23	RA3YCR	KO73	RN	420	1835	1964	2255	2429
24	I4XCC	JN63	GD	416	1177	1803	2275	3257
25	OM3AU	KN08	KI	401	2128	1756	2065	2513
26	PA3FOC	JO21	CL	400	1373	2010	2142	2179
27	DL5DTA	JO61	GL	399	1344	1578	1907	2057
28	OK1FM	JN69	GJ	398	1843	1438	2200	2150
29	DL7AKA	JO62	GM	396	1747	1916	2065	3620
30	F8OP	JN26	CG	395	1228	1196	2028	2720
31	SP5EFO	KO02	KM	392	1702	1982	2010	2626
32	OK1MAC	JN79	HJ	392	1536	1681	2005	2511
33	OK1JKT/P	JO60	GK	385	1701	1764	2121	2269
34	ON4ANT	JO20	CJ	382	1420	1965	2124	2725
35	I3LGP	JN65	GF	380	1335	1387	2020	3174
36	ON4GG	JO20	CK	377	1420	1965	2124	2124
37	UA3MBJ	KO88	SS	373	1560	2006	2573	2392
38	HB9CRQ	JN47	EH	369	1404	1288	2060	2959
39	F5FHI	IN97	ZH	355	1739	2051	2183	2735
40	DL3AMA	JO51	FL	354	1785	1803	1925	2075
41	OE3OKS	JN87	IH	350	1441	1273	1867	2788
42	I4YNO	JN54	FE	346	1374	0	1960	2276
43	UT1PA	KO21	ML	340	1901	1934	1806	2425

44	DL1SUN	JO53	FN	336	1824	1724	1845	2333
45	DL7YS	JO62	GM	334	1512	1528	1826	2136
46	PA3FJY	JO32	DM	333	1536	1337	1981	1940
47	G3LQR	JO02	AM	329	1776	2031	0	2406
48	S50C	JN76	HG	329	1463	1530	2233	3356
49	DJ1LP	JO64	GO	324	1347	1071	2058	2301
50	EA1DVY	IN81	YB	323	1946	0	0	2064
51	F6DKW	JN18	BI	322	1519	1602	2051	2755
52	OK1DKS	JO70	HK	321	1230	1308	0	3530
53	DK0OG	JN68	GI	316	1708	1722	2125	3320
54	PA0RLS	JO22	CM	311	1350	1890	1890	2832
55	DK1KR	JO53	FN	310	1481	2103	0	2026
56	SP3MFI	JO91	JL	307	1697	1632	1802	2617
57	UA3TCF	LO26	WQ	306	1131	1996	2498	2332
58	IW1AZJ	JN35	DF	306	1105	1188	1904	2780
59	DL5GAC	JN47	EH	305	1264	1876	2135	3079
60	DJ7OF	JO51	FL	304	1508	1011	1716	2161
61	SP9HWY	JO90	JK	303	1698	1928	0	2532
62	DL6BF	JO32	DM	303	1542	1932	1452	2332
63	G4YTL	IO91	ZL	303	1450	1774	2143	2172
64	OK1AXH/P	JO70	HK	300	2142	1486	1366	1768
65	DL8OBU	JO42	EM	297	1483	1866	1733	2159
66	RW3RW	LO02	UM	297	1298	2098	1740	2834
67	SM5BSZ	JO89	IT	293	1764	1824	1938	0
68	SP6GWB	JO80	IK	291	1780	1581	1875	2437
69	OK1DFC	JO60	GK	291	1775	2099	2024	2016
70	UA3DHC	KO96	TQ	289	1766	1891	2180	2429
71	F1FIH	JN23	CD	289	1305	999	1723	2934
72	IN3TWX	JN56	FG	283	1100	0	1609	1750
73	F1EAN	JN06	AG	282	1650	1420	0	2479
74	LA8AK	JO38	DS	280	1496	1804	1804	2413
75	PA0WWM	JO22	CM	278	1303	1839	1997	2212
76	OK1FFD	JO60	GK	277	1388	1720	1937	2154
77	DB6BX	JO32	DM	275	1534	1541	1921	2059
78	G4IGO	IO80	YK	274	2761	1917	1903	2833
79	SP2JXN	JO94	JO	274	1650	1690	0	2634
80	DK2BJ	JO30	DK	271	1476	1924	0	2205
81	UA4API	LO20	WK	271	1127	1820	0	0
82	DL1KDA	JO30	DK	269	1388	1924	2101	2276
83	UA4NM	LO48	YS	269	1215	1850	2510	2290
84	OK1IBL	JO60	GK	266	1438	1462	2003	3398
85	GW4LXO	IO81	YL	261	2750	1550	2000	2200
86	OZ1IPU	JO57	FR	261	1387	1187	1566	2452
87	UZ2FWA	KO04	KO	261	912	1759	2125	2010
88	OK1HAG	JN79	HJ	260	1441	1749	1909	3463
89	F5HRY	JN18	BI	257	1239	1695	2038	2758
90	ON4KST	JO20	CK	256	1435	1612	0	2383
91	DD0BI	JO33	DN	254	1565	1018	1102	2362
92	F6CKZ	JN09	AJ	252	1552	1330	1725	3407
93	DJ6LV	JO31	DL	250	1268	1880	1822	3130
94	G6HKM	JO01	AL	248	1304	1555	1660	2269
95	DG1BA	JO43	EN	245	1674	1280	1588	2239
96	PE1KHP	JO22	CM	241	1685	1214	1321	2010
97	F5JRX	JN25	CF	237	1598	1187	1616	2301
98	UV6AKO	KN84	SE	237	1155	960	2017	2567
99	OK1KEI	JO70	HK	235	1861	1259	983	2067
100	UT7GA	KN66	QG	231	1877	1446	2131	2617
101	OE6IWG	JN77	HH	227	1221	1110	2220	1954
102	DK1VI	JN49	EJ	227	1148	1107	1604	3131
103	F1GTU	JN05	AF	225	1650	967	1934	2400
104	DH3YAK	JO31	DL	225	1187	1162	0	2650
105	RA6HHT	LN05	UF	224	1255	1827	1827	2782
106	DH6JT	JO31	DL	221	1199	1051	1870	1634
107	OK1VBN	JN78	HI	217	1578	1682	1915	2209
108	DD0VF	JO61	GL	217	1279	1275	1800	2001
109	UA4UK	LO14	VO	215	0	0	0	0
110	DC6DY	JO31	DL	212	1416	1045	1914	2292
111	DL5BBL	JO42	EM	212	1416	1290	0	2028
112	F5PAU	IN88	YI	209	1630	0	0	2425
113	UR7GN	KN66	QG	205	1830	0	2010	1940
114	SP5HEJ	KO02	KM	201	1830	1705	1312	2313
115	UY5HF	KN66	QG	201	1750	0	1820	2032
116	HB9DFG	JN37	DH	201	1367	1299	1784	2302
117	G3XDY	JO02	AM	200	1355	2049	0	2124
118	DL9BDM	JO33	DN	197	1538	1248	1659	2321
119	DF9QX	JO42	EM	197	1446	1070	1455	3320
120	OK1SC	JO70	HK	195	1490	1673	0	1729
121	DK2DB	JN48	EI	192	1239	1136	0	3106
122	PA2TAB	JO32	DM	191	1302	1094	1949	2183
123	OE5VRL/5	JN78	HI	189	1665	1573	1990	2157
124	G6RAF	IO92	ZM	189	1507	1722	2078	2400
125	OK1DDO	JO60	GK	186	1329	1500	1720	2418
126	HB9MIO/P	JN37	DH	186	1316	975	0	2183
127	DL8AAV	JO52	FM	185	1236	1127	0	2144
128	S59AM	JN65	GF	184	1377	0	1945	1788
129	UZ3TXB	LO16	VQ	183	1163	1941	2145	0
130	HB9RUZ	JN47	EH	180	1060	970	0	3014
131	DK9RL	JN69	GJ	177	1311	1513	1286	3316
132	RA3TES	LO15	VP	177	1074	1935	2144	2247
133	G6LEU	IO70	XK	173	2620	750	0	2403
134	DL3YEE	JO42	EM	172	1574	1450	1480	2106
135	HB9AOF	JN36	DG	171	1201	670	1675	2166
136	HA1SO	JN87	IH	170	1787	1797	0	2143
137	OK1VEI	JO70	HK	170	1677	1197	1398	0
138	UA6LGH	KN97	TH	169	1918	758	1918	2167
139	DG0CR/P	JO50	FK	169	1279	1530	0	2010
140	UA3RBO	LO03	UN	169	952	1909	2137	2378
141	DL1BKK	JO43	EN	168	1513	928	0	2333
142	DG1VL	JO61	GL	168	1209	1223	1800	2038
143	UA3MAS	KO97	TR	167	1667	1752	1884	1996
144	IK1LGV	JN44	EE	163	1466	0	1613	1890
145	SM0FZH	JO99	JT	158	1226	1442	1200	2377
146	SP9FG	JN99	JJ	157	1647	1283	0	1698
147	OK1CA	JO70	HK	156	1540	1065	950	2096
148	UA3MHJ	KO87	SR	156	539	1943	2405	1948
149	OK1IAS	JO60	GK	153	1195	1004	0	2138
150	DG9NBT	JN49	EJ	151	1363	0	1648	1832
151	UT5JCW	KN64	QE	150	0	0	0	0
152	DL0UL/P	JN48	EI	149	1026	0	0	2019
153	OZ7IS	JO65	GP	148	1128	1294	1901	1845

154	DJ6XV	JO31	DL	146	1337	961	0	2007
155	PA3FXW	JO22	CM	144	1267	1247	1436	1965
156	DG5NEX	JN49	EJ	133	1234	0	1333	1941
157	UW3ZD	KO81	SK	126	1713	2126	1755	2363
158	LA7DFA	JP33	DX	125	630	1816	1803	0
159	RV3ZR	KO80	RK	124	1045	1956	1785	2077
160	DL3NAW	JN59	FJ	120	1019	0	1961	1237
161	UA4CFV	LO32	XM	118	1311	1824	0	2415
162	UA4AQL	LO20	WK	116	1123	2055	2158	1962
163	OK2UFB	JN99	JJ	113	1526	0	0	1983
164	DK0PX	JN48	EI	113	847	0	1815	1649
165	UV3PF	KO93	TN	112	984	1843	0	2163
166	DL0SP/P	JO62	GM	111	1315	785	0	1608
167	UA9XQ	LP63	AX	107	626	1832	2018	1656
168	UW4AK	LO20	WK	106	1125	1481	2028	2283
169	DL3IAS	JN49	EJ	106	988	1123	0	1646
170	UA3TIE	LO16	VQ	104	1161	1766	1808	1929
171	HA1DAB	JN87	IH	103	820	1130	0	2143
172	DJ8ES	JO43	EN	96	1306	0	0	1856
173	AM1DVY/P	IN82	YC	92	612	0	0	1954
174	UA9XEA	LP63	AX	89	776	1636	2034	1646
175	DK0FLT	JN49	EJ	81	997	0	0	1648
176	DF1IAZ	JN49	EJ	81	673	789	1737	0
177	DB8NU	JN49	EJ	71	867	0	0	0
178	CT1BGE	IM58	VY	65	0	0	0	0
179	UW9AH	LO93	DN	64	1310	1746	1989	1385
180	9A2EY	JN75	HF	64	707	0	0	0
181	JX7DFA	IQ50	FE	45	1	1120	2211	0

432 MHz Top List

NR	CALL	WW	EU	WK	TR	AU	MS	ES
1	DJ9BV	JO43	EN	219	2154	1863	1440	0
2	PA0RDY	JO22	CM	202	1979	1807	1376	0
3	G3LQR	JO02	AM	198	2031	1613	0	0
4	DL3BWW	JO72	HM	195	1547	1494	0	0
5	PA0EZ	JO22	CM	189	1787	1445	0	0
6	PA0WWM	JO22	CM	187	1547	1836	0	0
7	OZ7IS	JO65	GP	185	1499	1048	1294	0
8	F5FHI	IN97	ZH	184	1892	1280	1530	0
9	UA6LGH	KN97	TH	182	2216	0	0	0
10	OK1AXH	JO70	HK	181	1861	1239	0	0
11	DL8QS	JO43	EN	180	1513	1513	0	0
12	DL7QY	JN59	FJ	173	1640	1848	1292	0
13	DJ6MB	JO30	DK	171	1278	1733	0	0
14	PE0AGO	JO32	DM	163	1702	0	0	0
15	DK6AS	JO52	FM	161	1569	775	0	0
16	F6DKW	JN18	BI	161	1519	0	0	0
17	DK1KO	JO53	FN	160	1643	694	0	0
18	DB6BX	JO32	DM	158	1550	662	0	0
19	F1EAN	JN06	AG	154	1493	0	0	0
20	G3XDY	JO02	AM	154	1350	1619	0	0
21	DB6NT/A	JO50	FK	153	1823	0	0	0
22	PA3DIJ	JO33	DN	150	2116	1010	0	0
23	DK1KR	JO53	FN	150	1400	1827	0	0
24	OZ2OE	JO45	EP	148	2216	1020	0	0
25	RA3YCR	KO73	RN	147	1671	1788	0	0
26	OK1CA	JO70	HK	146	1670	0	0	0
27	SM6ESG	JO67	GR	144	1427	0	0	0
28	SM0FZH	JO99	JT	143	1900	1218	0	0
29	DF8LC	JO53	FN	143	1615	1361	0	0
30	DH3NAN	JO50	FK	143	1437	1008	0	0
31	SP6GWB	JO80	IK	141	1780	759	0	0
32	SP6MLK	JO80	IK	141	1780	0	0	0
33	OK1KEI	JO70	HK	138	1682	1185	0	0
34	OK1VEI	JO70	HK	136	1532	811	0	0
35	DL1SUN	JO53	FN	136	1157	1071	0	0
36	DL3YEE	JO42	EM	134	1574	1728	0	0
37	SM7ECM	JO65	GP	133	1348	1073	0	0
38	OK1KIR/P	JO60	GK	130	1773	0	0	0
39	SP9FG	JN99	JJ	130	1660	0	0	0
40	OH5LK	KP30	NU	128	1386	1196	0	0
41	DL1BKK	JO43	EN	127	1513	565	0	0
42	SP9EWU	JO90	JK	125	1544	1558	1664	0
43	LA8AK	JO38	DS	122	1373	981	0	0
44	OE5VRL/5	JN78	HI	120	1522	1031	0	0
45	G6HKM	JO01	AL	120	1289	281	0	0
46	G6RAF	IO92	ZM	119	1730	0	0	0
47	DL4VCG	JN39	DJ	115	1335	0	0	0
48	OZ1IPU	JO57	FR	113	1387	0	0	0
49	DL6BCT	JO43	EN	112	1152	0	0	0
50	DJ6XV	JO31	DL	112	1128	976	0	0
51	F5PAU	IN88	YI	111	1630	0	0	0
52	UA3MBJ	KO88	SS	110	1306	1541	0	0
53	GW4LXO	IO81	YL	109	1550	0	0	0
54	SP6GZZ	JO81	IL	109	1549	870	0	0
55	DL7UTS	JO62	GM	109	1507	772	0	0
56	HB9MIN/P	JN37	DH	109	1300	0	0	0
57	DL0UL/P	JN48	EI	109	1238	0	0	0
58	SM6CMU	JO57	FR	108	1641	670	0	0
59	SM6AFH	JO66	GQ	108	1315	1200	0	0
60	PA0BAT	JO31	DL	105	1301	0	0	0
61	UT1PA	KO21	ML	105	1238	1761	0	0
62	DF9QX	JO42	EM	105	1136	721	0	0
63	DC4XH	JO43	EN	103	1133	808	0	0
64	UA3DHC	KO96	TQ	101	1596	1009	0	0
65	HB9CRQ	JN47	EH	101	1010	0	0	0
66	DG9NBT	JN49	EJ	100	1204	0	0	0
67	UT7GA	KN66	QG	98	1877	0	0	0
68	ON4GG	JO20	CK	98	1407	0	0	0
69	SP9HWY	JO90	JK	98	1398	1306	0	0
70	OK1DKS/P	JO60	GK	98	1118	0	0	0
71	DK0OG	JN68	GI	97	1351	745	0	0
72	ON4ANT	JO20	CK	96	1406	0	0	0
73	DL3AMA	JO51	FL	95	1015	1219	0	0
74	DL2NWK	JO63	GN	92	1636	590	0	0
75	DJ1LP	JO64	GO	91	1414	0	0	0
76	DD0BI	JO33	DN	91	1259	0	0	0
77	DG5NEX	JN49	EJ	91	1187	0	0	0
78	G4LRT	IO92	ZM	90	1394	410	0	0

79	DK9RL	JN69	GJ	87	1185	0	0	0
80	SP5EFO	KO02	KM	87	1120	1705	0	0
81	F5HRY	JN18	BI	85	1222	583	0	0
82	HB9MIO/P	JN37	DH	85	1096	0	0	0
83	UY5HF	KN66	QG	84	1670	0	0	0
84	DK1VI	JN49	EJ	84	1125	870	0	0
85	DC6DY	JO31	DL	83	1190	0	0	0
86	DL5BCU	JO43	EN	83	1188	766	0	0
87	DG0CR/P	JO50	FK	82	1048	759	0	0
88	HB9AOF	JN36	DG	82	926	0	0	0
89	DK2DB	JN48	EI	81	1331	0	0	0
90	DF1EQ	JO31	DL	80	1249	0	0	0
91	DJ8ES	JO43	EN	79	1025	0	0	0
92	F6CKZ	JN09	AJ	76	1038	0	0	0
93	DH3YAK	JO31	DL	75	1165	0	0	0
94	F1GTU	JN05	AF	75	1114	0	0	0
95	OK1FFD	JO60	GK	74	1339	0	0	0
96	RW3RW	LO02	UM	73	1275	1284	0	0
97	UR7GN	KN66	QG	70	1790	0	0	0
98	OE3JPC	JN88	II	69	1000	1450	0	0
99	S50C	JN76	HG	68	817	0	0	0
100	DG1VL	JO61	GL	67	1125	0	0	0
101	DL0SP/P	JO62	GM	67	1018	0	0	0
102	I4YNO/4	JN54	FE	66	884	0	0	0
103	G6LEU	IO70	XK	63	1400	0	0	0
104	OK1SC	JO70	HK	63	1310	758	0	0
105	DK0PX	JN48	EI	63	1168	0	0	0
106	F5JRX	JN25	CF	62	1070	0	0	0
107	OK1DFC/P	JO60	GK	62	977	0	0	0
108	DL8AAV	JO52	FM	62	914	0	0	0
109	UA4NM	LO48	YS	58	1230	1310	0	0
110	UA3MAS	KO97	TR	57	1254	1251	0	0
111	DL3IAS	JN49	EJ	57	886	0	0	0
112	DB8NU	JN49	EJ	55	691	0	0	0
113	OK1VBN	JN78	HI	53	737	753	0	0
114	UA4UK	LO14	VO	51	1433	1296	0	0
115	UA3TCF	LO26	WQ	51	1131	1542	0	0
116	DL5BBL	JO42	EM	51	841	722	0	0
117	DL9BDM	JO33	DN	50	1278	0	0	0
118	OK1IBL	JO60	GK	48	1285	0	0	0
119	DK0FLT	JN49	EJ	47	1103	0	0	0
120	I2FUM/2	JN44	EE	47	875	0	0	0
121	9A2EY	JN75	HF	41	588	0	0	0
122	DL6BF	JO32	DM	40	895	667	0	0
123	HA1SO	JN87	IH	39	552	0	0	0
124	HA1DAB	JN87	IH	35	955	0	0	0
125	RA6HHT	LN05	UF	33	1030	0	0	0
126	UA4API	LO20	WK	32	1127	0	0	0
127	SP5HEJ	KO02	KM	31	1347	850	0	0
128	F1FIH	JN23	CD	30	796	0	0	0
129	SP2JXN	JO94	JO	27	1149	0	0	0
130	PA3FXW	JO22	CM	26	844	0	0	0
131	UA3TIE	LO16	VQ	25	1161	1082	0	0
132	RA3TES	LO15	VP	21	1074	0	0	0
133	OK1HAG	JN79	HJ	20	650	753	0	0
134	UA3RBO	LO03	UN	19	478	0	0	0
135	OK2UFB	JN99	JJ	16	428	0	0	0
136	DL7YS	JO62	GM	14	887	0	0	0
137	UA4CFV	LO32	XM	7	1308	0	0	0
138	UW4AK	LO20	WK	6	678	0	0	0

Regeln/Rules

Die **DUBUS TOP-List** veröffentlicht regelmäßig Eigenangaben von UKW-Amateuren über die Zahl der von Ihnen gearbeiteten Felder auf den UKW-Bändern. Für die Topliste zählt nur ein QTH und ein Rufzeichen (Kann ein Portabel Standort sein). Gültig sind alle Felder weltweit. Nur terrestrische Verbindungen zählen. EME-Verbindungen werden in einer eigenen TOP-Liste erfaßt, die der Redakteur für die EME-News verwaltet. Verbindungen über Satelliten und Relais zählen nicht. Die Liste wird in regelmäßigen Abständen veröffentlicht. Verwenden Sie den Vordruck und berichten Sie Ihren Felder-Stand entweder an DL8LAQ oder für Nur-EME an DL7APV. Um die Zahl der Einträge immer aktuell zu halten, wird jeder Eintrag pro Band nur dann weiter veröffentlicht, wenn er mindestens einmal pro Jahr von dem Rufzeichen-Inhaber durch Einsenden des untenstehenden Formblatts auf den neuesten Stand gebracht wurde. Nach Ablauf der Frist wird jeder Eintrag automatisch gelöscht.

DUBUS TOP-List publishes unconfirmed claims of squares worked by VHF/UHF-operators. Only one call sign or one QTH (may be portable) can be used for these claims. Only QSO's via terrestric propagation are valid for this TOP-List. EME-Standings (EME-QSO's only) should be reported to the EME-News editor. QSO's via satellites and relais are not valid. The TOP-List will be published regularly. Please report your standings to DL8LAQ or for EME-ONLY to DL7APV. To have a clear picture of competition and activity each claim one each single band has to be updated at least once a year. Otherwise this entry will be deleted automatically.

1296 MHz Top List

NR	CALL	WW	EUWKODX
1	PA0EZ	JO22	CM 122 1302
2	PA0RDY	JO22	CM 120 1286
3	OK1AXH/P	JO70	HK 118 1444
4	PA0WWM	JO22	CM 117 1298
5	F6DKW	JN18	BI 117 1273
6	F5FHI	IN97	ZH 115 1538
7	HB9AMH/P	JN37	DH 111 1351
8	DB6NT/A	JO50	FK 107 1243
9	G3LQR	JO02	AM 106 1274
10	G3XDY	JO02	AM 105 1199
11	PE0AGO	JO32	DM 102 1200
12	SP6GWB	JO80	IK 91 1580
13	OE5VRL/5	JN78	HI 90 1522
14	F1EAN	JN06	AG 90 1321
15	OK1KIR/P	JO60	GK 89 1208
16	DB6BX	JO32	DM 89 1117
17	SM6ESG	JO67	GR 88 1440
18	G6DER	IO93	ZN 86 1306
19	DL7QY	JN59	FJ 86 1261
20	F5PAU	IN88	YI 85 1630
21	SP6MLK	JO80	IK 85 1580
22	SM7ECM	JO65	GP 83 1326
23	OZ2OE	JO45	EP 82 1425
24	OK1KEI	JO70	HK 81 1316
25	OK1VEI	JO70	HK 80 1313
26	DL3YEE	JO42	EM 80 1136
27	DK1KR	JO53	FN 79 1097
28	PA3DIJ	JO33	DN 79 939
29	DK6AS	JO52	FM 78 1421
30	PA0BAT	JO31	DL 78 1014
31	DL1BKK	JO43	EN 75 995
32	G6LEU	IO70	XK 74 2620
33	OZ7IS	JO65	GP 72 1205
34	OZ1IPU	JO57	FR 72 1096
35	OK1AIY/P	JO70	HK 70 1490
36	OK1CA	JO70	HK 70 1421
37	DL4VCG	JN39	DJ 70 838
38	DK0OG	JN68	GI 69 1160
39	HB9RG	JN47	EH 67 920
40	G4PMK	IO93	ZN 66 1302
41	G4LRT	IO92	ZM 66 1152
42	OZ1DOQ	JO65	GP 65 1319
43	DF1EQ	JO31	DL 65 908
44	G6HKM	JO01	AL 64 1193
45	OK1DFC/P	JO60	GK 64 1176
46	DC4XH	JO43	EN 63 1090
47	HB9MIO/P	JN37	DH 63 1000
48	DG9NBT	JN49	EJ 62 1016
49	DH3NAN	JO50	FK 61 1143
50	DG5NEX	JN49	EJ 61 1060
51	HB9AOF	JN36	DG 61 920
52	ON4GG	JO20	CK 60 934
53	F5HRY	JN18	BI 59 1064
54	DL0UL/P	JN48	EI 58 962
55	DF9QX	JO42	EM 57 1066
56	ON4ANT	JO20	CK 57 914
57	SM0FZH	JO99	JT 56 1252
58	DJ6XV	JO31	DL 56 946
59	DG0CR/P	JO50	FK 55 1048
60	DC0DA	JO31	DL 55 1034
61	DL1SUN	JO53	FN 54 1162
62	DC8UG	JO30	DK 54 900
63	DL9GU	JN49	EJ 54 900
64	RA3LE	KO64	QO 52 1428
65	SP9FG	JN99	JJ 51 1492
66	DL3NQ	JN49	EJ 51 920
67	LA8AK	JO38	DS 49 1373
68	DB8NU	JN49	EJ 49 1016
69	GW4LXO	IO81	YL 48 990
70	OK1DKS/P	JO60	GK 46 1207
71	DJ8ES	JO43	EN 46 839
72	DJ6MB	JO30	DK 42 876
73	DB1BX	JO32	DM 41 895
74	OK1FFD	JO60	GK 40 1058
75	DL3IAS	JN49	EJ 40 769
76	F6CGB	JN18	BI 40 700
77	DC6DY	JO31	DL 39 865
78	DJ1KP	JO40	EK 39 698
79	SP9EWU	JO90	JK 37 946
80	F1GTU	JN05	AF 36 896
81	DK2DB	JN48	EI 36 873
82	OE3JPC	JN88	II 36 702
83	RA3YCR	KO73	RN 36 657
84	I0LVA	JN62	GC 33 1152
85	DH3YAK	JO31	DL 33 715
86	DF6VB	JO31	DL 31 722
87	UR7GN	KN66	QG 30 820
88	I2FUM/2	JN44	EE 30 779
89	DK0PX	JN48	EI 28 725
90	DG1VL	JO61	GL 28 723
91	S50C	JN76	HG 28 626
92	DK9RL	JN69	GJ 27 891
93	DK2BJ	JO30	DK 26 885
94	UT7GA	KN66	QG 26 680
95	OZ8VO	JO56	FQ 24 951
96	UA3MBJ	KO88	SS 20 301
97	OH5LK	KP30	NU 18 1349
98	DK0FLT	JN49	EJ 17 567
99	DJ1LP	JO64	GO 15 558
100	DK1VI	JN49	EJ 15 424
101	OK1VBN	JN78	HI 15 307
102	9A2EY	JN75	HF 14 395
103	HA1SO	JN87	IH 14 348
104	F1FIH	JN23	CD 13 475
105	HA1DAB	JN87	IH 13 292
106	UA3MAS	KO97	TR 11 265
107	OK1SC	JO70	HK 10 440
108	UA6LGH	KN97	TH 9 464
109	DL0SP/P	JO62	GM 9 347
110	RW3RW	LO02	UM 8 400
111	UY5HF	KN66	QG 6 520
112	UA3TCF	LO26	WQ 5 455
113	SP5HEJ	KO02	KM 5 433
114	UA3TIE	LO16	VQ 2 403

2320 MHz Top List

NR	CALL	WW	EUWKODX
1	PA0EZ	JO22	CM 73 962
2	PA0RDY	JO22	CM 62 831
3	DB6NT/A	JO50	FK 60 1119
4	PA0WWM	JO22	CM 57 863
5	G3LQR	JO02	AM 52 1006
6	PE0AGO	JO32	DM 49 800
7	OK1KIR/P	JO60	GK 48 1115
8	DL7QY	JN59	FJ 47 1018
9	G6DER	IO93	ZN 44 1265
10	DL1BKK	JO43	EN 43 760
11	PA3DIJ	JO33	DN 43 727
12	OK1AIY/P	JO70	HK 41 1296
13	SM6ESG	JO67	GR 40 1051
14	OE5VRL/5	JN78	HI 37 1289
15	F5FHI	IN97	ZH 37 1017
16	PA0BAT	JO31	DL 37 923
17	DC8UG	JO30	DK 33 900
18	DF1EQ	JO31	DL 33 678
19	OZ1IPU	JO57	FR 31 1028
20	DC0DA	JO31	DL 31 775
21	SM7ECM	JO65	GP 30 880
22	DL3NQ	JN49	EJ 29 890
23	DL9GU	JN49	EJ 29 877
24	G4LRT	IO92	ZM 28 1022
25	OZ7IS	JO65	GP 28 860
26	G3XDY	JO02	AM 27 947
27	DL3YEE	JO42	EM 27 912
28	HB9MIO/P	JN37	DH 27 694
29	DG0CR/P	JO50	FK 26 962
30	DF9QX	JO42	EM 26 915
31	OZ2OE	JO45	EP 26 809
32	DL4VCG	JN39	DJ 25 668
33	I0LVA	JN62	GC 23 612
34	DJ1KP	JO40	EK 23 454
35	G4PMK	IO93	ZN 22 1249
36	OZ1DOQ	JO65	GP 22 827
37	DL0UL/P	JN48	EI 21 493
38	DK2DB	JN48	EI 20 873
39	F1EAN	JN06	AG 19 940
40	DK0OG	JN68	GI 19 675
41	HB9AMH/P	JN37	DH 18 933
42	DK0PX	JN48	EI 18 566
43	DB1BX	JO32	DM 18 525
44	DL3IAS	JN49	EJ 18 465
45	DG9NBT	JN49	EJ 17 465
46	DB8NU	JN49	EJ 17 428
47	DG5NEX	JN49	EJ 16 465
48	DF6VB	JO31	DL 15 414
49	OK1DKS/P	JO60	GK 13 602
50	F5HRY	JN18	BI 13 539
51	DJ8ES	JO43	EN 12 682
52	DJ6XV	JO31	DL 12 396
53	DK6AS	JO52	FM 11 620
54	I2FUM/2	JN44	EE 10 354
55	DK1KR	JO53	FN 9 792
56	OK1KEI	JO70	HK 9 786
57	DL1SUN	JO53	FN 9 349
58	LA8AK	JO38	DS 8 677
59	OK1CA	JO70	HK 8 291
60	DK0FLT	JN49	EJ 7 464
61	DH3NAN	JO50	FK 7 331
62	F1GTU	JN05	AF 7 313

63	S50C	JN76	HG	5	346
64	F6CGB	JN18	BI	4	407
65	SP9FG	JN99	JJ	3	342
66	DF2CA/P	JN57	FH	3	206
67	GW4LXO	IO81	YL	3	200
68	OK1VBN	JN78	HI	3	158
69	F5PAU	IN88	YI	2	120
70	9A2EY	JN75	HF	2	96
71	SP9EWU	JO90	JK	1	134

3400 MHz Top List

NR	CALL	WW	EUWK	ODX
1	DB6NT/A	JO50	FK 27	738
2	PA0EZ	JO22	CM 25	636
3	PA0WWM	JO22	CM 19	538
4	DC0DA	JO31	DL 17	660
5	PE0AGO	JO32	DM 17	457
6	G3LQR	JO02	AM 16	924
7	PA0BAT	JO31	DL 16	568
8	DL1BKK	JO43	EN 15	703
9	DL3NQ	JN49	EJ 15	637
10	DL7QY	JN59	FJ 15	565
11	PA0RDY	JO22	CM 15	445
12	DC8UG	JO30	DK 13	724
13	G6DER	IO93	ZN 13	718
14	DF1EQ	JO31	DL 13	532
15	G4PMK	IO93	ZN 10	845
16	DB1BX	JO32	DM 9	425
17	DK2DB	JN48	EI 9	331
18	DL0UL/P	JN48	EI 9	239
19	G4LRT	IO92	ZM 6	563
20	DK0PX	JN48	EI 6	528
21	DL4VCG	JN39	DJ 6	339
22	DJ8ES	JO43	EN 4	578
23	DJ6XV	JO31	DL 3	396
24	GW4LXO	IO81	YL 3	117
25	DK0OG	JN68	GI 3	78
26	DF9QX	JO42	EM 2	143
27	DF2CA/P	JN57	FH 2	24

5760 MHz Top List

NR	CALL	WW	EUWK	ODX
1	DB6NT/A	JO50	FK 32	1000
2	SM7ECM	JO65	GP 29	960
3	HB9AMH/P	JN37	DH 29	700
4	PA0EZ	JO22	CM 27	835
5	HB9MIO/P	JN37	DH 27	694
6	SM6ESG	JO67	GR 21	947
7	G3LQR	JO02	AM 20	949
8	DL1BKK	JO43	EN 19	689
9	OZ1IPU	JO57	FR 17	805
10	PA0BAT	JO31	DL 17	723
11	OK1UWA/P	JO70	HK 16	998
12	OK1KIR/P	JO60	GK 16	393
13	PE0AGO	JO32	DM 15	800
14	I0LVA	JN62	GC 12	557
15	DL3NQ	JN49	EJ 12	318
16	PA0WWM	JO22	CM 11	863
17	DC0DA	JO31	DL 11	451
18	DL0UL/P	JN48	EI 11	266
19	DC8UG	JO30	DK 10	724
20	OK1AIY/P	JO70	HK 10	693
21	OZ7IS	JO65	GP 10	593
22	DL7QY	JN59	FJ 10	565
23	G6DER	IO93	ZN 9	947
24	OZ1DOQ	JO65	GP 8	415
25	HB9MIN/P	JN37	DH 8	286
26	S51WI	JN75	HF 7	532
27	G4PMK	IO93	ZN 6	958
28	DK0PX	JN48	EI 6	343
29	DK2DB	JN48	EI 6	315
30	DC8EC/A	JN57	FH 6	278
31	I2FUM/2	JN44	EE 6	201
32	DF1EQ	JO31	DL 5	461
33	DB1BX	JO32	DM 5	150
34	F6CGB	JN18	BI 4	407
35	DL1JIN/P	JO60	GK 4	321
36	DG0CR/P	JO50	FK 4	304
37	DK0OG	JN68	GI 4	78
38	DL4VCG	JN39	DJ 3	339
39	F6CGB/P	JN24	CE 2	375
40	DG1VL	JO61	GL 2	161
41	DJ6XV	JO31	DL 2	144

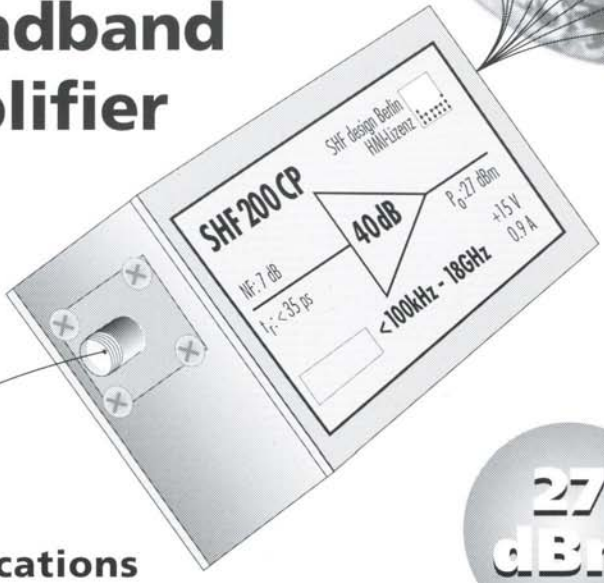
10 GHz Top List

NR	CALL	WW	EUWK	ODX
1	PA0EZ	JO22	CM 54	835
2	G3WDG	IO92	ZM 46	1135
3	HB9AMH/P	JN37	DH 43	939
4	SM7ECM	JO65	GP 42	1110
5	HB9MIN/P	JN37	DH 41	939
6	DB6NT/A	JO50	FK 40	1000
7	G4KGC	IO92	ZM 39	1135
8	I6XCK/6	JN63	GD 39	702
9	F6DKW	JN18	BI 35	1215
10	I6CXB/6	JN63	GD 35	751
11	DL3YEE	JO42	EM 35	700
12	SM6ESG	JO67	GR 33	1140
13	HB9RG	JN47	EH 33	761
14	DK1KR	JO53	FN 31	868
15	PA0BAT	JO31	DL 31	604
16	G4BRK	IO91	ZL 30	1115
17	G3LQR	JO02	AM 30	924
18	HB9MIO/P	JN37	DH 29	694
19	OE5VRL/5	JN78	HI 28	1134
20	DL1BKK	JO43	EN 27	664
21	DK0OG	JN68	GI 27	512
22	I0LVA	JN62	GC 26	850
23	DL3NQ	JN49	EJ 26	712
24	OZ1IPU	JO57	FR 22	941
25	PA0WWM	JO22	CM 21	589
26	OK1KIR/P	JO60	GK 21	419
27	OZ2OE	JO45	EP 20	789
28	DF9QX	JO42	EM 19	504
29	G4LDR	IO91	ZL 18	1118
30	PE0AGO	JO32	DM 18	800
31	DK0PX	JN48	EI 18	419
32	DJ1KP	JO40	EK 18	413
33	DK4GD/P	JN48	EI 18	411
34	OK1AIY/P	JO70	HK 17	736
35	DL0UL/P	JN57	EI 17	363
36	DC8UG	JO30	DK 15	753
37	S51WI	JN75	HF 15	532
38	DL7QY	JN59	FJ 15	492
39	OK1UWA/P	JO70	HK 15	434
40	G4PMK	IO93	ZN 14	958
41	DC0DA	JO31	DL 14	639
42	DK2DB	JN48	EI 14	432
43	F5HRY	JN18	BI 12	684
44	DG9NBT	JN49	EJ 12	426
45	DL4VCG	JN39	DJ 12	360
46	GW4LXO	IO81	YL 12	309
47	G4KNZ	IO91	ZL 12	247
48	DB1BX	JO32	DM 11	465
49	I4XCC	JN63	GD 11	426
50	DL3IAS	JN49	EJ 10	354
51	HB9AMH	JN37	DH 9	567
52	DC8EC/A	JN57	FH 9	297
53	SM0FZH	JO99	JT 9	242
54	F6CGB	JN18	BI 8	677
55	F6CGB/P	JN12	BC 7	823
56	DL1JIN/P	JO60	GK 7	345
57	OZ1DOQ	JO65	GP 6	472
58	PA3DIJ	JO33	DN 6	344
59	DJ8ES	JO43	EN 6	210
60	LA8AK	JO38	DS 5	212
61	DF6VB	JO31	DL 5	162
62	DJ6XV	JO31	DL 5	144
63	9A2EY	JN75	HF 4	374
64	DK0FLT	JN49	EJ 4	284
65	DG0CR/P	JO50	FK 4	283
66	DG1VL	JO61	GL 4	197
67	DF1EQ	JO31	DL 4	181
68	S50C	JN76	HG 4	176
69	DH3NAN	JO50	FK 3	134
70	G4LRT	IO92	ZM 3	103
71	DG5NEX	JN49	EJ 1	173

24 GHz Top List

NR	CALL	WW	EUWK	ODX
1	HB9MIO/P	JN37	DH 18	172
2	HB9MIN/P	JN37	DH 12	396
3	HB9AMH/P	JN37	DH 10	286
4	DC8EC/P	JN57	FH 8	245
5	DK4GD/P	JN48	EI 5	184
6	DB6NT/A	JO50	FK 5	178
7	DF2CA/P	JN58	FI 5	142
8	DL3NQ	JN49	EJ 4	287
9	DL3YEE/P	JO42	EM 4	151
10	DF6VB/P	JO31	DL 4	104
11	PA0EZ	JO22	CM 3	269
12	OK1AIY-P	JO60	GK 3	227
13	G4KNZ/P	IO83	YN 3	120
14	DK0PX	JN48	EI 3	99
15	DJ1KP	JO40	EK 3	75
16	OK1AIY/P	JO70	HK 2	266
17	DF1EQ/P	JO31	DL 2	133
18	DL1JIN/P	JO60	GK 2	58
19	DG0CR/P	JO50	FK 2	52

World's fastest broadband amplifier



27 dBm

Specifications

Bandwidth BW	:	< 100 kHz - 18 GHz typ.
Gain Gp	:	40 dB + 1 dB -2 dB max. non inverting
Gain ripple Δ Gp	:	$\pm$ 1.5 dB typ.
Output power at 1 dB compression $P_{0\,1dB}$	:	26 dBm < 100 kHz ... 10 MHz, 27 dBm > 10 MHz ... < 10 GHz, 26 dBm < 20 GHz
Input return loss S_{11}	:	< 15 dB < 10 GHz, < 12 dB < 15 GHz, < 10 dB < 20 GHz
Output return loss S_{22}	:	< 10 dB typ. 100 kHz ... 20 GHz
Risetime t_r	:	< 35 ps
Falltime t_f	:	< 30 ps
Noise figure NF	:	< 7 dB, 6 dB typ. < 10 GHz, < 10 dB < 20 GHz
Supply voltage U_B	:	15 V, 0.9 A, reverse voltage protected
L x W x H (mm)	:	74 x 51 x 28 + SMA connectors (20 mm) 160 x 75 x 40 + SMA con., with heat sink

SHF design

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20	DK2DB	JN48	EI	2	48
21	DC0DA/P	JO32	DM	1	104
22	F6CGB/P	JN37	DH	1	74
23	GW4LXO	IO81	YL	1	58
24	OZ1IPU	JO57	FR	1	55
25	OK1UWA/P	JO70	HK	1	43
26	DB1BX	JO32	DM	1	37
27	DL4VCG	JN39	DJ	1	9
28	PA0BAT	JO31	DL	1	3
29	G3LQR	JO02	AM	1	2

47 GHz Top List

NR	CALL	WW	EU	WK	ODX
1	HB9MIN/P	JN37	DH	8	185
2	HB9MIO/P	JN37	DH	8	166
3	HB9AMH/P	JN37	DH	5	166
4	DK4GD/P	JN47	EH	4	123
5	DF2CA/P	JN58	FI	4	15
6	OE9PMJ/9	JN47	EH	4	12
7	OE9YTV/9	JN47	EH	4	11
8	OK1AIY-P	JO60	GK	2	96
9	DB6NT/A	JO50	FK	2	95
10	DF6VB/P	JO31	DL	2	69
11	DC0DA/P	JO31	DL	2	69
12	DF2CA/P	JO60	GK	2	59
13	DL3YEE/P	JO42	EM	2	45
14	DL/HB9AMH/P	JN48	EI	1	184
15	DL1JIN/P	JO60	GK	1	58
16	DK0PX	JN48	EI	1	33
17	DC8EC/A	JN57	FH	1	14
18	OK1AIY/P	JO70	HK	1	12

76 GHz Top List

NR	CALL	WW	EU	WK	ODX
1	DG2MF/P	JO58	FI	4	4
2	DF2CA/P	JO50	FK	4	4
3	DK4GD/P	JN47	EH	3	114
4	OE9YTV/9	JN57	FH	3	1
5	OE9PMJ/9	JN57	FH	3	1
6	HB9MIO/P	JN37	DH	2	114
7	DB6NT/A	JO50	FK	2	77
8	DC0DA/P	JO50	FK	2	48
9	DF6VB/P	JO50	FK	1	18
10	DL1JIN/P	JO60	GK	1	11
11	OE9FKI	JN47	EH	1	2
12	HB9AMH/P	JN37	DH	1	1
13	HB9MIN/P	JN37	DH	1	1

145 GHz Top List

NR	CALL	WW	EU	WK	ODX
1	DB6NT/OZ	JO57	FR	1	3
2	DB6NT/A	JO50	FK	1	2
3	DL1JIN/P	JO60	GK	1	1

241 GHz Top List

NR	CALL	WW	EU	WK	ODX
1	DB6NT/A	JO50	FK	1	2
2	DB6NT/OZ	JO57	FR	1	0