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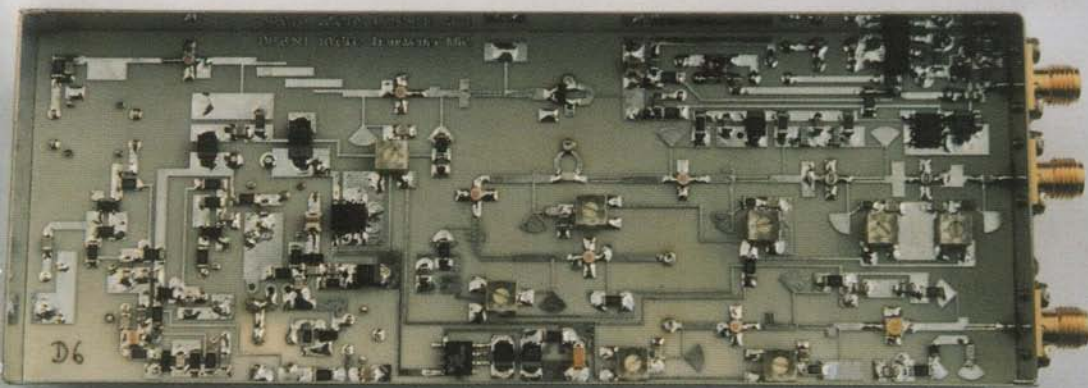
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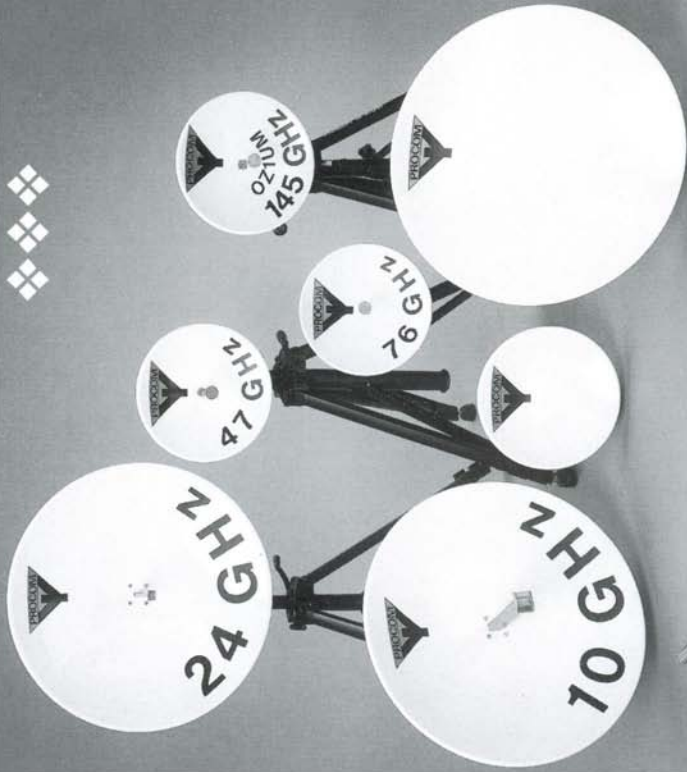
1/1999

10GHz Transverter



Entirely Devoted to VHF/UHF and Microwaves

MICROWAVE



ANTENNEN & ZUBEHÖR

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DENMARK

EISCH-ELECTRONIC

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DUBUS

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

DUBUS

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Technical Reports

Editor: Rainer Bertelsmeier, DJ9BV

10 GHz Transverter MKII

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1. Einführung

1977 wurde der erste 10 GHz Schmalband Transverter von DL7QY im DUBUS Magazin beschrieben. Dies war der Beginn der Schmalbandtechnik im 10 GHz Band. Der Aufbau der 3 cm Komponenten war in Hohlleitertechnik ausgeführt. Danach folgten verschiedene Veröffentlichungen in gleicher Technologie (1. Generation).

In den achtziger und Anfang der neunziger Jahren folgten diverse Transverter die auf Teflonsubstrat realisiert waren. Diese jetzt auch mit GaAs FET's bestückten Schaltungen bestanden meistens aus verschiedenen Einzelbaugruppen (LO, Mixer, Amp., usw.) die zu einem Transverter zusammengeschaltet wurden. Der Abgleich erfolgte durch "Fähnchenschieben" mit beachtlichem Messaufwand (2. Generation).

Der hier veröffentlichte Transverter ist auf keramikgefülltem Epoxysubstrat (Rogers RO4003) aufgebaut. Der Empfangsteil erreicht eine Rauschzahl von ca. 1,2 dB NF bei 20 dB Verstärkung. Das Sendeteil erreicht eine Ausgangsleistung von mehr als 200 mW bei min. 40 dB Nebenwellenunterdrückung und 144 MHz ZF. Soll 432 MHz als ZF ver-

wendet werden, ist lediglich ein 103,5 MHz Quarz einzubauen. Weitere Schaltungsänderungen sind nicht erforderlich. Die Nebenwellenunterdrückung vergrößert sich auf min. 50 dB. Der gesamte Transverter mit ZF-Umschaltung, Steuerausgang für Koaxrelais oder PA's, Quarzoszillator, LO-Aufbereitung ist in einem Weißblechgehäuse mit den Abmessungen 55x148x30mm untergebracht. Ein Abgleich durch "Fähnchenschieben" mit aufwendiger HF-Messtechnik entfällt.

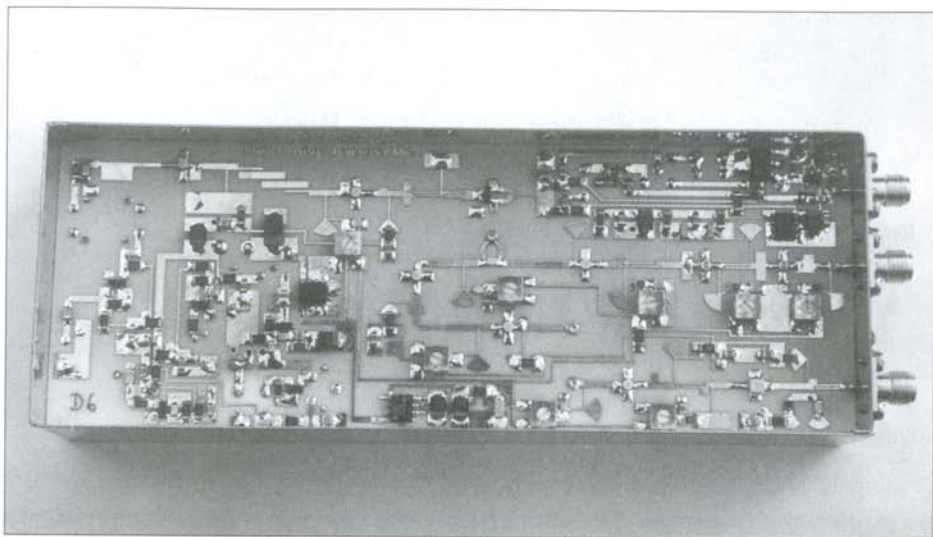
1. Introduction

In 1977 the DUBUS magazine published the first 10GHz SSB transverter which had been developed by Claus Neye, DL7QY. This was the begin of using narrowband techniques in the 3cm band. The construction technique at that time utilised the classical waveguide approach.

During the eighties several descriptions of modular approaches (LO, mixer, Amps) in separate boxes were published (2. generation).

The current transverter is a singleboard construction on RO4003 substrate. The receiver has a noise figure of 1.2dB and the transmit-

10GHz Transverter Top View



ter achieves an output power of more than 200mW. The IF is 144MHz and the spurious rejection is better than 40dB. A 432MHz IF can be selected just by change of the crystal in the XO. Then the spurious rejection is even better at at least 50dB.

Everything -TX, RX, LO, IF-Switch and T/R-control is on a single board housed in a 55x148x30mm large box from tinplate. Tuning is required only for the two cavity resonators, the four helix bandfilter in the LO-chain and the bias currents of the TX/RX amplifiers.

The restricted tuning range of the helix filters make 'false' resonances not possible.

2. Schaltungsbeschreibung

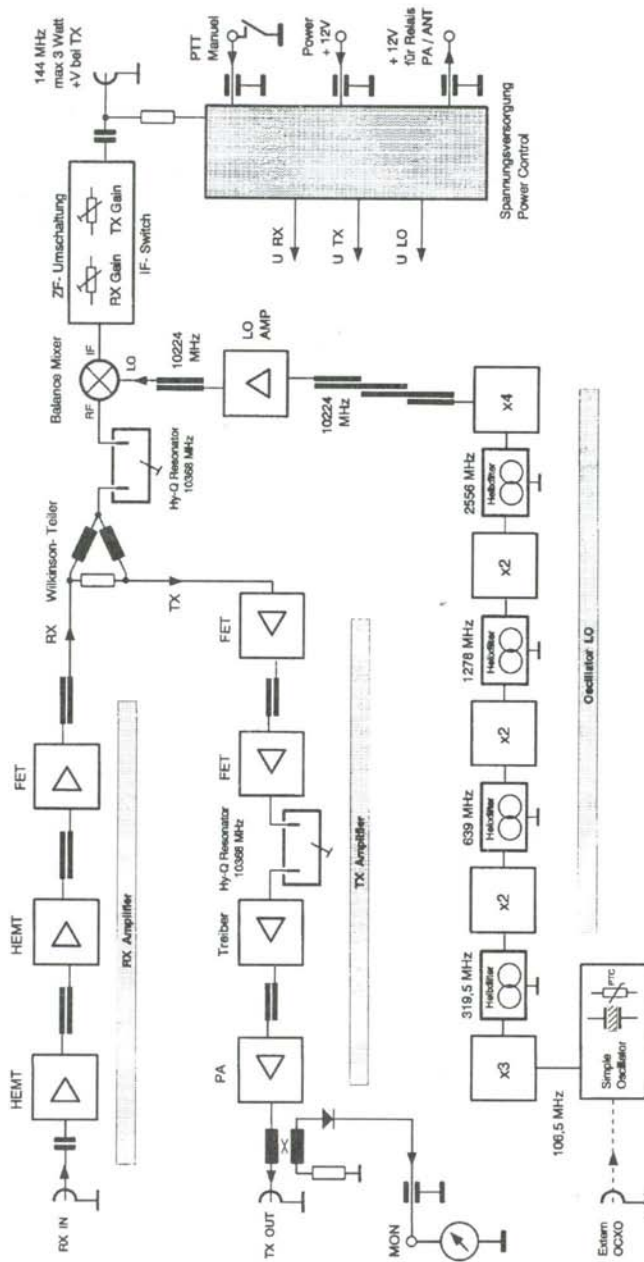
LO

Der bewährte "Simple Quarzoszillator" mit dem FET SST310 schwingt auf 106,5 MHz. Die Frequenzeinstellung erfolgt durch eine M3 Messingschraube, die gegen den Ferritkern getauscht wird. Ein auf das 40 °C Thermostatenquarz aufgesteckter PTC-Heizer stabilisiert die Quarztemperatur und somit

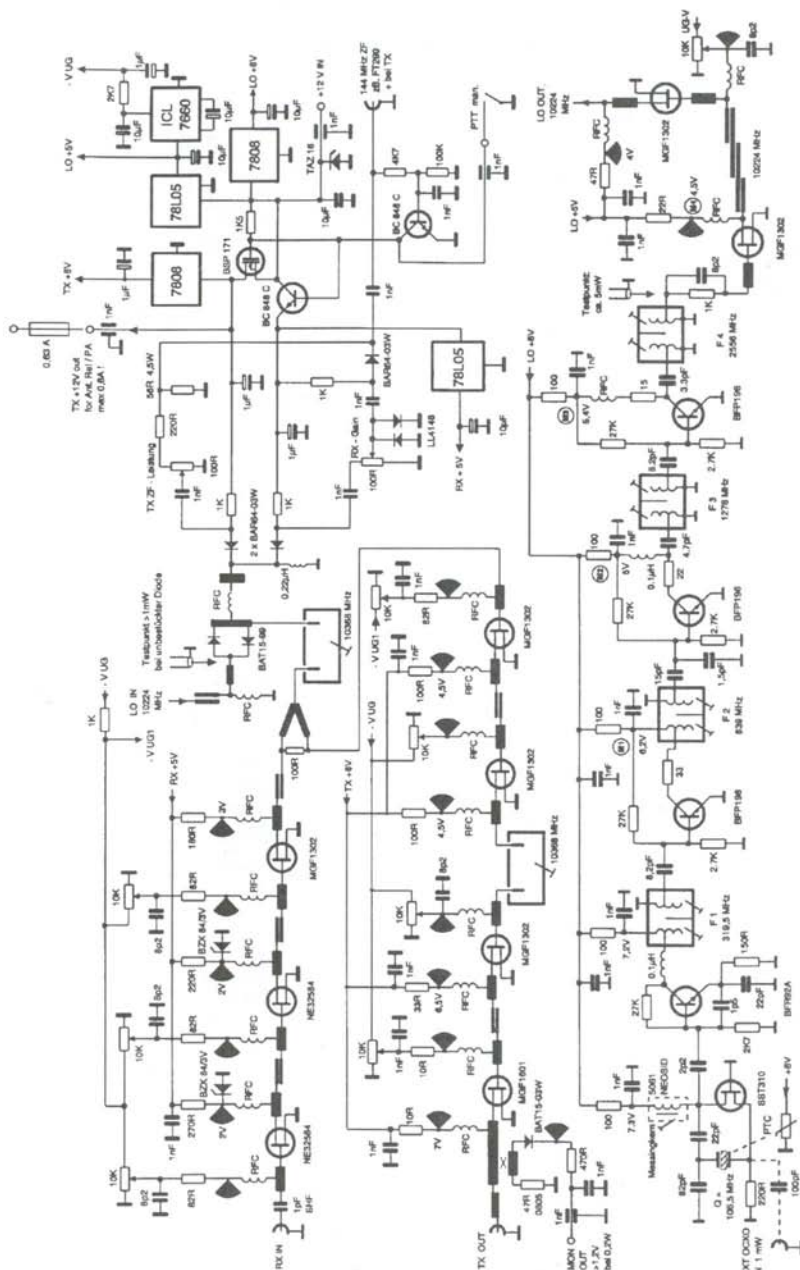
die Frequenzdrift in gewissen Grenzen. Weiterhin wird durch Einbau entsprechender Kondensatoren (TK) im Oszillator eine weitere Temperatur-Kompensation erreicht, dafür sind zwei Lötplätze vorgesehen. Die Stabilität reicht für normale Verhältnisse aus. Sollte eine sehr genaue und hochstabile Frequenz benötigt werden, ist an der im Schaltplan eingezeichneten Stelle ein externer "Ofen-stabilisierter" OCXO mit ca. 1 mW (DF9LN) einzukoppeln. Dazu wird der Quarz mit Heizer entfernt.

Nach dem Oszillator folgt eine Verdreifachungsstufe mit dem BFR92. Über ein Helixfilter wird die Frequenz 319,5 MHz selektiert und auf den Verdoppler mit BFP196 gekoppelt. Nach einem weiteren Helixfilter das auf 1278 MHz abgestimmt wird, gelangt das Signal auf eine weitere Verdopplerschaltung. Das folgende Helixfilter wird auf 2556 MHz eingestellt. Mit dem MGF1302 als Vervierfacher wird die Endfrequenz 10224 MHz erreicht. Das mit einem Mikrostripfilter selektierte Signal wird über eine Verstärkerstufe mit MGF1302 dem Mischer zugeführt. Die erzeugte LO-Leistung

Bild/Figure 1: Block Diagram

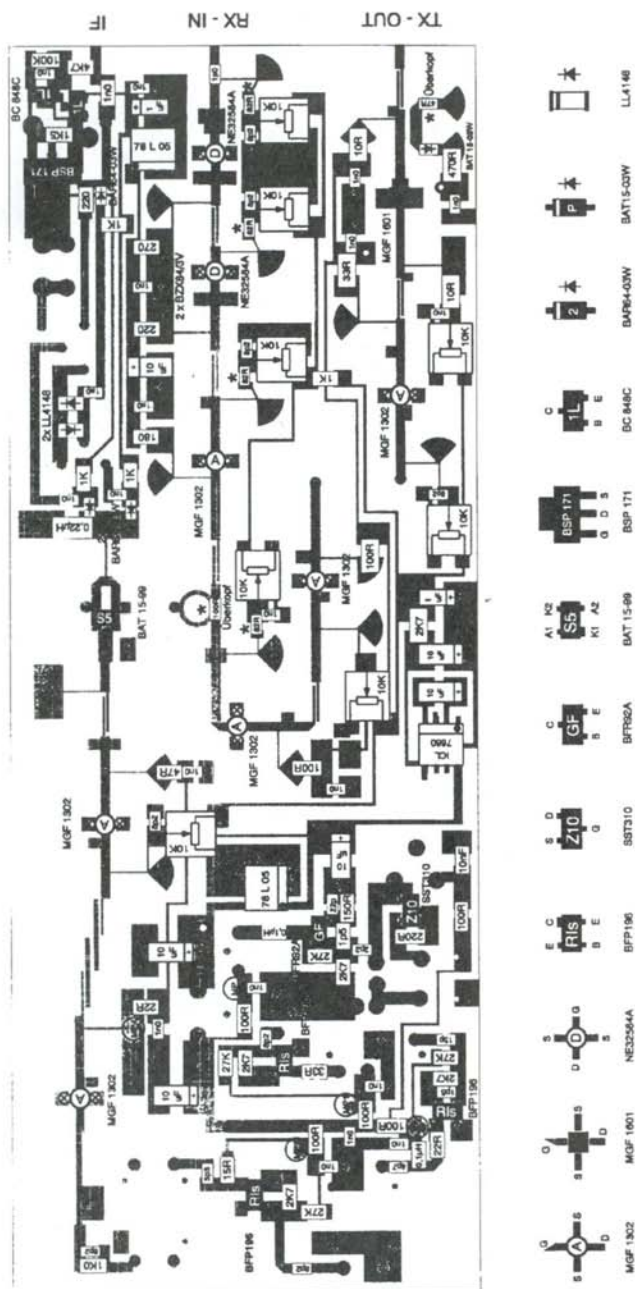


Bild/Figure 2: Circuit Diagram



Die Spannungs- und Leistungsangaben sind Messwerte der Prototypen. Die Angaben können durch Bauteiltoleranzen stark abweichen!

Bild/Figure 3: Parts Layout

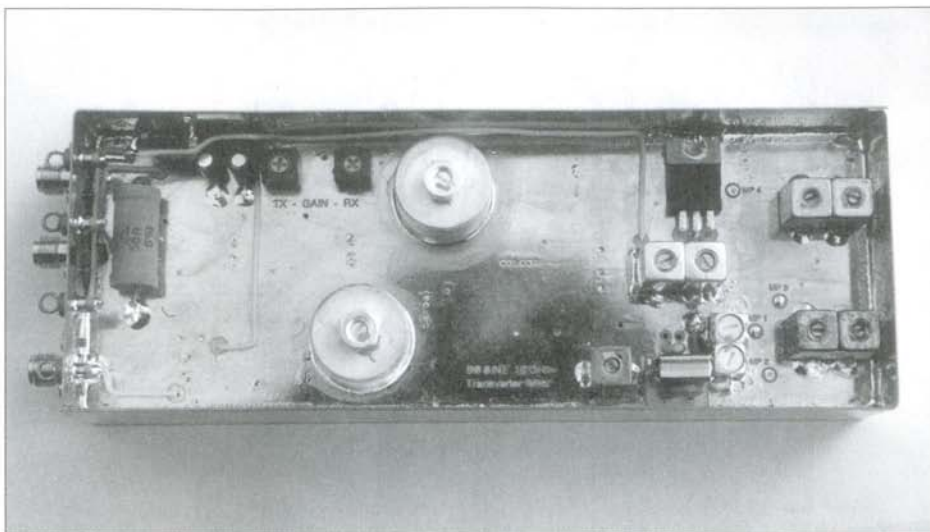


8 Durchkontaktierungen

 Mit Gehäuserahmen verlöten

*** Widerstand Bauform 0805**

10GHz Transverter Bottom View



beträgt ca. 5 mW (2mW sind bereits gut ausreichend).

Mischer

Die Mischstufe ist ein "einfach balancierter Diodenmischer" mit BAT15-99 (LOW-BARRIER). Das ZF-Signal wird über getrennt einstellbare Dämpfungsglieder für Sender und Empfänger geführt, die durch PIN-Dioden umgeschaltet werden. Die Sende-Empfangs-Umschaltung des gesamten Transverters erfolgt über eine Plusspannung bei TX auf dem ZF-Steuerkabel, wie es bei dem FT290R bereits eingebaut ist. Bei anderen Transceivern ist ein kleiner Umbau erforderlich (Eine bei Senden verwendete +Spannung im 2m Transceiver über einen 2K2 Widerstand auf die Ausgangsbuchse legen, fertig!). Diese Steuerung benötigt keine weiteren Steuerkabel und hat sich seit Jahren bestens bewährt. Des weiteren ist aber auch die klassische Umschaltung mit PTT-Kontakt nach Masse möglich. Die Betriebsspannungsumschaltung im Transverter erfolgt durch Transistoren. Die Schaltspannung des Senders ist herausgeführt und kann zur Steuerung von

Koaxrelais sowie kleinen PA-Verstärkern verwendet werden (max. 0,6...0,8A belastbar). Dieser Ausgang sollte unbedingt mit einer Feinsicherung geschützt werden.

Zur Spiegelfrequenz-Selektion werden Hi-Q Resonatoren (versilberte Messingtöpfchen) verwendet. Mikrostripfilter erreichen bei 144 MHz ZF keine ausreichende Selektion.

RX

Das Empfangsteil besitzt zwei HEMT-FET's und einen weiteren FET mit einer Gesamtverstärkung von ca. 30 dB. Dadurch wird kein weiterer ZF-Verstärker benötigt. Das über einen 1pF Kondensator gekoppelte Eingangssignal wird einem rauschangepassten NE32584C zugeführt. Danach folgt über ein Striplinefilter die zweite Vorstufe mit NE32584C. Über ein weiteres Striplinefilter wird das Signal auf den FET MGF1302 gekoppelt. Danach folgt ein Wilkinson Teiler und das HQ-Spiegelfrequenzfilter.

TX

Über das auch für den Sendezeitpunkt benutzte HQ-Filter hinter dem Mischer gelangt im Sen-

defall das TX-Signal auf zwei MGF1302 Verstärkerstufen, die durch ein Striplinefilter gekoppelt sind. Über ein weiteres HQ-Filter zur Nebenwellenunterdrückung wird die Treiberstufe mit MGF1302 angesteuert. Die über ein Striplinefilter folgende Endstufe mit MGF1601 verstärkt das Sendesignal auf mehr als 200 mW. Am Senderausgang ist ein Richtkoppler mit Schottkydiode BAT15-03W eingebaut. Er ermöglicht die Kontrolle der Ausgangsleistung (Monitoring MON) und erleichtert den Abgleich der Schaltung.

2. Description

LO

The proven 'simple' XO uses the FET SST310 in a grounded gate circuit. The crystal frequency for a 144MHz IF is 106.5MHz. The coil is tuned by a M3 brass screw, which is fitted instead of the usual ferrite tuning screw. An extra 40°C PTC-heater improves the drift characteristic of the XO. Extra pads are provided for fitting additional capacitors which can be selected for temperature compensation. For normal use in a restricted temperature change environment the stability is sufficient. But for more serious work a special outboard solution like the OXCO from DF9LN is required. This can be fed in at the source of the SST310, as indicated in the circuit diagram. The crystal and the heater have to be removed in this case.

The XO is followed by a tripler to 319.5MHz which utilises a BFR92A transistor. The third harmonic is filtered by a helix bandfilter and drives the doubler with the BFP196. The output filter sieves the harmonic at 639MHz. A second doubler with a BFP196 achieves an output frequency of 1278MHz. After another helix bandfilter on 1278MHz a further doubler with a BFP196 achieves an output frequency of 2556MHz. A helix filter is used for selectivity.

Now the chain of bipolars ends and the 2.5GHz signal drives a GaAs-FET quadrupler with a MGF-1302. A microstrip edge coupled filter selects the LO frequency of 10224MHz and drives a further linear amplifier equipped

with the MGF-1302. The power at this point is around 5mW (7dBm).

Mixer

The LO drives a single balanced diode mixer which uses a BAT15-99 low barrier double diode. The IF-port of the mixer is terminated by selectable attenuators for transmit and receive. These are switched by PIN-Diodes BAR64-03W to a common IF-connector. A voltage of at least +9V, which can be supplied by a FT-290 for example, activates the T/R-switching. Other brands of 2m transceivers have to be modified accordingly.

Whilst this method of T/R-switching via the IF coaxial cable is quite elegant, also a separate method via the PTT-MAN input can be accomplished.

An extra output is fitted for TX+, which can be used for external coaxial relays or PAs. This output must be guarded by a 0.63A fuse. It is not safe in case of short circuit!

On the RF-port of the mixer a cavity resonator cares for sufficient suppression of spurious responses.

RX

The RX-chain uses two HEMT-Amplifiers (NE32584C) and a third stage with a MES-FET (MGF-1302). The gain of 30dB renders an extra IF-amplifier obsolete. The stages are coupled with simple microstripline filters. The last stage is coupled to the mixer filter via a Wilkinson divider.

TX

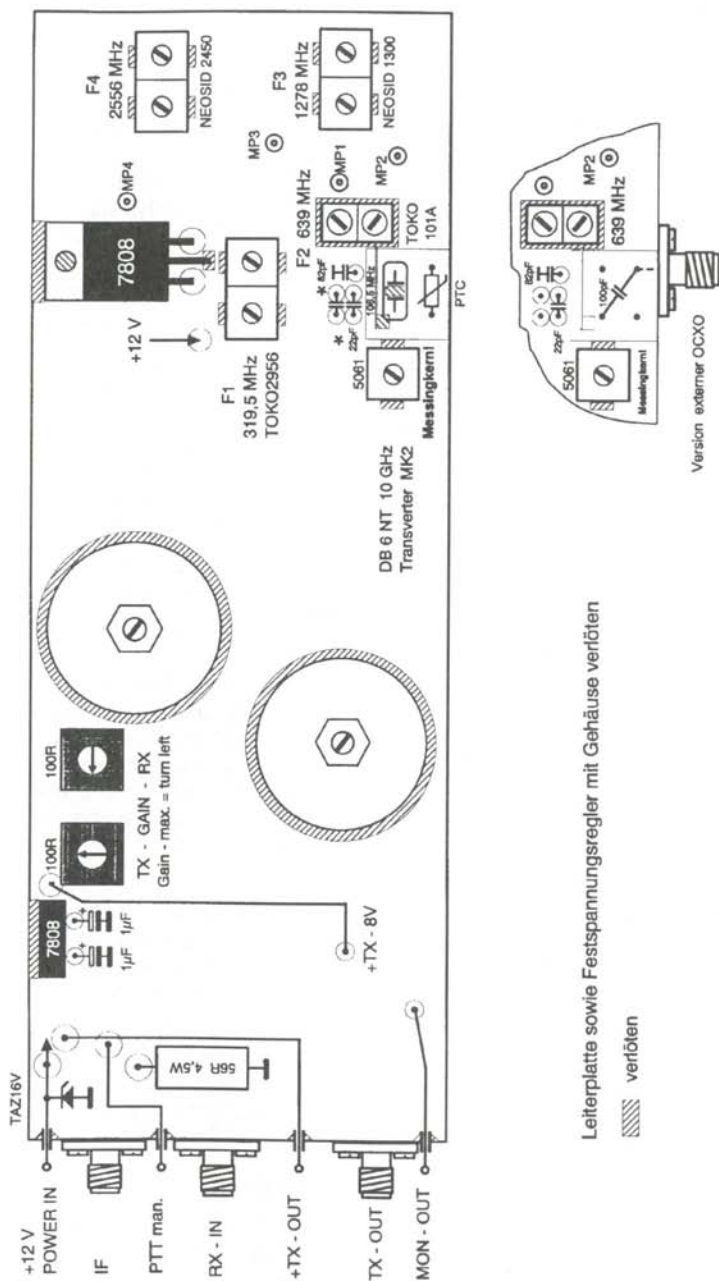
Two stages with MGF-1302 follow the Wilkinson divider. A subsequent cavity resonator cares for additional selectivity in the TX-chain needed for suppression of the LO.

Two further stages with a MGF-1302 and A MGF-1601 amplify the signal to a power of 200mW. A directional coupler with a BAT15-03W Schottky diode allows for a monitor voltage of the RF output power.

3. Aufbau

Zum Aufbau des Transverters sind Erfahrungen mit SMD-Bauteilen und deren Verarbeitung zwingend notwendig. Es sollte in keinem

Bild/Figure 4: Construction Hints



Bild/Figure 5: Parts Layout Top View

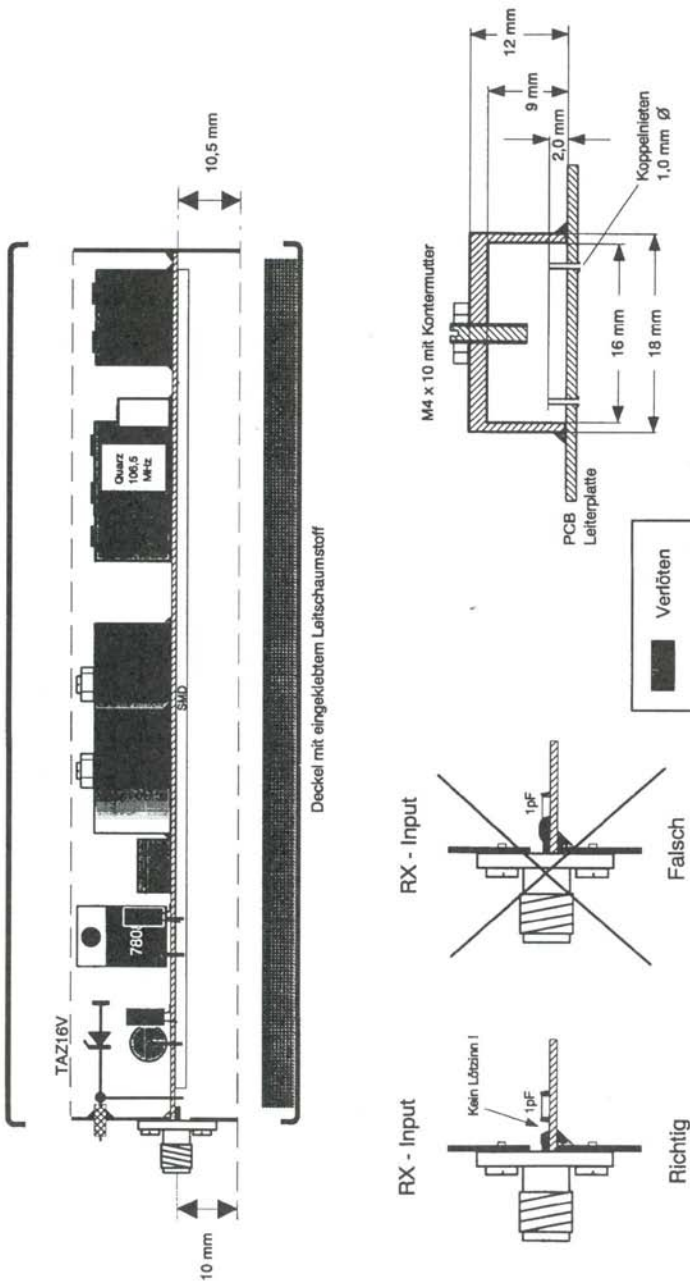
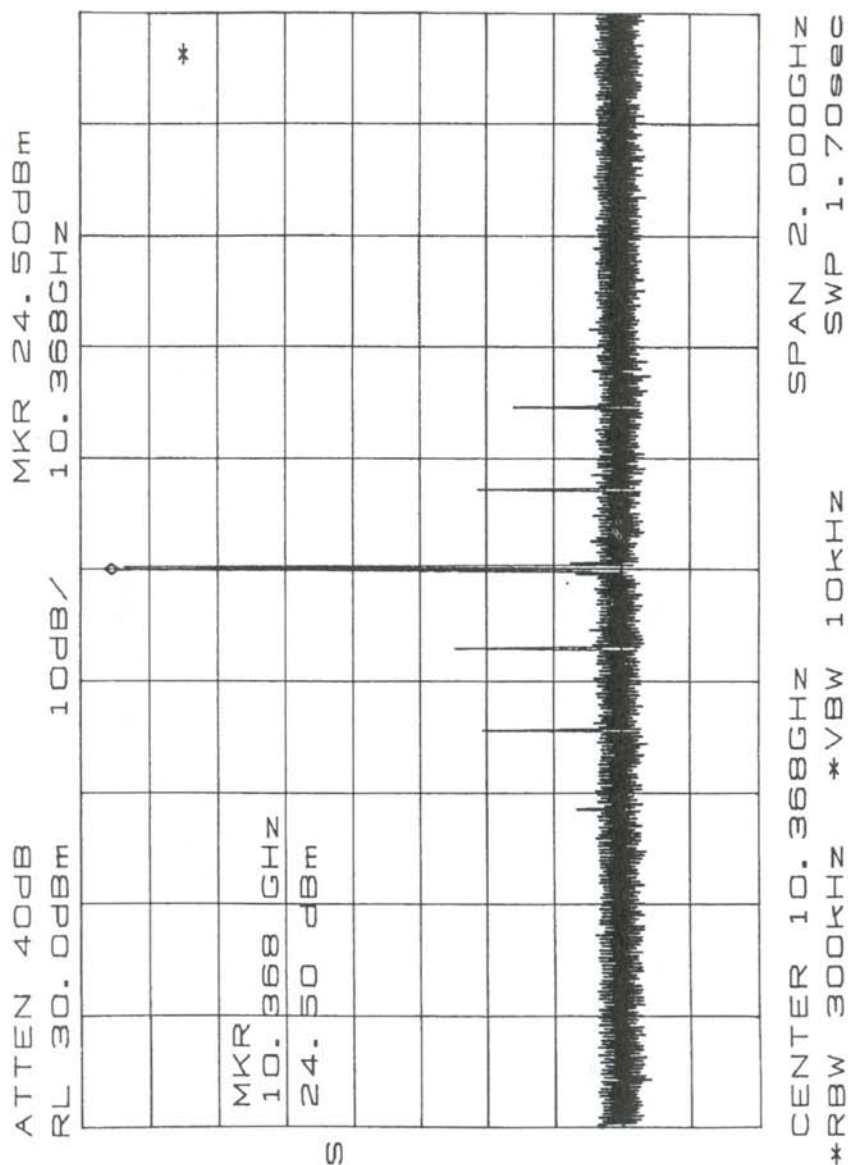


Abb./Fig. 6: Output Spectrum



Fall das "SMD-Erstlingswerk" werden, da Bauteile sehr kleiner Bauform zu verarbeiten sind. Ferner sollten Kenntnisse beim Aufbau von Mikrowellenschaltungen vorhanden sein. Verschiedene Komponenten wie FET's sind statisch sehr empfindlich. Es wird dringend empfohlen "ESD" Schutzmaßnahmen beim Aufbau einzuhalten. Dazu gehört eine geerdete und temperaturgeregelte SMD-Lötstation sowie eine leitende und geerdete Arbeitsunterlage (siehe [11]).

Aufbauaufolge:

1. Anpassen der Leiterplatten an das Weißblechgehäuse durch Anfeilen der Ecken.
2. Anzeichnen der Löcher für die SMA-Koaxbuchsen
3. Bohren der Löcher für Buchsen und Durchführungskondensatoren. M2 Gewinde für SMA-Buchsen Montage der SMA-Buchsen
4. Einlöten der Leiterplatte in das Gehäuse (siehe Zeichnung). Rundherum verlöten! Um einen gleichmäßigen Abstand der Leiterplatte beim Einlöten zu erreichen, hat sich ein 10,2 mm starkes Holzstück als Unterlage bewährt.
5. Einlöten der Koppelnieten für die HQ-Resonatoren. Auf senkrechte Montage achten!
6. Verzinnen der Unterkante der Resonatortöpfchen. Mit dem Zirkel die Position des späteren Resonators auf der Leiterplatte anzeichnen. Kurze M4 Zylinderkopfschraube in den Resonator eindrehen. Aufsetzen des Resonators auf die Leiterplatte. LötKolben mit dicker Spitze auf die M4 Schraube legen und warten bis der Resonator Löttemperatur erreicht hat. Unter Zugabe von etwas Lötzinn den Resonator mit der Leiterplatte verlöten.
7. Bestücken der Leiterplatte und Durchführungskondensatoren. Verlöten der Helixfilter siehe Bestückplan. Die Festspannungsregler werden mit ihrem Kühlflansch mit dem Weißblechgehäuse verlötet. Dabei ist das mittlere Masseanschlußbeinchen abzubreaken. Für die SMD Bauteile sollte 0,5mm Lötzinn verwendet werden. Danach wird die Baugruppe in Alkohol (Spiritus) gewaschen. Die

Metallabstimmerschrauben der Filter sind vorher auszudrehen um später die Trocknung der Bauteile zu erleichtern. Die Keramikabstimmerschrauben werden nur zum Abgleich gedreht (Metallabrieb auf der Keramik). Sollte ein Ultraschallwaschbad verwendet werden, ist der Quarz erst danach einzulöten (Quarze werden durch starken Ultraschall beschädigt). Nach dem Trocknen bei ca. 80°C im Ofen 1 Std., oder über Nacht auf einem warmen Heizkörper, kann die Baugruppe abgeglichen werden.

3. Construction

To achieve a successful construction of this transverter the builder has to have experiences in the use and handling of SMD-parts. Furthermore experiences with smaller projects in microwave circuits are valuable. In any case the construction of this transverter is not a beginners project.

The usual ESD protection measures should be obeyed. (see [5] for an excellent survey).

Construction Steps

1. Solder the walls of the tinplate box and trim the PCB for fitting into the tinplate box.
2. Mark the holes for the SMA-connectors
3. Drill holes for SMA-connectors and feedthrough caps
4. Solder PCB into the box (Fig. 4). Use a 10.2mm high piece of wood as a ruler to find the right adjustment.
5. Solder the coupling rivets for the cavity resonators. They must stand upright.
6. Tin the bottom of the resonators. Mark the correct position with a pair of dividers. Fit a short M4 screw to the resonator. Put the resonator onto the position marked and heat the screw with a soldering iron. If the resonator is on the right temperature solder at the bottom.
7. Mount the parts onto the PCB (Fig. 3). Mount the feedthrough caps. Solder the helix filters (Fig. 4). Solder the regulators with their heating to the wall of the tinplate box. Clean the finished PCB with alcohol. The tuning screws of the resonators should be removed. Dry the

module in a stove (1h at 80°C) or over night lying on a central heating.

4. Abgleich

Die folgenden Schritte sind für den Abgleich erforderlich:

1. Anlegen der +12V Betriebsspannung durch ein Netzgerät mit Strombegrenzung ca. 0,6A. Kontrolle der Betriebsspannungen an den Festspannungsreglern.
2. Messen der Kollektorspannung der BFR92 Verdopplers. Eindrehen des Messingkerns in die Oszillatorschule. Dabei sollte ein schmaler Papierstreifen beigelegt werden um einen straffen Sitz des Kerns zu gewährleisten. Beim Anschwingen des Oszillator geht die Spannung auf ca. 7V zurück.
3. Messen der Spannung am Messpunkt 1. Durch wechselseitiges Abstimmen des 319,6 MHz Bandfilters wird auf minimale Spannung abgeglichen, ca. 6V (maximaler Strom = optimale Ansteuerung).
4. Messen der Spannung am Messpunkt 2. Durch wechselseitiges Abstimmen des 639 MHz Filters wird auf minimale Spannung abgeglichen, ca. 5V. (Die Keramikschrauben verursachen bei sehr häufiger Betätigung Metallabrieb auf ihrer Oberfläche. Erkennbar durch "ruppiges" Abstimmverhalten. Der Belag kann mit Glasfaserstift entfernt werden.
5. Messen der Spannung am Messpunkt 3. Durch wechselseitiges Abstimmen des 1278 MHz Bandfilters wird auf minimale Spannung abgeglichen, ca. 5,3V.
6. Messen der Spannung am Messpunkt 4. Durch wechselseitiges Abstimmen des 2556 MHz Bandfilters ist auf maximale Spannung abzugleichen, ca. 4,5V.
7. Einstellen von 4V Drainspannung am LO-Verstärker.
8. Abschlußwiderstand oder Antenne an den Eingang des Empfängers anschließen.
9. Einstellen der Ruhestrome der 3 RX Transistoren auf 2V Drainspannung NE32584C und 3V für den MGF1302.
10. Anschließen eines 2m Empfängers am ZF-Ausgang in Stellung SSB. RX- und

TX-Gain Potentiometer sind dabei auf Linksanschlag zu drehen (max. Verstärkung). Beim langsamen Eindrehen der M4 Abstimmungsschraube in den HQ-Resonator ergeben sich zwei Rauschanstiege im 2m Empfänger. Das beim Eindrehen der Schraube erste Maximum ist das richtige Seitenband (oberes Seitenband 10368 MHz). Danach ist die Schraube mit der Kontermutter festzuziehen.

11. Transverter durch "PTT man." Kontakt auf Stellung "senden" schalten (ohne 2m HF-Ansteuerung). Einstellen der Arbeitspunkte der Sendetransistoren auf den im Schaltplan angegebenen Wert. Anschließen des Senderausgangs an eine geeignete Antenne oder einen Abschlußwiderstand. Ansteuerung durch ein 2m Sendesignal mit 1...3 Watt. Messen der Monitorspannung am Richtkoppler. Eindrehen der M4 Schraube in den HQ-Resonator im Sendezweig und Abgleich auf maximale Ausgangsleistung (Monitorspannung). Da der 1. Resonator beim Empfängerabgleich bereits auf die richtige Frequenz abgestimmt wurde, ist nur ein Maximum zu erwarten. Schraube ebenfalls durch Kontermutter festziehen. Danach sollte ein Feinabgleich des 1. Resonators am Mischer sowie des letzten Helixkreises (2556 MHz) und der Ströme des Sendeverstärkers erfolgen.
12. Einpegeln der Sendeleistung durch Zurückdrehen des TX-Gain Potis bis die Ausgangsleistung beginnt abzufallen.
13. Anschließen einer Empfangsantenne. Einstellen der Oszillatorfrequenz mittels einer Bake mit bekannter Sendefrequenz.
14. Einkleben von niederohmigen Leitschaumstoff in den unteren Deckel des Gehäuses (Dadurch werden Gehäuseresonanzen und somit Schwingneigungen verhindert). Einbau der Baugruppe in ein Gehäuse, wobei der Transverter zur besseren Kühlung auf das Chassisblech montiert werden sollte. Ein geeignetes Koaxrelais dient zur Sende-Empfangsumschaltung.

Fertig! QSO fahren!

4. Alignment

The following steps are necessary for the alignment:

1. Apply 12V. Use a current limited ($< 0.6A$) power supply. Check the voltage at the output of the fixed voltage regulators.
2. Measure the collector voltage at the BFR92A. Turn the tuning screw of the oscillator coil until the decrease of the collector voltage indicates the proper oscillation. The measurement should read around 7V.
3. Measure voltage at M1 (Fig. 2). Tune bandfilter F1 (319.5MHz) to minimum voltage (ca.. 6V) at M1.
4. Measure voltage at M2 (Fig. 2). Tune bandfilter F2 (639MHz) to minimum voltage (ca.. 5V) at M2.
5. Measure voltage at M3 (Fig. 2). Tune bandfilter F3 (1278MHz) to minimum voltage (ca.. 5.3V) at M3.
6. Measure voltage at M4 (Fig. 2). Tune bandfilter F4 (2556MHz) to minimum voltage (ca.. 4.5V) at M4.
7. Adjust 10k pot for a reading of 4V at the drain of the MGF1302 (LO-Amplifier).
8. Connect dummy load or antenna at input connector of RX
9. Adjust bias for the HEMTs for a reading of 2V at their drain and for the MGF1302 for a reading of 3V at its drain.
10. Connect 2m receiver at IF connector. Turn RX-Gain and TX-gain pots fully CCW. Adjust M4 tuning screw at resonator in front of mixer slowly clockwise (inwards) until you observe an increase in noise level. This is the upper sideband on 10368MHz. For verification turn the tuning screw further inwards until you observe a second peak in noise level. This is the lower sideband on 10080MHz. Turn back to the first maximum (Tuning screw is less inside the resonator) and lock with the security nut.
11. Switch transverter to transmit by grounding the PTT input. Connect a 50 Ω dummy load to the TX output. Adjust all FETs in the TX-chain by the appropriate bias pots to the drain voltage given in the circuit diagram (Fig. 2). Drive the transverter

with 1...3W on 144MHz. Measure the monitor voltage at MON OUT. Only adjust the resonator in the TX-chain to a maximum by careful tuning. There is only one maximum, because the first resonator has already been tuned in the step before. Lock the tuning screw with a security nut. A fine tuning can be carried out by optimising the first resonator (in front of the mixer) and the bias currents of the TX transistors.

12. Reduce the TX-gain by clockwise rotation of the TX-gain pot until the TX output decreases.
13. Connect antenna to RX input. Adjust the XO until a known beacon reads the correct frequency.
14. Take low resistance carbonised foam and glue it into the bottom cover. This damps resonances possible.

That's all.

5. Danksagung

Mein besonderer Dank gilt Lorenz DL6NCI der durch seine "Aufbau"-Erfahrung und zahlreichen Anregungen entscheidend zur Reife des Transverters beitrug. Ferner bedanke ich mich bei Richard, DF5SL, Gerd, DG8EB, und Jürgen, DC0DA, die durch "Nachbauten" die 100% Reproduzierbarkeit der Schaltung bestätigten.

5. Acknowledgement

My special thanks to Lorenz, DL6NCI. His support and the discussions were mandatory for the success of this development. Also my thanks to Richard, DF5SL, to Gerd, DG8EB, and to Jürgen, DC0DA, who verified the reproducibility of the design by building this transverter.

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TWT Power Supply Design

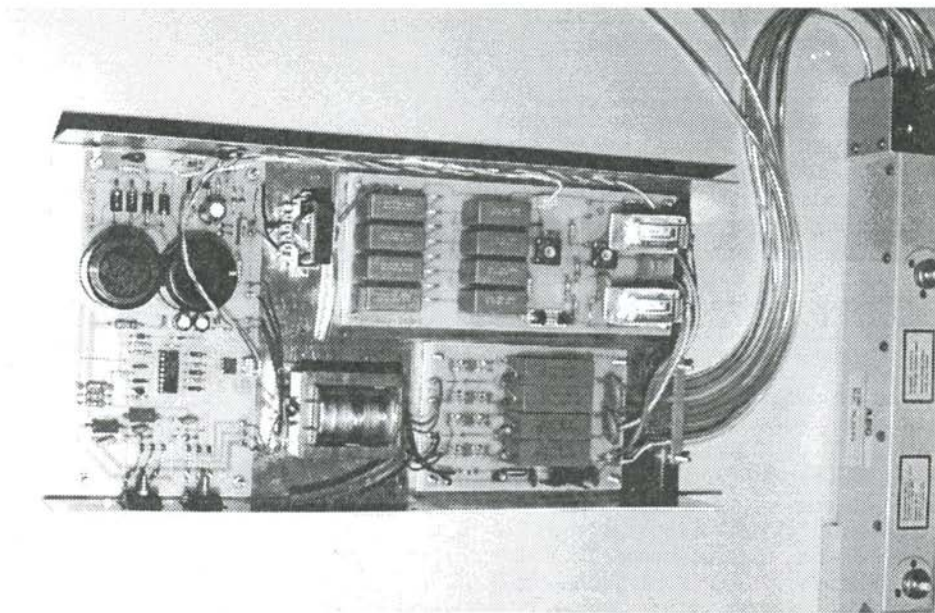
Luis Cupido, CT1DMK

Abstract: Surplus TWTs, available on the amateur markets, seem to appear in much greater number than their power supplies. Also some of the power supplies are designed for specific applications such as having exotic negative input voltages or are special such as for pulsed amplifiers, while the few good ones that show up, rapidly fall in good hands. The following article presents a switch mode power supply for TWT tubes. It operates directly from the mains and is capa-

ble of delivering up to 1KW DC. This design was done for medium power TWT's but all circuits are versatile enough to accommodate up to 10kV helix and up to 8kV collector voltages. The design description is done in a way that it can be assembled for any specific TWT you may have, providing the necessary modifications.

Kurzfassung: Leider sind gute Wanderfeldröhren einfacher auf dem Gebrauchtmart zu

TWT Power Supply Top View



haben als die dazu passenden Netzteile. Im folgenden Artikel wird ein Schaltnetzteil für TWT's beschrieben, das direkt an das Netz anschließbar ist und bis zu 1kW Gleichstromleistung erzeugen kann. Es ist für alle TWT's mit mittlerer Leistung geeignet.

1. Introduction

The TWT (Travelling Wave Tube) is an electronic tube that makes use of the interaction between a microwave signal and an electron beam to produce amplification of a microwave signal. The description of the physics or the operating principles underlying, is completely outside the scope of this article although good literature is available on the subject /1/2/3. Most of the tubes that can be of interest to our purposes have similar configuration and employ voltages in the range of 2 to 10kV. This fact justifies the development effort to make a generic power supply that could be easily adapted to any specific TWT in this range.

A TWT requires:

- a powerful collector supply (in our case, a few kV)
- a heater supply
- control grids
- and a very precise helix voltage supply (in our case up to 10kV).

Collector voltages are the power source of the electron beam and are not required to be very accurate, however, the tube should not be operated far from the recommended values as the power efficiency may be affected. A 20% variation from nominal is in most cases acceptable. Heater and grids require no different approach from any other type of beam tube, as they are used to form an electron gun (similar to the ones in CRT tubes).

The only critical issue, is in fact the helix voltage, this voltage sets the best interaction between the beam and the microwave signal. We need to understand how this voltage affects the operation, and the stability we require, to properly set a TWT in operation, specially if the operating voltages are to be determined by experimentation. Depending on the specific tube, helix voltage changes of

few percent may affect the tube gain and power output significantly, this requires a precise voltage source, preferably a feedback stabilised power supply. The helix voltage should be regulated as good as 1% but adjustable by 20% the nominal value to allow tuning for best performance. Grid 2 voltage is, normally, derived from the helix voltage therefore it will have a stable supply. If the tube has a Grid 1, its voltage is derived from the beam current using a Zener diode, so it can also be set accurately.

1. Einführung

Die Wanderfeldröhre ist eine leistungsfähige Vakuumröhre zur Leistungsverstärkung von Mikrowellen. Die Funktionsweise ist in den Veröffentlichungen /1/.../3/ beschrieben. Die meisten Typen sind ähnlich beschaltet. Deswegen macht es Sinn, eine Standard-Stromversorgung zu entwickeln, die gegebenenfalls auf eine bestimmte Röhre angepasst wird.

Eine Wanderfeldröhre braucht folgende Betriebsspannungen:

- Eine Spannungsquelle für den Kollektor (2...5kV/0.3...0.5A)
- Eine geregelte Spannungsquelle für die Helix (2...5kV/20mA)
- Spannungen für die Steuergitter
- Heizung

Die Kollektorspannung muß Leistung liefern und braucht nicht geregelt sein. Die Spannung für die Heizung ist klein und kann geregelt werden. Die Spannungsversorgung für die Gitter ist wie bei normalen Röhren.

Die einzige Angelegenheit, die etwas kritischer ist, ist die Versorgung der Helix. Die Verstärkung und die verfügbare Leistung der Röhre hängen sehr stark von der Helixspannung ab. Deswegen muß diese Spannung auf besser als 1% geregelt, aber trotzdem über einen Bereich von ca. 20% einstellbar sein.

Die Gitter2-Spannung wird von der Helixspannung abgeleitet. Die Spannung für das Steuergitter kann über eine Zenerdiode vom Strahlstrom abgeleitet werden.

2. Description

The design presented here has:

1. A collector supply with two collector connections (tubes with only one collector will not use the second collector connection).
2. An helix supply with voltage feedback control, that makes the output voltage stabilised but adjustable over a wide range.
3. Protection for helix over-current, and total power (collector protection can be fit if desired)

The switching frequency is 40KHz and full duty cycle is employed. The main control circuit is built around an UC3864 from Uni-tronide that provides all the basic functions of a SMPS. The power switching is done in a push-pull configuration.

The collector supply uses two, peak-to-peak rectifiers and requires separate windings for collector 1 and collector 2. One collector configuration should use two identical, separated windings, and the collector 2 terminal is left unconnected.

The heater supply uses a simple rectifier and a monolithic regulator to set the heater voltage to the desired value, with good regulation.

The helix supply employs a four times voltage multiplier to the peak-to-peak input voltage. The helix voltage is coming from a separated transformer that has a variable input voltage. The main transformer supplies a fixed voltage to the helix transformer through a variable voltage gap. By changing this gap the input of the helix transformer can be varied. The voltage gap is done with a full bridge rectifier containing a variable load at its DC terminals. The helix voltage control is done by feeding back, the helix voltage information, to the variable load inside the bridge.

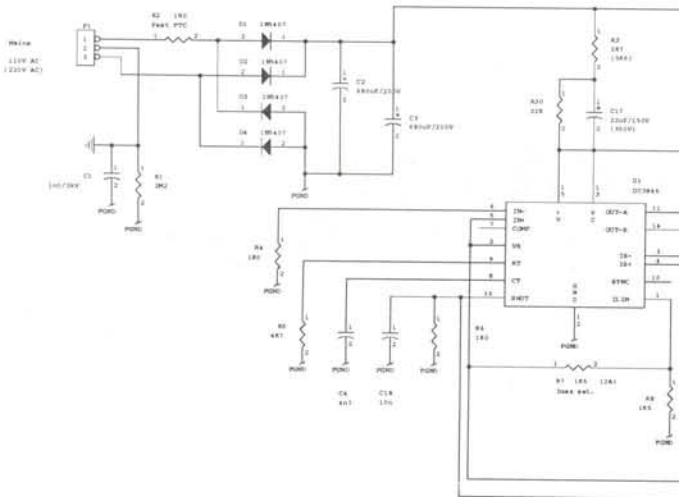
The complete power supply can be built using 3 PCBs. One main control board, one helix board and a collector board. The main and helix transformers are external and assembled directly to the chassis.

Main control board

The main DC voltage is obtained directly from the mains, 220VAC or 110VAC, after being rectified and filtered (D1-D4 and C2,C3). The IC is supplied by a bootstrap secondary on the main transformer. To start the supply C17 and R3 will provide about 20mA during 20 ms, time enough for the circuit to start functioning and supplying 12V via the bootstrap secondary. D11 will prevent the supply voltage to rise above 15V during the startup. Both R5 and C4 set the operating frequency, while C4 alone can be varied to adjust the dead time of the output switching waveforms (this is a simplified explanation, please refer to the data sheet for detailed information /4/).

This values result in an oscillation frequency of 80KHz to 90KHz with 8 % to 10 % dead time. The main switching frequency is half the oscillator's frequency. Some trimming can be done increasing C4 to reach the 40KHz, if necessary. As the UC3846 has built-in output drivers, the power FETs are interfaced directly using only a resistor divider (R9,10 and R11,12). The total current flowing through the FETs can be sensed at the resistors R14,15,16, which sets the peak current protection. R13, R27 and C5 will remove any spikes present at R14,15,16 to provide a clean signal to the current sensing inputs of the UC3846. R7 and R8 will set the maximum operating current and the operation mode. By using R7,8 both equal to 1.5k Ω , the maximum current is set to 2A and a latched shutdown is selected, that is, the power supply will not try to restart if a shutdown condition happens (such as helix or collector protection). To increase the maximum power capability just reduce R14,15,16 accordingly.

Protections against helix and collector over current will force a shutdown by controlling the UC3846 shutdown input. Protection signals are optically isolated by U2 and U3. The input side of the opto-couplers is intended to remain at low potential or near ground voltages as U2 and U3 can be effective isolating them from the mains (220V AC or 110V AC) potential. Never connect U3 to the cathode or collector leads of the TWT. If a collector protection is desired make it using a current



TWT POWER SUPPLY

By: CT1DMK

FCPPI.SCH - LC9818

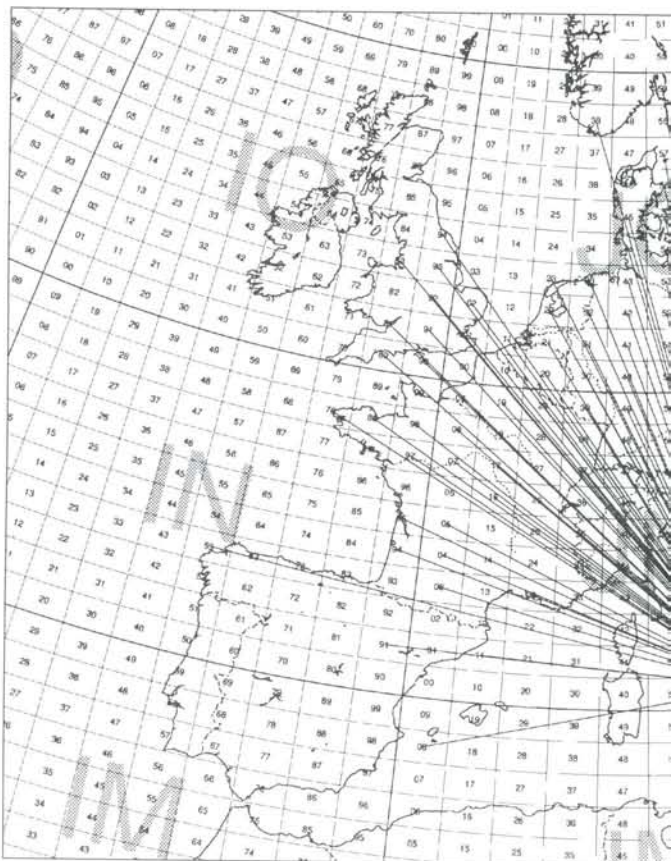
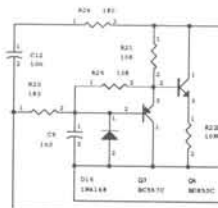
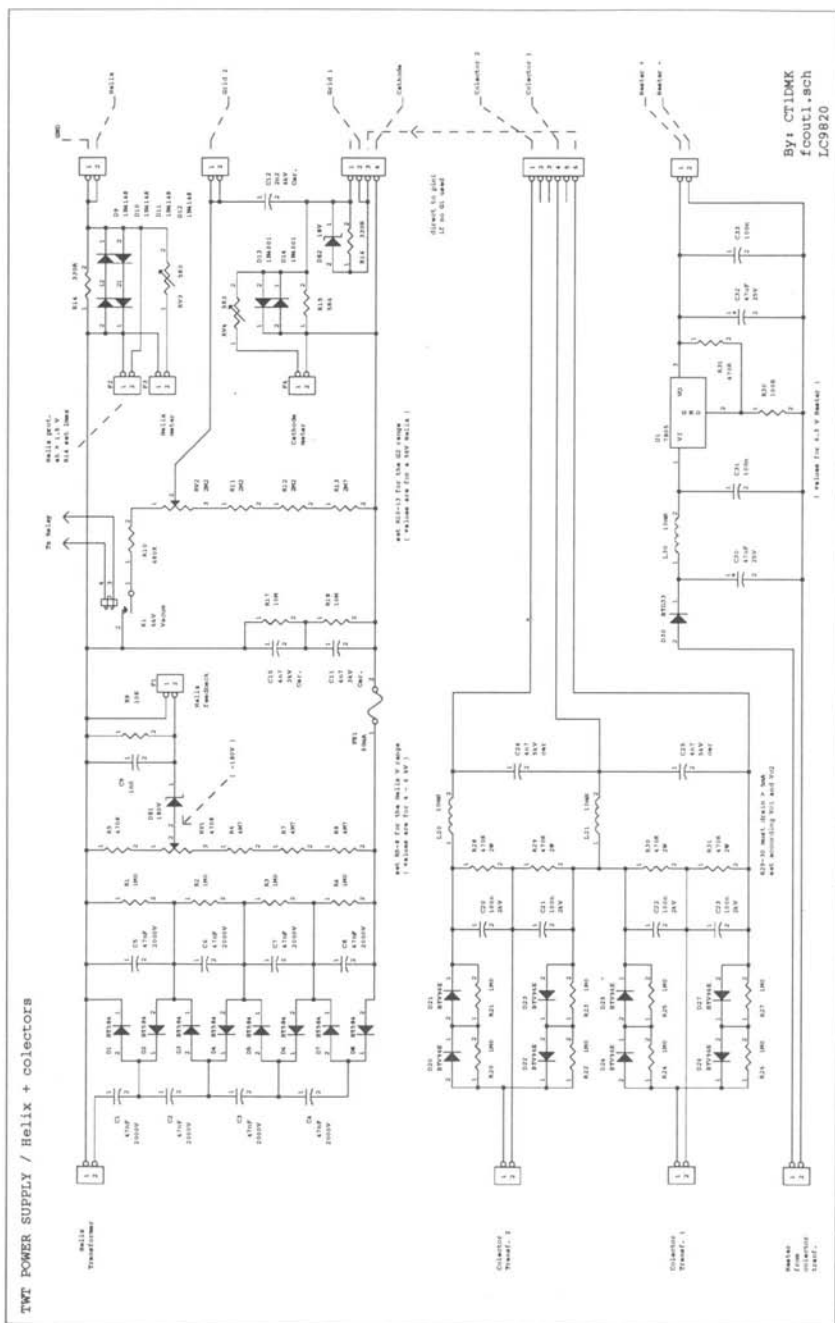


Abb./Fig. 2: Circuit Diagram Collector&Helix Supply



transformer on one of the leads of the collector wires coming from the main transformer. R28,C15 and R29,C16 are used to remove the spikes from the protection signals to avoid shutting down the supply with transients far below the damage levels. Some spikes on the helix current, while switching on and off the beam, can exceed the current limit by a factor of 5, although they last only a few microseconds. As they contain little energy they will not endanger the tube life and the power supply should not shut down in such events.

Also in the main control board, is the helix control circuit. It is composed of a full bridge rectifier, D12,13,14,15, and a variable load implemented with a power darlington transistor BD53C. The input impedance is further increased using an additional emitter follower, Q3. This way the input impedance is set only by external elements and the loop stabilisation calculations and implementation become greatly simplified. Only C12, R26, in a pole-zero compensation, are required to guarantee the loop stability. R24 and C11 make a peak-absorbing network to clean the switching waveform that is feed into the helix transformer.

Collector supply board

This PCB comprises the collector supplies and also the heater supply, as it is usually at cathode potential. The collector supply employ two peak-to peak rectifiers in series and an additional noise filtering C24, 25 and L20, L21. The bleeding resistors R28,29,30,31 are used to prevent the voltage of rising up to the peak of the switching overshoot, while the tube is in standby with no beam current flowing. The value of these resistors may be set to have the collector voltages below the maximum ratings of the tube while the tube is in standby. This way the power wasted on this resistors is the minimum possible. However if we want to have the collector voltages near the nominal when the tube is in standby, a larger amount of current must flow through the resistors. Practical experimentation shown that 5 to 10mA is enough to have less than 20% rise off load. This effect has little impact in the collector voltage variation under load since when significant current is being

drawn the rectification come down to the nominal values of the input square wave, that is from top and bottom. The heater supply uses a conventional voltage regulator that can be adjusted for the correct heater operating value by changing R30 and R31. At lower currents a small heat-sink should be fit into the regulator. However if the tube drawn currents near or above 1A a bigger regulator should be provided. Do not try to thermally connect the regulator to the box or external heat-sink as it is at cathode potential (that is helix value below ground). The isolation would have to stand far above 10kV for safety reasons.

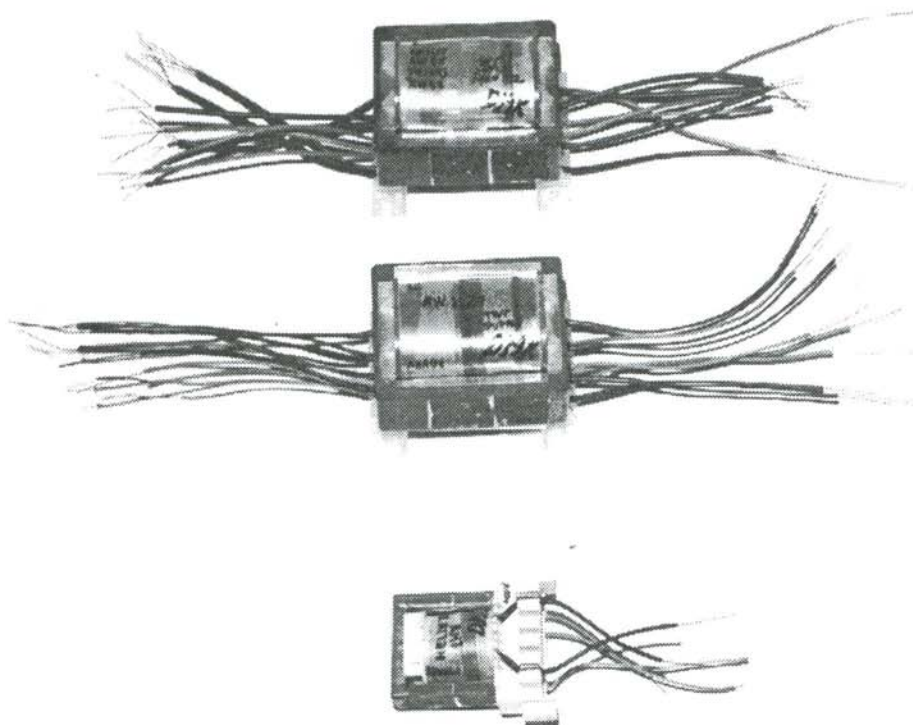
Helix supply board

The helix supply PCB contains the helix circuits and the grid 1 and grid 2 voltage settings. The variable voltage coming from the main transformer and gap regulator is rectified in a 4 times peak-to-peak voltage multiplier. This way, a 4kV helix will require the transformer to be wound to 1kV peak to peak, that is 500V rms (remember we have square waves where rms = peak). R1 to R4 are used as bleeding resistors and help to maintain a minimum current what ever the helix current flowing. The feedback is taken at RV1 with an offset of 180V. This offset will make the calculation of the voltage divider network easier and will increase the control loop gain. R1 and RV1 are equal in all voltage ranges.

In my design, for the maximum helix voltage desired, the transformer is driven with 100Vpp while at nominal value it may be around 80Vpp. For the helix control loop to operate properly up to the maximum value a control margin is necessary. To guarantee this situation the main transformer is wound to supply 120Vpp to the helix circuits. Note that the variable gap regulator will have half the peak-to-peak value on DC to control. This way, at the maximum helix voltage the voltage gap will be 8.6 V that is $(120 - 100)/2$ minus the diode bridge voltage drop.

The total helix voltage range can exceed a 2:1 ratio. We need to drive the helix transformer with 50Vpp to have half the maximum helix voltage and this situation corresponds to a

Various Transformers Used



DC gap of about 35V. This value is handled by Q4 without any problem.

Other voltage values for the helix control circuits may be used if the proper relations are maintained.

2. Beschreibung

Das vorliegende Design weist folgende Eigenschaften auf:

1. Eine Spannungsversorgung für den Kollektor mit 2 Ausgängen
2. Eine einstellbare und geregelte Versorgung für die Helix mit einem Schaltregler

3. Schutzschaltung für Überstrom im Helixkreis

Der Schaltregler hat eine Schaltfrequenz von ca. 40kHz und benutzt einen UC3864 IC von Unitrode.

Die Kollektorversorgung benutzt je zwei Gleichrichter in Spannungsverdopplung und benötigt separate Wicklungen für zwei Kollektoren. Wird nur ein Kollektor betrieben müssen beide Wicklungen gleiche Windungszahlen haben.

Table 1: Parts dependent on Supply voltage

Main Board	Input Voltage		
	48V DC	110V AC	220V AC
C2 and C3	2200uF/63V	680uF/200V	330uF/400V
R3	820 R	2.7 K	5.6 K
C17	47uF/50V	22uF/180V	22uF/360V
R18 and R19	150 R / 5W ni	470 R / 5W ni	1 K / 5W ni
C13 and C14	470p / 500V cer	390p / 500V cer	270p / 1kV cer

Die Versorgung für die Heizung benutzt einen Einweg-Gleichrichter mit einem anschließenden Regler, der auf 6,3V einstellbar ist.

Die Versorgung für die Helix hat als Wechselspannungsquelle einen steuerbaren Transformator. Die am Transformator anliegende Wechselspannung wird über eine steuerbare Wechselstromimpedanz variiert. Diese besteht aus einer Vollwellenbrückenschaltung, die eine variable DC-Last an den Gleichspannungsklemmen hat. Damit kann durch Verändern des Gleichstromwiderstandes die Wechselstromimpedanz und damit die am Trafo anliegende Spannung gesteuert werden. Die Steuerstrecke wird zu einer Regelstrecke, indem die Helixspannung zur variablen Last in der Brücke rückgekoppelt wird.

Die ganze Schaltung befindet sich auf drei Platinen, der Hauptplatine (Main Control Board), der Kollektorplatine und der Helixplatine. Die Transformatoren befinden sich extern und werden direkt auf das Chassis gesetzt.

Steuerschaltung

Die Speisespannung des Netzteils kann eine Wechselspannung von 110 oder 220V sein. Diese Spannung wird von einem Brückengleichrichter D1...D4 gleichgerichtet und von den Elkos C2 und C3 gesiebt (Abb. 1). Dort liegt dann eine Gleichspannung von maximal 160 oder 310V an. Der IC wird über C17 und R3 über eine Zeit von 20ms mit ca. 20mA versorgt, so daß er starten kann. D11 begrenzt die Startspannung auf 15V. R5 und C4

bestimmen die Schwingfrequenz des Wandlers. Die angegebenen Werte resultieren in einer Frequenz von 80...90kHz bei einer Totzeit von 8...10%. Die Wandlerfrequenz ist die Hälfte dieser Steuerfrequenz.

Der UC3846 hat eingebaute Treiber, um Leistungs-FET's über Widerstandsteiler ansteuern zu können. Der Strom durch die FET's wird durch R14...R16 in eine proportionale Spannung umgewandelt, die nach Siebung durch R13, R27 und C5 an den Stromfühleingängen des UC3846 anliegt. damit wird der Spitzenstrom begrenzt und die Schalt-FET's geschützt. R7 und R8 setzen den maximalen Strom auf 2A und selektieren den 'Latched Shutdown' Modus des UC3846. Damit wird der automatische Wiederanlauf nach einem Überschlag oder Überstrom verhindert.

Die Überstrom-Schutzschaltung wird von den Optokopplern U2 und U3 und den Fühlwiderständen im Primärkreis gebildet. Der Ausgang der Optokoppler geht auf den 'Shutdown' Eingang des UC3846. Der Eingang von U2 geht auf den Helix-Trip (Stecker P2). Dieser liegt praktisch auf Massepotential.

Die Beschaltung von U3 ist schwieriger. Der Kollektor bzw. die Kathode liegen auf hohem negativem Potential. Das ist für den Optokoppler zu viel. Man benutzt dann einen Stromtransformator, der in einen der Kollektorzuführungen, die galvanisch mit dem Transformator verbunden sind, eingeschleift wird.

Table 2: Parts dependent on helix voltage

Helix Board	Helix Voltage (kV)		
	2.5...4	4...6	6...10
R1 to R4	1 M	2.2 M	4.7 M
R6, R7, R8	2M2, 2M2, 2M7	4M7, 4M7, 4M7	3x 10 M (3kV)
R11, R12, R13	2M2, 2M2, 0	2M2, 2M2, 2M7	4M7, 4M7, 4M7
RV2	2M2	2M7	4M7
C10 and C11	10 nF / 3kV cer	4.7nF / 5kV cer	2.2nF / 10kV cer
D1 to D8	BY584	BY584	2 x BY584
C1 to C8	100nF / 1.5kV	47nF / 2kV	22nF / 3kV

Damit die Schutzschaltung nicht auf Spikes anspricht, werden die Signale mittels R28, C15 und R29, C16 gesiebt.

Dadurch führen Störungen auf der Helixleitungen, die nur einige μ s dauern, aber das 5-fache des Betriebsstroms erreichen können, nicht zur Auslösung.

Die Helixregelschaltung befindet sich ebenfalls auf der Steuerplatine. Sie besteht aus dem Brückengleichrichter D12...D15 und die variable Last mit dem Leistungstransistor BDX53C. Vor dem BDX53C befindet sich der Transistor Q3, der die Eingangsimpedanz nochmals erhöht. Damit läßt sich die Regelschleife leicht mit den Elementen C12 und R26 stabilisieren. R24 und C11 dienen wieder als Störfilter.

Kollektorversorgung

Die Leiterplatte enthält die Versorgung des Kollektors und den Stabilisator für den Heizkreis (Abb. 2). Zwei Gleichrichter in Spannungsverdopplung sind in Serie geschaltet. C24 und C25 sowie die Spulen L20, 21 dienen als zusätzliche Filter. Die Lastwiderstände R28, 29, 30 und 31 verhindern ein Hochlaufen der Spannung wenn die Röhre stromlos ist. Ein Strom von 5...10mA ist ausreichend, um die Spannung auf 20% stabil zu halten.

Die Heizspannungsregelung benutzt einen 7805, der mit R30 und R13 auf die richtige

Spannung eingestellt werden kann. Ein Kühlkörper ist nicht schlecht. Für Ströme um 1A kann es auch ein stärkerer Regler sein. Der Kühlkörper darf auf keinen Fall am Chassis befestigt werden, da an ihm eine Spannung von bis zu 10kV liegen kann!

Helixversorgung

Die Leiterplatte enthält den Gleichrichter für die Helixspannung und die Schaltung für Gitter 2 und Gitter 1. Die variable Spannung vom Regler und Helixrafo wird von einem Vervielfacher gleichgerichtet. D.h. wir benötigen eine Trafospaltung von 1kVpp, falls wir eine Helixspannung von 4kV DC erreichen möchten. R1 und R4 dienen als Grundlast. Die Spannung zur Rückkopplung auf den Regler wird über RV1 geführt. Die Zenerdiode D21 erzeugt einen Versatz von 180V. Damit ist die Berechnung und Auslegung des Spannungsteilers einfacher.

Das Design ist so ausgelegt, daß für maximale Helixspannung die Primärspannung des Helixtransformators ca. 100Vpp beträgt. Dann ist für die Nominalspannung die Eingangsspannung ca. 80Vpp. Zur Sicherheit wird für eine korrekte Funktion der Regelung eine Spannung von 120Vpp angenommen. Damit ist die Spannung am Steuerglied (BDX53C) für den oberen Regelpunkt $(120-100)/2 - U_D = 8,6V$. Wenn wir die Spannung halbieren, d.h. 50Vpp am Transformator anlegen, ist die Spannung am BDX53C ca. 35V.

Aus dieser Betrachtung kann man schließen, daß die Regelschaltung für einen Bereich der Helixspannung von 1:2 funktioniert.

6. Power transformers

The transformers must be selected to work at 40KHz and handle the power required so please refer to the corresponding data-sheets before attempting to use any core. The best information I could find was on Siemens and Philips ferrite cores catalogues. The calculation of the windings can be found in the literature, and more practical examples are normally found on the manufacturers application notes. The main transformer I use was an E type 3C80 core with 12x20mm section. This core was used to make a 300W DC power supply and also served for evaluating the number of volts per turn required (note that as a single turn provides more than one volt, therefore the notation is usually reverse from the one used on classical transformers). For the 3C80 material on an E type of core with 240 mm² a 4 Volt peak to peak per turn was used. No air gap is used in order to maximise the number of volts per turn. For bigger 3C80 cores you can simply scale this value up according to the core cross-section and save a lot of mathematics (See Box).

For the helix transformer a small core is enough as the power consumption on helix circuits and helix itself hardly goes above

10W. A3C85 core with only 44mm² was used and wound at 3 Volt peak-to-peak per turn. This core should be good for any design and any helix voltage.

Diagrams and component value considerations

The diagrams presented are from a power supply for a typical 5kV helix tube, such as the RW1127 from Siemens, and powered from a mains of 110VAC. The following tables 1 and 2 summarise the components required to be changed for different tube or mains designs.

All other capacitors and diodes, namely on the collector board, should be selected for handling the correct voltages.

6. Transformatoren

Die Transformatoren müssen auf der Frequenz von 40kHz die benötigte Leistung übertragen können. Die beste Informationen über Kerne und Ferrite fand ich in den Unterlagen von Siemens und Philips.

Der Haupttransformator ist ein E-Kern mit einem Querschnitt von 12x20mm und einem 3C80 Ferritmaterial. Dieser wurde für eine 300W Version benutzt. Für diesen Kernquerschnitt von 240mm² ist die Windungsspannung 4V pro Windung bei 40kHz und einem 3C80 Material. Es wird kein Luftspalt benutzt, um die Zahl der Windungen zu minimieren.

How to Calculate Transformer Windings

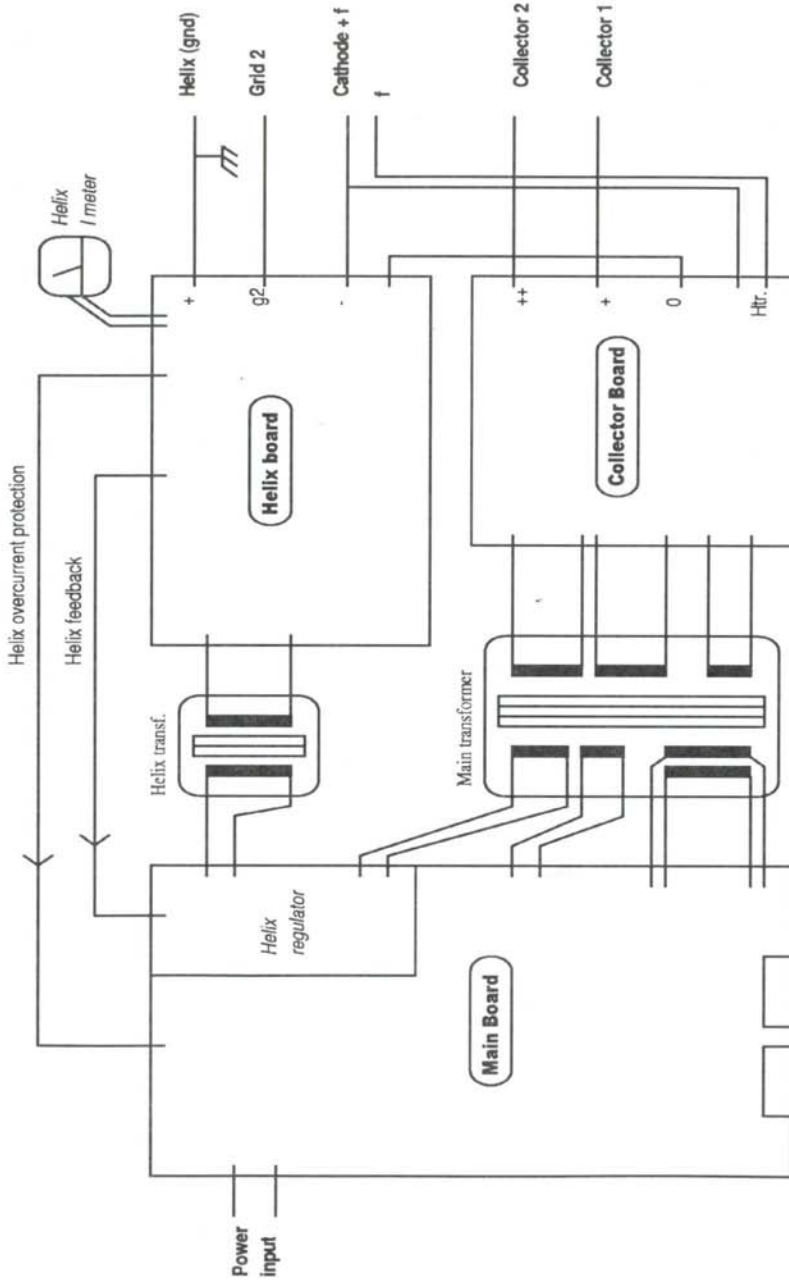
While making the primary calculations do not forget to take into account the drop on the rectifier diodes, about 1.4Volt, and the loss of about 3 Volt on the saturated drain to source (or calculate it exactly from R_{DSon} and I_{max}).

Example, for a 110V mains supply, each primary winding would have:

Supply voltage to drains (110V AC):	$V_{DD} = 110 \times 1.41 - 1.4 = 154V$
Vdc Switching voltage at the drain:	$V_{DDpp} = 2 \times (V_{DD} - V_{DSsat}) = 302V_{pp}$
At 4 Vpp per turn:	$N = V_{DDpp} / 4 = 76 \text{ turns.}$

On secondary the calculations are straight forward, just divide the required peak-to-peak voltage by four (as we are using 4V_{pp} per turn)

Abb./Fig. 3: Block Diagram



Benutzt man einen größeren Kern, kann man einfach mit der Kernfläche skalieren. Siehe auch die Box für Beispiele.

Der Helixtransformator kann wesentlich kleiner sein, da die übertragene Leistung nur maximal 10W beträgt. Hier ist ein Kern mit 44mm^2 Querschnitt und einem 3C85 Material sinnvoll. Die Windungsspannung beträgt 3V. Dieser Kern kann für alle Leistungen des Netzteils (100...1000W) verwendet werden.

Modifikationen

Die vorliegenden Schaltpläne beschreiben ein Netzteil, das für eine RW1127 Röhre von Siemens mit einer Helixspannung von 5kV verwendet wird. Die Eingangsspannung beträgt 110V Wechselspannung.

Solche Teile, die von der Versorgungsspannung oder der gewünschten Helixspannung abhängen sind in den Tabellen 1 und 2 aufgeführt.

Alle anderen Teile müssen auf jeden Fall die dort anliegenden Spannungen sicher aushalten.

7. Concluding remarks

The power supply described in this article was tested on a few types of TWT and proved to be reliable under the most demanding situation like testing damaged tubes.

The prototypes of this supplies were always built with 110VAC input. This gave some room for errors and allowed prototyping with reduced smoke. I strongly recommend the use of 110VAC as all components on the primary side, namely the power FETs, will be operated far away from the maximum ratings.

One of the prototypes was used intensively several hours consecutively on a RW1125 and YH1102 during the November 98 microwave EME contest, without any failure or undue shutdown. The slim construction I used, that has only two small CPU fans for cooling (rotating relatively slow) operates several hours and remain nearly cold.

Several hams are already building copies of this supply and giving me useful feedback. Thanks to Hubert, ON6JZ Geert, PA3CSG

Sigi DL4OAN, and Alessandro IW5JWB for beta testing this design.

All comments and suggestions from builders will be in my web page as soon as I can make a nice compilation of all:
<http://escriba.cfn.ist.utl.pt/cupido>.

7. Bemerkungen

Die vorliegende Schaltung wurde intensiv, auch an defekten Röhren getestet.

Die Prototypen wurden immer für 110V Wechselspannung gebaut. Damit liegt man deutlich unter den Maximalwerten für die FET's.

Einer der Prototypen wurde mit einer RW1125 bzw. mit einer YH1102 im November 1998 während des EME-Kontest getestet. Es lief alles ohne Störung.

Ich möchte Hubert, ON6JZ, Geert, PA3CSG, Sigi, DL4OAN, und Alessandro, IW5JWB, für die Testserien und hilfreichen Beiträge danken.

Leser können Kommentare und Erfahrungen über meine WEB-Seite mit der Adresse <http://escriba.cfn.ist.utl.pt/cupido> berichten.

8. References/Literatur

- /1/ - Foundations for microwave engineering - R. Colin - McGraw Hill
- /2/ - Microwave tubes - A.S. Gilmour, Jr - Artech House
- /3/ - High power Microwave Sources - Artech House
- /4/ - Unitrode data sheet on the web at: <http://www.unitrode.com>

A SMA-Microstrip Junction

Charles Suckling, G3WDG

A new method of connecting the groundplane of a microstrip to an SMA connector has been developed as part of the effort to design some 2.3GHz power amplifiers. Normally the body of the SMA connector is soldered to the groundplane of the microstrip directly, as shown in Fig 1(a). This method is used in the majority of microwave pcb designs. However this method causes some problems in power amplifiers when the pcb is to be mounted either flat on a heatsink, or just above a

heatsink, in that the solder fillet on the groundplane side gets in the way, and the heatsink needs to be filed to accommodate it. Also, the connector has to be soldered to the board before the board is fitted to the heatsink, which causes major mechanical difficulties if the connector is not soldered perfectly square to the board, or if the heatsink is not exactly the same length as the pcb.

Fig. 1: Microstrip Launcher

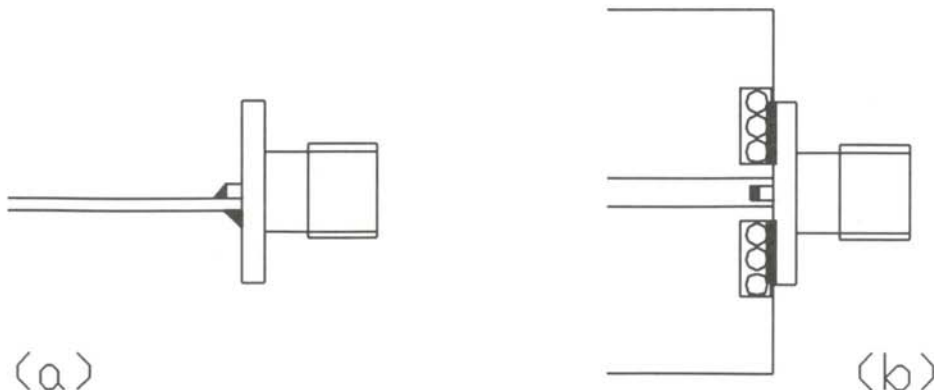
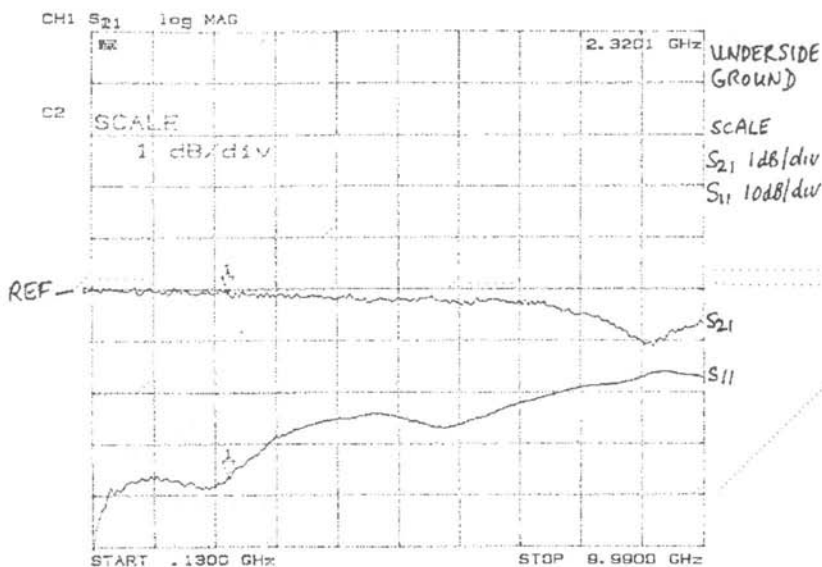


Fig. 2: Electrical Properties Ground Underside



To get round these difficulties, a new method of grounding the body of the connector has been developed, where grounded pads of metal are provided on the top side of the pcb, and these are soldered to the connector with no connection on the groundplane side. In the prototype, three veropins were used to ground each pad. The configuration is shown in Fig 1(b).

The performance of the new transition is shown. The performance of the conventional method is also given for comparison. In both cases, the microstrip was a 20mm long piece of 50 ohm line etched on 0.79mm thick material. The launch to the other end of the line was via a conventionally mounted SMA connector. It can be seen that the new transition has almost the same performance as the conventional type, having better than 30dB return loss up to about 2.8GHz and better than 20db return loss to nearly 7GHz.

This type of transition is being incorporated into the latest prototypes of 1W and 10W 2.3GHz power amplifiers, details of which should be published shortly.

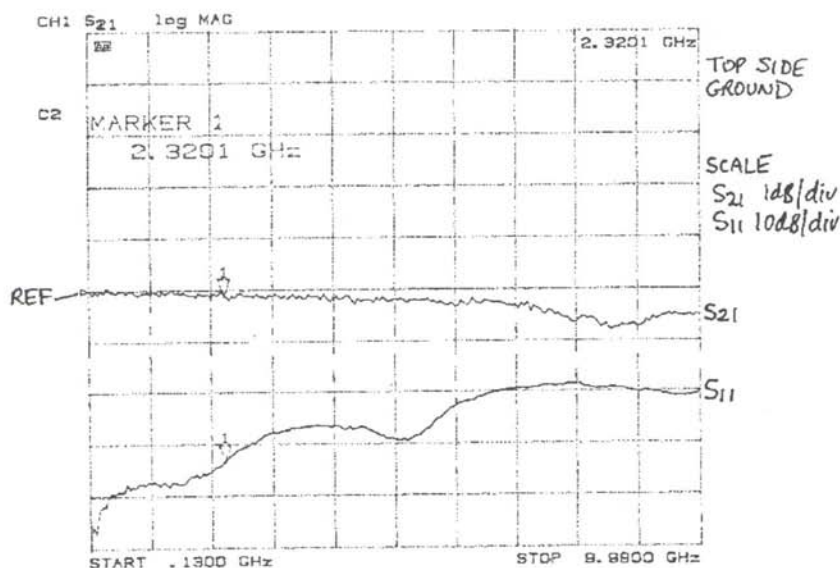
Deutsch:

Während der Entwicklungsarbeit an einer 13cm PA wurde eine neue Methode entwickelt, um eine SMA-Buchse elektrisch 'sauber' mit einer Mikrostreifenleitung zu verbinden.

Normalerweise wird eine Buchse wie in Abb. 1a gezeigt, mit der Leiterplatte verbunden. Bei Leistungsverstärkern, bei denen die Leiterplatte flach auf einen Kühlkörper montiert werden muß, stört die Lötstelle zwischen der Massefläche der Leiterplatte und der Buchse. Außerdem muß man die Buchse vorher festlöten, was zu Einbauschwierigkeiten führt.

In der neuen Befestigungsmethode (Abb. 1b) werden durchkontaktierte Masseflächen auf

Fig. 3: Electrical Properties Ground Topside



der Oberseite angeordnet, an denen die Buchse dann festgelötet werden kann. Drei Durchkontaktierungen pro Massefläche reichen aus.

Wie man aus den Abb. 2 und 3 erkennen kann, haben die 'alte' und die neue Methode kaum Unterschiede in den elektrischen Eigenschaften.

In beiden Fällen wurde eine 20mm lange 50Ω Mikrostreifenleitung auf ein 0,79mm dickes Substrat geätzt. Das eine Ende war immer mit einem konventionellen Übergang bestückt.

Die Einfügedämpfung liegt bei 2,3GHz unter 0,1dB und ist selbst bei 7 GHz weniger als 0,3dB. Die Rückflußdämpfung ist bis 2,8GHz besser als 30dB und selbst bei 7GHz noch besser als 20dB.

Es Openings on 2 m

Angel Nestorov, LZ1AG

Many of the active VHF DX-men would observe with regret that in the last 2-3 years they have not had a chance to come across a sporadic E propagation on 2 m. Even those who have developed their own techniques for predicting the appearance of ES are unable to gain from its rare and brief openings. Perhaps many of you are asking the question why has there been such a drop in the observed cases of ES on 2 m? Is this regular, or is it a demonstration of the "sporadic" character of the sporadic E-layer?

The purpose of this article is to share an idea which has arisen from my personal observations and data collected in the period 1974 - 1997. My observations include over 120 cases, while the information at my disposal suggests that during the period under consideration there have been a total of 629 days with ES propagation on 2 m in Europe.

Most of the information I have used comes from DUBUS, but I have also been made aware of certain cases by reading other radio amateur journals. While being convinced that these are not all the cases, as well as doubting the precision with which some of them have been reported, I nevertheless assume that the data at my disposal is sufficiently full and correct. It is this data that I will try to present to you.

Table 1 shows all dates in the period 1 May - 28 August, year by year, on which ES on 2 m has been registered. Beyond this period there have been reports of individual cases which are not reflected in the table, which in any case is already quite long. Are there any

comments on the completeness of this table? I would be grateful if you would help me fill in some of the empty cells in the table.

Let us look at the sum totals by date. The diagram in Figure 1 shows the number of ES openings on 2 m on any given date during the 24-year period under consideration. Bearing in mind that probability is defined as the relationship between the number of observations and the total amount of possible cases, this diagram indicates the probability of getting ES opening. It would appear that the highest probability is on 21 July, but in general the probability is high in the whole period from 1 June to 31 July. Perhaps if the number of years for which observations are made were to be doubled, the diagram will resemble even more the "bell-shaped" figure known by statisticians as a Gauss distribution. Whether described as normal or not, it is obvious that the distribution of the dates on which ES propagation occurred on 2 m in Europe is concentrated around the summer solstice of the sun (22 June) and covers the period from the beginning of May to mid-August.

The number of dates with ES opening on 2 m during each year in the period 1974 - 1997 has been used to construct the diagram in Figure 2. The period under consideration covers two solar cycles - 21 (1976 - 1986) and 22 (1986 - 1996). If each of these cycles is considered separately, it is evident that during solar cycle 21 there is a tendency for the number of days with ES propagation on 2 m to increase gradually from the beginning towards the end of the cycle. An opposite ten-

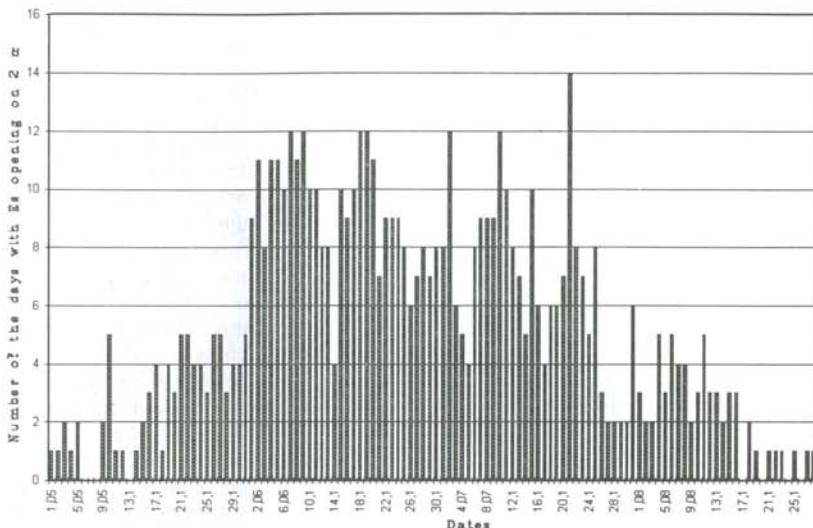
Table 1

Year	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
MAY	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
JUNE	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
JULY	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
AUGUST	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

dency is observed in cycle 22, during which the number of days with ES propagation decreases towards the end of the cycle. It may seem paradoxical that in the years with a minimum solar activity between the 20 and 21 cycle and 22 and 23 cycle, there is a small number of days with ES opening, while in the years with a minimum solar activity between the 21 and 22 cycle this number is the highest. This distribution made me think that there are also 22-year solar cycles, related to changes in the polarity of the magnetic fields of sun spots and the polarity of the magnetic field of the sun as a whole. Could it be the case that the appearance of ES propagation on 2 m is related to the status of the magnetic field of the sun in the course of the 22-year cycle? This would be difficult to prove, especially when the observations relate only to one 22-year solar cycle. In fact, what do we know about the 22-year solar cycles?

It is usual to talk about 11-year solar cycles, which astronomers associate with the spots observed on the surface of the sun. Each of these cycles begins with the appearance of a small number of spots at a relatively high latitude (most frequently 30-40) on both sides of the solar equator. During the 3-4 years which follow, the number of these spots increases constantly and they appear closer and closer to the solar equator. The maximum number of

Fig. 1. Number of the days with Es opening on 2 m on each date during the period 1974-1997



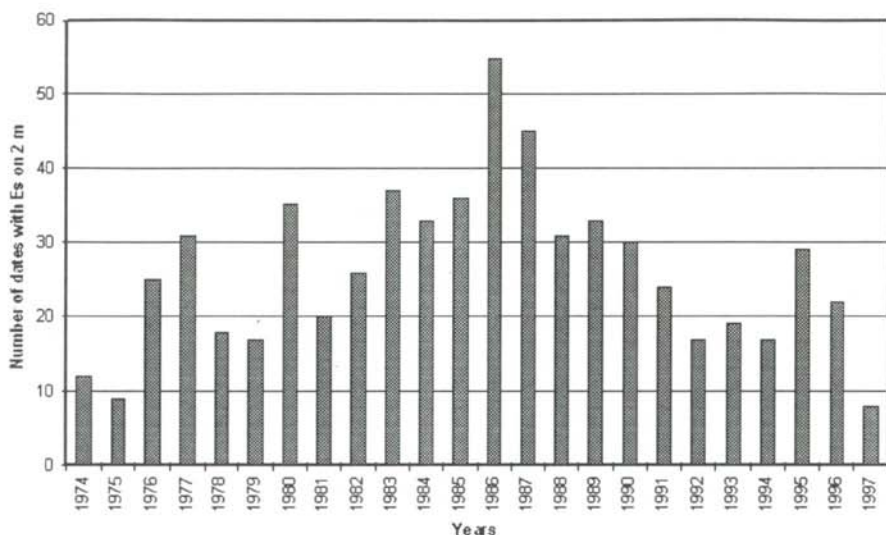
spots is usually reached by the 4-5 year. Subsequently there is a decrease in the number of spots, and they appear less frequently at high latitudes. In the course of the last 1-2 years of each cycle the spots appear primarily near the equator, and are fewer and fewer in number. This regularity was established by E.W.Mouder (1904) and since the figure which is formed when the spots are projected onto a plane resemble the wings of a butterfly, it is called "Mouder's butterfly". In fact, although Chinese astronomers were already familiar with the phenomenon of sun spots, it was only the solar cycle which began in 1755 that was designated as number 1.

In the first decade of 20th century it became possible not only to register sun spots, but also to study some of their properties. W.G. Hale discovered that the spots have strong magnetic fields and there is a regularity in their polarity throughout the 11-year solar cycles. For example, in the course of a cycle the spots north of the solar equator are always

situated in such a way that east is "+" and west is "-", while south of the equator it is the other way round: east is "-" and west "+" (one should be reminded that "-" stands for the earth N pole, and "+" corresponds to the earth S pole). During the next cycle the polarity of the magnetic fields in the two hemispheres is reversed. In fact, Hale's law determines that every 22 years there is a full cycle of change of the solar magnetic fields. In other words, each pair of 11-year solar cycles forms one 22-year cycle. For the time being 22-year cycles have not been named or numbered by physicians and could in fact be seen as the combination of any two 11-year cycles.

I read in a popular book some time ago that on the sun - leaving aside all other factors which make human presence there impossible - man would be unable to use a compass. The magnetic fields of the spots are considerably more powerful than the overall magnetic field of the sun. Moreover, for a long time it was impossible to establish and measure

Fig. 2. Number of dates with Es opening on 2 m during each year in the period 1974-1997



the magnetic field of the sun. Interestingly, when in 1955 the 19th solar cycle began, it was established that the overall magnetic field of the sun was opposite to that of the earth, i.e. north was "+" and south "-". However, three years later (i.e. in 1958) the magnetic field of the sun was reversed and north became "-" and south "+". The polarity of the magnetic field of the sun is preserved in the course of 11 years and is reversed usually 3-4 years after the beginning of each cycle. A huge dynamo, whose field is reversed every 22 years!

Perhaps this makes it possible to observe an example of an earth phenomenon which is related to the 22-year solar cycle? I would like to propose the following tentative conclusion:

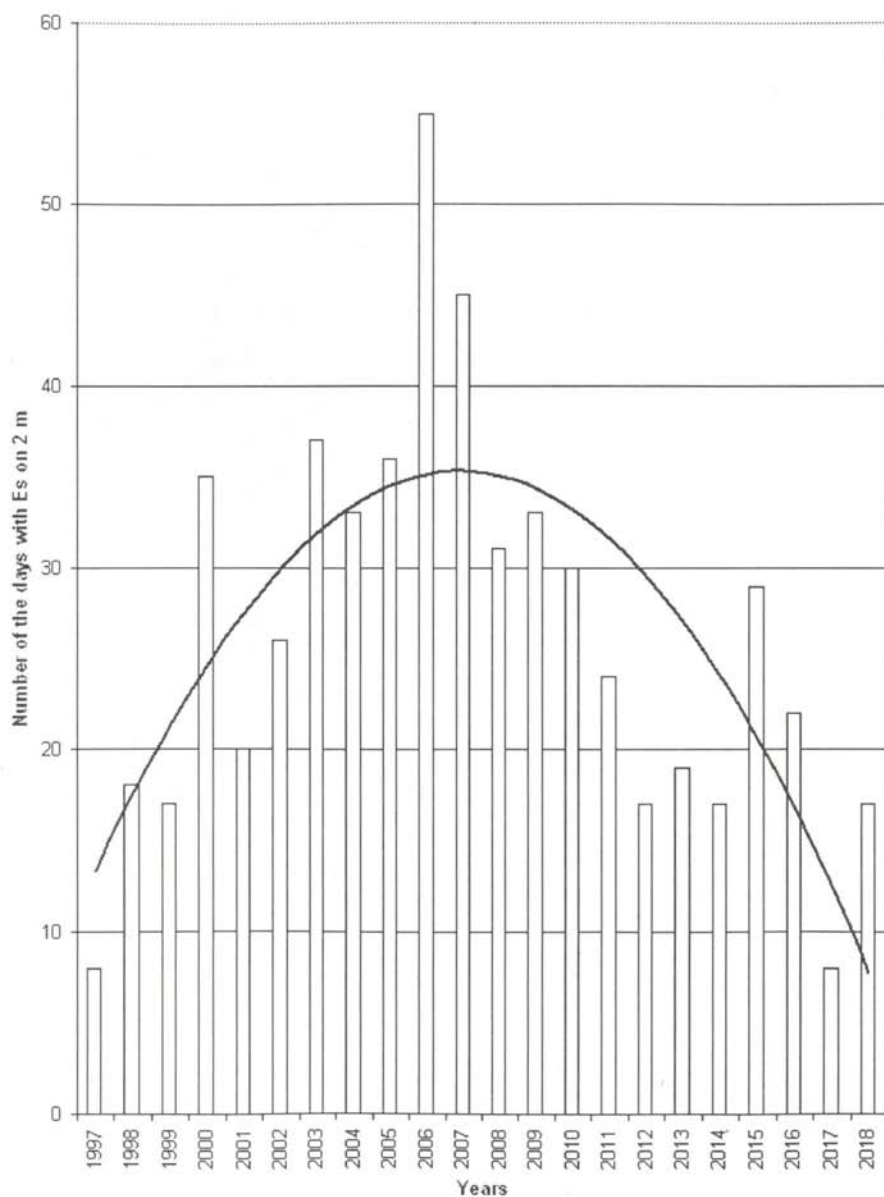
The appearance of ES propagation on 2 m is related to the 22-year solar cycles. In periods when the polarity of the magnetic fields of the earth and the sun coincide, the average number of annual cases of ES propagation is bigger than in periods when the respective polarities are opposite. The extreme values of the number of cases appear in the years of minimum solar activity.

Conclusion

Let us compare the data in figure 3 with the change in the magnetic field of the sun:

Periods	1974-1979	1980-1990	1991-1997
Magnetic Field Polarity	N +	-	+
	S -	+	-
Average annual number of the days with ES propagation on 2 m	18.7	34.6	19.4

Fig. 3. Trendline of solar cycles 21 and 22 transferred to solar cycles 23 and 24



There is nothing to do but to wait for the elapse of the next 22 years (and I am myself already 61), during which time more data will be collected on the appearance of ES on 2 m. Will the tendency outlined above be repeated? Look at Figure 3! I can only wish that in the next years there are more days with ES propagation on 2 m, with a new maximum in 2006. Perhaps that will create conditions for the first QSO on 70 cm with ES reflection.

Well, it is not forbidden to have dreams... Hence my invitation to you: let us try and establish whether there is a connection between the appearance of ES propagation on 2 m and 22-year solar cycles, by collecting and publishing as much information as possible in the years to come. For example, on the pages of DUBUS, which I find extremely useful. Besides at present we have INTERNET and my be after 2005 we will have something which we do not know yet.

As for the rest, it is the job of physicists, who still owe us an explanation of the nature of processes which take place in the sun and in the earth ionosphere and make ES propagation on 2 m such an exciting event. Or perhaps such explanations would deprive us of an enjoyment?

Microwave Parts

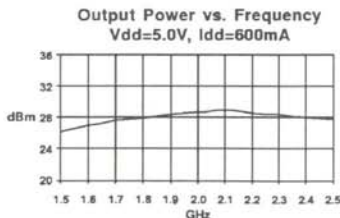
Editor: Rainer Bertelsmeier, DJ9BV

Product Description

Stanford Microdevices' SMM-208 is a gallium arsenide monolithic-microwave-integrated circuit (MMIC) amplifier housed in a low cost, surface-mountable ceramic package. Designed for operation in wireless systems operating in the 1.5 to 2.5 GHz frequency range, this amplifier has 25dB of gain with +28dBm of output power at mid-band with proper heat-sinking.

The SMM-208 will operate with supply voltages as low as 3 volts, making it suitable for use in portables.

Also available in die form, its small size (2.0 x 1.5mm), makes it suitable for use on thin and thick film circuits. Proven gold-based metallization and die passivation add to the reliability and durability of this device.



Electrical Specifications at T_a = 25°C

Symbol	Parameters: Test Conditions	Units	Min.	Typ.	Max.
P _{1dB}	Output Power at 1dB Compression: V _{ds} = 5.0V, I _{ds} = 600mA	f = 2.0 GHz f = 2.4 GHz	dBm	27	28 27
G _A	Associated Power Gain V _{ds} = 5.0V, I _{ds} = 600mA	f = 2.0 GHz f = 2.4 GHz	dB	25	27 24
P _{SAT}	Saturated Output Power V _{ds} = 5.0V, I _{ds} = 600mA	f = 2.0 GHz f = 2.4 GHz	dBm	30	31 29
P _{1dB}	Output Power at 1dB Compression: V _{ds} = 3.0V, I _{ds} = 400mA	f = 2.0 GHz f = 2.4 GHz	dBm	24	25 24
G _A	Associated Power Gain V _{ds} = 3.0V, I _{ds} = 400mA	f = 2.0 GHz f = 2.4 GHz	dB	21	23 22
PAE	Power Added Efficiency V _{ds} = 5.0V, I _{ds} = 600mA		%	20	25
VSWR	Input and Output		-		2:1
IP ₃	Output 3rd Order Intermodulation Point V _{ds} = 5.0V, I _{ds} = 600mA	f = 2.0 GHz	dBm	37	38

SMM-208

1.5-2.5 GHz, 0.8 Watt GaAs MMIC Amplifier



Product Features

- 25dB Gain and +28dBm P_{1dB}
- High Power Added Efficiency
- 5dB Noise Figure
- Characterized at 3 Volts
- Low Cost Surface-Mountable Package

Applications

- 1.9 and 2.4 GHz Wireless Systems
- Portable applications

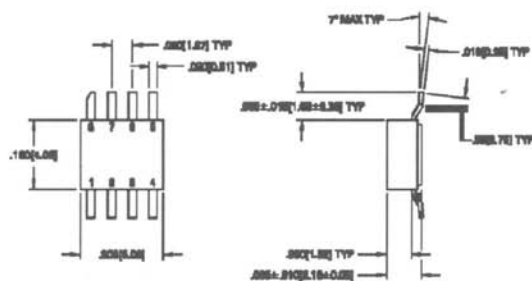
SMM-208 1.5-2.5 GHz 0.8 Watt GaAs MMIC Amplifier

Absolute Maximum Ratings

Parameter	Absolute Maximum
Positive Supply Voltage (V+)	+10V
Positive Supply Current (I+)	700mA
Negative Supply Voltage (V-)	-10V
RF Input Power (Pin)	250mW
Operating Temperature	-45C to +85C
Storage Temperature	-65C to +150C

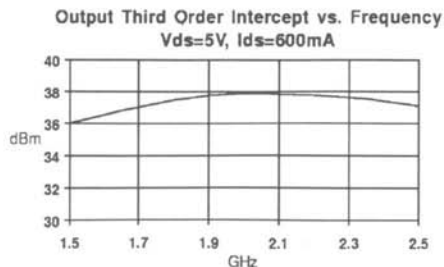
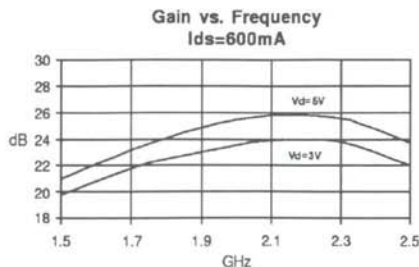
Notes:

1. Operation of this device above any one of these parameters may cause permanent damage.
2. Mounting Surface Temperature = 25°C



Pin numbers shown for reference only, not marked on part

Pin Designation	
1	Ground
2	Vdd
3	RF in
4	Ground
5	Ground
6	RF out
7	Vg = -5V
8	Ground

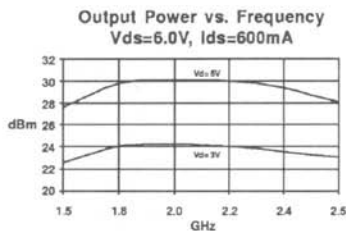


Product Description

Stanford Microdevices' SMM-210 is a high performance gallium arsenide monolithic-microwave-integrated circuit (MMIC) housed in a low cost, surface-mount ceramic package. Designed for operation in wireless systems operating in the 1.5 to 2.5 GHz frequency range, this amplifier has 26dB of gain with 30dBm of output power at mid-band with proper heat sinking.

These amplifiers will operate with supply voltages as low as 3 volts, making it suitable for use in portables.

Also available in die form, its small size (2.0 x 1.5mm), makes it suitable for use on thin and thick film circuits. Proven gold-based metallization and die passivation add to the reliability and durability of this device.



Electrical Specifications at T_a = 25°C

Symbol	Parameters: Test Conditions		Units	Min.	Typ.	Max.
P _{1dB}	Output Power at 1dB Compression: V _{ds} = 6.0V, I _{ds} = 600mA	f = 2.0 GHz f = 2.4 GHz	dBm	29	30 28	
G _A	Associated Power Gain: V _{ds} = 6.0V, I _{ds} = 600mA	f = 2.0 GHz f = 2.4 GHz	dB	25	27 24	
G _A	Associated Power Gain: V _{ds} = 3.0V, I _{ds} = 400mA	f = 2.0 GHz f = 2.4 GHz	dB	22	24 21	
P _{SAT}	Saturated Output Power: V _{ds} = 6.0V, I _{ds} = 600mA	f = 2.0 GHz f = 2.4 GHz	dBm	30	31	
PAE	Power Added Efficiency: V _{ds} = 6.0V, I _{ds} = 600mA	f = 2.0 GHz f = 2.4 GHz	% %	20	25	
VSWR	Input and Output		-		2:1	
IP ₃	Output 3rd Order Intermodulation Point: V _{ds} = 6.0V, I _{ds} = 600mA	f = 2.0 GHz	dBm	37	39	

SMM-210

1.5-2.5 GHz, 1 Watt GaAs MMIC Amplifier



Product Features

- 26dB Gain and 30dBm Output Power
- High Power Added Efficiency
- Characterized at 3 Volts
- Low Cost Surface Mount Package

Applications

- PHS, INMARSAT
- Portable Applications

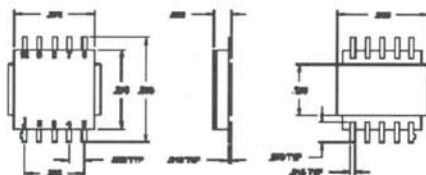
SMM-210 1 Watt GaAs MMIC Amplifier

Absolute Maximum Ratings

Parameter	Absolute Maximum
Positive Supply Voltage (V+)	+10V
Positive Supply Current (I+)	700mA
Negative Supply Voltage (V-)	-10V
RF Input Power (Pin)	250mW
Operating Temperature	-45C to +85C
Storage Temperature	-65C to +150C

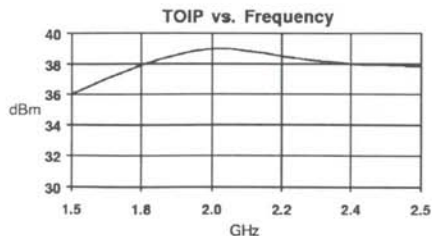
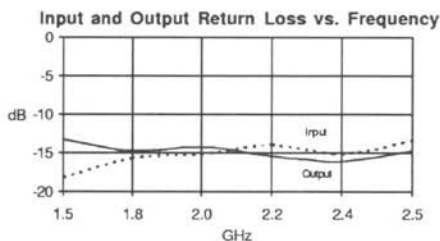
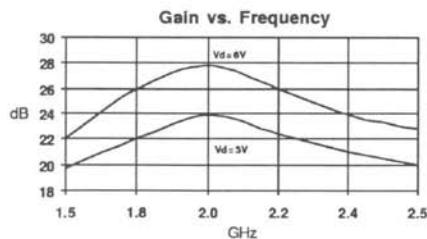
Notes:

- Operation of this device above any one of these parameters may cause permanent damage.
- Mounting Surface Temperature = 25° C



Pin Designation	
1	Ground
2	Ground
3	RF In
4	Ground
5	Vg = -5V
6	Ground
7	Ground
8	RF out
9	Ground
10	Vd = +5V

Typical Performance at 25° C (Ids = 600mA)

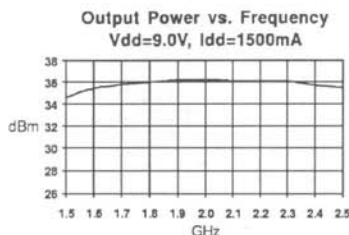


Product Description

Stanford Microdevices' SMM-280-2 is a gallium arsenide monolithic-microwave-integrated circuit (MMIC) amplifier housed in a copper-tungsten package for efficient heat transfer.

Designed for operation in wireless systems operating in the 1.5-2.7 GHz frequency range, this amplifier has 24dB of gain and +33dBm of output power at P1dB.

This 3-stage amplifier's output third-order intercept point is typically +43dBm when biased at 9 volts and 1.5 amps.



Electrical Specifications at $T_a = 25^\circ\text{C}$

Symbol	Parameters: Test Conditions		Units	Min.	Typ.	Max.
P_{1dB}	Output Power at 1dB Compression: Vdd = 9.0V, Idd = 1500mA	f = 1.8-2.4 GHz f = 1.5-2.7 GHz	dBm	33	33.5 33	
G_{1dB}	Gain at P1dB Compression: Vdd = 9.0V, Idd = 1500mA	f = 1.8-2.4 GHz f = 1.5-2.7 GHz	dB	21 18	24	
P_{SAT}	Saturated Power Output: Vdd = 9.0V, Idd = 1500mA	f = 1.8-2.4 GHz f = 1.5-2.7 GHz	dBm		34 33.5	
VSWR	Input and Output		-		1.7:1	
IP_3	Output 3rd Order Intermodulation Point: Vdd = 9.0V, Idd = 1500mA	f = 1.5-2.7 GHz	dBm		43	
PAE	Power Added Efficiency: Vdd = 9.0V, Idd = 1500mA	f = 1.5-2.7 GHz	%	15	20	

SMM-280-2

1.5-2.7 GHz, 2 Watt GaAs MMIC Amplifier



Product Features

- 24dB Gain and +33dBm Output Power
- High Third Order Intercept, +43dBm Typ.
- High Power Added Efficiency
- Low VSWR, 1.7:1 Typ.
- Copper/Tungsten Package

Applications

- Power Amplifier for Wireless Systems

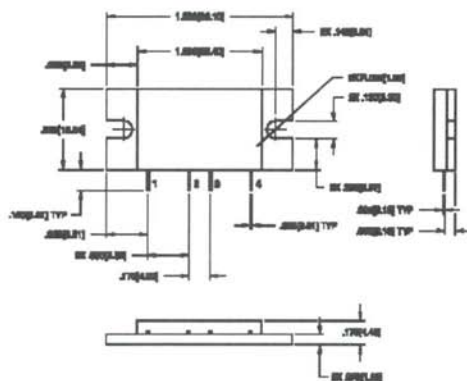
SMM-280-2 1.5-2.7 GHz 2 Watt GaAs MMIC Amplifier

Absolute Maximum Ratings

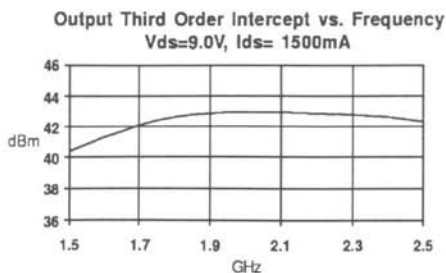
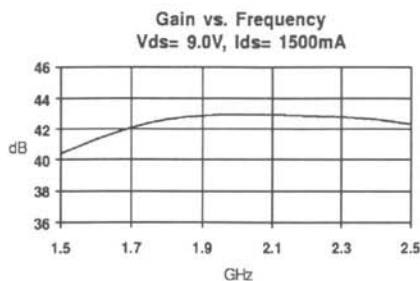
Parameter	Absolute Maximum
Positive Supply Voltage (V+)	+12V
Positive Supply Current (I+)	1800mA
Negative Supply Voltage (V-)	-10V
RF Input Power (Pin)	500mW
Operating Temperature	-45C to +85C
Storage Temperature	-65C to +150C

Notes:

1. Operation of this device above any one of these parameters may cause permanent damage.
2. Mounting Surface Temperature = 25° C



Pin Designation	
1	RF out
2	Vd = +9V
3	Vg = -5V
4	RF in



Microwave Europe

Editor: John Sørensen, OZ1IPU

1296 MHz

F6HTJ/p JN12EK 2300m asl wkd: 10.5.98 EA5/F6GBQ/p IM98XR 460 km. F6HTJ JN12KQ wkd: 29.5.98 TK/DC3VW/p JN42LM, 19.6.98 I1SCL JN33UT, 6.7.98 IZ5EME JN52NS. Rig: 8W 55el F9FT. Tks fer info Michel.

2304 MHz

F6HTJ/p JN12LL 1100m asl wkd: 25.10.98 EA6ADW/p JM19NW (1st F/EA6 ?). Rig: 5W 52el loop yagi. Tks fer info Michel.

2320 MHz

F6HTJ/p JN12EK 2300m asl wkd: 10.5.98 EA5/F6GBQ/p IM98XR 460km, 2.8.98 F1BOH/p JN24NI 16.8.98 F5KTL/p JN05TO, 4.10.98 F6BVA/p JN33DU. Rig: 5W 52el loop yagi. Tks fer info Michel.

3400MHz

DG1VL/p JO61XE wkd: 4.10.98 DG2DWL/p JO60VR. Rig: FT290RII, Transverter 400mW/4dB, 60-er Dish. Tks fer info Henry.

5760MHz

DG1VL/p JO61XE wkd: 4.10.98 OK1KIR/p JO60PM, DG2DWL/p JO60VR DG0VO/p JO60UT. Rig: FT290RII, Transverter 500mW/4dB, 60-er Dish. Tks fer info Henry.

F6DRO JN03SM wkd: 6.6.98 F6KNB/p JN04, 22.6.98 F5HRY JN18 one way only 28.6.98 F6ETU/p JN13, F5FLN/p JN04, F5JWF/p JN35, 4.7.98 F1HDF/p JN18, F6KBF/p JN18, 6.7.98 F1XAO/p IN88, 10.7.98 F1JGP JN17, 18.7.98 F1SAH/p IN93 25.7.98 F5FLN/p IN92, 26.7.98 F1HDF/p JN18, F6ETU/p JN13, F8UM/p JN05 F5FLN/p IN92, F1NWZ JN17 one way only,

10.8.98 F1GHB/p IN88 (odx 669km), 27.9.98 F5FLN/p IN93. Rig: 75cm, 6w, NE325, Unfortunately, low activity on that band. Tks fer info.

10368MHz

DG1VL/p JO61XE wkd: 07.06.98 OK1DFC/p JO71FA, DK0FLT JN59FW via RS, DJ7AL JO61VC, OK1DST/p JO70GU, 25.06.98 OK1JKT/p JO60OK via RS, DL2NUD JO63MF via RS, DG8EB JO60CK via RS, DL6NCI JO50VI via RS, DL3YEE JO42GE via RS, Hrd: DB0HEX/B JO51, DB0JX/B JO30LX via RS, 4.10.98 OK1KIR/p JO60PM, DG0VO/p JO60UT, OK1UWA/p JO60LJ, DG2DWL/p JO60VR, DK0WAL JO61OA, OK1KRU/p JO70LR, DB6NT JO50TI, DG0VO/p JO60UT, OK1KEI/p JN79CX, DG0VE JO71AG. Tks fer info Henry.

F6DRO JN03SM wkd: 17.3.98 FX0SHF/B JN17, 2.4.98 F1XAP/B IN88, 3.5.98 F1AAM/p JN13 one way only, 15.5.98 FX0SHF/B 53rs, F1JGP JN17 59RS, 16.5.98 F5BUU/p IN93 17.5.98 F1BJD/P/IN98 one way only, 21.5.98 F5FLN/p IN94, F5FVP/p IN95, 24.5.98 F9QN/p JN04, 31.5.98 F1EIT/p JN02, F6BVA/p JN24, F9QN/p JN04, F4ARY/p JN03, F5FLN/p JN04, F5BUU/p JN03, F5FVP/p JN04, F8UM/p JN05, F6DKW JN18 one way, 6.6.98 F5FVP/p JN04, F5BUU/p JN04, F6KNB/p JN04, F6KUB/p JN04, 10.6.98 F5XAD/b JN12 54rs, 20.6.98 F1ANY/p JN12, F6BVA/p JN23, F1EIT/p JN12, 21.6.98 TM2SHF JN42 (odx 600km), 27.6.98 F5XAD/b JN12 55rs, F6BVA(fixed!) JN33 53rs, 28.6.98 F6ETU/p JN13, F6BVA/p JN23, F9QN/p JN04, F5FLN/p JN04, F8UM/p JN05, F5FVP/p JN04, F1GTx/p JN03, F4ARY/p JN04, 1.7.98 F5XAD/b JN12 59+RS, 4.7.98 F6KUB/p JN04, 5.7.98 F1BJD/p IN98, one way only, F6KPQ/p IN87 (odx 606km), F5FVP/p IN94, 11.7.98 F6CGB/p JN12, F5GGL/p JN03, 18.7.98 F6CGB/p JN12, F5XAD/b JN12 59RS, 19.7.98 F6CGB/p JN12, F1GTx/p JN03, F1EIT/p JN02, 24.7.98 F5FLN/p IN92, 25.7.98 F5FLN/p IN92, 26.7.98 F5BUU/p JN03, F6ETU/p

JN13, F1GTX/p JN03, F6CGB/p JN12, F1PYR/p IN87(553km), F1BLQ/p JN04, F1EIT/p JN02, F5FVP/p JN04, F5FLN/p IN92, F2SF/p JN12, F1ANY/p JN12, F1HDF/p JN18(525km), 2.8.98 F5MDY/p JN13, 10.8.98 F6ETZ IN97, F1GHB/p IN88(odx 669km) super tropo but no activity. 11.8.98 F6ETI/p IN87 9+ again no activity. 13.8.98 F5XAD/b JN12 59rs, 4.9.98 F5UEC JN07, F6DWG/p JN19 both hrd 319 but no qso!, 6.9.98 F1ANY/p JN02, F9QN/p JN04, F5BUU/p JN03, F5FLN/p JN04, F4ARY/p JN04, F6ETU/p JN13, 26.9.98 F1XAE/b JN24 53rs, F5XAD/b JN12 55rs, F6DKW JN18 55rs(cw+ssb), 27.9.98 F5FLN/p IN93, F1BJD/p IN98 one way, F5BUU/p JN03, F5FVP/p JN03, F4ARY/p JN03, F6BVA/p JN23, 4.10.98 F5CAU/p JN14, F6BVA/p JN33, F6DPH/p JN18 one way, 5.10.98 F5XAD/b JN12 55rs, 6.10.98 F5XAD/b JN12 55rs, 25.10.98 F1AAM/p JN24 57rs, F5RVO/p JN24 57rs, F1BJD/p IN98 52rs(530km), F6CBC IN94 52rs, F5PL/p JN02, F2SF/p JN12, F5UEC/rover JN05, 16.12.98 F6DKW JN18 59+, F5HRY JN18 good tropo only two guys active, 17.12.98 F6APE IN97 59+ nobody else qrv, 27.12.98 F5BUU/p JN03. Rig:60cm/4W/ATF36077. Too low number of fixed stations QRV on 3cm. Many good tropos and rs openings are really unproductive. Tks fer info F6DRO.

OK1JKT JO60OK wkcd: 16.7.98 DL1VAA JO61 RS, OE3LFA JN88, 17.7.98 DL1VAA JO61 RS, 19.7.98 OK1UVY JO60, 21.7.98 OE5VRL/5 JN78 RS, DG0RG JO62 RS, DL6NCI JO50 RS, DF6TK JN47 RS, DJ7GK/A JN69 RS, DG7MHR JN57 RS, DD7MH JN68 RS, DB6NT JO50 RS, DL1YMK JO31 RS, HB9AMH JN37 RS,

22.7.98 DL1VAA JO61, 23.7.98 OE5VRL/5 JN78 RS, DL1VAA JO61 RS, DD5OI JN57 RS, DG7MHR JN57 RS, DK9MN JN58 RS, HB9AMH/p JN37 RS, DB4CE JN57 RS, DL4WO JO61 RS, 25.7.98 DG7MHR JN57 RS, DC8EC JN57 RS, DK9MN JN58 RS, 27.7.98 DL6NCI JO50 RS, DJ1KP JO40 RS, 30.7.98 OK1VTF JN78 RS, OE5VRL/5 JN78 RS, 1.8.98 DL0RCW/p JO60, DL1VAA JO61 RS, 12.8.98 DG0RG JO62 RS, DK9MN JO58 RS, DD7MH JN68 RS, DL6NCI JO50 RS, DL1VAA JO61 RS, DF6NA JN49 RS, DL4EAU/p JO51 RS, 15.8.98 I4JED/3 JN56, Rig: Ant 1,2m dish, Rx: 3dB, Tx 1,3W. Tks fer info Karel.

24192MHz

DL4WO/p und DG1VL/p JO61XE wkcd: 4.10.98 DG2DWL/p JO60VR, DK0WAL JO61OA, OK1UWA/p JO60LJ 113km. Rig: FT290R, DB6NT Transverter, abt 50mW, 65-er Dish. Tks fer info Henry.

The next deadline is 15. May 1999, your reports can be send to me on Fax ++45 98467877, E- mail dmtechnik@post4.tele.dk as a ASCII-DOS text or by post to my NEW ADDRESS: John Sorensen, Solystvej 13, DK-9300 Sæby, Denmark, and please if possible on a disk in ASCII- DOS text, that will help me a lot, thank you. 73 de John Sorensen OZ1IPU

Microwave: World Firsts and World Records

Band (GHz)	World First QSO			World Record		
	Date	Calls	QRB (km)	Date	Calls	QRB (km)
10	1946-05-06	W2JRM-W2JN	3.3	1994-12-30	VK6KZ/p-VK5NY/p	1912
24	1975-10-14	G3BNL/P-G3EEZ/p	150	1998-09-03	JM3KMO-JR3EDZ	402
47	1984-10-03	HB9AMH-HB9MIN	1	1998-05-15	F6BVA/p-F5CAU/p	193
76	1985-12-30	HB9MIN-HB9AGE	0.5	1995-12-07	HB9MIO/p-DK4GD/p	114
145	1992-12-12	DB6NT/p-DL1JIN/p	1	1997-04-07	DL6NCI/p-DB6NT/p	53
241	1993-05-23	DB6NT/p-DL1JIN/p	0.1	1995-06-07	DB6NT/p-DF9LN/p	2.1
411	1998-01-06	DB6NT/p-DL1IN/p	0.05	1998-01-06	DB6NT/p-DL1IN/p	0.05

If you have an update or a correction, please write to:

John Sørensen, OZ1IPU, Rosenvej 49, DK-9300 Sæby, Denmark. Tel.: (++45)9846-3311

Microwave Japan

Editor: Toshihiko Takamizawa, JE1AAH

It is more than a year since last News from Japan was appeared on the DUBUS. I have been VY QRL and have had a limited time for radio program. Will try to get back to RF field this year for more on MW.

Cumulative MW contest in Japan

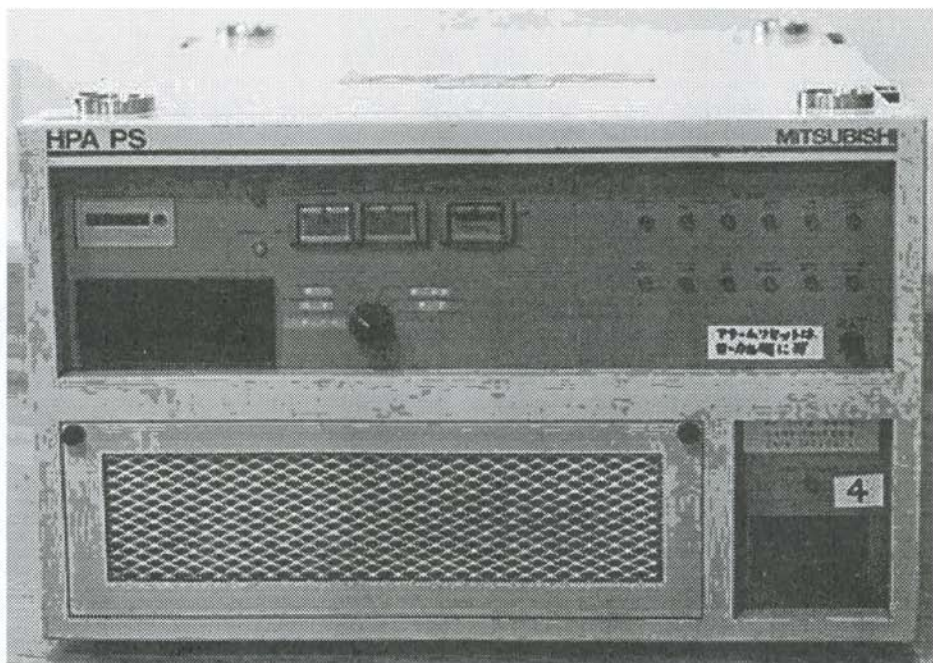
This year is a second year of cumulative microwave contest in Japan. Although last year result was not announced yet but I hope we will see many activity on the MW band this year.

First oversea DX on SHF Last October we had first oversea DX on 10GHz to Korea. The

QSO was made using ATV by ATV group(led by JA6ENX) in JA6 area. There were more than 30 people working at different location so I could not know who is the first. On HL end, HL5BBD, HL5BHZ, HL5BLI, HL5UPJ were on the air. The group has been trying this QSO since 1997. See detail on the web, <http://www.mars.dti.ne.jp/~njosi100/microwave/MWN9810.html>

This is Japanese HP but you can see JPEG files of antenna and others. As everybody know that Japan is located east end of continental and west end of BIG Pacific ocean. This makes JA hams difficult to make oversea

Mitsubishi High Power TWT



DX QSO(all DX is oversea, Hi!) on MW band. We made 1.2GHz QSO to Korea before but no QSO on SHF. Congrat JA6 OMs who makes this first 10GHz oversea QSO.(not only first 10GHz oversea but first SHF oversea!)

More Drakes

JE1AAH has sent more than 300pcs of Drake S band converter to hams in VK, G, DL, W and other countries. There are more than 100s of the unit still available. Contact Toshi for the unit. It is nice PIII-D S band reception as well as terrestrial DX use. Modification is appeared on Internet. According to those information, it is easy to modify the unit for lower NF and higher gain.

X band high power station

JR1EDE, Kohjin, is trying to get EME on 10GHz ready. Recently he discovered used high power TWT made by Mitsubishi(?) which was originally designed for Ku band satellite uplink module used for SNG(satellite news

gathering). He measured more than 400W output on 14GHz. Unfortunately, He found that the output circulator does not work on X band. He is trying to get WR75(original input/output waveguide) and WR90 WG components(high isolation couplers, dummies, etc) to complete EME transmitter. He is continuously trying to work the TWT to run on 10GHz. WA7CJO is helping him.

The TWTA unit was made by Mitsubishi(how nice it is!) and tube was made by Thomson-CSF as JR1EDE mentioned. Below is technical data of the tube (Thomson-CSF TH 3591B):

Helix voltage: 9.75 - 11.25 kV

Helix current: 15mA

Collector voltage: 4.75 - 6.2kV

Anode voltage: 5.25 - 6.7kV

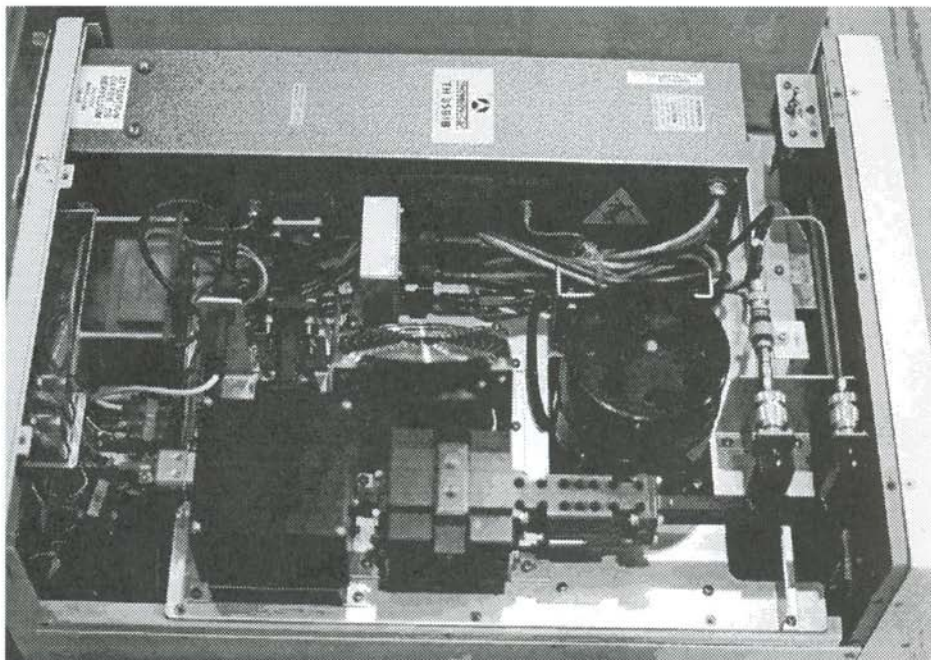
RF input power: 20mW

Output power: 750W (observed 400W@14.6GHz didn't try further)

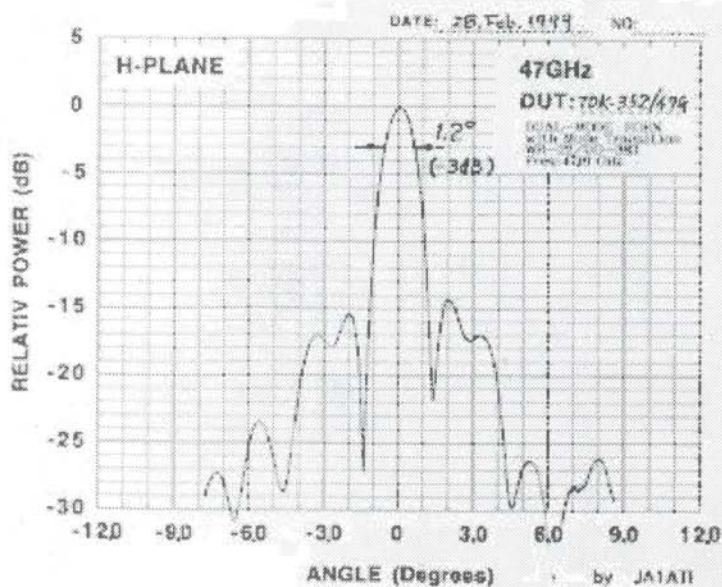
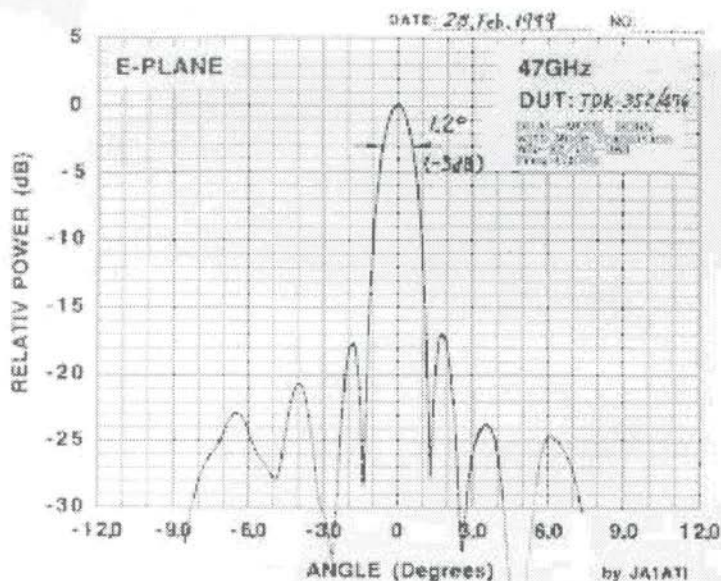
Frequency Range: 13.9 - 14.6 GHz

Gain: 49dB minimum

Mitsubishi High Power TWT



47 GHz Dish



47GHz dish as bolt-on-kit

JA1ATI, Masatake, is one the top notch JA SHF frontier. He has recently made good dish for 47GHz. Originally dish was made for commercial satellite TV receiving system(DBS) and it has unique center feed system made by TDK. Other manufacture is using offset dish for this DBS system. He modified this 35cm TDK DBS antenna to 47GHz as bolt-on-kit. Description follows.

47GHz parabolic antenna using DBS dish by JA1ATI

This is to outline modification of TDK DBS antenna(TDK-352) to 47GHz as a bolt-on-kit form. It is very easy to modify the dish to 47GHz since feed line is interchangeable.

FD ratio of the dish was measured 0.3 which requires radiation angle of 94 degrees at -10dB point. This is realized by sub-reflector type feed.

The sub reflector is 70mm dia aluminum block and it tolerance is within 0.05mm by NC machinery technology. Dual mode horn(IMU type) was used as E/H plane pattern of the dual mode horn is even and has less side lobes characteristics. Since rectangular waveguide is used for feed line, circular transition was used.

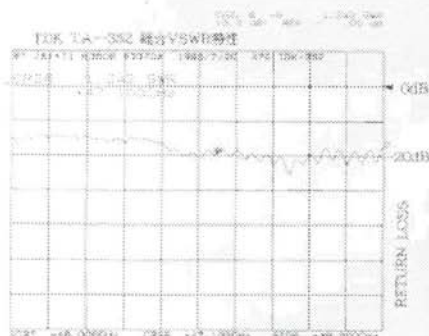
Gain was measured 40.1dB which was obtained by comparison to reference horn antenna. Beamwidth is 1.2degree(-3dB) while VSWR is around 1.3. Please refer to chart for gain, beamwidth and VSWR

Cost of the original DBS antenna is 67USD and modification parts costs about 300USD. This is prompt report and full detail will appear in future DUBUS(JE1AAH).

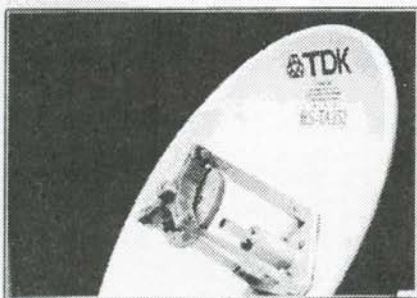
JE1AAH HP and mail address

JE1AAH Toshi could be reached at toshi@kw.netlaputa.ne.jp (no more OR domain) Or ttakamizawa@jp.ko.com. HP is <http://www.netlaputa.ne.jp/~toshi> JE1AAH activity as well as US surplus information is on the HP.

47GHZ Dish



TA-352用給電系の
総合VSWR特性



TA-352用に組立てた
47GHz 給電系

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EME News

Editor: Bernd Wilde, DL7APV

intro: The ARRL contest is over, activity seemed to be normal, but condx were partial very good. Next contest is in progress REF/DUBUS dates are 27/28 Feb and 27/28 March, see lunar calendar. A big discussion started after the ARRL contest about **skeds in contests!!** To get a clear picture let us know your opinion, should there be skeds during the contest or should they not count?

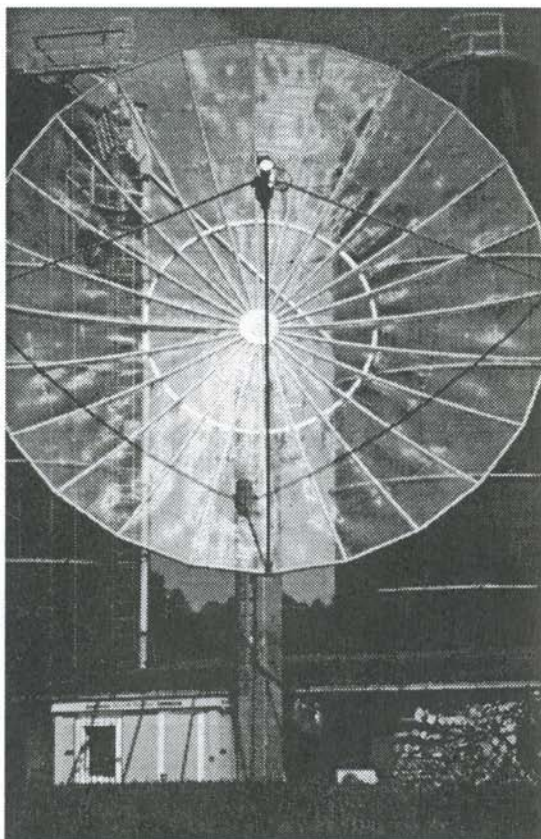
W5UN, OE5JFL, SM5FRH, WA1JOF, G4TYL, VE7BQH, K5GW, SM3MXR, LA9NEA, EA3DXU, PA1OGF, WB5LBT, GD4IOM, UA4AAV, W0HP, OH2BC, AF9Y, W4AD, N2WK, K1UHF, WA6PEV, W9HLY, W7UPF, YO2AMU, DL9GS, DK5YA, SP7DCS, UA3PTW, VE2JWH, PE1LCH, HB9Q, K2GAL, K5AIH, S52LM, RU1A,

HB9BBD's 10m Dish

144 MHz

CT1DMK: worked CT1WB O/O for the first CT-CT via EME on 05.sept.98, during the arrl contest added 13 new ones and 2 new DXCC, GD and LZ, wkd 10/11. oct.98 IK3MAC, I2FAK, F3VS, DJ5MN, OZ1HNE, SM5FRH, I3DLI, HB9Q, KB8RQ, WA9KRT, W5UN, K7CA, WB5LBT, K5GW, VE1ZJ, K8BHZ, JL1ZCG, SM5BSZ, SM5DCX, SM2CEW, SM5MIX, AA4FQ, VE3KDH, EA6VQ. On 5/6.nov. 98 GD4IOM, EA2LU, K1CA, K6MYC, K2GAL, OH2BC, OZ9AAR, EA2AGZ, RU1A, K0GU, W7HAH, WA6PEV, LZ2US, PA2CHR, SM7SJR, JH2COZ. Cond. 4x11el + 1.2kW.tnx fer info Luis

OE5EYM wkd : in ARRL EME- Contest 1998: S57TW, VE3BQN, W7HAH, K2LME, W1XE, VE3KDH, F3VS, KB8RQ, WA9KRT, LZ2US, K6MYC, PA2CHR, I2FAK, K8BHZ, I5WBE, W0AH, SM5BSZ, I3DLI, DJ5MN, JA9FJI, JA9BOH, OK1MS, F6BSJ, 7K3LGC, EA2AGZ, JH2COZ, IK3MAC, OZ9AAR,



EME-TOPLIST

Call	small	SQR	DX	US	WAS	WAC	#
			CC	States			

144MHz

I2FAK	448	56	105	50	1993	1988	942
PA2CHR	254	43	63	48	--	1993	364
DJ7OF	150	28	30	22	--	1996	170
9A9B	66	16	21	11	--	--	84
PE1OGF	46	14	16	12	--	--	55
UA3PTW	40	12	14	9	--	--	41
EA1ABZ	37	15	17	?	--	--	39
SP7DCS	33	15	15	8	--	--	33
S53J	28	11	12	3	--	--	31
YO2AMU	23	11	17	4	--	--	29
YO2IS	21	10	6	10	--	--	31
JA9BOH	?	?	39	34	--	--	210
CT1DMK	?	?	41	?	--	--	118

432MHz

OK1KIR	229	43	62	43	--	1982	329
G3LTF	206	?	55	47	--	--	327
DL7APV	128	26	32	40	--	1984	151
F1ANH	117	24	30	23	--	--	141
YO2IS	113	23	33	23	--	--	139
OE9ERC	107	24	27	22	--	1993	126
G4ERG	77	21	24	19	--	--	93
OK1CA	71	24	25	22	--	1996	121
EA6ADW	64	19	23	19	--	--	65
CT1DMK	49	?	19	?	--	--	49
PA2CHR	38	14	17	10	--	--	45
OK1DFC	21	12	11	6	--	--	21
JA9BOH	?	?	48	42	--	--	296
G3SEK	?	?	54	42	--	--	275
ZS6AXT	?	?	34	?	--	--	134

1296MHz

OE9ERC	140	29	35	28	--	1993	201
OK1KIR	112	29	34	24	--	1989	139
G3LTF	108	?	31	20	--	--	134
F1ANH	100	24	30	20	--	1994	128
EA6ADW	97	23	29	23	--	1994	129
DJ9YW	96	26	32	17	--	1998	104
HB9BBD	92	23	31	20	--	1994	119
CT1DMK	67	?	24	?	--	--	69
OK1DFC	58	18	24	11	--	--	65
OK1CA	34	16	18	7	--	--	31
JA9BOH	?	?	1	?	--	--	2
HA5SHF	?	?	20	6	--	--	46
ZS6AXT	?	?	30	?	--	1993	142

2300MHz

OE9ERC	41	14	19	8	--	--	44
OK1KIR	31	13	17	8	--	--	32
F1ANH	16	8	11	5	--	--	17
G3LTF	13	?	12	2	--	--	14
EA6ADW	8	4	8	1	--	--	9
ZS6AXT	?	?	16	?	--	--	27

5760MHz

OE9ERC	14	7	12	2	--	--	16
OK1KIR	7	4	6	1	--	--	7
CT1DMK	5	?	4	?	--	--	4

10368MHz

OE9ERC	11	8	7	3	--	--	11
OK1KIR	11	7	10	2	--	--	11
CT1DMK	10	?	8	?	--	--	11

WB4JEM, K0FF, KB8JVH, UT1RA, AA7A, all Random. Rig: Dish 13m Diameter, Tx: YL1050, Rx: MGF1801. tnx fer info

SP7DCS wk: 23. may KB8RQ, F3VS, 24.05. I2FAK, SM2CEW #12, 29.05. W5UN, 30.05. RU1AA #, IK3MAC, WA9KRT #, DL5MAE #. During June and July he was off for work. In aug. Murphy visited him, when he moved his preamp to the feed of the ant. burned preamp and after the relays, so his preamp is back in the shack. Italian contest 16.aug. SM5FRH, F3VS, IK3MAC, I2FAK, KB8RQ, WA9KRT, W5UN, OZ1HNE #, WB5LBT #, SM2CEW, RU1AA, 13.09. I3DLI, SM5BSZ, W0HP, VE7BQH #, ARRL: 10.10.

F3VS, IK3MAC, I2FAK, SM5FRH, HB9Q #, W5UN, LZ2US #, VE3KDH #, WB5LBT, SM2CEW, K5GW, K7CA #, RU1A #, VE7BQH, 11.10. SM5BSZ, KB8RQ, AA4FQ #, W0HP, OZ1HNE, WA9KRT, I3DLI, EA6VQ #, 05.dec. K2GAL #, EA2LU, JL1ZCG #, OE5EYM, AF9Y #. 01.jan.99 SM5FRH, 02.01. IK3MAC, JL1ZCG, DJ6FU #33 after 30 min. calling. all qso random!. rig FT736R, FHX35, DSP MFJ784B, GS35B, 4x10+10el V/H no rotors all handy azim + el. email SP7DCS@friko2.onet.pl. tnx fer info chris

144 MHz news

YO2AMU, Doru Zaslo is living in ARAD / Romania at QTH LOC is KN06PD. He is active in EME since 12. sept.1998 working for the first time in ARI CONTEST. He is using 800W to 4 x F9FT, hb. Hemt preamplifier, hb. down converter 144/28 and a SB-303 RX. He made 51 QSOs with 17 DXCC and #29. Tnx fer info Doru

432 MHz

CT1DMK: worked CT1WB#, PA2CHR#, during the ARRL contest weekend 10/11. oct. 98 DL9KR, OH2PO, F1ANH, DF3RU, HA1YA, G4ERG, K1FO, N4GJV, F5AQC, N9AB, OE5EYM, UR5LX, K5GW, K2UYH, EA3DXU, SM3AKW, DL4MEA, KORZ, OZ4MM. After the contest added the initials: DL8OBU, ON5OF and W7CNK. rig: 5.6m Dish V/H and 1.5kW. tnx fer info Luis

DL3EAG reports : On Dec. 27th, I saw by accident the EME spots of DF3RU in the DX-Cluster. When I tuned on, I heard him loud and clear and I decided to switch on my amplifier. After fixing a small problem with the pre-amp I could work K1FO with real loud sigs 539/439 and N21QU with even louder sigs 559/539. Then I called CQ and worked N4GJV with weak sigs O/O and got my last initial for 1998 W7CNK O/O #46. In jan SW due to illness in the family, I worked only a few stations: Jan 30. : JA5OVU 539/549, Jan 31. DF3RU 549/549, 7M2PDT 429/O and I5MPK 539/559. Heard were also DL9NDD, F5FLN and K1FO. tnx fer info Stephan

DL8OBU wkd: 26.dec.98 OE3JPC O/O #92, I5MPK 559/549, 02/01/99 K1OR O/O #93, JA5OVU 549/549, DF3RU 549/549, F5FLN 449/549, 03.01.99 K1FO 449/549. Three tests on 01/02/03. Jan with WL7U were negativ from both sides. he was a little frustrated about his 4 skeds in feb sw all nil, but he did work on random 29.01.99 JA5OVU 549/559, I5MPK 559/549, SM2CEW 559/559, 7M2PDT O/O, JA5OVU 549/559, I5MPK 569/559, tnx fer info Juergen

DL9NDD wkd : 30/31 Jan KA0RYT, N7LQ #, K1FO, WE2Y, IK5QLO, W7BBM, HP3XUG, I5MPK, K2UYH, VK4AFL#, JA5OVU, in Sked W7KK nil, W7ALW nil, WL7U nil, VK4KAZ nil. Condx was ok, activity was poor. tnx fer info Günther

HA5SHF reports: We was active in Jan. during the 1st SW, I heard few station, only 5 complete QSOs (all were random). 02.Jan W2UHI 449/429, K5JL 559/539, W2UHI sked/rely switching problems, HB9SV 569/559, 03.Jan. ON5RR sked/?, K2DH sked/?, K5JL 569/549, VE3BQN sked/?, F1ANH 449/539, K9ZZH sked/?, IK6EIW sked/?, WD5AGO sked/?, VE4MA sked/?, N6BQ sked/?, W7GBI sked/?, VK5MC sked/?, GW3XYW sked/?. tnx fer info Csaba HA5BGL:

IK6EIW reports :I lost the elevation motor on my dish and I will not able to repair before the springtime. Now I am active only on 144 and 432MHz, on 432 I have 4 x 23 elements, 0.5db NF and 500W. I can be active every skeep weekend compatible with my family busines. In the last ARRL contest I made 5 QSO and I heard very strong: OE5EYM, DF3RU, N9AB, F5FLN. He needs the diagram of power amplifier for 432MHz with TH347 tube, can anyone help?. tnx fer info Stefano lmontir@tin.it

OE5EYM wkd : in ARRL EME- Contest 1998: HB9SV, DJ6MB, G4ERG, DF3RU, JA2TY, DL9NDD, SM3AKW, DJ5MN, F1ANH, HA1YA, ON5OF, EA3DXU, OH2PO, KORZ, K2UYH, W7CNK, I5CTE, K1FO, UT3LL, UR5LX, CT1DMK, W7GBI, OH2DG, DL4MEA, UA9FAD, DK3WG, G3LTF, S52CW, OE5JFL, 7M2PDT, OZ4MM, JH4JLV, N4GJV, N7LY, KB4CNI, G3SEK, N21QU, VE1ALQ, DL9KR, F6CGJ, N9AB, W8MQW, K9BCT, WA9FWD, WD5AGO, W7CI, F5FLN, IK5QLO, DL1YMK, JH1XUJ, DL7APV, VE1ZJ, OZ6OL, DK3FB, S57RA, YO2IS, GD4IOM, DL5FN, DJ3FI, F5KDK, DL3EAG, W0KJY, UT1PA, JJ1NNJ, JA5OVU, JA4BLC. all Random, Rig: Dish 13m Diameter, Tx: YL1050, Rx: MGF1302. tnx fer info

Result of 5th EME Italian contest

Memorial IKSUBM Luca Scatena: This year the Italian EME contest entitled to Luca IKSUBM, friend and EMER, that this year is on *silent key*. I hope to help us to remember of him for that what he was, ONE of US.

Were present : I1ANP, I1JTQ, I1PIK, IK1FJI, IK1MTZ, IZ1AEM, IZ1BPN, I2FAK, I2RV, IK2DDR, IW2MNU, I3DLI, I3EVK, IK3MAC, IK3COJ, IN3AGI, IV3CER, IK4DCO, I5CTE, I5MZY, I5TDJ, I5WBE, IK5QLO, IW5DAN, IZ5BXF, IK6EIW, IK7EZN, I0UGB, IK0OZK.

• Classification stranger stations

144 MHz

Call QSO It.stn points

Category A) antenna max 20 elements

1) F9HS	9	3	153 (1x 10+10BV)
1) YO2IS	9	3	153 (2x 10BV)

Category B) antenna between 21 to 40 elements

1) EA3DXU	21	4	294 (2x 17M2)
2) DK9ZY	20	3	263 (4x 10BV)
3) UA4AQL	7	2	112 (2x 15BV)
4) JR4ENY/1	1	-	10 (2x 13CREAT.)

Category C) antenna between 41 to 80 elements

1) S52LM	26	6	386 (4x 17M2)
2) LA8KV24	4	324	(4x 15el.)
3) JH2COZ	20	5	305 (4x 14BOH)
4) LZ2US	20	4	284 (4x 19el.)
5) UA3PTW	21	3	273 (4x 12BV)
6) EA1ABZ	16	4	244 (4x 12WU)
7) SP7DCS	15	3	213 (4x 10+10 HB)
8) PE1OGF	13	3	193 (4x 11FT)
9) JA4BLC	11	3	173 (4x 17M2)
10) JH0WJF	10	3	163 (4x 17M2)
11) YO2AMU	10	2	142 (4x 16FT)
12) JH5FOQ	3	1	51 (4x 13CREAT.)
13) NP4C	3	-	30 (4x 11el.)

Category D) antenna between 81 to 160 elements

1) SM5BSZ	59	10	800 (4x 14+14BSZ)
2) OZ1HNE	49	6	616 (4x 18+18el.)
3) DL5MAE	32	6	446 (8x 17M2)

Category F) antenna over 321 elements

1) SM5FRH	127	21	1711 (32x 10el.V+32x 19el.H)
2) F3VS	89	15	925 (24x 20el.)

For E category not received any log.

• 432 MHz

Category A) antenna max 50 elements

1) JA3SGR	4	-	40 (1x 32el.)
2) EA3DXU	3	-	30 (2x 38M2)

Category C) antenna between 101 to 200 elements

1) G4ERG	15	2	192 (16x 10BV)
2) JH4JLV	10	1	121 (6x 24FO)

3) UT3LL	12	-	120 (4x 27BV)
4) YO2IS	5	-	50 (4x 27BV)
5) JH1EFA	2	-	20 (4x 26 FO)

Category D) antenna over 201 el. & dish >4,51mt. dia.

1) JA5OVU	23	3	293 (16x 14el.)
2) UR5LX	27	1	291 (10.7mt.Dish)
3) JA4BLC	10	1	121 (6mt.Dish)

Categories A,B, for rules,are together.

• 1296 MHz

1) ZS6AXT	17	-	170 (5mt.Dish)
2) HA5SHF	13	-	130 (3.6mt.Dish)

• 2304 MHz

1) ZS6AXT	3	-	30 (5mt.Dish)
2) JA4BLC	1	-	10 (6mt.Dish)

I haven't received any log on other frequencies, also to SWL

• Italian stations

• 144 MHz

Call QSO It.stn points

Cat.B) ant. between 21 to 40 elements

1) IW5DAN	7	1	70 (4x 10el.)
2) I2RV	4	2	40 (2x 16KLM)

Cat.C) ant. between 41 to 80 elements

1) IK1FJI	32	5	320 (6x 12M2)
2) IK2DDR	30	5	300 (4x 18CCmod.)
3) IV3GBO	22	5	220 (4x 20Laret)
4) I1ANP	18	5	180 (4x 16BV)
5) IK7EZN	3	-	30 (4x 12BV)
5) IZ5BXF	3	1	30 (4x 11FT)
7) I1PIK	2	-	20 (4x 12PIK)
7) IK0OZK	2	-	20 (4x 17FT)

Cat.D) ant. between 81 to 160 elements

1) I3DLI	58	9	580 (6x 19LLY)
2) I0UGB	11	3	110 (8x 17FT)

Cat.E) ant. between 161 to 320 elements

1) I2FAK	67	7	670 (16x 18xxxM2)
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Cat.F) ant. over 321 elements

1) IK3MAC	88	14	880 (30x 19LLY)
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Cat.SWL) HRD

1) IW2MNU	3	2	30 (16 el.)
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• 432 MHz

Cat.B) ant.between 51 to 100 elements

1) IK5QLO	3	-	30 (2x 28M2)
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Cat.D) ant. over 201 elements

1) IN3AGI	4	-	40 (8x 33el.)
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• 1296 MHz

1) IK3COJ	1	-	10 (2 mt.Dish)
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WIN : F9HS, YO2IS, EA3DXU, S52LM, SM5BSZ, SM5FRH, JA3SGR, G4ERG, JA5OVU, (ZS6AXT) HA5SHF, ZS6AXT, IW5DAN, IK1FJI, I3DLI, I2FAK, IK3MAC, IK5QLO, IN3AGI, IK3COJ, IW2MNU.

A best compliment at winners.

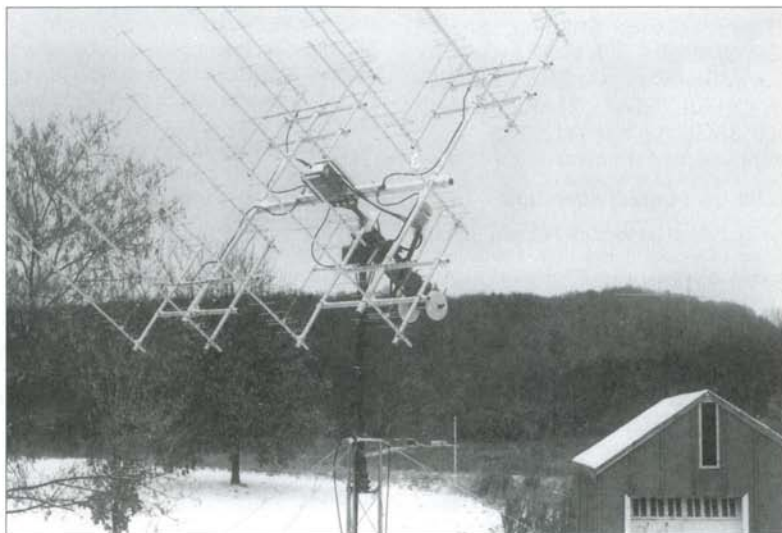
5th EME Italian contest soap box

It was a weekend to forget in Italy, the wx was very bad. Also Faraday rotation are vertical for most of the time during the contest, only the stations with cross polarization made good qso. Good activity for Italian stns on 144 and 432 MHz, on 1296 only IK3COJ, up nothing. I sure on next year have better participation on high band.

Comments of participants;

JH4JLV : I enjoyed this year. Initial is 3 up this time. 73 Kazuhiko. **HA5SHF** : Hello, we was first time on EME contest. We are new station on 23 cm. eme from JN97NM. Ours crew: HA5AWS, HA5AZB, HA5BGL, HA5BMU. 73 Csaba, HA5BGL. **IW2MNU** : Overdose of Murphy law, bad conditions of the last year, no good period to test the antenna. 73 Matteo. **IN3AGI** : I work on contest a very short time, for high wind and strong rain, this is my first wonderful eme experience. 73s Piergiorgio. **IK1FJI** : Modest conditions, TKS to all participants. 73s Walter. **IK3MAC** : Wx during the contest was very bad, i haved much rain. Also very bad propagation, high noise and much Faraday rotation, i not listen many stations that normally contact during week-end EME, however i am amused, hope to better next year. 73 Graziano. **SM5BSZ** : This year I was too tired to work all the ours. Activity was below usual. I guess the poor conditions (-4.5 dB) was a big part of the reason for low activity, 73 Leif. **I2RV** : Murphy law are present, one week before and after a good conditions. **DL5MAE** : TNX for NICE contest, vy 73 Wolfgang. **IK2DDR** : For this edition of contest are negative for two fact, first is meteorological, saturday night and day, WX are very bad, high wind and strong rain, with QRN s9+ and have ROS on antenna sistem. Second fact, negative for me and other that work with a fixed polarization horizontal (SIG), is rotation of Faraday, that sunday night and morning, the signals of return of the moon was vertical. The confirm was stations with cross polarization, OZ1HNE, SM5BSZ, haved stable signals any time. For this global negative situation, so much hours not to be active. TKS for organization of contest, hope better the next year, 73 Francesco. **I1PIK** : bad WX and high wind, fear for antenna, very short activity, 73

Pietro. **IK7EZN** : Haved weekend with great storm and high wind, not possible good activity, 73 Ermanno. **IV3GBO** : The first night haved discrete reception, after any hours a WX go bad, rain and electric light accompanied for all the contest. The second evening was very bad, several time phase rotation and QRN, minus number of qso taked, ciao Giampiero. **F9HS** : Conditions good on saturday, but heavy QRN at horizon. On sunday signals were weaker. Polarity was mostly vertical boths days. 73 Claude. **I3DLI** : Participation, to judge of result, equal to 40% of the stations work normally the ARRL, no bad, for contest on single pass. The first night, had been difficult for WX, storm with rain and wind. A second day the WX was little better, but haved libration and Faraday rotation for long time, very difficult qso. SRI for stations that not have complet qso, TNX to all, Paolo. **EA3DXU** : un saludo para todos, JOSE. **ZS6AXT** : It was very discouraging, that there were no Italian stations on both band! Thanks for the contest, at least I made two new initials and missed at least another two, 73 Ivo Cladeck. **IK3COJ** : Arranged emergency station on my new house, temporary dish (2 mt.) mounted for 23 cm., not work much time for WX, very bad. Hope for next year month great dish in a good conditions and to be active full time on any WX conditions, 73 Aldo. **JR4ENY/1** : I am very happy to work SM5FRH by random. on saturday i called him about one hour, but no success. But on sunday i called him only two times! Many TNX Tobbe for qso, have 150 watts, TR751D no filter cw, 2x 13el. creative design, vertical polarization, rotate by my hands and my eyes, 73 Susumu. **YO2IS** : Not to many stations, changeable conditions, fair on saturday better on sunday. Would like to have an entry certificate, best 73 Szigy. **IW5DAN** : To be active short time on saturday and sunday morning, rain and wind to be present full time of the contest, with noise very high, HRD: WB5LBT, DK9ZY, I2FAK, RU1AA, I1ANP (tropo and on the moon). 73 Luigi. **I25BXF** : Discrete participation at the contest, sunday morning signals very weak hrd sunday only 4 stations big. Great qrn for storm and strong rain. HRD : KB8RQ, F3VS, I2FAK, SM5BSZ, S52LM, WB5LBT, I1ANP i call but no aswer, 73 Michele. **IK0OZK** : Weekend of to forget, high wind and many storm, possible to operate one hour on sunday morning, during pause of wind, i call but no aswer to IK3MAC, KB8RQ. Hope to better next edition, 73 to all Renato. **IK5QLO** : Little hours of operations for bad WX,



WE2Y pol. rot. system

OE3JPC :worked N4GJV and W7CNK random both with fb signals, and VE1ALQ on random, all with good to vy strong signals. I almost fell off my chair when I received my echoes the first time last weekend "M"- "O" still using 2x7.7wl BVopt, 1x 4CX250R/500W tnx fer info Johannes

SV1BTR activity: he worked: K7XD but had big problems copying his final R's, W1ZX (539/549) very good signal copied in V pol. I5TDJ 2 yagis, NC11 (549/559) copied in V pol. and then switched to H pol. In V pol. I had high swr 100W reflected because vertical fiberglass masts were wet. N4GJV (429/549) copied in V pol. high swr because vertical fiberglass masts were wet. I also had static noise. Had 8.5-9db of sun noise today. No matter how much losses before first stage preamp are decreased and after a lot of tests and counselling from VE7BQH I am almost sure that I am 4 db worse off than other similar stations because i can not see cold sky due to QRM. Only 0.5-1db better off if compared to dummy load. Will change to a new cavity ATF36077 first stage preamp by Ron, this will help the days that QRM is down, and an unconditionably stable 2nd stage soon. Things seem to be much better in terms of

how to handle the IMD problems, acquire better understanding of the environment and preamps' considerations, with the help of Lionel VE7BQH. Hope results will prove it too.hi !!! tnx fer info Jimmy SV1BTR 4*32el. Cross BVO H/V pol. + 1.4KW KM17vx

W1ZX reports: Willie was on 07.nov.98 DF3RU 559/449, sked GW3XYW nil, NC11 569/569, 08.nov.98 I5MPK 559/579 #284, VE1ALQ 559/579, WE2Y 549/569 #285, DL8OBU 549/559, UA4API 549/559 #286, IK5QLO 449/549 #287, DL4KG 549/559 #288. Willie heard many European stations off the MOON after 0645 on Nov 8th answering Willie's CQ's 3 or 4 stations on the same freq. lot of QRM, sorry, Thanks for the calls, see you all next month-Dec. Willie is still working the 1296 equipment, building converters, power supplies etc, no HPA at this time, one tube 7289 only 90 watts & horn at this time.

432 & up NETnews

Nov.14./15. new station in Ohio on 23cm **WA9UUU** (EM89) 14.5 foot dish and 200W at the feed, **ZS6AXT** loc is KG33vv and E-mail <zs6axt@global.co.za>, **VE6TA** moved, he is

now located in **DO33gs** and have the base cemented in for the dish. His new address is **ve6ta@telusplanet.net**, Grant, **VE6TA**. New station on **432 VK4AFL** 4yagi 500w, **QG62oj**. **OE5EYM** In the first part of the contest I had troubles with my 70cm-RX. Now it is working very well again and the sunnoise rised from 15dB to 22dB. **K2DH** new e-mail address **k2dh@frontiernet.net**.

Nov.22/23 W5ZN 5 meter dish is now mounted Now has to deal with **AZ/EL** system. **WA8WZG**: fixed all problems still working on 6cm rcv. **K6IBY**: amplifier is finally complete and will assume it's position in the water proof box along the LNA hoping to be on by Dec weekend. **NU7Z**: made changes to 13cm system waiting for wx to settle down.anyone with an **update** to the *microwave list*, please send to Rick with any changes also any changes to Dubus directory. **W4TJ**: has amp running up to 500w now. **HB9JBT** will be QRV with 4 meter dish by spring time next year.

Nov 28, E-mail **SM4DHN** I have change E-mail address to: **labedhn@telia.com**. **LA8LF** During my 3 weeks vacation on EA8, we had a snow/rain/iceing storm at home which made the very heavy 6.4 m. mast for my dish to *collapse*. It is the bottom section of a Strumech VERSATOWER type BP80 which fully assembled and extended is 80 feet high. The dish, feed (my new nice **W2IMU** brass type), **AZ** motor, **EL** drive and possibly the elaborate 90MM mast tube with expensive bearing systems were destroyed. What a mess. One year of hard work and much expense for just 2 years of operation seems meaningless. I will need some months in re-thinking what to do concerning the hobby. Anders, **LA8LF**. **W7SZ** who is now on 23cm. Mailing address: Lawrence A Liljequist Sr.; 2804 SE 347th Ave.; Washougal; WA 98671-9510 US; E-mail: <lll@pacifier.com> grid square is **cn85uo**. rig 10 ft dish, feed-6.5 in dia times 17 in long, wd5ago LNA and 90 deg hybrid, single 7289 @90 w out. Presently showing 12 db sun and 6bd earth. Hope to add scalar and 50 more watts in near future. **W2UHI**: everything is back operating again. **K2DH**: back on the air EME and all is working very well. good echoes on 23cme-mail address has changed

back to old address change from **dhalidy@mdsroc.com** to **k2dh@frontiernet.net** dish is also under computer control **G4RGK**: just got back from West Coast will be on next weekend. **SM6IKY/W5** will be QRV on EME from EM12 with the following equipment. 5 Meter dish f/d 0.42. (Solid **HUGHES** dish) 500 Watts at the feed. (4*7289 Water-cooled. 600W from amp). 0.22 dB lna - 38 dB gain. (2*MGF4318D) 17.4dB sun noise at solarflux of 112. 73 de Mats Bengtsson, 649 Parkwood Cir, Duncanville, TX 75116. **LU4HO**: changing feed line 4x36 ele to open wire hopes to be on in a week or so with **K2RIW** amp and new feed. **SV1BTR**: has 10db sun noise, some water in V pol, but will fix.

Sat, 5 Dec K5JL: was on 23cm all night about 15 new ones thinks activity was down low European activity. **VE1ALQ**: was at it for hours 5 new **GD4IOM**, **DJ5MN?**, **F5FLN**, **OH2PO**, **OE5EYM**. **WA8WZG**: was on 23cm last night he worked **F5GQC**, **G3LQR**, **WA9OUU** and could not get on 13cm, but now may be solved. **HP3XUG**: worked **OZ4MM**, **K2UYH**, **DL9NDD**, **SM3AKW**, **WD5AGO** all new ones. call and called a number of stations but no luck. **KD4LT**: did rebuild 432 feed and got 20db sun noise. **W5LUA**: good night on 23c and 13cmwkd **F5AQC**, **WA9OUU**, **W7CS**. 13cm **OH2DG #41** on 2304. **K2DH**: was on last night a bit late start. 0500z 23cm worked 19x12. **WA9OUU**, **W7CS** new one. **NU7Z**: was not on 13cm last night. sheared the shaft on the hydraulics. so out of business. have to take it apart and rebuild. will make skeds when az/el is repaired (13cm). **K3HZO**: very frustrating night . sigs seemed to be down sun noise is still same. **OK1DFC** new one **HA5SHF** was heard very well nil **EA3UM** nil heard. will be on tonight on 23cm. **W2UHI**: all worked well. good time lots of stations 41x? so far. **W7FN**: good signal reported by **N4GJV**.rcv is still down but worked 14 last night. **WA4NJP**: all is working good. **HA5SHF**, **N6BQ**, **W7GBI**, **DLOSHF(SSB)**, **DJ5MN** got away. **DL9KR**: the bad wx went away. **DJ3FI**, **JO31**. **OZ6OL** on 70cm. **WW2R** Also **W7ALW**.new ones.was copying a **VE3???** **QRZ** many times. (**DEJ???****ZEJ**).for **HO3A**, copied superb 569 when **F5FLN** try. **UR5LX**:

Lunar Weekend Calendar 1999 (by G3SEK)

Date	Declina- tion/°	Signals(dB)	Sun offset/°	Sky Temp /K 144/432MHz	Comments
27/28. March**	14.4	0.1	+134	210/13	night
03./04. April	-12.2	-0.9	-146	453/29	moon in south
10./11. April	-16.4	-0.1	-68	375/24	moon in south
17./18. April	13.7	1.0	+26	412/24	Sun noise
24./25. April**	12.1	0.0	+117	217/14	day (PM)
01./02. May	-14.5	-0.9	-164	428/29	moon in south
08./09. May	-14.8	0.0	-87	372/20	moon in south
15./16. May	15.8	1.0	+9	SUN/27	sun noise
22./23. May**	9.5	-0.1	+99	228/14	day (PM)
29./30. May	-16.5	-0.9	+174	590/39	moon in south
05./06. June	-12.6	0.1	-104	328/17	moon in south
12./13. June	17.5	1.0	-12	SUN/27	sun noise
19./20. June**	6.9	-0.2	+81	240/15	day (PM)
26./27. June	-18.0	-0.9	+159	811/39	moon in south
03./04. July	-9.9	0.2	-121	280/16	moon in south
10./11. July**	18.8	0.9	-29	524/34	sun noise
17./18. July	4.3	-0.3	+63	270/15	day (PM)
24./25. July	-19.1	-0.9	+141	1394/91	moon in south
00./01. August	-6.7	0.3	-138	275/19	moon in south
07./08. August**	19.7	0.9	-46	575/34	day (AM)
14./15. August	1.6	-0.4	+44	327/21	day (PM)
21./22. August	-19.9	-0.9	+122	3745/124	moon in south
28./29. August	-3.4	0.4	-154	279/20	moon in south
04./05. September**	20.2	0.9	-63	467/29	day (AM)
11./12. September	-1.3	-0.5	+25	360/20	moon in south
18./19. September	-20.3	-0.8	+103	816/149	moon in south
25./26. September	-0.2	0.5	-172	304/20	moon in south
02./03. October**	20.1	0.8	-79	392/20	day (AM)
09./10. October	-4.2	-0.6	+8	351/SUN/20	moon in south
16./17. October	-20.4	-0.8	+83	917/41	moon in south
23./24. October	2.8	0.5	+167	324/20	night
30./31. October**	19.3	0.7	-96	254/14	day (AM)
06./07. November	-7.2	-0.6	-14	376/SUN/23	moon in south
13./14. November	-20.1	-0.7	+64	553/41	moon in south
20./21. November	5.5	0.6	+148	342/20	night
27./28. November**	18.0	0.7	-115	219/14	day (AM)
04./05. December	-10.1	-0.7	-32	419/26	moon in south
11./12. December	-19.3	-0.7	+44	405/24	moon in south
18./20. December	8.1	0.7	+128	419/22	night
25./26. December**	16.4	0.6	-135	204/13	night

all values calculated Sat/Sun midnight UTC.

**=sked weekends

note: IARU reg1. 2m tropo contest sept. 4/5 and IARU reg.1 70cm & up tropo contest at oct. 2/3!!!! The dates for **ARRL EME** contest are not fixed yet. ([watch arrl.org/contests/...](http://www.arrl.org/contests/...))

very bad wx. iced up. **ON5OF**: worked only 3 more. 22x13. snowing in Europe. hopes to be on tonight if wx OK. **WA4NJP** called but when Derk called .no Ray!! **ON4CIW/A** was a visitor to Derk. **F5FLN**: had to repaired ant before contest. many new inits. good condx.no snow but called. did not understand the callsign **HO3A**. **N2IQU**: just got on radio. all is ok. worked a bunch of new ones. a little on activity. most of time on 70cm. 70cm 79x27, 23cm 59x31 will be on tonight.

Dec. 6 VE1ALQ: was someone on near Darrell while trying to work a JA, and could never get the call on 23cm. (VK5MC reported by Jay). 23cm = 47, 70cm = 32. **W2UHI**: had terrible wx. fog etc, tracking a problem. equipment working fine though. Slim pickins last night. 45x27 rough count. Frank says that when someone sends "YYY" please the other station send your call only several times. !!!! **K2DH**: worked plenty last night. missed KB0PYO. 44x23. and also a number of initials. still looking for HA5SHF & DJ5MN. Dave reports many good signals on 23cm. missed VK5MC but worked JF3HUC for a new **W7QX**: 42X17 at this time. **W5LUA**: had fun on 23cm, 33 worked. worked several on 13cm as well. **ZS6AXT**, **N2IQU**: was on 70cm last night. 94x32 on 70cm, 61x30 on 23cm as a preliminary count. **KD4LT**: was watching football last night bad dude on EME 70cm was very enjoyable. had fun on 70cm 34x21 on 70cm 48x28 on 23cm 22 new inits on 23cm 7 new inits on 70cm during the contest. **LX1DB**: copied W5LUA was xmit the wrong period 1st 15 min.during the AA5C was a snow storm.heard nil from USA on 13cm 57 from Ja on SSB on 13cm.will be available on 10ghz tomorrow..20W . 1.8db moon noise. 15db solar noise. 4.5db ground to cold sky with the feed horn. **N6BQ**: worked about 23 during the weekend.too windy last night. **DL9KR**: gave up 4 hours before moonset had one sked @ 0500 UN7AX. 130x41 at this time. will be on moonrise tonight. polarity was involved. **OH2PO** working WL7U but heard nil from WL7U. **K1OR**: worked N7LQ, JA5OVU. two new ones. things working better. KB7UIF reported hearing K1OR on single yagi. looking for new ones. **N4GJV**: skeds for N4GJV.055 or lower !!! heard VK5AFZ but no contact. still

needs skeds. poor results. could not stay awake. 5 new ones 105x32. **K5WXX**: missed the whole European window, bad wx. 41 worked and one new inits. **K9ZZH**: T-storms had a few contacts has to QRT.**VE4MA**: was on 23cm frustrated sigs good tried calling VE1ALQ several times but Darrel know who he was??. Darrell reports Barry was in a pile-up worked 7 stations last night. still looking for KD4LT heard many OZ9CR amp is down. **WA4NJP**: 23x13 on 23cm 13x11 on 70cm. heard GD4IOM. 9H1ES was on sked with N6BQ but was 5 khz low. enjoyed last couple eve 23cm was 5mtr dish 100w. **ON5OF**: 28x17 sun noise 13db heard JAs also SM2CEW condx good but snow still. **SV1BTR**: 2nd part of contest. 1st day high winds. 12x11 only on one day dassappointed at times. but much QRM and QRN local interference. no matter how much work on the system , the sun noise is not improving may go back to 2 meters EME next summer. **F5FLN**: lot new entries worked very strong KB4CNI 74 inits now. **KA0RYT**: wkd 22x18 KB4CNI was a new. **K0RZ**: 59x24 finished up. Called HO3A for at least half hour. no luck for Bill. **W7FN**: 27x16 not too bad, still feels rcv is down.

DEC 19 Louis **HP3XUG/HO3A/KG6UH**, Know how N0RZ feels, as I called DF3RU for over 2 hours and nil responses! Sunday was a 100% total bust, no QSOs! Had not so great echos this day, as did on 5th. Had a lot of very weak stuff around.020-028 and couldn't find a decent spot to yell on. Guess a lot of that weak stuff was Faraday non-recip sigs of N0RZ, W7CNK and who else? Sorry, but just wasn't gettting anywhere Sat eve! On Sun AM things weren't any better - tried W7FN numerous times, J53SIM, N9AB were all super good copy and not even a QRZ - at least the QRZ's were always answered by some other station. Was a bitter end to the great start of 5th! Oh well, will look to try and make it with a few in the future, like W7CNK, etc. Heard Lucky QSOing others, and no response. Seems, besides this peanut whistle station, Faraday in its non-reciprocal format is really bugging us. Warmest of Holiday greetings to all, and may 1999 be the end of the worst, and the beginning the best of times to come for all, as

The 2nd NL 23 cm EME SSB Contest

- is scheduled for the **30/31 Jan SW**. To encourage maximum participation the contest time period corresponds to the 2nd SW Moon operating day.
- The contest starts at local moonrise on Saturday 30 Jan, (This is the 2nd moonrise of the SW, the 1st is on Friday afternoon local time), and ends on the following moonset on Sunday 31 Jan.
- Scoring will be contact points times number of large Grid Sectors (IO, JM, FN, ...). SSB to SSB contacts will count as 2 points. SSB to CW (or CW to SSB) 1 point. CW as well as SSB stations may enter the contest.
- The exchange is your 2 letter Grid Sector.
- Operation may be by single or multiple operator stations.
- No distinction for scoring will be made.
- Only one callsign per station may be used during the contest.
- Contest logs should be sent to the K2UYH before March 14th. The results of the contest will be announced in the NL and special certificates issued to the highest scoring stations.
- Last years contest was well-attended and great fun. Expectations are for an even greater turnout this year.

we wind up this Century and Millenium. Louis HP3XUG/HO3A/KG6UH

VE6TA QRV 23cm. **W2UHI** new E mail address active now as follows: <flblum@pathwaynet.com> Thanks, Frank **K7XC**: 70cm station is now going QRT. will re-active in DM33 later in year. Phoenix new location. DM09bp now QRT. **WB7VVD** DM33 is putting up 2 dishes. 70cm-23cm & and 2-10ghz. Ward is his name. **VE1ALQ**: hi winds. dish broke loose. all is down. OFF the air.

DEC 20 K1FO: slowly re-assembling shack. will be on regularly. missed 2130z with W7CNK. still remodeling house. 102x34. only 5 hours on 2nd weekend. maybe 30 hours total time. 19.5 sun noise. **DL9KR**: worked EG3TVC special event station in Barcelona. 20.5 sun noise @1200z. 131x40 after cleaning up log. **DL9NDD**: 82x32 in contest. looking for K6DV(KD6R) & W8TH ????

Dec 26 VE6TA new address is ; Box 77 Site 14 R.R. 4, Edmonton, Alberta, Canada, T5E 5S7. 73 Grant **UR5LX** Contest scores 106*35. 73! Sergey. **W5ZN**: QRV on 70cm. Al is a Granpa and he is getting slow, so please cut him some slack in his old age remember to send his reports a couple times slow so he can comprehend **VE4MA**: e-mail change. ve4ma@escape.ca will no longer be valid after Jan 1. please use ve4ma@home.com

K5JL: 83x36 on 23cm. **W7SZ**: Ill@pacifier.com is Larry's email address. that is 3 els not 3 ones. **OE9ERC** Results from the ARRL contest 1998: 82 x 36 on 23 cm, 14 x 13 on 13 cm, 9 x 8 on 6 cm. 73 de Erich, **W7EME** Am now ready for skeds. Looking forward to working many of you on 432 mcs. This 2nd January have had beautiful echos on cw es ssb. Now running 1.3 kW into 336 elements hor. or vert. no inbetween. 73 Jeremy DN14wx, **N4GJV**: worked DJ3FI copied DL5FN ? worked VK4AFL on skeds CT1WB, DL5MAE, VK4KAZ in FEB Ron needs min 25deg elevation. **DL9KR**: made first contact this year with VE3DEW FN04 16fo12 pol, 80w #710. **KD4LT**: reports that VE3BQN'S actuator is broken. VE3FAC is new station 70cm FN03is (Richard) 8xFO? 700w has rcv problems.

Jan 9 KL7HFQ: We had wind here with sustained winds over 50 miles per hour and two of my antennas were bent, the elevation control is off 22 degrees and my azimuth control was off 10 degrees. If it warms up here will drop the antenna and try to repair it. The antenna system load up fine though. roger **VE1ALQ**: working on getting damaged equipment back in operation now almost complete. needs to run checks and then will be QRV.

JAN 10, SV1BTR: HNY to all. was on trip TO OE land. will be QRV on 70cm end of January. with help of many stations, rcv is getting better all the time. **91HES:** will be available end of JAN all skeds welcome.

JAN 16 W7CS: worked on antennas and now will accept schedules. **N6BQ:** QRV again working last two weeks on antenna will be on next weekend. **UT3LL** was activ 2/3 Jan 99 wkd : #PA3CSG, DL9NDD, DL7APV. UT3LL and UA4API open for skeds. 73! Sergey.UR5LX. **F6DRO:** I am in the process of building a multiband microwave eme station with main interest in the beginning for 6 and 3cm bands. I already build transverters for both bands and have 20W TWTAs on both bands. I have a 3m solid 12Ghz andrew dish. I have been QRV on 144Mhz EME in the past. On that band it is no problem to get infos on what to do to get QRV. Lots of articles on how to get qrv on 144/432 eme where published. But nothing really complete on micro-waves. It is really a problem. I saw articles by DF7FJ but only roughly on the propagation aspect of EME, but haven't seen yet an hardware aspect. I am interested to get infos abt tracking the moon: rotors used, or any other systems: it is in my opinion the most critical part of the job. (the software part is OK with F1EHN and other's) I haven't seen yet a complete article describing the system used for moon noise measurement, only partial schematics. Same about polarisation to use. 73's Dom. **VE3FAC** (Richard) has full elevation on a 20 meter tower with 8x22 fo's but no preamp as of yet on 432. However he is running 700 watts. possibly 900 with a couple of drive changes and will have 1500 watts sometime this summer (which I hope gets here soon! 66 inches of snow in 15 days is a lot!) 73s de John WE2Y. **LU4HO:** will not be QRV on EME till further notice. he has moved to Bueno Aires till March. (via KA0RYT). **K2DH:** will get serious on 70cm in the near future. **WB0JQQ:** trying to get on 70cm EME with 10' dish

Jan 23 1999 Weinheim is Sep 12/13.
W4HHK: Paul sent me info on solar activity report. looks like good info.
<http://www.dxlc.com/solar/index.html>

JAN 24 WB0JQQ: Randy EM39. trying to get EME running. W4OP is hearing well with 12'. cir pol.xmt rt rcv left. **HP3XUG:** will be on sked weekend as time permits. **F6DRO:** now has 3 meter dish now and will be installing. hopes to be on 23 -3 cm.

JAN 30 IK5QLO I am available for skeds on 432 MHZ My conditions are 2 x 28el and 900W (43 initials WKD). Take note for following SWs that I prefer nighttime skeds after 22.00 UT and my max elevation is abt 47°. Tnx de ANDrea IK5QLO **S52CW.** Found very nice conditions during the Sunday evening, but not much stations QRV. I worked K1FO, NC1I, SM2CEW, KD4LT Heard were also DL8OBU, DJ3FI?, W7QX, W7CNK, N4GJV 73 de Uros, S52CW **K7XQ** I will be QRV as a QRP 432 EME within a month. The antenna array complete and is small (2 X 9 WL) so i want to start listening for now while i finish up my Power Amp project. 73's from K7XQ Jeff in CM97QI (Atwater, CA.) ex KO6RD 2 X 432-9WL's 400 watts Full Elevation - 432 MHZ Internet:vhf2micro@aol.com Webpage: <http://members.aol.com/vhf2micro/k7xq.qml>

JAN 31 DL2LAC EMail is ECarstensen@t-online.de **KB4CNI:** completed DK3WG, could not dig **DL7APV** out of mud maybe condx. **JA5OVU** was also worked. hearing a lot of stations very well. K1FO, NC1I & W7CNK

FEB 6/7 Trevor, VK4AFL is now running a KA0RYT cavity preamp which has made a big difference. Al - **K2UYH** I thought the 2nd 1296 SSB Contest went reasonably well. There was good activity, although some "big guns" and "smaller guns" were conspicuously missing. I worked 24x12 (with 2 CW to SSB QSOs). Others did much better than me. It was a lot of fun. The only problem is that I have received very few logs. Could ask people to get there contest logs into me. I'd like to have a pretty complete report on the contest for the next NL. **WA8WZG:** worked WA4NJP on 23cm for # hopes to have 13cm running for next sked weekend. **N2IQU:** working on 10ghz machines a reminder of EME Symposium in Syracuse, NY in August 20-21 time-frame. **PA3CSG:** got the TWT P/S working



JH4JLV 432MHz 6 yagi ant.

4db more power on 10ghz, but dish is still down. A Dream is gone Michel **HB9JAW**. Hi out there. Today, before I even could get it running for the first time, my 40 foot dish has crashed under a 70cm Snowload which we received today during daytime. A broken Elevation drive made it impossible to move the dish in a position where the snow would be unable to get a hold on! I hope some others have survived this winterstorm better then I did. (When talking to some older People in my village this seems to be one of the heaviest Snowstorm this village has seen in the last 3 decades.) Still life goes on. hi All the best to the EME community de Michel **HB9JAW**

FEB 20 W5LUA: are these stations active on 3cm DF3RU, ZL1GSG, F6CGJ, DL0SHF, OE9ERC, HB9EGE, S57UUU, G3WDG, SM4DHN. If any info on these stations reply to W5LUA or to net notes **K2DH**: KB2AH type 4 & 6 tube amps work as advertised. All is working well web page is <http://www.geocities.com/ResearchTriangle/Node/5867/>.

W0KJY: repaired some antennas web site for solar info. <http://www.sec.noaa.gov> look down through pages

FEB 21 W7CNK: DL9KR 5/4 5/5. deep QSB. Jan was down quite a bit. productive day yesterday worked G3SEK best ever heard.

CNK SSB to SEK and complete. G4ERG, DL9KR, WE2Y, JA5OVU and heard VK4AFL. last 2 times heard or worked DL9KR, KR was down some. question is, noticed enhancement on echoes at SUNrise and SUNset on 70cm consistently and does not matter what the moon declination is only noticed on own echoes.

VE6TA: significant aurora could have affected 70cm. **DL9KR**: signals down about 10db sunrise/sunset comments are that it happens at times, but

not not consistent.

1296 MHz

CT1DMK: While echo testing, after changing the feed from 5.7GHz to 1.2GHz worked: W6HD# and W4OP. During the contest added 3 new ones and worked: F5PAU, G3LTF, HB9BBD, ON5RR, W2UHI, DF7PV, ZS6AXT, OE9ERC, K5JL, OK1DFC, OE9XXI, K4QI, N21QU, F5AQC, W5LUA, KB2AH, G3LQR, KD4LT, F2TU, S59DCD, OH2AXH, GW3XYW, VE1ALQ, F6CGJ, W2UHI, SM3AKW, K2UYH, K2DH, WD5AGO, OZ6OL, OZ4MM, OE5EYM, VE1ZJ.

HA5SHF: results Nov(Oct.) 31.Oct. DJ9YW 449/449 DF4PV 439/429, 7.nov. KD4LT 439/549 #36, WAS:6, W2UHI 449/439, VE1ALQ 549/529, KB2AH 559/429, K5JL 579/549, 08.Nov. JA6CZD 549/439 #37, DXCC:18 /SKED, WA4NJP O/ #38 /SKED, DF9QX 449/549 #39 /SKED. ARRL EME Contest 2nd rounds: 05.Dec F5PAU 559/O #40, K4QUI 549/439, F5AQC 559/449, KB2AH 569/549, K5JL 569/539, OE9ERC 579/559, HB9BBD 559/539, OE9XXI 579/549, OH2AXH 559/549, OE5EYM 549/429, JA6CZD 559/549, S59DCD

449/439, EA3UM 549/439 #41 DXCC:19, 06.Dec F6CGJ 559/449, VE1ALQ 559/439, WD5AGO O/O #42, OK1DFC M/O #43 DXCC:20, OK1KIR 449/439 #44, OZ4MM 559/449, JH5LUZ O/O #45, DJ9YW O/O, F1ANH 549/O #46, DF4PV O/O, Total for ARRL EME Contest:44x23., they wkd in ssb contest 30.01.HB9BBD 57/JN97 - 549/JN47 SSB/CW, OE9ERC 56/JN97 - 449/JN47 SSB/CW, OE9XXI 57/JN97 - 54 /JN47 SSB/SSB, LX1DB 57/JN97 - 559/JN29 SSB/CW, 20:54 UTC -Our receiver was dead (preamplifier defect). Unfortunately we don't have any FHX35 anymore.tnx fer info Csaba HA5BGL

OE5EYM wkd : in ARRL EME-Contest 1998: HB9BBD, F6CGJ, ZS6AXT, G3LTF, OE9ERC, LA6LF, KD4LT, OK1DFC, K3HZO, OE9XXI, OZ4MM, N2IQU, DF4PV, HB9BHU, K9BCT, EA6ADW, W2VHI, K5JL, OK1KIR, OH2AX, S59DCD, F5AQ, OE5JLF, F5PAU, ON5RR, F1ANH, OZ6OL, SM3AKW, G3LQR, PA2CSG, HB9SV, DC6UW, HA5SHF, W7CS, K4QI, K2UCH, SM4DHN, F2TU, W4OP, W2UHI, F6HYE, JH5LUZ, DF9QX, D1XF, JA6CZD, WD5AGO, KB2AH, VE1ZJ, W6HD, CT1DMK, K2DH, W5LUA, W3XS, SM2CEW, VE1ALQ, DJ9YW, JF3HUC, GW3XYW. Rig: Dish 13m Diameter, Tx: 4° 2C39, Rx: FHX35.

OE9ERC reports JAN 1999. I had very good contest-weekends, even though 10 min. before the end of the second contest weekend my elevation drive is broken. The last station, which I heard, was SM2CEW, but I could not anymore work him. On both ARRL contest weekends I worked on 23 cm follow new stations (initiales): DF4PV #, OE5EYM #, W4JSS #, WA9OUU #, W7SZ #, IK2RTI #, JF3HUC #, RW3BP # and my 200 initial with DL8OBU. I hope to have repaired my elevation drive till the next eme-weekend. Results from the ARRL contest 1998 : 81 x 36 on 23 cm, 14 x 13 on 13 cm, 9 x 8 on 6 cm. In the 2nd NL 23 cm SSB Contest I made 31 QSO's in 13 fields for a score of 767 points. My contest log read as follows: on 30/31 JAN OE9XXI 57/57 JN47, ON5RR 43/52 JO, HB9BBD 56/56 JN, HB9BHU 54/55 JN, DF9QX 55/56 JO42, LX1DB 57/56 JN39,

IK3GHY 44/55 JN65, OH2DG 54/56 KP30, HA5SHF 449/56 JN97, DF3RU 44/56 JN59, GW3XYW 55/57 IO71, S59DCD 55/57 JN76, OK1DFC 54/55 JO60, G3LTF 54/56 IO91, DF4PV 53/57 JN49, N2IQU 57/58 FN13, K2UYH 55/56 FN20, K5JL 56/57 EM15, OZ6OL 54/55 JO65, W2UHI 55/55 EN73, RW3BP O/559 KO85,CT1DMK 43/55 IN50, K2DH 55/56 FN12, VE6TA 44/55 DO31, N6BQ 42/42 CM97, K3HZO 33/52 FN20, W7SZ 449/55 CN85, WA4NJP 43/55 EM84, KD5FZX 55/54 EM12 # 201 (new station with 5 mtr dish and 500 watts), W0KJY 43/52 DN70, WA8WZG 33/55 EN81. I heard also in the contest VE1ALQ, KB2AH, NL7F, K9ZZH, W4RDI. I will be QRV on 23 cm in the Dubus Contest(Feb). In february I go for holidays 3 weeks to Cuba. 73 de Erich, OE9ERC

W2UHI: quite a time last week, just got the whole system winterized, all systems working well. Then the High winds and bad wx came. dish in bird-bath position. then the dish moved towards horizon, then the wind took over and spun it around and stripped the az wormgear. and wx continued to destroy the antenna system. Frank has a lot of repairs to make. needs new feed poles, new gearbox, and much more. so until further notice, Frank will be QRT. the dish itself is all OK. and as usual, this happens just as winter moves in.

OK1DFC report from second part of ARRL EME contest. I was throe all time the contest ill with fever heat 38C. It was a little handicap. Whole time I was look for new station. Sorry to say PY5ZBU was not QRV and also another station from SA was not activ. I hope after the EME conference 2000 in Brasil will be situation much better. SA is my last continent where I have not to WAC Award. So back to contest. I worked G3LQR, F2TU, CT1DMK, K2DH, K3HZO #, VE1ZJ #, K9KFR #, VK5MC # DXCC25 thank you Chriss for nice Christmas pressent, DC6UW, N6BQ, K2UYH, HA5SHF, OE9ERC, W5LUA, W2UHI, GW3XYW, SM2CEW, HB9BBD, DF9QX #, OZ6OL, DJ9YW. Now I have 70 # on 23cm and 25 DXCC. All together I have 60 QSO = 6000 points and 34 multipliers. Its all to gether 204.000 points on 23cm. Whole time was strong wind and was go snow. Conditions

was good, also my equipments was working without problem. tnx fer info Zdenek OK1DFC

K3HZO: Completed the ARRL EME contest with 30 X 17 which was somewhat disappointing. First run in October was as I expected with 22 QSO's. However, I only completed 8 QSO's in December. Not sure why the difference. Perhaps the second weekend results define the limit of the stations workable with a 3M dish. Looking forward to Spring and the larger (15') dish. During December contest weekend I worked two new initials: DF4PV and OK1DFC. On skeds, EA3UM was nil once again. He has a larger station and I should be hearing him. Heard HA5SHF FB all sequences, but since I started 1.5KC-2KC below the frequency I heard him on, I could not move onto his frequency. Unfortunately, we did not complete as Csaba did not hear me. I also did not complete with 9H1ES. I copied 9H1ES on his sked with N6BQ just before my sked, but copied nil during my sked. Also heard CT1DMK on random very loud, but with contest QRM could only generate QRZ's from him. I am looking for QSL's from F2TU, SM4DHN, SM6CKU, DF9QX, F5PL, OE9XXI, VE1ZJ, and WA4NJP. Harry, K3HZO

RW3BP reports : on 06. Dec. he had his first EME QSOs on 23cm. OE9XXI O/O and OE9ERC O/O. After changing feed had three QSO on 23cm: 07 Jan. K5JL O/M - 529, 08 Jan. SM2CEW O/O, 10 Jan. HB9BBD O/539, My antenna is mounted on the wall of apartment (16 floor) so I have AZ and EL limits. AZ from 206.5 degrees to moonset. EL no more than 42.5 degrees. It means that practically I have no AZ/EL limits in US Canada window. Ready for skeds with big stations. Next 10 complete QSO : 27 Jan ZS6AXT M/M; 29 Jan W5LUA M/M; 30 Jan W2UHI O/O; 31 Jan VE1ALQ O/O; K2DH O/O; G3LTF O/O; OK1DFC M/M and my first random CW/SSB - OE9ERC 44/O; OE9XXI 44/549; KB2AH 34/449. Nothing heard from OZ4MM and W4NJP. My rig: 1.65m offset dish, CP, 250W in feed, FHX35 preamp. KO85ws tnx fer info Sergei rw3bp@mail.sitek.ru

W5LUA Jan 29 1296.075 MHz worked RW3BP M/M reports initial #165, I have now worked Sergei on 3 bands! tnx fer info AI

3400 MHz

LX1DB: worked W5LUA on 9cm.

W5LUA : Jan 26 LX1DB worked with 549/559 reports initial #5. tnx fer info AI

5760 MHz

CT1DMK: The feed and TWT supply were ready in time for the first microwave EME contest. As I had no time to make the preamplifier I decided to run directly the transverter into the coaxial switch. Got about 0.4 dB of moon noise and own echoes were very strong > 6dB. Good echoes also on SSB when libration was low. Worked during the uW contest: OK1KIR, OE9ERC, OE9PMJ, I6PNN, OE9YTV. This was the first EME activity from CT at 5760MHz.16 and 28/Nov./98 Now with an ATF35075 preamplifier I have about 1dB of moon noise and good SSB echoes. Nothing with VE4MA on sked, and worked W5LUA. Cond. 5.6m dish, V/H pol.sw, 33W. 73 de CT1DMK.

OE9ERC wkd : Nov 7/8 CT1DMK for #16 and DXCC 12 (first CT-OE), OK1KIR, I6PNN, OE9PMJ, VE4MA, W5LUA, JA7BMB, SM4DHN and IK2RTI.

ZS6AXT reports : He hope to have soon first QSO on 6cm, so far he was twice heard by OE9ERC, but the LNA was probably full of water from the cloudburst before the sked !! Having 0,6 dB + of Moon noise at present and he thinks his horn position is not yet fully optimized, since he had more than 6dB ground noise with the horn only. GL, 73, Ivo

10368 MHz

VE4MA: worked LX1DB on 10ghz.

LX1DB : worked : SM4DHN on 3cm 559/449.

W5LUA: worked LX1DB on 10ghz. Jan 27 DL2CAC worked with O/M reports initial #24 his first EME QSO ever!!

AA5C: worked LX1B on 10ghz last Sunday for inits #18.

G4ERG reports : I can hear my own echos on 10 GHZ. Now i am looking for skeds. Anyone interested ? 4 m dish, 20 W TWT 1.3 db nf, thanks fer info Peter

Expeditions

DL8YHR: all is looking fine for **3V8AA**. QRV in March and April. 2x38 m2 on 70cm , 1kw, 2x16ele (2.8lambda) m2 1kw on 2mtrs. JM46. will operate for 10 days. will also be on 6 meters. info will be confirmed later. also looking for a location in 3A but not yet.can anyone help with a QTH to set up eme station in 3A. vanoffel@village.uunet.be ON5OF can help with 3A2MS. dl8yhr@aol.com .

DL9KR: HB9SUL is interested in exp to **TA** (Turkey). Looking for equipment to make up this expedition looking for 4 yagis. 5 meters long maximum. also looking for preamp. looking for lightweight AZ rotor.like KR-600. 3kv P/S @ 1 amp. expedition to be around April or May.

HB9SUL ANDREA : I hope you did well in contest. I'm still alive but living behind the Moon.My 4 bay array is still down but the spirit is still alive.Therefore, I am planning a one-man operation from **TA on 432 EME** next year (if someone wants to join pse drop a note) and I am asking via the NL if somebody has some h/w to give. What is requested are especially antennas (up to 6m long), preamp, HiPwr T/R coax relais, and aluminium mast both as main support and as H-frame. Anyway, I'm open to any king of discussion. Pse note my new GSM Nr. +41-79-3104421 Thanks and CUL de Andrea-hb9sul@compuserve.com

ON5OF: did not have any replies for **3A** expedition HELP !!! please send inquiries to Dirk.

Last

As you may have heard, the sanctioned **EME Conference** will occur next in Rio, in the

Summer of 2000. The organizer on site is Don, PY5ZBU (cleide@inepar.com.br).

But an informal warm up to Rio will occur this coming Summer: **EME Symposium 99**, a beginner's workshop August 20-21, Syracuse, NY, Organizer on site: Mark Gummer, N2IQU, gummer@dreamscape.com The objective is to bring in new blood. Many old hands will be there to tell of their experiences and to advise hams thinking about trying this most demanding mode of communication. The registration fee will be nominal to pay meeting room rent and cost of the proceedings: An EME Primer. How do you suggest that we publicize this event?

Silent key GM3JFG Last night I received a phone call from Jim GM4TXX bringing the sad news of the passing away of Iain GM3JFG in the **age 85**. Iain was not so active over the last years on EME due to his illness but I recall working him many times in the past on 144 and 432 tropo and aurora. In fact he was the only active station active from GM. Jim GM4TXX wants to restart his activity, lots of the equipment he used years ago is still there. With the passing away of Iain, Jim wants to activate GM again on the moon on 432 MHz.

Sad news: **RA3YCR is a silent key**, Viktor had been active on 432 EME for many years and will be missed.

- Other publications :email NL 432 www.ni-tehawk.com/rasmit/.
- Keep photos coming
- deadline every first of Feb./May/August/Nov.
- my email bernd_wilde@eac-com.de

73 Bernd DL7APV

EME Directory

Editor: Klaus Tiedemann, DL4EBY

Adressen - Addresses (update)

Call	Loc	Name	Address (Phone)	Remarks
AD6GD	DM12JU	Paul Chominski	5021 Via Papel, San Diego, CA 92122 (1-619-623-9693+f)	ex W6/SM0PYP
DF4PV	JN49AX	Günter Wertich	In den 100 Morgen 9, D-55218 Ingelheim (49-6132-85311 +fax)	
DF5JJ	JO31	Peter Cerveny	Andreasstr. 77, D-47441 Moers (0202-713260)	Nov-Feb only
DH00AH	JO42OB	via DL6YDH	, (49-172-6759310)	= DL6YDH, DJ5QX
DH5NAH	JN59CP	Klaus Dahlfeld	Sudetenstr. 35, D-97340 Marktbreit (Fax 09332-3193)	Parents: 09332-9516
DK5AI	JO51GO	Wolfgang Hellberg	Am Mühlenberg 34, D-37441 Bad Sachsa (49-5523-8886)	
DL0GC	JO31CQ	Oliver	, ()	= DL1EJA
DL1YMK	JO31QX	Michael Kohla, Dr.	Pieperfeldweg 31, D-48329 Havixbeck (49-2507-4121)	
DL2LAC	JO44MR	Ernst-Guenther Carstensen	Schlossbergstr. 1, D-25917 Stadum (49-4662-3688)	
DL6YDH	JO42OB	Ernst-Otto Köhne	Ölbergstr. 17, D-32816 Schieder-Schwalenberg ()	= DH00AH, DJ5QX
DL7APV	JO62JR	Bernd Wilde	Nordhofer Str. 8, D-16833 Nordhof (033922-79933)	= DK0NHF
F/G8MBI	JN04FT	Graham Daubney	Le Faget, Septy, Pomport, F-24240 Sigoules ()	
F1CH	JN23VF	Jacques Gibert	Le Bastidon, 348 Chemin du Matelas, F-83330 St Anne du Castellet ()	
F5KDK	JN23VF	Michel Tourbot, RCEMEP,	11 Place du Gaillardet les Balustres, F-13013 Marseille ()	loc. at F1CH
G4ERG	IO93SR	Peter Etheridge, 42 Wascana	Close, Anlaby Park Rd, S. Hull Humberside HU4 7BX (+44-1482-641552)	
HA5SHF	JN97NM	Csaba Kiraly	Garay u.38, H-1076 Budapest ()	
HO3A		Louis	, ()	Contest call of HP3XUG
HP3XUG	EJ88SS	CAPT Louis Anciaux	USN(ret), Apartado 417, David, Chiriqui (1-507-774 2124)	Contests: HO3A
I6PNN	JN72BL	Amato Patregnani	Contrada da Macchiano 46, I-65015 Monte Silvano Colle (39-85-835421)	
I6QGA	JN63SO	Gabriele Priori	Via Tamburini 12, I-60023 Collemarino (AN) (39-71-882570)	= IK6EIV
IK1MTZ	JN35UB	Diego Sibona	Strada del Cresto 31, I-10132 Torino (39-11-8998086)	
IK3GHI	JN65BH	Giorgio Murador	via Ca Fornoni 57b, I-30030 Favaro U.T.O (VE) ()	
IN3AGI	JN56	Piergiorgio Gorfer	Loc. Bosco 76, I-38045 Civezzano (TN) (39-461-851020)	
JA9BOH	PM86FA	Kimio Macgawa	67-9 Shimo Asojima, Ohno Fukui 912-0815 (81-779-65-6059)	back Mar 2000
KB4CNI	FM08JF	Cowles Andrus III	75 Pleasant Hill Lane, Churchville, VA 24421-2600 (1-540-337 6452)	
KN6M			, ()	nw KR5V
KR5V	EM13SD	Morrie Young	Rt. 5, PO Box 430A2, Princeton, TX 75407 (1-972-734 8877)	ex KN6M
LY2WR	KO24OQ		, ()	op LY2BIL
N7LQ	DM09DP	Shawn Tayler	PO Box 12397, Reno, NV 89510-2397 ()	ex WB7TDI; /p DN01FA
OE3JPC	JN87EW	Johannes Pichler	Johann Siegmayer-Gasse 5, A-2361 Laxenburg (43-2254-75769 +fax)	
OZ6OL		Hans Joergen Oldenburg,	Oesterhoejvej 3, DK-4671 Stroeby (45-5657 7531)	
OZ9AAR	JO45TS	Carsten Groen	Kaervaenget 46, Gl. Sole, DK-8722 Hedensted (45-7690 8000)	2m only
S57UUU	JN76EC	Marko Cebokli	Topniska 45, 1000 Ljubljana, Slovenija (386-61-1374602)	ex S56UUU
UR3EP	KN78WM	Vladimir	PO Box 447, Pavograd 5, ()	
UT3LL	KO80AC	Valery Loshakow	PO Box 4349, Kharkiv, 310166 (+0572-141 345)	
VK4AFL	QG62OJ	Trevor Benton	5 Stratford Crt., Birkdale, Qld. 4159 (61-7-38221264)	
W6/SM0PYP	DM12JU	Paul Chominski,	()	now AD6GD
W6HD	CM98PF	Taylor Howard	PO Box 48, San Andreas, CA 95249 (1-209-754 3255, fax 1770)	
W7CNK	EM15FI	Lester Whitaker	?, Oklahoma, OK (1-405-691 2265)	
W7CS	DM42OO	Chuck Smallhouse	PO Box 1540, Oracle, AZ 85623 (1-520-896 2891)	ex WA6MGZ
W7QX	DM44AR	Jerry Kleker jr.	445 Rocking Chair Rd, Cottonwood, AZ 86326 (1-602-634-9522)	ex W9QXP
W8TN	EM98AK	Clark Stewart	407 Beechwood Est., Scott Depot, WV 25560 (1-304-757 2941)	
WA5TKU	EM13II	Wes Atchison	PO Box 565, Sanger, TX 76266 (+1-940-482 3914)	
WA9OUU	EM89	John Berker	PO Box 125, New Holland, OH 43145 (1-740-636 9023)	
WW2R	EM13QD	Dave Robinson, 2506 Sherbrooke Ln,	McKinney, TX 75070 (1-972-548 1760)	ex WG3I (G4FRE)

Equipment (update)**432 MHz**

Call	Antenna, Pol	[W]	Qty
9H1BN	2x20el BV,	700	J
CT1WB	8x21el FT,	500	J
DH0MBH	6y,		J
DH5NAH	4x23el Flexa,	500	J
DK5AI	8x26el FT mod,	750	N
DL0GC	4x11el,	1000	J
DL1YMK	4x30el BV, hor	1200	J
DL7APV	8x21el, hor	700	J
F/G8MBI	2x 4x4.5wl, v/h	100	J
F5FLN	16x26el KR,	1600	J
F5FST	16x26el KR,	1600	J
F5KDK	4x26el BV,	600	J
IK0BZY	1x33el BV,	650	J
IN3AGI	8x32el,	1300	J
KB0VUK	4x25el RIW,		N
KB4CNI	8x33el FO,	1500	J
KR5V	4x25el FO,	1500	J
N2HLT	8x22el FO,	400	J
N7LQ	4x25el FO,	1500	J
NA4N	4x22el, hor	1200	J
OE3JPC	2x24el BVopt,	500	J
OK1DFC	3.8m dish, rot	1500	J
UT3LL	4x27 BV OPT,	400	J
VK4AFL	4x28el WU,	500	J
W7ALW	4x13wl,	1500	J
W7EME	8x M2 mod, v/h	800	J
WA4NJP	11m dish,	250	J

902/903 MHz

VE4MA	3m dish, rot		J
W5LUA	7.3m dish,	300	N
WA8WZG	4.9m dish, h/v		J

1296 MHz

AX1ITU	10m dish, lin	40	N
DF4PV	6m dish,	600	J
F1CH	4x23el FT,	200	N
HA5SHF	3.6m dish, cir	100	J
IK6EIW	6m dish,	600	J
K3HZO	3.2m dish,	200	J
N6BQ	3.7m dish,	1500	J
NA4N	3m dish,	200	J
OK1DFC	3.8m dish,	1000	J

ON5RR	6m dish,	250	J
OZ6OL	5m dish, circ	150	J
W5/SM6IKY	4.9m dish,	400	J
W6HD	6m dish,	80	J
W7CS	5m dish,	100	J
W7QX	3m dish,		N
WA4NJP	11m (5m) dish,	100	J
WA9OUU	4.4m dish,	200	J

2304/2320/2424 MHz

DD1XF	3.7m dish, circ	200	N
I6QGA	6m dish,		J
K2DH	5.5m dish,	350	N
K2UYH	8.7m dish,	30w	J
LA8LF	5m dish,	100	J
OE9XXI	9m dish, circ	150	J
VE4MA	3m dish,	150	J

3456 MHz

VE4MA	3m dish,	75	J
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5760 MHz

DD1XF	3.7m dish, vert	40	N
RW3BP	1.65m dish,	40	J
VE4MA	3m dish,	45	J
W5ZN	3m dish,	18	N
W7CNK	5m dish,	50	J
ZS6AXT	5m dish,	20	J

10 GHz

AD6GD	3m dish,	26	J
DF3RU	3m dish, vert	10	J
DL2LAC	4m dish, hor	20	J
S57UUU	3m dish,	50	N
VE4MA	3m dish,	50	J

24 GHz

VE4MA	3m dish,	0.2	J
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The most up-to-date list (including EMail addresses) may be obtained from the Internet at

http://www.nitehawk.com/rasmit/eme_dir5.html

I would appreciate your submissions to the directory via EMail, FAX or Mail, or any other way...

- EMail (Internet): tklaus@berlin.snafu.de
- 24h FAX: +49-30-795 98 14
- Klaus Tiedemann, Halskestrasse 35, D-12167 Berlin, Germany

Thanks, Klaus, DL4EBY

6m News

Editor: Joachim Kraft, DL8HCZ - Joachim@Kraft.net

ZS6AXT, KG33vv, 6m report Feb. / March

1999: Friday 19. Feb. 6m band opened at 0951 with YO2BEH 529, at the time no beacons, weak video. 1102 hrd and wkd : LZ1SJ 539, YO7VS 539, LZ1SJ 57, LZ1MC 529, LZ1DJ 519 AT 1125, by then SV1SIX 599, LZ1 bcn 559, 5B4CY 579, 1127 5B4AGN 59+, OD5SX 59, IT9SGN 519, SV5BYR 559, 1213 SV1DH 559, S59A 529, 1240 ONLY 5B4CY no other beacons. Band closed. 1430 SV1SIX again, 1439 F5LNU 55, LZ1MJ, 9H2XT 59, EH1IE 559, YO7BKX 579, 1530 4X1IF 59, 5B4AGN 59, 1700 LZ1SJ, LZ1SX, Z32MA 55, IW5BEN, F8VQ, YU1HQR, 1805 IOWTR 579, EH6VQ 53, LZ1ZX 529, LZ2JH 579, LZ1QE 53, at that time beacons : SV1 579, LZ1 529, 5B4 559 and 9H1SIX 539. 1840 IT9, LZ, IWs - 59 sigs. 1843 IW5BML 599, 1900 IK0BAL 59, IZ0COK 59 and AT 1903 CQ from ON ??? was hrd. Band closed about 1920. Hope it will continue like that !

Sunday 21.Feb. 0935 weak CW from North, 1040 SV1SIX 559, only shortly, video 559, 1110 SV1SIX, video 59. 1210 SV1DH, 1300 video 59+, 1340 SV1DH, OD5SIX 599+, 5B4CY 559. All only heard. 1347 wkd or hrd : OD5SB 59, IW5BML 59++ (+ 20 kHz wide!!), F6FHP, 1400 9A3JL 559, IT9TPJ 599, DL3RB 559, LZ1DQ 519, EH1EH 559, at that time ZS6WB wkd OEs, more IS, SV5BYR, EH5BIF, DL6AV 579. 1500 SV1SIX, CT0SIX, CT0WW beacons strong, EH7AW, strong backscatter at that time, 5BRAGM, EH1EH, 4X1IF, 1530 SV1SIX weak, 5B4CY 559, 9H1ET, 9H1YG, 1600 SV1SIX 599, CT beacons 519, I0AMU CALLING EL2VO no QSO, 1650 5B4CY 57, SV1SIX 579, OD5SIX 559. IT9 59, 1705 9H1 beacon 559, SV1SIX 579. 1715 I0, 9H, SV5. 1730 SV1SIX 539, IW, 5B4 stations still there, 1745 band closed.

Not too many stations from Eu active. Where are the CTs ? I0JX had faulty CW TX, clicks +- 15 kHz. IW9BCD is very bad operator, shouting over other people QSOs !

Monday 22. Feb. 1130 strong TV sidebands all over. 1133 5B4AGM 559, 9A3FT 519, SV1OH 59, yo7VS 53. Then 1149 UU7JM 519, UU2JJ 559, UT5JAJ 579, at 1203 UU7JM again, 559, then Is, SVs, YOs, LZs, 1302 EH, SV, LZ, 9A3, Is, 1402 UU7JM again 559, EK6AD 529, with TV sidebands very strong, no Eu stations, only EK6AD until 1632, 1650 5B4, LZs, that time strong backscatter on local stns, 1750 Is and EH7KW, and at 1850 A61AH, 57 on SSB, LL74pg, MY COUNTRY #100 and his first 6m QSO. He is running 50W into dipole at the moment. It is probably also first A6 to ZS QSO. He will be QRV from Wednesday 24th every evening. ZR6ZL and ZS4SS managed to work him too. Band was weakly open till 2000, with weak sigs and beacons.

14.3. 1150Z 4X, LZ, OD5, 1200 UR5ZEL, SV, beacons : OD5, I0, SV1, 1300 UR5ZEL, 5B4, I, Fs, G3NVO, 1430 SV, 9H, Is, DL3IAE, Fs, DL2GBT, 1500 Fs, Is, IT9s, SV5, LZ, EH7, EH9, 1600 YO, Fs, YU, EHs, 1800 EH, SVs, 1850 hrd IW working to PY, 1910 band closed.

15.3. 1650 5B4, SV7, then thunderstorms.

16.3. 1200 F5QT, EHs, YU, CT beacons 579, 9H1, Is, Fs, 1300 EHs, 1630 Is, SVs, 5B4, IT9, CN8LI beacon 579 (50,027), 1800 CT3FT calling VQ5DX, Fs, 9H calling 5H3US, not heard here, SV1DH hrd until 2000.

17.3. 1040 VIDEO S9, UU7JM, UU2JJ, 1100 YU, SP9REN, OE6FGG, OK1FFD, Z32, 1130 OK1FFD 57 on SSB, DJ5JK, OE6FGG, SP9REN, EU5R 52 KO33ST my #102, EU1AB, EW1EW, ON4GG, Is, Fs, S5, OE6IMD, 1200 UU2JJ, YO, SP6CPH,

UU7JM, EH, EH6, Is, CT1, 1300 SV9ACE, SP9DSD, DL9UDS, ZB2EO, EH6ADW, CU7BC/CT, 1400 OK2VMD 55 on SSB, OM3CBR (hrd), EH6FB, CT, OK1KRY, DM2AFN, DL6AMI, PA3HEN/MM, DL2DXA, 1500 DL3AMA, OK1KRY, somebody calling 5T5U (probably Japanese operator), 1700 Is ETC., 1900 5H3US heard 41, OD5, EHs, SVs, 5B4, 5Z4, 9H until about 2000.

Great opening with GREAT mess on 50,110. On occasions up to 5 stations calling there CQ simultaneously on SSB, never mind the CW stations also there. On occasions one can hear stations from UU via SP, DL, OK F, to EH and CT at one time. However one new country for me is a good result. The especially IW stations got upset quite a few local ZS6, who were calling "CQ Central and Northern Europe" and they were consistently calling them! I wonder if they will ever improve their operating manners!

To my knowledge Italy is in Southern Europe. I was testing the IC706MkII during this opening, it seems to be good, the IF selectivity however is not the best, needs better IF filter. (I am used to the matched extra IF filters in my TS830 which I run with transverter).

18.3.1999: strong video from 1000Z. Then 1100 hrd and wkd : UU1JD weak, working ZS6PJS, LZ1RB, UU7JM, at that time OK2VMD heard ZS6PJS about S2, 1225 ZS6TWB beacon S2 in OK2, 1245 OD5SX, 1300 band closed, no video. 1600 video 599, 1645 A61AH wkd by few ZS6, plus LZ, YU, I, 9H, IT9, SV7, 1730 EK6AD 519 only, more LZ and Is, 1807 5H3US 41, hope that we will have a chance to work him sometimes, 1815 5B4, Is and 4Z5. About 1830 band closed.

19. March 99: Worked or heard: 1028Z UR5GL, LZ1MC, that time strong TV sidebands. 1100Z 9As, SP7EXY, DK4RV, PA0HIP, Is, YOs, YUs, ON4GG, Fs, OE6MIG, ON4CBA, LX1JX, more Fs, DL7AMI, G3NVO + other 10 Gs, 1200Z SP6ASD, EH5, CT1s, more EHs, DJ5RE, 1300Z DK2PH, ZB2EO, SP9DSD, 1400Z no stations, 1530 F, 9H, EH, LZ, Is, 5B4, YU, 1630Z strong video and SV1, OD5 beacons, 1642 T72EB/A, LZ, 1700 many Is, few Fs, 1800Z 5B4 and SV1 weak

with TEP modulation. At 1600Z 5B4AGM calling VR2LC, no QSO recorded. Again - few Italian stations with very bad operating manners; when they will learn ??

23.3. video S5 from 1000Z, 1040 SV1 beacon, video S9, 1045 UR5ZEL 559, UU1JD 529, SV, LZ, YU, I, 1107 UU7JM, UU1JD 55, SV8, EK6AD 559, F, 1200 F, I, OD5SB, SV9, YU, SV5, LZ, 9A, 1300 I, LZ, F, EH, YU, EH6, LZ beacon (50,013) 599, 1400 no SV or 5B4 beacons, only CT and 9H beacons copied, EH1EH 1430 closed. 1530 5B4AGM 59+, strong backscatter in Eu, nothing here, 5B4 beacon only copied 59, no other beacons, 1545 LZ, SV9, SV1 beacon 599, S59, Z32AU, DL9BBB (?), I, YO, YU, 1700 SV1, CT, S5 beacons strong, EH1EH, 1730 SV1 and CT beacons clean note, 5B4 with strong TEP modulation, 4X1IF, CT3FT, 1800 only 5B4 beacon, 5B4AGM 55, 9H5EE, IT9 stations only with strong TEP modulation until over 2030 Z. Very selective conditions this afternoon and evening! In the evening some Eu strong stations are continuously calling CQ on 110 for few minutes, thus wiping out everybody else. CQs on 110 should be short to give a chance to others!! Also - RTTY should NOT be used in the DX portion of the band. One Italian station was even calling CQ in RTTY on 50.110! What a mess.

Ivo Chladek, ZS6AXT, loc. KG33vv 3B9R, Rodriguez Island: wkd 3.4.99 DL3IAE

Coming 6m-Dxpeditons: CY9CWI Jul21. - Jul28. VE group CY9SS Jun07. - Jun14. VE group C6AFP Jul99. N5JQQ E4... Jun14. - Jun28. GJ4ICD If problems with E4-Licence they go to SU, Egypt! HZ1AB Sep99. K8PYD LK27 J45K Jul28. - Aug11 DL9USA, DL9UDS Loc: KM36 OH0/K7BV May23. - Jun03. OJ0/K7BV May23. - Jun03. OJ0/... Jun24. - Jun28. Int. Group ZD7VC qrv since April 99, wkd to EU already! D44BC qrv again since 4/99, wkd to EU already!

Pakistan, AP. March 28, Sergio, AP2WAP, made his firsts QSO's on Six! From the log: ZS6AXT, ZS6EZ, ZS6WB, ZS6XJ, ZS6BTE. QSL via IK4ZGY, William Debbi, P.O.Box 5 I-41040 Corlo (MO) Italy.

Tropo News

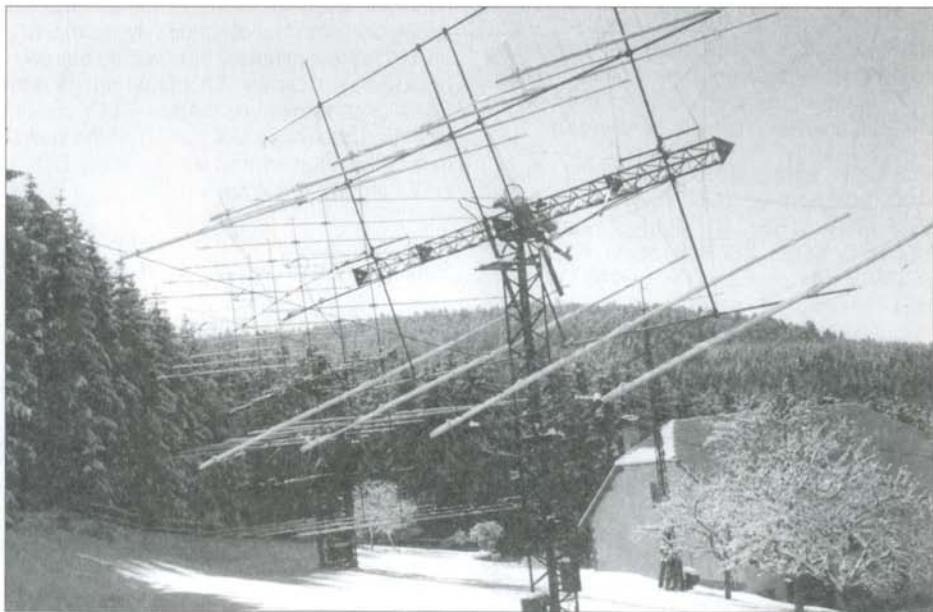
Editor: Joachim Kraft, DL8HCZ - Joachim@Kraft.net

2m > 700 km

PA3BIY, JO22EB, 2 x 9 ele, wkd in 1998:

980225 EI6GF IO62RG, EI4DQ IO51,
SP4MPB KO03, SP1EOI JO73. 980226
SP3GFP JO82OJ, 980226 SP2OFW
JO93AC, 980226 SP7DCS/7 JO91MN.
980921 SP2FAX JO83. 980924 OK2ZZ
JO89AO. 981006 OZ6ABAJ O57DG. 981201
OZ4DER JO75JF. 981216 EA2AWD IN93CI.
Txn for info Peter

DK5KK/MM etc sind vom 22.4.-2.5. wieder
Maritimobil qrv. Bnder: 6m (100w), 2m
(600w), 70cm (170w) 23cm (100w). Die
Gruppe fährt mit einem Schiff von Hamburg
durch die Ostsee in Richtung Finland (OH2)
oder Schweden (SM3). Als reine Wasser-
felder werden JO85 und evtl. das extrem
seltene JP91 aktiviert. Andere Felder: JO96,
KO07, 17, 18, 19, 08, 29, 39 (bei OH2-Fahrt)
ODER: JO86, 87, 98, 99, JP90, 80, 91, KP01
(bei SM3-Fahrt). JO85 ist in jedem Fall dabei!



F3 VS

Meteor Scatter

Editor: Norbert Götsche, DL8LAQ

Dear Readers, don't forget to send in all your reports, experiences and comments about the MS activity!

It happens sometimes that I can't recognize what column of your report includes the number of bursts or pings or the tx/rx report. Please don't forget to give me a short hint. In this column the order is bursts, pings and seconds. And here is again the meaning of the short cuts: c = complete, bs = backscatter, m = many, nc = not complete, nil = not in log (no reflections!), r = random, s = ssb, sc = sidescatter and t = tailend.

Send your reports to dl8laq@hamburg.roses.de or to my packet radio address DL8LAQ@DB0HB.HH.DEU.EU.

73, Norbert

F/DDOYF (JN33GE) wkd on 144 MHz:

1998-10-18
0500 0530 DH3YAK JO31 27 27 12 4 1 c
0533 0647 DF8AA JO60 1 nc *4
0647 0730 DL1ELY JO31 nil
2000 2050 OE3MWS JN88 27 26 15 5 2 c
1998-10-19
0300 0330 S54AA JN75 nil
0400 0455 G3KWY IO92 27 1 0.2nc *1
1998-10-20
0500 0600 DG5OAF JO51 26 26 25 12 1 c
0600 0630 DJ3VI JO51 27 26 16 1 1 c
1998-10-21
0300 0338 DL1EJA JO31 27 27 30 18 11 c
0340 0412 DF8IK JO30 26 26 15 16 1 c
0420 0525 DK6EL JO31 nil
1998-10-22
0400 0500 SP6GVU JO81 26 27 7 5 0.5nc *2
0500 0600 LY2MW KO24 nil
0600 0638 DL1DUR JO70 27 27 18 20 0.5c
1900 1940 IW7DEC JN81 26 1 0.3nc *3

Equipment: IC275H, 100W, 8el 3.5m boom, DTR, ETM9c Remarks: *1 Sorry! Vy bad take off in this qth, also PE1OGF same qrg. *2 Sorry, no rr hrd, I wanted to be qrv from top of a hill this day, but all of them with fb take off to northeast where difficult/dangerous to reach during darkness and far away - so I stay at fix qth (with bad take off to NE). *3 Offset 45deg.

DDOYF (JO61VA) wkd on 144 MHz:

199812-11
2050 2125 IC8FAX JN70 27 27 32 3 7 cr
1998-12-12
0527 0543 YU7MS KN05 27 27 13 2 1 cr
2032 2110 18TWK JN70 27 27 10 3 1 cr
1998-12-13
0607 0627 11JTQ JN35 27 27 11 5 0.5cr
1702 1708 RU1A KO48 27 27 6 1 cr
1717 1745 LY2WR/P KO16 27 37 12 3 11 cr

2057 2145 S53VV JN65 27 26 13 2 2 cr *1
2247 2307 EU6MS KO45 28 28 39 5 cr
2322 2335 LY8X KO24 27 27 12 1 cr
1998-12-14
0002 0025 OH1XT KP01 27 27 10 3 cr
0717 0727 9A5Y JN85 27 38 9 1 cr *2
0800 0832 F6CRP IN96 27 79 3 1 ncr
0942 1057 15WBE JN53 38 27 7 9 5 cr
Equipment: 3ele 0.86m boom, 100W! Remarks: *1 Backscatter, *2 Sidescatter.

Due to a carcrash I could not reach my 2nd qth, so I stayed at home and put a 3ele on our southern window or I was "p" from the northern house-balcony. I was very surprised, how it works with such a small rig. OH1XT said: "You sounds like everybody" hi!

DDOYF (JO61VC) wkd on 144 MHz:

1998-08-14
0100 0130 Z30/P KN00 nil *1
1998-08-21
0700 0800 OH/DK5KK KP14 27 26 13 6 3 c
19981008
2000 2050 RV3AH KO85 28 27 6 3 3 c
1998-11-17
0000 ES2RJ KO29 59 27 1 c sr
0004 LY2WR KO24 59 59 1 c sr
0005 OH5LK KP30 27 38 1 c sr
0011 YU7RF KN05 59 59 1 c sr
0021 EA3ADW JN11 39 39 1 c sr
0024 IK1LGV JN44 39 39 1 c sr
0038 OH1XT KP01 59 59 1 c sr
0044 RV3ZR KO80 39 37 1 cr
0110 UA3PTW KO93 59 59 1 c rs
0115 RV3IG KO88 59 59 1 c rs
0130 GM3JIJ IO68 59 59 1 c rs
0133 SM3UZS JP92 59 59 1 c rs
0136 G8XVJ IO83 59 59 1 c rs
0150 EA5EJZ IM98 59 59 1 c rs
0158 18MPO JN70 59 59 1 c rs
0217 LZ2FO KN13 39 37 1 c rs
0224 SV0EC KN10 59 55 1 c rs
0244 UT8AL KO61 59 59 599 1 cr
0255 EA6FB JM08 59 59 1 c rs
0258 F1CH JN23 59 59 1 c rs
0300 9A1RKV JN74 59 57 1 c rs
0303 EA3TI JN11 39 39 1 c rs
0328 UT5ER KN69 59 59 1 c rs
0332 EA/DF9OX IM88 59 59 1 c rs
0336 OH6KSR KP22 39 59 1 c rs
0346 OH7HLG KP32 59 57 1 c rs
0355 Z30B KN01 59 59 599 1 cr
0356 YZ7MON JN95 59 59 1 c rs
0401 F6HVK JN27 59 59 1 c rs
0413 UR5LX KO70 59 59 1 c rs
0713 UT5EC KN78 59 59 1 c rs

Meteor Scatter

0721 OH7PI KP32 599 599 1 cr
 0723 LA0BY/P JO59 59 59 1 crs
 0724 F/G8MBI JN04 59 59 1 crs
 0738 F1FIH JN23 59 59 1 crs
 0740 EA5FKX IM98 59 59 1 crs
 0818 I5WBE JN53 59 59 1 crs
 0939 EA2AGZ IN91 59 59 1 crs
 0945 IZ5EME JN52 59 59 1 crs
 1021 S55AW JN75 59 59 1 crs
 1040 F6FAI IN98 59 59 1 crs
 1110 OH6NUW KP13 59 59 1 c?rs *2
 1123 SM3KJO JP92 59 59 1 crs
 1152 OH2MFE KP20 59 59 2 crs
 1200 SM2CKR KP03 59 59 1 crs
 1215 F5FLN IN94 59 59 1 crs
 2300 2330 OH9NDD KP26 nil

1998-11-18

0000 0100 LA5TFA JP99 26 3 1 0.5nc
 0200 0230 RA3DQ KO85 nil
 0300 0400 RA3DRC KO95 27 27 12 7 16 nc
 0500 0600 UA1OLJ LP03 26 4 3 25 nc

Remarks: *2 C? Local station break in my qso. Equipment: 13ele 7m boom, 100W. Heard continuous forward: SV1OE 30 min, OH7PI 10 min (high muf?) this is not to explain with high muf only: hrd a few HA's with beam EA (90deg offset) for 10min continuous! Thanks for your report, Steffen.

DL8EBW (DL66a / JO31NF) wkd on 144 MHz:

1998-12-11
 0500 0522 LA4XGA JP33VC 27 26 11 25 1 c *1
 1998-12-13
 0335 0350 9A5Y JN8500 28 27 11 10 3 cr *3
 0405 0416 YU7MS KN05EF 28 27 9 20 2 cr *3
 0437 0445 RU1A KO48VR 38 27 9 m 6 cr *3
 0515 0525 LY2WR/p KO16 37 28 8 m 5 cr *3
 1998-12-14
 0100 0215 LY8X KO24PQ 27 m m 5 ncr *3
 2325 0000 OH8N KP34VJ 26 3 2 1 ncr *3
 0500 0552 LA4XGA JP33VC 26 27 6 24 6 c *1
 1998-12-24
 0500 0552 LA4XGA JP33VC 26 27 6 24 6 c
 1999-01-03
 1200 1300 RV3AH KO85TO 1 3 nc
 1999-01-04
 0400 0500 RK1NA KP71ET 26 27 2 3 0.5nc
 0500 0521 TK5EP JN41IW 28 27 8 mni 3c

Remarks: *1 Regular sked to Geir (1320 km), to test ms-condx. (stopped due low ms conds, btw januar-april!) *2 Aurora backscatter condx during the sked! *3 QSOs made in random for the BCC98 MS-Contest. NIL skedresults: 1998-12-13 RA3IS KO76 (1956 km), 1998-12-14 RK1NA KP71 (2020 km), 1999-01-03 RA3DRC/UA1 KO55 (1650 km).

Geminids: Had less time to check reflections all over the time, but believe condx was fair. Activity was not as high as last years, but not surprising after these usefull LEOs!! Quadrantids: Same like GEM. Was qrv from 3.1. (12ut to 23ut) and in the early morning of 4.1. (4-6ut) - hrd some 5-10sec reflections and also refl. over 2000km, but at all activity was low as in geminids. Lets hope you getting not too "fat"(hi) from that LEOs 98 and we all will meet again in april/may when saison starts agn! Equipment: FT726r modified (CF300), 4CX250R (250W), 11ele Flexa, MGF1302, DTR (by

DF7KF) ETM9C, RX/TX max 3500lpm, OH5IY Compact-MS-Soft Version 5.0

Every sked for ms, also with stations worked before is very welcome! Thanks for your report, Guido.

F6KHM (IN78RJ) wkd in SSB on 144 MHz:

1998-11-16

2340 IW5DAN JN53 59 59

1998-11-17

0017 G4DHF JO02 59 59

0029 HB9QQ JN47 59 59

0042 PA3DYS JO21 59 59

0044 SP6ASD JO81 59 59

0051 SP2OFW JO93 59 59

0052 G3XDY JO02 59 59

0052 DD3XN 55 59

0106 S57TW 59 59

0120 9A3PA 59 38

0125 F1NSR JN33 59 59

0127 DJ2QV JO41 59 59

0128 DJ5BV JO30 59 38

0128 DK5DQ JO31 59 59

0129 SP2FAX JO83 59 59

0145 DG3GAG JN48 58 39

0210 I8MPO JN70 59 59

0217 S54AA JN76 59 59

0230 I1JTQ JN35 59 37

0237 SP6GVU JO81 59 59

0243 SP4MPB KO03 59 37

0245 OK1UAK JO70 59 59

0255 S51AT JN75 59 59

0303 DL1EJA JO31 59 57

0305 SP3SFN JO82 47 59

0310 9A1CCY JN85 59 59

0350 DL5WG JO52 59 59

0355 LA5KO JO59 59 59

0400 EA7GTF IM87 59 59

0403 EA3ADW JN11 39 39

0406 HA8UG JN97 59 59

0408 F6CBH JN19 59 59

0408 DK5DQ JO31 59 59

0410 SP9EWO JN99 59 59

0412 DL9AN 39 37

0420 CT1FAK IN50 49 49

0421 DK5KK JO63 59 59

0430 EA9MH IM85 59 59

0446 CT2GLU IN50 38 26

0449 EA3TI 39 39

0458 HA8CE KN06EN 59 59 ODX 1875km

0507 PE1HWA 38 37

0511 DL5ME 59 58

0513 HB9SUL JN47 59 59

0515 SP9EWU JO90 59 59

0518 DH1TW 59 59

0519 DH9OY JO51 59 59

0519 EA3DUY JN12 59 59

0533 DK5KK 59 59

0542 OZ1BPN 59 59

Equipment: TS790E + SP2 + 2.13 3.2WL + 400W PA.

This qsos were worked by myself from the brest radio-club F1AKK, 73, Olivier, F6HKM. Thanks for your report, Olivier.

The Leonids on top of a mountain by HB9SUL

Just a short note to let you know what happened on top of a Swiss mountain between the 16th and 18th November on 144MHz. Since the cableway was closed due to high winds, we had no chance to go up but walking; after 2.5 hours of climbing with about 15kg on the shoulders, snow up to the knees (and sometimes a bit higher...Hi freezing) and the speed of the wind up to 60 km/h we reached our 1600 m peak (down was 900m ASL) when it was already night. Just the time to recover and we started to set the antennas and rig. By the time we were ready only with 1 antenna there was already the end of the world going on. I logged my 1st qso at 2242 and then we went back and forth from the shack to outside (snowing) several times to install a second separate antenna and making some qso. You can imagine the situation. We wanted already to enjoy the 20-m-like pile up but we had to finish to set the 2nd aerial. Impressive! So, here is my summary:

HB9SUL worked on 2m SSB random (+2 QSO random CW) without dupe qso from JN47PH: EA6, EI, ES, EU, HG, LZ, OK, YO, 6 x 9A, 3 x DL, 2 x EA, 2 x F, 15 x G, 6 x GM, 2 x GW, 3 x I, 7 x LA, 4 x LY, 10 x OH!!; 2 x ON, 2 x OZ, 7 x PA, 2 x S5, 16 x SM, 9 x SP, 4 x UA, 4 x UR, 4 x YU. Equipment: FT726, PA8877, ant 13B2, preamp SP2, DTR, OH5IY software.

I must apologize for not being qrv on sked with SM3UZS, SM5TSP, RV3ZR and OH5KJQ since I had to leave my TRX down at the village and so the cable for the DTR which enables tx was wrong for the other rig which I have used. I had fixed it later the 18th when the sked were over.

Finally we were able to use the cableway on Wednesday to go down. 73, Andrea. Address: Andrea Bianchi, Via Arbostra 23E, CH-6963 Pregassona TI. Thanks for your report, Andrea

The Leonids '98 by I8MPO

I8MPO (JN70FP) wkd on 144 MHz in SSB on random (complete only) with QTF as noted +/-5 and QRG as noted +/-1 kc:

1998-11-16

2256 2257	DJ5BV	JO30	27 38 360 .200 C?
2259	YU7EW	KN05HP	27 27 360 "
2300	HA8CE	KN06EN	59 59 360 "
2301 2302	SP4MPB	KO03GS	47 37 360 "
2307	DL1EJA	JO31DS	59 57 360 "
2307 2308	DL5WG	JO52VK	59 59 360 "
2308 2309	DG5OAF	JO51EP	59 59 360 "
2309	DL9AN	JO62SN	57 27 360 .200 C?
2320	SP2FAX	JO83VA	29 59 360 .206
2324 2325	S51TE	JN76BI	27 38 360 .200
2325	G4DHF	IO92UU	29 29 360 .202 qrm
2325 2326	OZ8ZS	JO55RT	29 29 360 .203
2339	LA3BO	JO59CD	27 27 360 .197
2342 2343	SP7EXY	JO90	27 27 360 .199
2343	PA3FJY	JO32EH	39 39 360 "
2343	DG6JF/P	JO33QN	28 28 360 .199
2354 2355	ON1AEN	JO10UV	59 59 360 .200
2355	ON4AMX	JO20KV	59 59 360 "

1998-11-17

0008 0009 G0PQF JO01BU 49 59 360 "

0009	G3XDY	JO02	58 59 360 "
0009 0010	PA3DOL	JO22MT	38 39 360 "
0011	ON4KHH	JO10WK	57 59 360 " qrm
0012	DF9QT	JO42UD	57 57 360 "
0018	S51AT	JN75GW	29 37 360 " qrm
0024	DJ2QV	JO41EV	57 59 360 "
0026	IK0BZY	JN61GW	37 59 360 "
0026	DL1EAP	JO31IK	59 59 360 "
0026 0027	DL8EBW	JO31NF	59 59 360 "
0027	DL1KDA	JO30FQ	59 59 360 "
0027 0028	DH3YAK	JO31	59 59 360 "
0028	SP2NJI	JO92	27 27 360 .200
0029	G3WZT	IO90UX	59 59 360 .200
0029 0030	G3YVR	IO91WD	57 59 360 "
0030	G7RAU	IO90IR	59 59 360 "
0035	YT1VV	JN94	27 37 360 "
0036 0037	SP9EWU	JO90NH	27 27 360 "
0054	DL9MS	JO54WC	59 59 360 "
0055	HA6NY	JN98WA	39 27 360 "
0055 0056	HA6NQ	JN98WA	59 59 360 "
0115	IW1AZJ	JN35UB	59 59 360 " QRM
0118 0119	OM1AVK	JN88OD	37 37 360 "
0119	OK1CDJ	JO70VA	47 39 360 "
0119 0120	DL2ARD	JO60AR	59 59 360 "
0122	G3UTS	IO94CU	59 59 360 "
0131	DJ5MS	JN68KS	29 39 360 "
0131 0132	PE1LWT	JO22VA	59 59 360 "
0132 0133	PA0ZM	JO32GK	37 39 360 "
0133	OZ3K	JO45TL	39 39 360 "
0135 0136	DG3XA	JO43	39 39 360 .200
0137	9A1CCY	JN85OO	38 38 360 .206
0145	SP6GVU	JO81LC	59 59 360 .300 qrm
0150	-IV3BBR	JN65TW	57 59 360 .200
0157	DD0VF	JO61VC	39 39 360 .202
0157	LY2WR	KO24OQ	59 59 360 "
0158 0159	DG7WKM	JO63?	57 57 360 "
0200	OK1VSO	JN79WG	59 59 360 "
0205	SP6ASD	JO81	59 59 360 "
0206 0207	DH4FAJ	JO40LB	39 57 360 "
0207	DG5AAG	JO51CT	59 59 360 .202
0207 0208	OZ3K	JO45TL	59 59 360 .202
0212	F6KHM	IN78RJ	59 59 360 .300
0214 0215	SV0EC	KN10CJ	57 59 360 .202
0216	SV1OE	KN17VX	57 59 360 .300 qrm
0220 0221	SM7FMX	JO65KN	29 29 360 .198
0222	DD3XN	JO53BN	59 59 360 .300
0222	DL3YEL	JO41EV	59 59 360 .300
0231	YT1VV	JN94	59 59 360 .300
0235	SP3SFN	JO82TM	59 59 360 .300
0239	SP9EWO	JN99HW	59 59 360 .307
0241	EA6FB	JM08PW	57 57 360 .300
0245	DK5DQ	JO31PH	59 59 360 .300
0253	LY2MW	KO24PQ	59 59 360 .307
0300 0344	SM4DHN	JP60VD	27 27 360 .157 sked
0400 0412	SM4VQP	JO79NB	27 27 360 .157 sked
0422 0423	PA3DYS	JO21JP	59 59 360 .300
0424	HA8UG	JN97SA	59 59 360 .300
0424 0425	DG3GAG	JN48NB	39 39 360 .310
0425	HB9DFG	JN37SM	57 58 360 .310
0438	YT4D	JN94BR	59 59 360 .203
0448	9A1CAL	JN86EL	59 59 360 .302
0448	S51AT	JN75GW	59 59 360 .302
0448 0449	LY2SA	KO14LL	59 59 360 .302
0500 0530	OH5LK	KP30ON	- 15 .381 sked
0534	9A3PA	JN85EL	57 59 360 .306
0540	PE1OGF	JO21QJ	59 59 360 .300

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0540	ON1IM	JO11UB	57 55 360 "	0735	G0JUR	IO92WT	59 59 330 "
0548 0549	PA3FOC	JO21VW	57 59 330 "	0739	F3VX	IN97	59 59 330 "
0549	PA3HDD	JO22FE	59 59 330 "	0739	DL6YCY	JO41CU	59 59 330 "
0549	DL5MAE	JN58VF	59 59 330 "	0739	G4AEP	IO91NJ	59 59 330 "
0550	EA3TI	JN11DO	59 59 330 "	0740 0741	G8CIW	IO81	59 59 330 "
0550	ON4KST	JO20	59+ 59 330 "	0741 0742	F5HUE	JO10	59 53 330 "
0551	PE1HWQ	JO21GV	59 59 330 "	0742	PA0ME	JO22OB	57 37 330 "
0551	PA3BIY	JO22EB	59+ 59+ 330 "	0743	DH5FS	JO60UA	59 59 330 "
0552 0553	S57MSU	JN76EF	59 59 330 "	0743 0744	DD7SB	JN58BR	59 59 330 "
0553	DJ2TI	JN39QG	59 59 330 "	0744	DF8JD	JO31	59 59 330 "
0553	F6FLV	JN18AT	59 59 330 "	0749 0750	F1FEP	IN95	59 59 330 .300
0554	F1LHL	JN19	59 59 330 "	0802	OK2DL	JN89AO	57 57 330 .294
0554	PA2CHR	JO22XA	59 59 330 "	0804	I4RHP	JN54QL	59 59 330 .300
0555	OZ5AGJ	JO56DF	59 59 330 "	0804	DG4GAN	JN48NC	59 59 330 "
0557	F6CEK	JN19	59 59 330 "	0805	DG7MHR	JN57	59 59 330 "
0600 0601	DF1BN	JO31GD	59 59 330 "	0805	DL1MAJ	JN68AH	59 59 330 "
0601	F6AQI	JN19?	59 59 330 .300	0805	DL3AL	JO50	59 59 330 "
0601	F6IWF	JN19WD	59 59 330 .300	0812 0813	DJ0EM	JN37UV	59 58 330.300"
0602 0603	F1CML	JN07WE	59 59 330 "	0813 0814	ON1DHF	JO20CW	59 59 330 "
0604 0605	F8OP	JN26MM	59 59 330 " qrm	0814	DL5ME	JO52SD	59 59 330 "
0606	DL8GP	JN39LH	57 59 330 "	0814	OK1DDO	JO60	59 59 330 .300
0608	G4ASR	IO81MX	59 48 330 "	0815	G4BRK	IO91DP	59 59 330 .300
0609	F1EYB	JN23KK	59 59 330 "	0815	G4YAM	IO93VO	59 59 330 "
0609	G8IZY	IO91VC	59 59 330 "	0815 0816	PA0DVM	JO21IX	57 59 330 "
0611	IK1LGV	JN44JK	59 59 330 "	0816 0817	ON4PS	JO20KQ	59 59 330 "
0611	F1BKM	IN98MV	59 59 330 "	0820	G1WPF	IO91RP	59 59 330 "
0612	F1NYN	JN17AV	59 59 330 "	0821	DJ8ZJ	JO320H	59 59 330 "
0612 0613	DF8IK	JO30IT	59 59 330 "	0825	SP2SGZ	JO82UJ	59 59 330 "
0613	F6CBH	JN19	59 59 330 "	0830 0831	F1CJW	JN04FH	59 55 330 "
0614	G4XBF	IO91	59 59 330 "	0831	DK1KO	JO53CT	59 59 330 "
0614	ON1ALJ	JO10VV	59 59 330 "	0833	DL5MCG	JN58KH	59 59 330 "
0615 0616	IZ2BKU	JN45?	57 59 330 "	0834	DL2DBD	JO41	59 59 330 "
0616	F6APE	IN97QI	59 59 330 "	0834	ON4FZ	JO10SX	59 59 330 "
0618 0619	PA0JMV	JO21PM	59+ 59+ 330 "	0835	DH4PAA	JN49CW	59 59 330 "
0619	PA3CEE	JO33IJ	59+ 59 330 "	0836 0837	FA1CIL	JN16	59 59 330 "
0619 0620	DL6BF	JO32QI	59 59 330 "	0837 0838	F1PPH	JN07	59 55 330 "
0620	G0FIG	IO90VV	59 59 330 "	0846 0847	F6FAI	IN88	59 59 330 "
0621	G0RUZ/P	IO93	59 59 330 "	0847	F6FHP	IN94TR	59 59 330 "
0621 0622	HB9ONN	JN37NC	59 59 330 " qrm	0848 0849	F1DVI	JN05UD	59 59 330 "
0622	DJ3VI	JO51BS	59 59 330 "	0849	G6TTL	JO01NI	59 59 330 "
0623	DL3NCR	JN48QX	59 59 330 "	0850 0851	G7LIJ	JO01GG	59 59 330 " qrm
0627 0628	OK1UAK	JO70MB	59 59 330 "	0852	G4LOH	IO94QA	59 59 330 "
0628	SP8NCJ	KO12	59 59 330 "	0853 0854	F6DWG/P	JN19AJ	59 59+ 330 "
0629	EA3TI	JN11DO	59 59 330 "	0854	G3KWW	IO92IS	59 59 330 "
0629	PE1BVM	JO21RI	59 59 330 "	0854	ON4AVJ	JO11UB	59 59 330 "
0642 0643	DK3YV	JN57HV	57 57 330 "	0856 0857	DJ7OJ	JN58	59 59 330 "
0644	DL9YEV	JO41GV	57 57 330 "	0858	F6DRO	JN03SM	59 59 330 "
0647	DL9YEV	JO41GV	59+ 59+ 330 "	0858	F5ADT	IN97	59 59 330 "
0647	PA3FJY	JO32EH	59 59 330 "	0900	F6DWG/P	JN19AJ	59 59+ 330 "
0649	PA0PVW	JO21VX	59+ 59 330 "	0901	F1BUO	JN29AG	59 59 330 "
0654	ON1APG	JO20AT	59 59 330 "	0902	DL2IAN	JN49BE	59 59 330 "
0654	DL7FF	JO62	59 59 330 .300	0907	PA3BUT	JO21TX	59 59 330 "
0655	ON4YZ	JO20GG	59 59 330 .300	0908	DL6YFB	JO31	59 59 330 "
0656	9A2RD	JN65TF	59 59 330 "	0913	I1JQT	JN35UB	59+ 59 330 "
0658	LA2PHA	JO38IB	59 59 330 "	0913	G6XRK	IO90RN	59 59 330 "
0658	DL1EJA	JO31DS	59 59 330 "	0920 0921	F1FYE/P	JN08	59 59 330 .300
0700	DG0KW	JO64	59 59 330 "	0921	DL6YFB	JO31	59 59 330 .300
0700	F9OE	IN78QF	59 59 330 "	0921	G6FQZ	IO91JR	59 59 330 "
0702	PD0PYR	JO21UQ	57 59 330 .300	0922	G4DOL	IO80SP	59 59 330 "
0704	F/G8MBI	JN04FT	59 59 330 .198	0923 0924	F4AGR	JN07OQ	59 59 330 .300
0706	PE1PJG	JO33NA	59 59 330 .300	0930	PA0FHG	JO22	59 59 330 .200
0709 0710	LA0BY/P	JO59IX	59 59 330 .310	0942	F1IQI	JN38SV	59 59 330 "
0715	9H1CG	JM75EW	59 59 330 .201	0943	GW4EAI	IO81JP	59 59 330 "
0726	DJ4SO	JO44	59 59 330 .300	0945	OZ6ABA	JO57DJ	59 59 330 C?
0728	DF7KF	JO30GU	59 59 330 " C?	0952	EA1BLA	IN53VL	59 59 330 " qrm
0731	DL9MS	JO54WC	59 59 330 "	1000	EA2AGZ	IN91DV	59 59 330 .200

1002	1003	F1QI	JN38SV	59	59	330	.295
1003		DK8EL	JO31LJ	59	59	330	"
1003		DK2EA	JO50UF	59	59	330	.295
1005		I1CRB	JN45AN	59	59	330	.300
1006		PD0ORT	JO23RE	59	59	330	.306
1007		PE1PKR	JO23SE	59	59	330	.306
1016		G3WCS	IO83RH	59	59	330	.300
1035	1036	G1EFL	JO01FS	59	59	330	"
1036		PA3CWI	JO11	59	59	330	"
1047	1048	PD0MNF	JO30AV	59	59	330	"
1057	1058	IK1ZQH	JN45AN	57	56	330	"
1058	1059	DL1SUN	JO53PN	59	59	330	"
1114	1115	G7UWJ	IO83	59	57	330	"
1118		F6GEX	IN97	59	59	330	"

1998-11-18

0027	SP2OFW	JO93AC	59	57	330	"
0049	IK1MTZ	JN35UB	37	27	330	.300
0157	DH0HAR	JO53AP	37	37	330	.200
0159	G4IVH	IO92	37	27	330	"
0225	OM3RM	JN88PA	38	59	330	"
0226	F6FHP	IN94TR	59	59	330	"
0227	DG5OAF	JO51EP	59	59	330	"
0942	F1DUZ	IN97O1	37	59	330	"
0948	OZ3K	JO45TL	27	59	330	"
1017	PA2CHR	JO22XA	57	57	330	"
1017	DK5DQ	JO31PH	57	57	330	"
1039	F6BSJ	JN26HP	59	59	330	"
1045	F8OP	JN26MM	59	59	330	.200

Also heard these 50 stations: DC9YC, DF9PX, DG5HV, DH2OAA, DL3IAE, DL4DWA, DL4EBV, DL6XCE, DL8AFW, EA3ADW, EA4AQQ, EA7GTF, F1BEV, F1CYB, F1FIH, F1NSR, F2GN, F2QL, F6DWH, F6FKB, F6GGF, F8DO, F9HS, FA1UJI, FA1UQL, G1SWH, G4CLA, G8TIC, G8XVJ, HA2SX, I4XCC, I6VYV, I7CSB, IW1BCV, IW5DAN, IZ4AIK, IZ5EME, ON4PG, ON5OJN, OZ6OL, PA2DWE, PE1LCH, S51AA, S54AA, S57TW, SK6AU, SP8NJG, 9A1RKV, 9A1UDY, 9A2LD... and too many others to write down!

2 x SBB Meteor-scatter analysis	heard	worked
qso's	n/a	243
stations	350 +	226 (1)
squares	118	107
countries	24	23
fields	10	9

(1) multiple qso's: 15 callsigns two times, 1 callsign three times

QRB evaluation

Short distance QSO's <250km):

214 km IK8XFR	216 km IK0BZY
JM89CG backscatt. hrd	JN61GW backsc.rndm.

Long distance QSO's (>2000km)

Random	Sked
2186 km GM4CXM	2381 km OH5LK
IO75TW hrd	KP30ON nil
2167 km LABY/P	2170 km SM4DHN
JO59IX (1)	JP60VD (2)
2080 km LA3BO	2050 km SM4VQP
JO59CD	JO79NB

2014 km LA2PHA

JO38IB

(1) ODX Random ; (2) ODX Sked

Furthest geographic point worked

North SM4DHN JP60VD East LY2WR KO24OQ

South 9H1CG JM75EW West EA1BLA IN53VL

QSO breakdown

By date	Random	Sked
16 November	18	0
17 November	210	3 (nil)
18 November	13	0

By squares (top 5)

JO31	JO21	JO22	IO91	JN19
12	10	8	7	7

By country

60 DL (1)	12 ON, SP	3 EA, LA, LY, S5, SM, YU
34 F (1)	10 I	2 HB9, OM, SV
29 G (1)	5 OK	1 EA6, GW, 9H
24 PA	4 HA, OZ, 9A	

(1) DL+F+G = 51% of total QSO'S

By field

119 JO	13 IN	2 JM
73 JN	5 KO	1 JP
26 IO	3 KN	1 KM

Comments:

It all started around midnight's local time. I went in the shack to pull the big switch so that I could get some good sleep and get ready for the following night's peak. I had checked for a few minutes on .200 half an hour earlier and could not hear anything. Fortunately, though, I looked at the S-meter and turned up the volume again before switching off the radio: IK0BZY was calling Sporadic-E style with many takers!

The biggest thrill to me has been to make more than 20 % of my QSO's on back or side scatter. Since I live on the western side of a mountain, I have usually no way of contacting any country in the East direction. My only chance, during very favourable MS or ES openings, is to beam to a common scatter point away from the direct path. Anyway, it was never as successful as this time. Toward West (240 to 150 deg), instead, I have a super take off since I am only 500 meters away from the Mediterranean in most directions.

My only complaint is that I've been unable to work OH5LK. Conditions were excellent at the time but maybe Jussi and I were too anxious to go back on .200. We only tried for 30 minutes thinking that the peak would have occurred the day after as it was foreseen. Wrong! I can see now that this was a big mistake...

Anyway, Leonids 98 has been for me THE VHF EXPERIENCE OF A LIFETIME but... Stay tuned! Leonids 99 could be even better...

Meteor Scatter

Equipment: TR751A unmodified, solid state P.A. (with built in preamp) 200 w out, 13 el Yagi. Mailing address: Lucio Pentimalli, Parco Comola 1 bis, I-80122 Napoli, Italy. Phone (GSM): ++39 335 460374. Many thanks for your report, Lucio.

I8TWK (JN70GR) wkd on 144 MHz during Leonids:

1998-11-17

0639	DB6LS	59 59
0640	F8OP	JN26NM 59 59
0640	F8DO	JN26IF 59 59
0642	HB9DFG	JN37SM 39 37
0643	DL2IAN	JN49BC 59 59
0647	DK5DQ	JO31PH 59 59
0648	ON4KST	JO20EP 59 59
0648	IW1CHX	JN35 59 59
0649	ON1IM	JO11VB 59 59
0650	ON4KST	JO20EP 59 59
0655	F8DO	JN26IF 59 59
0656	DF1BN	JO31IE 59 59
0656	DL9YFY	JO41GV 59 59
0657	OK1FFM	59 59
0657	PA3HDD	JO22FE 37 57
0659	S51AT	JN75GW 59 59
0659	PE1OGF	JO21QJ 59 59
0700	G3WCS	IO83RM 59 59 CW
0724	G1WPF	IO91RP 59 59
0725	ON1ALJ	JO10VV 59 59
0730	PA0PVV	JO21VX 59 59
0733	G1WPF	IO91RP 59 59
0734	PE1OGF	JO21QJ 59 59
0735	ON4YZ	JO20GG 59 59
0737	SP2FAX	JO83 59 59
0737	F6DRO	JN03SN 59 59
0740	DF6VL	JN03SN 39 57
0741	G4ASR	IO81MX 59 59
0742	PA3FOC	JO21FJ 59 59
0743	PA3UWP	59 59
0743	DK3BU	JO33NO 59 59
0744	DF7KF	JO30GU 59 59
0744	PA2CHR	JO22 59 59
0744	DL6BF	JO32QI 59 59
0750	EA2LU	IN92ET 59 59
0756	G1WPF	IO91RP 59 59
0757	DH5FS	IO91RP 59 59
0759	F5HRY	JN18EQ 59 59
0759	DJ9BV	JO43XN 59 59
0759	DL3NCR	JN48QX 59 59
0759	PA0PVV	JO21VX 59 59
0800	G3WZT	IO90UX 59 59
0800	DL1HTT	JO61FR 59 59
0801	DL7FF	JO62TJ 57 59
0801	OK1UAK	JO70MB 57 59
0801	ON4PS	JO20KQ 59 59
0812	PA0GHB	JO11WH 59 59
0813	F9FT	JN29AG 59 59
0813	PE1GNP	JO31IX 59 59
0814	DL3YEL	JO41EV 59 59
0814	DL6YCY	JO41CU 59 59
0816	PE1BVM	JO21RI 57 59
0816	PA3BIY	JO22EB 59 59
0818	F1DKM	JN02 59 59
0820	DF9QT	JO30OR 59 59
0825	ON1ALJ	JO10VV 57 59
0829	PA0ZM	JO32JE 59 59
0829	DL2IAN	JN49BC 59 59

0830	G3WZT	IO90UX 59 59
0830	ON1DHT	JO20KS 57 57
0831	DF9PX	JN49HU 59 59
0831	DF8JD	JO31MF 59 59
0837	F1TH	JN23MT 57 55
0847	F8DO	JN26IF 59 59
0848	ON4AMX	JO20KV 59 59
0849	M0BUV	IO90 57 59
0852	9A2RD	JN65TF 59 59
0853	F1DVI	JN05 57 57
0854	ON1IM	JN11UB 59 59
0857	OZ1LPR	JO44WX 59 59
0857	DL2ARD	JO60DQ 59 59
0909	G4LOH	IO94IA 39 39
0909	G0RUZ	IO93FR 59 59
0928	I24AIK	JN64 59 59
0929	DL5MCG	JN58KI 59 59
0931	PE1PKR	JO22 59 59
0931	PA3BKT	JO22 59 59
0936	SP2FAX	JO83VA 59 59
0938	DF9YC	JO41 59 59
0938	PA3BUT	JO31DX 59 59
0939	DL5ROB	JO31 59 59
0939	DL4DWQ	JO31 59 59
0941	OZ6QT	JO47XB 59 59
0942	ON4PS	JO20KQ 59 59
0945	DJ9KV	JN68OK 59 59
0945	DH7FB	JO62SN 59 59
0945	DL1EAP	JO31IK 59 59
0946	DL5CC	JO31 59 59
0946	DG7KP	JO30NX 59 59
0947	OZ6ABA	JO57DJ 59 57
0953	G4LOH	IO94IA 59 59
0953	G3WPJ	IO91 59 59
1006	DJ3FF	JO51GR 59 59
1007	PA3FBN	JO33HF 59 59
1019	F1CH	JN23VE 57 55
1024	DH2OAA	JO42TU 59 59
1025	ON1DHF	JO11 59 59
1025	DK9JR	JO31TM 59 59
1025	DG9JF	JO33QN 59 59
1026	OZ1KLU	JO46LC 57 59
1028	G1IMV	IO91OX 59 59
1042	ON1IM	JO11VB 59 59
1047	PA3DOL	JO22LU 59 59
1052	ON4PS	JO20KQ 59 59
1057	PA0ZM	JO32JE 59 59
1058	DL2ALU	JO32JE 59 59
1058	DL5DTA	JO61SD 59 59
1059	DL1SUZ	JO53UN 59 59
1100	DG8NCO	JO50VH 59 59
1126	DK1KO	JO53CT 59 59
1126	DL2MV	JO53 59 59
1126	DL2MEV	JN58FN 59 59
1127	DL5XV	JO53AO 59 59
1128	DG5TR	JO53AO 59 59
1128	PA3CEE	JO33JI 59 59
1129	DG0KW	JO64MH 59 59
1140	DH2UAK	JO61? 59 59

1998-11-18

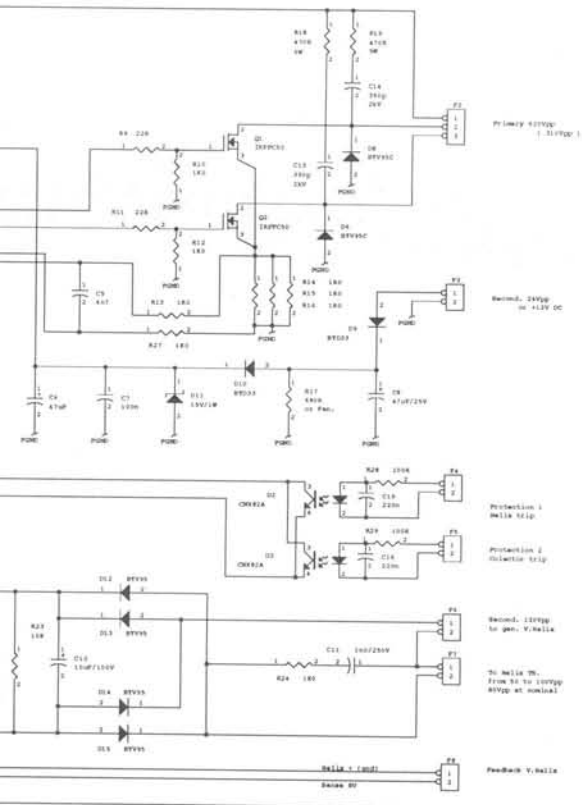
0052 SM7CKM JO76GX 37 59

All contacts were single-burst.

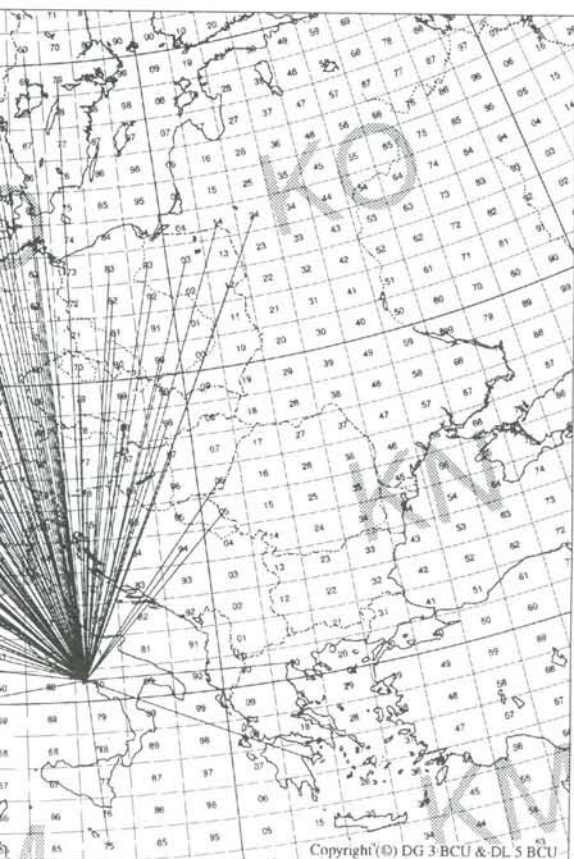
I8TWK (JN70GR) wkd on 144 MHz during BCC contest '98:

1998-12-11

Abb./Fig. 1: Circuit Diagram Control Circuit



18MPos QSO during Leonids



Meteor Scatter

2040 2055 DJ9YE	JO43	37 27 17	2 cr*	1998-09-25			
2110 2135 DL5MAE	JN58VF	27 27 17 2	1.5cr*	2100 2130 EU6MS	KO45	27 28 17 23 2	c*1
2210 2230 DL9AN	JO62SN	27 27 19 3	2 cr*	1998-10-09			
2330 2355 SP2OFW	JO93AC	28 38 m 1	7 cr*	2100 2142 EU6MS	KO45	27 28 21 31 2	c*1
1998-12-12				1998-10-16			
0600 0615 LY2WR/p	KO16	27 27 8	1 cr*	2100 2200 EU6MS	KO45	27 27 10 33 1	c? *1
0650 0740 G0FIG	IO90	27 37 12 m 1	1 cr*	1998-10-23			
1825 1845 PA4VHF	JO32	28 27 6	2 cr*	0200 0230 OH5KJQ	KP41		nil
1900 1915 DH9GCD		27 26 8	1.5cr*	2100 2135 EU6MS	KO45	29 27 13 29 3	c*1
1920 1935 PE1LWT		27 26 9 2	1 cr*	1998-10-30			
1940 1950 DN2MS	JO31	27 27 3	cr*	2200 2255 EU6MS	KO45	27 28 11 31 2	c*1
2040 2105 DD0VF	JO61	27 27 4 1	2 cr*	1998-11-06			
2135 2145 DL1MAJ	JN58	39 28 3	8 cr*	2200 2225 EU6MS	KO45	27 28 14 12 2	c*1
2300 2315 DL8CMM	JO52	27 27 7 2	1.5cr*	1998-11-13			
1998-12-13				2200 2215 EU6MS	KO45	55a 56a started in MS, ended in Aurora!	
1955 2015 DL1SUZ	JO53	27 28 12	3 cr				
2015 2030 SP4MPB	KO03GS	27 27 8 2	6 cr*				
2040 2055 DL0LSW		27 28 7 2	5 cr*				
2125 2150 YU7MS	KN05	27 27 12	6 cr*				
2215 2230 LZ1ZX	KN32IO	28 27 9 2	3 cr*				
2315 2325 DH0LS	JO60II	27 38 4	2 cr*				
1998-12-14							
0235 0255 PA6T		27 28 11	3 cr*				
0320 0335 F8DO		27 29 6	3 cr*				
0345 0255 PA3FOC		29 38 6 3	2 cr*				
0400 0410 DL3IAE		28 28 6 1	3 cr*				
0500 0540 OZ5AGJ	JO56	27 27 5	61cs* sked				

NC: 9A5Y 27/-, PA3BZL 27/- Heard:YT3D, HB5OK, HB9FAP, G0GMS, DJ3HW, ON4KHG, PB1TT, F6CRP, LZ2HV. Equipment: IC271 + Frontend MuTek + 4CX250R (400W) + 4218 CC + DTR DK7KF + OH5IY rev.4.3 + PC.

Nice contest, flat maximum on 12-13th december. Maybe less good condx as last year, but I enjoyed more (better wx here...)

Final result: 23 valid QSOs, 22 Prefixes, total score 1518 pts.

I8TWK (JN70GR) wkd on 144 MHz during Quad-drantids:

1999-01-03			
2010 2025 DF0WD	JO42	27 36 11	1 cr
2045 2105 DK3IK	JN39	27 27 4 3	3 cr*
2155 2225 PA3BZL		38 m m 6	ncr
2235 2300 DK1CO	JO63SX	27 37 m	8 cr
2305 2325 DJ5BV	JO30	28 27 11 4	2 cr
2340 0005 DF1BN	JO31IE	37 27 15	4 cr
1999-01-04			
0017 0025 OZ8ZS	JO55RT	27 2	2 ncrs

Remarks: * He tx'd only 800 lpm! Nice sigs. Heard:DK5KK, ON4AMX, UR5BAE, PE1OGF (maybe his partner). Equipment: IC271/MuTek, 4CX250R (400W), 4218 CC, DTR DK7KF, OH5IY rev.4.3.

Comments: Was not so great shower, maybe things were better some times after I got bed... but was not allowed to listen all night as in the morning I had a long trip. Anyway reflections rather short, found difficult try SSB contacts. Nice reflections in all CW QSO. 73, Carlo. Thanks for your report, Carlo.

PA3BIY (JO22EB) wkd on 144 MHz

1998-09-04			
2100 2137 EU6MS	KO45	28 28 23 30 2	c*1
1998-09-11			
2100 2135 EU6MS	KO45	27 28 17 30 3	c*1
1998-09-18			
2100 2135 EU6MS	KO45	27 27 11 38 1.5c	*1

What comes next was mostly done in SSB: The LEONIDS! Some QSO's were done in slow speed CW. I have not put down the length of the bursts, because that was academic! Sometimes stations could be heard for 15 minutes, without ever fading out! It was a fantastic experience. Pity that all my skeds which I had planned during the "maximum" failed, hi! Still, the experience on the night of 16 to 17 November was worth it though no new squares were worked.

1998-11-16			
2253	ES2RJ	37 37	ssb
2257	OH5LK	37 37	ssb
2311	LY2WR	49 59	ssb
2315	SP2FPA	59 39	ssb
2320	SP9EWO	37 39	ssb
abt 2330	OH6KTL	39 39	ssb Lost exact time!
2338	LY2MW	49 39	ssb
2343	9A1CCY	59 59	ssb
2350	YT1VV	59 59	ssb
2357	LY2SA	59 59	ssb
1998-11-17			
0014	SP4MPB	57 57	ssb
0023	RW1RZ	55 59	ssb
0037	OH1XT	59 59	ssb
0050	IK0BZY	59 59	ssb
0051	S51AT	59 59	ssb
0055	YT4D	59 59	ssb
0059	SP2NJI	39 38	ssb
0100	IW5DAN	59 39	ssb
0105	HA6NQ	59 59	ssb
0116	UT8AL	55 59	ssb
0124	9A1CAL	59 59	ssb
0124	SP2FAX	59 59	ssb
0131	S51TE	55 27	ssb
0133	S57TW	59 59	ssb
0147	EA3ADW	59 39	ssb
0150	UT8AL	559 559	cw
0151	9A3PA	559 38	cw/ssb
0155	OH8HDL	59 59	ssb
0155	OH8UV	59 59	ssb
0225	RU1AA	599 599	cw
0248	9A4EW	599 55	cw/ssb
0252	SP7ASQ	559 599	cw
0302	SM5BSZ	599 559	cw
0311	HA2RD	59 59	ssb
0322	HA8UE	599 599	cw
0330	OH6KSR	59 59	ssb
0344	SP7EXY	59 59	ssb
0418	RW1AW	59 59	ssb
0433	YU1EM	59 59	ssb

0433	HB9FAP	59 59 ssb			0015 0037 IC8FAX	JN80	27 27	5	cr
0444	LZ2FO	37 37 ssb			0050 0100 S53VV		28 28 m	m	5 cr
0519	U5YM	559 599	cw		0105 0112 F5HRY	JN18	28 38	3	cr *2
0527	HB9SUL	59 59 ssb			1998-12-18				
0540	HA2SX	59 59 ssb			2200 2232 EU6MS	KO45	27 27 18 19 3	c	*1
0543	IW2BNA	59 59 ssb			1999-01-01				
0549	LZ1QI	599 59 cw/ssb			2200 2300 EU6MS	KO45	27 28	4	nc *1
0553	I8MPO	59 59 ssb			1999-01-03				
0553	F1FIH	59 59 ssb			1922 1950 EU6MS	KO45	29 29 m	m	3 cr
0554	IK1MTZ	59 59 ssb			2022 2032 RU1AA	KO48	27 38 m	m	10 cr
0555	YO3JW	59 59 ssb			2112 2145 LY2FE		28 28 m	m	cr
0603	IZ1BPN	37 37 ssb			2125 2140 OH1XT	KP10	38 28 m	m	6 cr
0606	9A3TU	59 59 ssb			2200 2240 UA3PTW	KO93			nil
0607	9A1RKV	59 59 ssb			2240 2250 LY2WR	KO24	29 39 m	m	10 c s9
0609	9A2RD	59 59 ssb			2315 2335 RW1AW	KP50	37 37 m	m	10 c rufb!
0613	I4RHP	59 59 ssb			1999-01-04				
0637	HA2SX	59 59 ssb			0012 0027 LY2MW	KO24	39 39 m	m	10 c r s9
0643	I7CSB	59 59 ssb			0500 0550 LA5TFA	JP99			nil
0645	HA8UG	59 59 ssb			1999-01-08				
0649	YU1WP	59 59 ssb			2200 2237 EU6MS	KO45	27 27 19 24 1	c	*1
0652	LY1DQ	59 59 ssb			Remarks: *1 Regular weekly sked. *2 I was beaming				
0658	SP5CCC	59 48 ssb			45. Nice backscatter! Equipment: Homemade, 400W,				
0702	SP2SKZ	59 59 ssb			2 x 9ele. Good DX and hope to catch you on MS, Peter.				
0759	OH1XT	59 59 ssb			Thanks for your report, Peter.				
0800	OH7PI	55 59 ssb							
0807	I5WBE	59 59 ssb							
0810	S54AA	59 59 ssb							
0816	I8TWK	59 59 ssb							
0823	SM3JLA	59 59 ssb							
0831	IW1BCB	59 59 ssb							
0845 0905	LA5TFA	JP99	26	cw 2b nc sked					
0955	SM3COL		57	59 ssb					
1022	SP8UFT		59	59 ssb					
1022	YU7KB		59	59 ssb					
1025	S57IBU		59	59 ssb					
1025	YU110		59	59 ssb					
1025	YU7VA		59	59 ssb					
1040	EA2LU		59	59 ssb					
1998-11-18									
0100 0140	RK1NA	KP71		nil					
0200 0300	LA5TFA		47	1 30 nc					
0300 0400	RA3DQ	KO85		nil					
0400 0430	UA3PTW	KO93		nil					
0400 0530	RX3PX	KO84		nil					
1998-11-20									
2200 2237	EU6MS	KO45	27	28 18 26 2 c *1					
1998-11-27									
2200 2237	EU6MS	KO45	27	28 9 22 3 c *1					
1998-12-04									
2200 2227	EU6MS	KO45	28	28 16 26 1.5c *1					
1998-12-11									
2117 2125	RU1A	KO48	27	37 8 2 cr					
2200 2230	EU6MS	KO45	29	27 17 13 8 c *1					
1998-12-12									
0037 0052	YU7MS		28	27 m m 3 cr					
0227 0236	9A5Y		28	27 m m 10 cr					
1745 1802	LY2WR/P	KO16	29	29 m m cr					
2020 2045	OH8N	KP34	28	27 m m 5 cr					
2212 2225	LY8X	KO24	28	27 m m 5 cr					
2352 0012	RW1AW	KP50	27	27 7 14 3 cr					
1998-12-13									
1800 1832	SP4MPB	KO03	29	27 m m 5 cr					
2005 2022	EA3DXU		28	37 m m 7 cr					
2200 2240	LA5TFA	JP99		nil					
2320 2340	EU6MS	KO45	38	27 m m 5 cr					
1998-12-14									

PE1OGF (JO21QJ) wkd on 144 MHz:

1999-01-03				
0600 0657	EB4FQP	IM68TV	26 27	c
2322 2335	TK5EP	JN41IW	29 37	cr
1999-01-04				
0027 0045	UT8AL	KO61	29 37	cr
0114 0118	IK4DCX	JN64GA	37 27	csr
0148 0148	9A2PT	JN75UE	29 29	csr
0158 0200	I2FAK	JN45OB	52 52	csr
0238 0238	S51AT	JN75GW	27 27	csr
0240 0240	9A1CAL	JN86EL	27 27	csr
0240 0240	YU1WP		27 27	csr
0257 0258	I8MPO	JN70FP	27 37	csr

Heard: EA2LU, 9A3PA, F6CHP?, S51MQ, DL5MAE, S57EAL?, LZ1ZX, I4XCC, LY2MW, LY2BIL, RW1AW, EU6MS, RU1AA, LA0BY and several others... Nicest QSO was UT8AL, Alex was producing real nice bursts heard one when he was in QSO with DF0WD 11sec S9+20dB on a QRB of 1900Km! Alex was having a "German" pile-up so it was rather hard to beat the pile-up as I was on a rather long QRB and signals are going down very fast. For sure he was producing fire-work on 1200-1600Km. Only a few 1 burst QSO worked 9A1CAL and YU1WP in the same burst which was about 20sec "short". After we have experienced the Leonids this was just a "minor" shower hi, but if I compare to last year I made 500% improvement. Franco I2FAK was readable 52 in tropo all the time on 760Km with the Alps in between but from time to time he was producing 59+ bursts but all relatively very short. Marco, IK4DCX, was also continuous readable in tropo 41-51 but giving much more reflections. Even the smallest part of dust what was coming down gave an enhancement of the weak tropo signal, from time to time 59+ reflections. Just like in Leonids the air was ionised but much less!! Lucio, I8MPO, who is in JN70 and on a real good MS QRB (about 1300Km) was almost every minute readable and as a tradition we made a QSO of course. Don't think we ever missed a shower to make a QSO he is

in the log a couple of dozen times...

Equipment: TS-850S + transverter, MGF1302 (0.4dB NF), PA 2 x MRF245 + GS35b, 4 x 11el F9T 2.2w.

I was QRV some hours in quadrantids, due to QRL circumstances I could not be QRV in early evening hours but the radiant was very low at that time anyway. 73, John. Thanks for your report, John.

TA1ZK/O (KM39AT) wkd on 144 MHz:

1998-07-19
2200 2300 YU7BCL KN05FW nil
2300 2400 DL1EAP JO31IK nil
1998-07-20
0000 0100 HA8CE KN06EN 26 26 1 5 1 c s7
0100 0200 LY2WR KO24OQ 27 26 2 28 2 c s5
0200 0300 DJ5MS JN68KS 26 27 1 16 1.5c *1
0300 0400 DH3YAK JO31 nil
0400 0500 RX1AS KO59 nil
0500 0600 LY2SA KO14LL 26 27 1 11 20 c s2 *2
0600 0700 RA3QTT LO01GQ 26 1 7 nc *2
1700 1800 DF8LC JO53GT 26 1 10 1 nc *3
1800 1900 DD0VF JO61VB 26 1 5 1.5nc
1998-07-21
1700 1800 DJ7OF JO51 26 2 nc weak
1900 2000 IW1AZJ JN35UB 26 1 5 1 nc
2000 2100 IK1PAG JN35UB 26 27 2 11 2 nc s5 *3
2100 2200 UT5ER KN78ER 26 2 8 2 nc s3 *3

2200 2300 OK1FID JO80CH nil
2300 2400 OK1KT JO70WE nil *4
2317 2335 S57TW JN75EX 28 27 5 mni 2c r s8
2340 2350 LY2BIL KO24OQ 27 27 3 mni 1c r s5
1998-07-22
0000 0100 S51AT JN75GW 27 26 1 26 3 c s7
0100 0200 DL1EAP JO31IK 27 1 5 3 nc s5 *5
0200 0300 DL2IAN JN49BC 27 27 3 13 5 c s9
0300 0400 DL8EBW JO31NF nil
0400 0500 IV3HVT JN65 27 1 9 nc *3
0500 0600 LY2MW KO24PQ 26 27 9 37 18 c s9 *3
0600 0700 ISWBE JN53 nil
0700 0800 DL9AN JO62SN 27 27 2 22 2 c s5 *6
0800 0900 DD0VF JO61VB 27 27 1 23 1 c s7
0947 1035 DL1KDA JO30FQ 27 27 2 14 3 nc r s2 *7
1150 1215 IZ4AIK JN63HV 27 27 1 29 1 c r s5
1300 1400 I8TWK JN70GR 37 37 13 40 5 c s9

Remarks: *1 I started later. I had a flying object in my PA; *2 High wind; *3 UFB refl rx from my partner; *4 SRI copied later 2350, earlier nil; *5 1971KM fb refl; *6 UFB QSO; *7 1945KM fb refl. Pity we could not complete!

Equipment: TR751, GI7B, 17B2, SP2, DTR, OH51Y software. 73, Andrea, HB9SUL. Thanks for your report, Andrea.

Aurora

Editor: Norbert Götsche, DL8LAQ

DL8EBW (DL66a / JO31NF) wkd on 144 MHz:

1999-01-13
1825 SM6ENG JO67 52a hrd 0
1830 YL3AG KO26 55a hrd 0
1845 G4LOH IO94 55a hrd 0
1906 GM0GMD IO86 52a hrd 350
1920 SK4BX JO79 42a hrd 350
2203 OZ1KLU JO46 59a hrd 30
2208 SM7BOU JO66 59a 59a 30 *1
2211 SM6ENG JO67 57a hrd 30
2215 YL3AG KO26 53a hrd 10

A big opening over long hours, but very low signals most of time at my qth in JO31 (was lying mostly down horizon...!) Kiruna Magnetometer showed max. 500nT peak... - at next day (14.01.) was abt 1200 nT peak but only a visible Aurora was noticed at GM/G (nothing on 144MHz!)

1999-01-18
1550 MM0BQI IO85 52a hrd 30
2020 OZ1EEZ JO45 55a hrd 20

2059 DL9MS JO54 51a hrd 30
Equipment: FT726R (CF300), 11ele DL6WU, MGF1302, 250W (*1 60W! TV-Time). Thanks for your report, Guido.

PA3BIY (JO22EB) wkd on 144 MHz:

1998-09-25
0615 SM7MXO JO77IP 55a 55a
1544 GM0CLN IO85MX 55a 53a
1998-11-09
1703 YL80AG KO26AW 55a 55a
1730 DL9MS JO54WC 55a 59a
1858 LA4CQ JP20QL 52a 54a
1998-11-13
1712 YL80AG KO26AW 55a 57a
1831 LY3ED KO14UD 52a 55a
2218 EU6MS KO45 55a 56a
2222 SK4BX JO79OG 54a 57a
2241 G4LOH IO94 54a 52a

73's Peter. Thank for your report, Peter.

News & Comments

Editor: Klaus Tiedemann, DL4EBY

The 21st Nordic VHF/UHF/SHF-Meeting 1999

We hereby have the pleasure to invite you to the annual Nordic VHF/UHF/SHF-meeting. We have booked the weekend 11.-13. June 1999 at the resort Budor (JP50PW), near Hamar, about 140 km north of Oslo. Budor is a tourist hut located about 625 m above sea level, surrounded with forests.

Accommodation and Meals

Indoor accommodation is available for 52 persons, and for 24 persons in 6 cabins. In addition we have several timber cabins without electricity or water. No kitchen is available for preparation of your own meals. We will serve all meals at reasonable prices. A big caravan park is available, and if you prefer to sleep in a tent, that will also be possible. Please bring your own sleeping bag or bedding.

Prices / Preise

Indoor or cabin bed, one night Betten im Hause, eine Nacht	NOK 100
---	---------

Timber cabin bed, one night Betten in Holzhütten, pro Nacht	NOK 60
--	--------

Caravan, one night Wohnwagen, pro Nacht	NOK 100
--	---------

Tent, one night, Zelt, eine Nacht	NOK 50
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Friday evening barbecue Freitag abend Grill	NOK 70
--	--------

Breakfast/Frühstück	NOK 60
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Lunch/Mittagessen	NOK 100
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Saturday/Samstag Ham-dinner	NOK 250
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Reservations

Please forward following information with your reservation:

- name & callsign of all attending persons
- day of arrival and departure
- indoor / timber cabin accomm. / caravan

Please send your reservation to LA1BR:

Email: la1br@online.no, packet radio: la1br@la5g.rau.e.nor.eu fax: +47 623 63592, mail Helge Karlsen, Skaug, NO-2355 Gaupen

Internet

For more information, please visit: <http://business.fortunecity.com/lerner/260/> The program will be as usual with lectures and flea market.

Driving Instructions

Please find the city of Hamar on your map. Budor is located on road no. 25 between Hamar and Elverum, then find the road sign to Budor at a little village called Brenneriroa. The road up to Budor is a toll road. Check in frequency will be 145.625 MHz (RV50).

Thanks to Stefan Heck, LA0BY, for this info.

Das 21. Skandinavische VHF/UHF/SHF-Meeting 1999

findet am Wochenende vom 11.-13. Juni 1999 in Budor, in der Nähe von Hamar, ca. 140km nördlich von Oslo statt. Budor ist ein Erholungspark mit Hütten, etwa 625m über dem Meeresspiegel, umgeben von Wald.

Unterkunft und Verpflegung

Im Hause ist für 52 Personen Platz, für weitere 24 Personen stehen 6 Hütten zur Verfügung. Ausserdem gibt es einige Holzhütten ohne Strom und ohne Wasser. Eine Küche zum selber Kochen steht nicht zur Verfügung.

Wir werden alle Mahlzeiten zu akzeptablen Preisen anbieten. Ein großer Campingplatz für Wohnwagen ist vorhanden, Zelten ist ebenso möglich. Bitte Schlafsäcke o.ä. mitbringen.

Reservierung

Wir bitten um folgende Informationen aller teilnehmenden Personen:

- Namen und Rufzeichen
- Tag der Ankunft/Abfahrt
- Art der Unterbringung (in Haus, Hütte oder Wohnwagen)

Anmeldung erbeten an LA1BR: EMail la1br@online.no, Fax: +47 623 63592, Packet Radio la1br@la5g.rau.e.nor.eu Post: Helge Karlsen, Skaug, NO-2355 Gaupen

Internet

Für weitergehende Informationen: <http://business.fortunecity.com/lerner/260/> Das Programm besteht wie üblich aus Vorträgen und Flohmarkt.

Anreise

Budor liegt an der Straße Nr. 25 zwischen Hamar und Elverum. In einem kleinem Dorf namens Brenneriroa folgen Sie dem Schild nach Budor. Einweisungsfrequenz ist 145.625 MHz (RV50).

44. UKW Tagung in Weinheim 1999

1999 September 11./12.

This years VHF/UHF/SHF Convention will be held on the second weekend in September, not the third weekend as in the years before. There will be the usual meetings on Friday and Saturday with barbecue at DLOWH, lectures, exhibition and fleamarket on Saturday and Sunday.

We also plan to arrange an EMEer's meeting in the afternoon.

Die diesjährige Weinheimer UKW-Tagung findet am zweiten September-Wochenende statt, nicht am dritten, wie in den Jahren zuvor. Das bekannte HAM-Treffen mit Grill findet am Freitag und Samstag ab 18:00 Uhr an der Station DLOWH statt, Vorträge, Ausstellung und Flohmarkt wieder am Samstag und Sonntag.

Wir planen, auch ein kleines EME Treffen zu organisieren.

EA1/2 Expedition May 99

(DH3YAK & DL8EBW Expedition to EA1/2 area in first week of May 1999)

DH3YAK and DL8EBW, both operators of the VHF-DX-Group DL-West are planning to be qrv on 144MHz (also MS) from EA1/2 area from 2. - 7. May 1999. Details are not known yet. Definitely **no** sked will taken in advance because of variable square chances! Please check for further announcements on packet radio and internet as well as in other publications....

DH3YAK und DL8EBW, beide OPs der VHF-DX-Gruppe DL-West, werden versuchen, im Gebiet von EA1/2 im Zeitraum 2. bis 7. Mai 1999 auf 144MHz (auch MS) qrv zu werden. Details stehen bisher nicht fest. Es werden **keine** Skeds im Voraus gemacht, da vor Ort die Entscheidung gefällt wird, wann welches Square aktiviert wird! Weitere Details folgen in den kommenden Wochen via PR, Internet und einigen Zeitschriften...

Most Wanted Squares 99

After a lot of requests in the magazines FT (Funk-Telegramm), CQ-DL, FA (Funk-Amateur) as well as in some other foreign publications, and in packet-radio (DXC and BBS), via Internet (special thanks for lot of work to DK3XT, Bernd, he provided us with the graphics and designed the internet page) please welcome the result of the 144 Mc (M)ost (W)anted (S)quare and DXCC/WAE inquiry 99, by Guido, DL8EBW, JO31nf VHF-DX-Group DL-West, in co-operation with 'Funktelegramm'.

The details were compiled between 1998 Dec 1st and 1999 Feb 10th. We are very proud that 114 stations did send us their information (last year we got 84 entries - looks like this inquiry will have a lot of friends inbetween!!)

Most Wanted 144 MHz DXCCs 1999:

ZA (73*)
HV (63*)
3A (56*)

1A (49*)
 SV/A (47*)
 SV5 & 7X (41*)
 CN (36*)
 R1F(4J) (33*)
 TA (32*)
 C3 (31*)
 ZB (28*)
 3V (27*)
 5A (26*)
 TF & T9 (25*)

Most Wanted 144 MHz Squares 1999:

KO30 (62*)
 KN39,KN49 (56*)
 KN35,KN36,KN47 (55*)
 KN48 (54*)
 IO42 (52*)
 IO44,KO31 (51*)
 KN20,KN38,KO23 (50*)
 KN24,KN30 (49*)
 IO54,KO43,KO47,KO57 (48*)
 JM87,JN92,KN37 (47*)
 IN72,IO43,KM09,KN25 (46*)
 JM89 (45*)
 JN84,KM28,KN27 (44*)
 JN40 (43*)
 IO41,JM88,KM29,KN00,KN26,KN57,
 KO42,KO67,KO69 (42*)
 KO06,KO44 (41*)
 IO55,JM99,JN91,JP31,JP42,KN15,KO19,KO
 41,KO63 (40*)
 IM57,JM79,KM19,KN28,69,KO18,20 (39*)
 IO65,KN29,44,KO40,49,50,62,75 (38*)
 IM66,IN82,IN83,IO52,KN83,JO98,KM16,
 KN56,KN59,KO10,13,74,78,KP61 (37*)
 JM48,KN42,KN65,KO21,KO54,KO79,KP23,
 KP33,KP35 (36*)
 JP97,KN40,KN43,KN58,KO00,KO12,KP53,
 KP54 (35*)
 IN62,IO66,JN20,JN51,JP32,KM06,KN55,
 KO07,08,68,76,89,KP41,43 (34*)
 IM69,IN81,JM67,JN82,JP30,KM27,KN02,KN
 45,KO56,KO66,KO90 (33*)
 IO67,JN32,JP72,JP75,JP94,JP95,KM26,
 KM38,KN41,KO01,KO17,KO51,KO77 (32*)
 IM89, JN10, JP65,76,84, KM08, KN10,50,
 67,74,75,76, KO65, KP00,24,62 (31*)
 JP43,JP71,JP74,JP96,KO27 (30*)

The figures (eg.:45*) at the end of each line give you an idea about how many people

would like an activity on 144 MHz for this special country or square!

As a result of so much input, we found a very interesting aspect: people do need a lot of countries / squares which have been activated in past years (eg.: 3A, 4J bzw. IN72, IO42, KN25, KO23...). At the "top" of the country - inquiry we have not too much changes compared to past years - at the square list there will be a lot of changes due to the good activity of expeditions as a result of our MWS 98 list! (eg.: KO32)

Next inquiry we also have to think about the water squares because there might be activity also (eg.: GW0KZG/mm, DK5KK/mm and others). On the internet-homepage of Bernd, DK3XT, (<http://fs1.ilc.de/sites/gap/traf.htm>) you can download some graphics and a ZIP-file with a total overview of all needed countries / squares and of all stations which have sent in informations to this list.

We also will put this ZIP file to packet radio, but leave out the graphics due to space limits. Of course if anybody does need the inquiry on paper, he is asked to send an SASE (DIN A4) to DL8EBW. Many thanks for all the input in the name of all active VHF-stations. And hope to meet you soon again... (eg.: possibly during our May expedition to EA1/2 area (IN72,82,83), of course a result of the above listing!! More info about the details of our trip will follow as soon as possible....)

MWS Umfrage 1999

Hallo liebe VHF-Funkfreunde,

nach erneut vielen Aufrufen im FT, CQ-DL, FA sowie diversen anderen, auch ausl. Publikationen, als auch via Packet-Radio (DX-Cluster und BBS) sowie via Internet (besonderen Dank an dieser Stelle an DK3XT, Bernd, für seinen Einsatz rund um die Internet- und Grafikdarstellung!) hier nun das Ergebnis der 144MHz (M)ost (W)anted (S)quare und DXCC/WAE Umfrage 99 der VHF-DX-Gruppe DL-West.

Gesammelt wurden diese Daten über einen Zeitraum vom 1998-Dez-01 bis zum 1999-Feb-10. Besonders erfreulich ist zu vermelden

den, daß sich insgesamt 114 Stationen (!!!) dieses Jahr beteiligten (im Vorjahr waren es noch 84 Stationen - ein Indiz dafür, daß diese Liste Anklang wohl gefunden hat!).

Das Ergebnis unserer Umfrage ist weiter oben zu finden. Die Zahl (Bsp.: 45*) hinter den Ländern oder Squares gibt die Anzahl der Stationen an, die eine 144 MHz-Aktivierung des entsprechenden Landes oder Grossfeldes begrüßen würden!

Bei der grossen Anzahl der Einsendungen war es interessant festzustellen, daß bereits aktivierte Großfelder oder Länder wieder ganz weit vorne in der Gunst liegen! (siehe z.B. 3A, 4J bzw. IN72, IO42, KN25, KO23...)

Bei den Ländern ist die 'Spitze' nur geringfügig gegenüber dem Vorjahr verändert - bei den Feldern ergibt sich ein Unterschied durch die vielen Aktivitäten, die anhand der MWS Liste 98 getätigt wurden! (z.Bsp. KO32 um hier nur mal ein Feld zu nennen).

In Zeiten von GW0KZG/mm, DK5KK/mm und vielen anderen /mm Stationen sollte man ab der nächsten Liste vielleicht auch mal mehr Augenmerk auf Wasserfelder legen...

Auf der Internet-Seite von Bernd, DK3XT, (<http://fs1.ilk.de/sites/gap/traf.htm>) sind all diese Daten samt einer Übersichtsgrafik und einer Aufstellung aller Stationen, die Info zur MWS99 eingereicht haben auch als ZIP-File abgelegt!

Im AFU PR-Netz wird das ZIP-File unter der Rubrik VHF in die BBS eingespielt, allerdings verzichten wir hier natürlich aus Platzgründen auf die Grafik.

Gegen SASE (DIN A4) können auch Kopien aus dem Gesamt-Ergebnis bei DL8EBW angefordert werden. Dankeschön im Namen aller Aktiven für die vielen Informationen! Wir hoffen auf ein baldiges Wiederhören... (z.Bsp. bei unserer Mai-Expedition nach EA1/2 (IN72,82,83), die natürlich schon ein Ergebnis der oben stehenden Liste ist! Ausführliche Info folgen, sobald die Details feststehen...)

Guido, DL8EBW, VHF-DX-Gruppe DL-West

ATV records

Michel Vonlanthen, HB9AFO, the Swiss ATV President, sends us the updated list, which was last updated 1999 Dec 27. Its goal is not to promote competition itself, and only, but to encourage the ATV traffic and experimentation.

He asks to let him know about any new detail or additional information per EMail at mvonlanthen@vtx.ch.

Especially, he is looking for any information on the 70cm ATV record QSO some years ago between ON5ID and EA2CR on 430 MHz, and also the QTV QSO between KC6CCC and KH6HME on 430 MHz.

Band	ATV record
241 GHz	no ATV registered
145 GHz	no ATV registered
76 GHz	no ATV registered
47 GHz	69 km, 10.5.1998, F1JSR (JN36FG) - F6FAT (JN36GV)
24 GHz	303 km, 27.12.1998, F5CAU/p (JN24PD) - F6BVA/F6HTJ/p (JN12FI)
10 GHz	821 km, 27.6.1998, TM2SHF/p (JN42HF) - EA5/HB9AFO/p (IM98XU)
5.7 GHz	140 km, 23.8.1998, F1JSR (JN36FG) - F6FAT (JN26JT)
2300 MHz	no ATV record registered
1200 MHz	602 km, 4.7.1994, F8MM (JN08WV) - F1GTP (IN93PS)
430 MHz	4041 km KC6CCC-KH6HME (unidirectional, no other info)

You will find all details of each QSO, the chronology of all registered records and the methodology used (french & english) at: <http://www.cmo.ch/swissatv>.

Michel Vonlanthen, HB9AFO, ATV-Vorsitzender Schweiz, schickt uns die Liste der

ATV Rekorde

zuletzt geändert am 1999 Dec 27. Sie soll nicht dazu dienen, den Wettbewerb als solches zu fördern, sondern die ATV-Aktivitäten und Experimentierfreudigkeit.

Er sucht Details zu zwei Rekorden, einmal auf 70cm ON5ID-EA2CR vor einigen Jahren, zum anderen zwischen KC6CCC-KH6HME, ebenfalls 70cm.

Einzelheiten zu den oben abgedruckten Rekorden findet man in englisch und französisch unter <http://www.cmo.ch/swissatv>.

French 6m Contest

I am very pleased to announce the first French contest on six meters which is organized by F1PUX and F8OP, members of the REF contest committee.

To improve the activity on 6 meters and give a chance to work many French departments, the REF organizes a 6 meters contest.

Name of the Contest:

DDFM CONTEST (French Departement Contest)

Date:

Saturday 19.06.1999

Time:

04.00 to 16.00 UTC (12 hours)

Mode:

CW or SSB

Sections:

1. French stations,
2. Rest of Europe.

Frequency:

50.200 and up (QSO's between 50.090 and 50.199 are not valid)

Call:

CQ F8OP/71 (Callsign/No. of departement)

Exchange:

The contest exchange shall consist of:

- Callsign
- RST and serial number

- Locator (only 4 characters) e.g. 599001 JN26

Scoring:

One point is scored per contact.

Multiply by: The total number of departement worked + the total number of locators worked:
 $\text{SCORE} = \text{CONTACTS} \times (\text{DEPARTEMENTS} + \text{LOCATORS})$

e.g. $20 \text{ QSO} \times (10 \text{ Dpts} + 10 \text{ Locators}) = 400 \text{ points}$

Other Rules:

The contest is open to all users of 50 MHz. All licence conditions must be observed. During the contest it is prohibited to solicit contacts by using packet or cluster.

Entries:

Logs can be in any format.

A check list of departement and locator square worked must be included with your entry. The following declaration must be also included with your entry: "All rules governing amateur radio in my country have been respected, and I agree the contest manager's decision is final."

Entry must be postmarked no later than 19th July 1999 and send to the contest manager:

Denis Gaiffe, F1PUX, 9 route de la Motte, F. 71160 Digoin

Parts for Zero-IF Transceivers

The PC Boards and Aluminium & Brass boxes for NO TUNE Zero IF RTX are available from Branko Zemljak, S57C. The possible take over is on Friderichshafen fair (June) or Weinheim (September) or via the Post!

phone: +386 41 717714 or +386 61 751131
 e-mail: S57C@HamRadio.si
<http://lea.hamradio.si/~s57c>

Kitchens Corner

by DJ9BV



This is a Slovenian receipt which was supplied by Anni, S56CGO. This is a soup with strong taste:

JOTA

Potrebuješ:

$\frac{1}{2}$ kg fižola,
 $\frac{1}{2}$ kg krompirja,
 $\frac{1}{2}$ kg kislega zelja,
sol,
10 dag prekajene slanine,
2 žlici čebule

Skuhaj posebej namočen fižol, na kose zrezan krompir in kislo zelje. Tega lahko pokuhaš z žlico prežganja. Na kocke zrezano slanino ocvri s čebulo in stresni v kislo zelje. Dodaj kuhan, razpadel krompir in odcejen fižol. Vse sestavine osoli že pri kuhanju. Dobro premešaj. Biti mora gosto.

Jota

Ingredients:

0.5kg beans
0.5kg potatoes
0.5kg pickled cabbage (Sauerkraut)
salt
100g of bacon
2 sliced onions

Cook wet beans, cutted potatoes and Sauerkraut each separately. Fry bacon, cutted in little cubes, together with the onions and put into the Sauerkraut. Crush the cooked potatoes and add. Pour water off the beans and add them.

You have to salt all ingredients already during cooking. Then mix these ingredients well.

This soup should be thick.

DUBUS Toplist

Editor: Norbert Goettsche, DL8LAQ

DUBUS 50 MHz Top List

NRCALL	WW	WK	DC	TR	AU	MS	ES	F2
1 ON4KST	JO20	742	151	801	1415	1509	7920	16498
2 DL7QY	JN59	674	133	741	1665	2186	6900	16353
3 PA0RDY	JO22	651	0	725	1617	1597	****	16320
4 G4IGO	IO80	627	0	578	1308	2528	7301	16188
5 ON4PS	JO20	606	125	752	1740	1902	6520	16358
6 G4UPS	IO80	603	0	0	0	0	0	0
7 ON4GG	JO20	595	0	741	1757	1695	7243	16547
8 ON4ANT	JO20	576	0	710	1757	1695	7243	16547
9 G6HKM	JO01	552	0	347	1883	780	5674	16112
10 PA2TAB	JO32	512	132	762	1370	1809	5797	15339
11 GW4LXO	IO81	500	0	300	650	1200	7500	10000
12 DL8HCZ	JO53	479	0	365	1250	1356	3350	0
13 I4XCC	JN63	477	0	707	0	1427	3349	18627
14 F8OP	JN26	458	0	631	1023	1369	5508	13547
15 OK1DDO	JO60	454	93	620	1423	1340	6100	13300
16 DL3AMA	JO51	419	83	519	1431	1600	4001	10345
17 F1GTU	JN05	418	0	699	815	1421	3268	16400
18 SP6GZZ	JO81	407	0	515	0	1826	8103	0
19 DL9GU	JN49	402	0	721	450	0	8500	15625
20 DL6NCI	JO50	393	101	514	1294	505	7815	14239
21 SP4MPB	KO03	391	0	520	1836	1507	8290	0
22 OK1IBL	JO60	377	77	530	1320	1717	6941	11816
23 PA3FYM	JO22	375	0	1238	2019	0	****	16373
24 ES1VC	KO29	372	71	530	1968	2116	5253	9263
25 SP6GWB/P	JO80	360	68	696	629	1880	7540	8567
26 DL4ALI	JO50	359	73	464	628	1024	3969	10313
27 OK1FFD	JO60	354	79	580	1231	1067	6250	13300
28 OK1FAV	JO60	343	75	0	579	1093	6250	10366
29 OK1VBN	JN78	338	60	455	0	897	5793	0
30 SM3BIU	JP73	336	77	907	1704	1982	4414	0
31 OK1MAC	JN79	336	0	0	0	0	0	0
32 PE1OGF	JO21	332	76	0	0	0	0	0
33 YO2IS	KN05	325	0	270	1155	1404	6942	14292
34 SM7JUQ	JO65	324	84	372	1349	1062	3900	14070
35 DL7ARM	JO62	315	0	909	1189	1245	8324	15817
36 ES2RJ	KO29	313	59	345	1726	2052	4642	0
37 F8CS	JN27	313	68	336	0	0	7454	9753
38 HB9AOF	JN36	312	77	500	0	0	5400	10663
39 ES9QB	KO37	310	74	450	625	0	5145	13410
40 F5PAU	IN88	306	75	0	0	0	0	0
41 OZ7IS	JO65	296	81	410	1294	850	3100	0
42 F5DE	JN05	293	76	860	0	0	2304	12539
43 YL3AG	KO26	287	53	397	1817	0	6420	0
44 SP2IQW	JO94	286	57	556	1537	1470	2767	0
45 OK2ZW	JN89	286	85	0	0	0	0	15580
46 HB9STY	JN36	280	65	367	0	1431	4448	7810
47 DF7RG	JN68	277	62	496	1569	0	3230	14153
48 IW5AVM	JN52	275	55	768	0	1712	3056	7839

49 F1FIH	JN23	273	98	796	0	1637	2492	15613
50 IK5OIV	JN52	262	0	332	0	1444	2826	8305
51 DL3YEE	JO42	261	0	540	1056	1300	2700	13053
52 ES1AJ	KO29	261	51	415	1710	1850	3340	0
53 ES1II	KO29	259	52	335	1569	0	3325	0
54 DL1SUZ	JO53	258	60	546	1434	865	5921	8020
55 ES2WX	KO29	257	53	336	1063	1847	4651	0
56 ON5SE	JN29	257	78	0	0	0	0	0
57 I3ZVN	JN55	254	65	532	0	0	5742	8422
58 ES2NA	KO29	252	52	415	352	1843	3340	9276
59 DL2DR	JO31	247	20	1003	0	0	4769	2001
60 OK1VQ	JO60	245	46	245	539	0	2002	2755
61 OE3OKS	JN87	243	45	467	0	0	7985	0
62 DL7YS	JO62	240	60	342	461	1086	3547	8767
63 ES5DE	KO38	239	56	228	606	0	5299	8249
64 DL5BBL	JO42	237	0	414	1008	0	3975	5863
65 ES1MW	KO29	232	52	315	650	0	2855	0
66 DJ6XV	JO31	221	48	401	0	1130	3232	0
67 CT1BGE	IM58	215	0	0	0	0	0	0
68 DL6BF	JO32	207	71	574	1108	0	3058	8011
69 SP5HE	KO02	206	0	568	0	1838	4699	0
70 ESSMC	KO38	205	58	432	1786	0	5143	13142
71 YU1VG	JN94	201	50	1766	0	1450	3666	1650
72 OK2PPP	JN99	201	40	0	0	0	3200	0
73 OK1UDX	JN79	198	47	333	1054	0	3513	0
74 SP2JXN	JO94	198	0	0	0	0	0	0
75 SP6MLK/P	JO80	195	39	437	0	1322	2062	0
76 OK1DKS	JO70	192	42	934	0	0	1973	8514
77 ES4NG	KO39	191	47	412	725	0	3105	0
78 PA2CHR	JO22	187	72	1334	909	0	5215	13966
79 DL8EBW	JO31	186	51	247	1050	1150	5800	0
80 ES5RY	KO38	177	36	317	0	0	3640	0
81 CT1DIN	IN60	174	37	1581	0	0	3169	0
82 SP6AZT	JO81	169	0	612	0	1168	4327	0
83 HB9RUZ	JN47	168	54	406	0	960	3585	0
84 DJ2XS	JO53	164	0	440	419	0	4155	0
85 G7LRQ	IO91	154	41	0	0	0	3574	0
86 OH2BNH	KP20	147	37	391	948	0	3246	0
87 DL5GAC	JN47	147	0	129	690	0	5100	11900
88 DF1EQ	JO31	138	0	279	0	0	2769	0
89 OK2XTE	JN79	138	42	162	0	0	2419	0
90 IW2DVK	JN45	137	38	534	0	1022	7332	0

DUBUS 144 MHz Top List

NR CALL	WW	WK	DC	TR	AU	MS	ES
1 DK1KO	JO53	656	0	2124	2057	2210	3285
2 DK3WG	JO72	650	1	2243	2034	2295	2782
3 DF8LC	JO53	600	70	2105	2045	2226	3291
4 PA3BIY	JO22	588	63	1550	2026	2205	3143

5	DL8HCZ	JO53 559	0 1615 1976 2096 3527	60	PA2DWH	JO22 345	59 1230 1950 2150 2250
6	PA0RDY	JO22 551	0 1582 1979 2272 2819	61	DL6BF	JO32 344	50 1542 1932 1814 2332
7	DL8EBW	JO31 547	61 1454 1918 2059 2214	62	OH2BNH	KP20 344	37 1334 1787 2003 2003
8	OH5LK	KP30 517	0 1962 2041 2235 2891	63	YU1WP	JN94 341	53 1422 1850 2236 2825
9	SP6GZZ	JO81 512	0 1670 1794 2017 2717	64	UT1PA	KO21 340	0 1901 1934 1806 2425
10	SP9EUWJ	JO90 509	62 1710 1927 2154 2531	65	YU7EF	KN05 340	58 1135 987 2248 2440
11	HA1YA	JN87 509	71 1548 1876 2183 2885	66	SP6AZT	JO81 335	0 2080 1463 1710 2566
12	PA3FOC	JO21 509	59 1373 2010 2209 2326	67	OK1DKS	JO70 334	56 1230 1308 0 3530
13	OE3JPC	JN88 504	0 1584 1821 2128 2769	68	G3LQR	JO02 333	0 1776 2031 0 2406
14	I2FAK	JN45 493	0 1797 1508 2405 2995	69	DJ1LP	JO64 331	46 1347 1071 2058 2301
15	I4XCC	JN63 474	0 1177 1803 2275 3257	70	DL5GAC	JN47 330	0 1264 1876 2135 3079
16	OZ1DOQ	JO65 467	58 1885 1940 1981 2888	71	F6DKW	JN18 328	51 1519 1602 2051 2755
17	DL8LAQ	JO43 460	0 1376 1806 1934 3302	72	OK1MG	JO70 319	49 1526 1590 0 2632
18	ON4GG	JO20 459	0 1420 1965 2150 2124	73	DK1KR	JO53 319	0 1481 2103 0 2026
19	DL5DTA	JO61 454	58 1344 1876 2045 2885	74	ES2XM	KO29 308	37 1389 2198 0 2252
20	PA2CHR	JO22 453	0 1432 1683 2240 3201	75	SP3MFI	JO91 307	0 1697 1632 1802 2617
21	LY2WR	KO24 452	54 2051 2075 2218 3007	76	F1FIH	JN23 304	51 1305 999 1757 2934
22	OH7PI	KP32 451	0 1902 1926 2151 2489	77	F5HRY	JN18 304	52 1276 1695 2038 2758
23	OK2ZW	JN89 445	56 1417 1775 2113 2471	78	G4YTL	IO91 303	0 1450 1774 2143 2172
24	YU7EW	KN05 437	67 1404 1755 2179 2430	79	ES4EQ	KO39 302	39 1541 1840 2240 2245
25	DJ7OF	JO51 436	63 1512 1518 1970 2156	80	DB6BX	JO32 302	52 1534 1541 1921 2115
26	DK0OG	JN68 430	0 1708 1722 2172 3320	81	I1JTG	JN35 301	0 1106 1269 1825 2742
27	DL7FF	JO62 430	0 1516 1379 2057 2312	82	OK1AXH	JO70 300	0 2142 1486 1366 1768
28	OK2VMD	JN89 428	58 1662 1765 2031 3605	83	PE1OGF	JO21 300	54 1391 1602 1959 2260
29	SP4MPB	KO03 427	0 1886 1764 2038 2697	84	SP6GWB/P	JO80 296	47 1780 1581 1875 2437
30	DD0VF	JO61 427	58 1736 1275 2017 2328	85	ON4KST	JO20 296	54 1435 1612 1940 2383
31	RX1AS	KN59 427	0 1709 1905 2271 2547	86	SM5BSZ	JO89 293	0 1764 1824 1938 0
32	IWSAVM	JN52 423	63 1590 0 2040 2893	87	OK1DFC/P	JO60 291	51 1775 2099 2024 2016
33	F8OP	JN26 419	0 1228 1196 2028 2720	88	OK1FFD	JO60 289	53 1388 1720 1964 2154
34	DL3AMA	JO51 416	54 1785 1803 1925 2075	89	IK1PAG	JN35 289	0 1186 0 1910 2725
35	ES2WX	KO29 415	40 1370 1950 2270 2071	90	PA2TAB	JO32 287	53 1302 1239 2103 2183
36	YU7MS	KN05 410	62 1319 1856 2160 2438	91	SP2JXN	JO94 286	0 1650 1690 0 2634
37	YO2IS	KN05 407	0 1360 1916 2130 2556	92	PA0WWM	JO22 283	49 1303 1839 1997 2212
38	OK1FM	JN69 403	56 1843 1438 2200 2150	93	IN3TWX	JN56 283	0 1100 0 1609 1750
39	ON4ANT	JO20 399	0 1420 1965 2124 2725	94	ES3GZ	KO28 281	35 1495 1720 2134 2101
40	DL7AKA	JO62 396	0 1747 1916 2065 3620	95	LABAK	JO38 280	0 1496 1804 1804 2413
41	OK1MAC	JN79 392	0 1536 1681 2005 2511	96	OE6IWG	JN77 279	50 1221 1110 2220 2126
42	ES6RQ	KO37 391	37 1500 1840 2172 1725	97	ES5WE	KO38 278	32 1406 1695 1934 2530
43	OK1JKT/P	JO60 389	51 1701 1764 2121 2269	98	G4IGO	IO80 274	0 2761 1917 1903 2833
44	F8CS	JN27 387	54 1161 1468 2124 3231	99	DL1BKK	JO43 273	0 1513 928 0 2712
45	IW1AZJ	JN35 386	60 1115 1188 1971 2780	100	DK2BJ	JO30 272	46 1476 1924 0 2205
46	UA3MBJ	KO88 374	0 1560 2006 2573 2392	101	RZ6BU	KN84 272	0 1172 960 2017 2953
47	HB9CRQ	JN47 369	0 1404 1288 2060 2959	102	UA4NM	LO48 270	0 1215 1850 2510 2290
48	DL1SUN	JO53 367	0 1824 1724 1845 2333	103	G6HKM	JO01 269	0 1304 1555 1660 2269
49	PA3FJY	JO32 366	0 1536 1337 2085 2086	104	OK1IBL	JO60 266	50 1438 1462 2003 3398
50	DL1KDA	JO30 366	59 1388 1924 2101 2339	105	IK5OIY	JN52 265	0 1048 0 2095 2253
51	I4YNO	JN54 366	63 1374 1374 2122 2276	106	OZ1IPU	JO57 262	40 1387 1187 1566 2452
52	DH3YAK	JO31 360	55 1424 1162 1960 2650	107	GW4LXO	IO81 261	0 2750 1550 2000 2200
53	SM7JUQ	JO65 358	41 1902 1646 1921 2332	108	RK2FWA	KO04 261	0 912 1759 2125 2010
54	ES2RJ	KO29 358	40 1190 1861 2000 2127	109	OK1HAG	JN79 260	0 1441 1749 1909 3463
55	YL3AG	KO26 356	33 1552 1912 0 2448	110	F6CKZ	JN09 258	0 1552 1330 1721 3408
56	OE3OKS	JN87 356	59 1441 1273 1867 2788	111	DH8GV	JO33 257	42 1565 1018 1102 2450
57	SM3BIU	JP73 353	32 1460 1844 2260 2242	112	ON4PS	JO20 257	47 1449 1435 1822 1964
58	S5OC	JN76 351	61 1463 1530 2233 3356	113	DK8EL	JO31 256	0 1199 1051 1870 1996
59	DL7YS	JO62 348	53 1512 1528 1826 2136	114	ES1RF	KO29 252	30 1184 1820 1978 2084

115YU1VG	JN94	248	47	1407	826	1727	2294	170HB9RUZ	JN47	183	48	1060	1050	0	3014
116DG1BA	JO43	245	0	1674	1280	1588	2239	171OK1IAS	JO60	179	34	1392	1444	0	2138
117LZ1ZX	KN32	243	0	1162	0	1945	2729	172DG3XA	JO43	179	35	1371	1061	1839	2183
118DK1VI	JN49	241	0	1148	1107	1604	3131	173DL3YEE	JO42	178	0	1574	1450	1480	2106
119DF1IAZ	JN49	240	51	1038	1143	2069	1873	174DK5WO	JO30	177	35	1474	1219	0	1993
120OM7AQ	JN98	239	49	1484	1294	1793	2483	175DK9RL	JN69	177	0	1311	1513	1286	3316
121OK2QI	JO80	238	47	1475	1686	1380	2050	176DG3HS	JO53	174	0	1152	1091	0	2306
122OK1KEI	JO70	235	0	1861	1259	983	2067	177HB9AOF	JN36	173	45	1201	670	1675	2166
123UT7GA	KN66	234	0	1877	1446	2131	2617	178OK1VEI	JO70	170	0	1677	1197	1398	0
124OK2PNN	JN89	234	0	149	1216	0	3771	179ES1AO	KO29	169	25	1162	1176	1792	2136
125DG1VL	JO61	232	43	1373	1223	1817	2325	180OK1KRY	JN69	166	40	1437	977	0	1830
126HB9DFG	JN37	232	49	1367	1299	1784	2302	181YU7ON	KN04	164	36	914	0	1897	2273
127OK1PG	JO70	229	49	1773	0	0	3488	182ON4ZN	JO21	163	32	1390	980	0	2149
128F5PAU	IN88	229	43	1630	0	0	2425	183ES1JL	KO29	163	17	1379	1596	0	0
129LY2SA	KO14	227	40	1569	1742	2163	2088	184SP2IQW	JO94	162	27	1611	1611	997	1877
130OK1VMS	JO70	225	44	1692	1232	0	2225	185DG0CAL	JO52	161	0	1160	0	1543	2105
131F1GTU	JN05	225	0	1650	967	1934	2400	186UA4AQL	LO20	161	0	1124	1841	2158	2195
132DL1SUZ	JO53	225	41	1238	1661	1730	2006	187DL0ULP	JN48	159	0	1026	0	0	2019
133OK1VBN	JN78	223	45	1578	1682	1915	2209	188SP9FG	JN99	158	30	1647	1283	0	1698
134F5DE	JN05	222	38	1891	1671	1892	2399	189ES1AW	KO29	158	25	1230	1680	0	1924
135ES5EJ	KO38	218	30	1422	1804	0	2070	190OK1CA	JO70	156	0	1540	1065	950	2096
136ES0IW	KO19	216	32	1545	1687	0	1861	191YZ7MON	JN95	156	31	1004	0	1653	2279
1379A4EW	JN95	216	0	1075	0	1956	2293	192ES0BI	KO18	154	21	1439	1823	1528	0
138DL5BBL	JO42	215	0	1416	1290	0	2028	193RW3PF	KO93	153	0	1015	1840	0	2162
139DC6DY	JO31	212	0	1416	1045	1914	2292	194ES2QN	KO29	152	22	1175	1460	0	2116
140OK1DDO	JO60	210	46	1329	1500	1720	2418	195DJ6XV	JO31	151	34	1337	961	0	2007
141UR7GN	KN66	208	0	1830	0	2010	1940	196OZ7IS	JO65	151	32	1128	1294	1901	1845
142GX3DY	JO02	208	38	1355	2049	0	2124	197ES6PZ	KO38	151	20	1101	0	0	2532
143DH9NBB	JN49	207	47	1363	1228	1725	2039	198YU7KB	JN94	150	35	853	0	1874	2256
144ES0NW	KO19	207	30	1060	1720	1797	1965	199UT5JCW	KN64	150	0	0	0	0	0
145IK1LGV	JN44	204	0	1466	0	1613	1890	200CT1FAK	IN50	149	25	2129	0	2250	2488
146SP5HEJ	KO02	201	0	1830	1705	1312	2313	201DK0PX	JN48	147	0	1161	0	1815	1649
147UY5HF	KN66	201	0	1750	0	1820	2032	202ES1CW	KO29	142	21	1192	1570	0	2143
148ES8RO	KO28	199	27	1802	1800	0	1780	203OK2PMN	JN88	141	0	871	1547	887	2101
149OK1SC	JO70	198	0	1490	1673	0	1729	204DL0GTH	JO50	138	22	1124	0	0	0
150DL8AAV	JO52	198	44	1236	1127	0	2144	205OK2UFB	JN99	136	27	1526	0	0	1983
151DL9BDM	JO33	197	0	1538	1248	1659	2321	206RW4AK	LO20	136	0	1126	1480	2158	2301
152G6RAF	IO92	197	0	1507	1722	2078	2400	207ES5QA	KO38	135	35	1665	1788	1555	2236
153DF9QX	JO42	197	0	1446	1070	1455	3320	208OK2KDS	JN99	134	0	1568	0	0	1983
154ES0SM	KO08	196	31	1578	1767	1991	0	209DG5NEX	JN49	133	0	1234	0	1333	1941
155DK2DB	JN48	195	0	1239	1136	0	3106	210DL3IAS	JN49	130	36	988	1123	1830	1866
156F1HDF/P	JN18	194	0	1452	0	0	2425	211OK1DTG/P	JO70	127	27	1351	1352	0	0
157ES1OX	KO29	194	18	1016	1449	1158	2121	212RU3ZD	KO81	126	0	1713	2126	1755	2363
158OE5VRL/5	JN78	192	0	1665	1573	1990	2157	213DL5IO	JN49	126	0	1073	925	1450	1899
159IT9VDQ	JM68	192	41	1625	0	1950	2491	214LA7DFA	JP33	125	0	630	1816	1803	0
160PA0JUS	JO22	192	38	1409	1050	0	2167	215HB9S/P	JN36	123	24	1135	0	0	0
161DL2DR	JO31	190	39	1158	980	0	2057	216S53J	JN75	123	27	1123	1036	983	1984
162ES7RDR	KO27	189	31	1200	1750	1000	2101	217DL3NAW	JN59	120	0	1019	0	1961	1237
163ES0HD	KO18	187	23	1550	1918	0	0	218F6FGO	JN25	118	31	1390	0	0	2218
164UA3MHJ	KO87	186	0	1227	1943	2405	1948	219OK2KJU	JN89	115	32	1318	1766	0	1494
165DH0GHU	JN38	186	41	1170	0	2117	1937	220YU7AZX	KN04	113	29	914	0	1389	2173
166HB9MIO/P	JN37	185	0	1316	975	0	2183	221OK2XTE	JN79	111	33	1362	0	0	2267
167S59AM	JN65	184	0	1377	0	1945	1788	222DL0SP/P	JO62	111	0	1315	785	0	1608
168ES5RY	KO38	183	32	1198	1695	2002	1409	223DL5NEN	JN59	106	30	748	0	1767	1640
169UA3T	LO16	183	0	1163	1941	2145	0	224ON7WR	JO20	106	24	0	0	0	1834

225DJ8ES	JO43	104	19	1306	0	0	1856	44	G6RAF	IO92	122	0	1730	0	0	0
226I3ZVN	JN55	97	31	1212	0	0	2237	45	PA2CHR	JO22	122	31	1357	323	0	0
227OK2PHM	JN89	97	20	829	1265	0	2262	46	OE5VRL/5	JN78	121	0	1524	1031	0	0
228ES1II	KO29	95	13	979	1570	0	0	47	DL4VCG	JN39	119	0	1335	0	0	0
229LA/DL7YS/P	JO37	93	22	1207	0	16730	0	48	OZ1IPU	JO57	118	18	1387	0	0	0
230CT1DIN	IN60	91	18	1218	0	0	2338	49	F5PAU	IN88	117	24	1630	0	0	0
231OK1UDX	JN79	91	19	537	0	0	0	50	OK1VMS	JO70	116	23	1434	972	0	0
232CT1DDW	IN60	90	17	2100	0	0	2500	51	OK2QI	JO80	114	25	1410	0	0	0

DUBUS 432 MHz Top List

NR	CALL	WW	WK	DC	TR	AU	MS	ES								
1	DJ9BV	JO43	219	0	2154	1863	1440	0	56	DL6BCT	JO43	112	0	1152	0	0
2	K33WG	JO72	204	74	1547	1494	0	0	57	SP6GZZ	JO81	110	0	1549	870	0
3	G3LQR	JO02	203	0	2031	1613	0	0	58	UA3MBJ	KO88	110	0	1306	1541	0
4	PA0RDY	JO22	202	0	1979	1807	1376	0	59	ON7WR	JO20	110	23	1163	0	0
5	PA0EZ	JO22	195	35	1787	1445	0	0	60	GW4LXO	IO81	109	0	1550	0	0
6	PA0WWM	JO22	191	36	1547	1836	0	0	61	DL7FF	JO62	109	0	1507	772	0
7	OZ7IS	JO65	188	32	1499	1048	1294	0	62	DK0OG	JN68	109	0	1459	745	0
8	DL8QS	JO43	182	33	1513	1513	0	0	63	HB9MIN/P	JN37	109	0	1300	0	0
9	OK1AXH	JO70	181	0	1861	1239	0	0	64	ON4ZN	JO21	109	21	1132	0	0
10	DL7QY	JN59	173	0	1640	1848	1292	0	65	F1HDF/P	JN18	108	0	1204	0	0
11	DJ6MB	JO30	171	0	1278	1733	0	0	66	DH9NBB	JN49	107	24	1363	0	0
12	DB6BX	JO32	169	32	1550	662	0	0	67	DL3AMA	JO51	107	21	1015	1219	0
13	F6DKW	JN18	163	23	1519	0	0	0	68	DL0GTH	JO50	106	20	1113	0	0
14	HA1YA	JN87	163	40	1438	1221	0	0	69	DL4KG	JO31	105	21	1273	0	0
15	G3XDY	JO02	163	27	1350	1619	0	0	70	UT1PA	KO21	105	0	1238	1761	0
16	LY2WR	KO24	162	25	1751	1593	1935	0	71	DF9QX	JO42	105	0	1136	721	0
17	SP6MLK/P	JO80	160	30	1780	0	0	0	72	ON4PS	JO20	104	21	1335	0	0
18	DK1KO	JO53	160	0	1643	694	0	0	73	DK5WO	JO30	104	20	1150	0	0
19	DB6NT/A	JO50	154	0	1823	0	0	0	74	DC4XH	JO43	104	20	1133	808	0
20	DF8LC	JO53	154	0	1615	1361	0	0	75	ES6RQ	KO37	103	19	1452	1148	0
21	SP6AZT	JO81	154	0	1538	1087	0	0	76	DL2DR	JO31	103	21	1158	0	0
22	PA4FP	JO33	152	0	2116	1010	0	0	77	DL1KDA	JO30	102	22	1286	999	1334
23	DK1KR	JO53	152	0	1400	1827	0	0	78	OK1DKS/P	JO60	102	23	1118	0	0
24	SP6GWB/P	JO80	151	30	1780	759	0	0	79	UT7GA	KN66	101	0	1877	0	0
25	OZ2OE	JO45	149	0	2216	1020	0	0	80	HB9CRQ	JN47	101	0	1010	0	0
26	YL3AG	KO26	149	19	1571	1041	0	0	81	ON4GG	JO20	98	0	1407	0	0
27	SM6ESG	JO67	148	26	1436	712	0	0	82	F5HRY	JN18	98	18	1222	583	0
28	DH3NAN	JO50	147	0	1437	1008	0	0	83	ON4ANT	JO20	96	0	1406	0	0
29	SM7ECM	JO65	147	24	1389	1073	0	0	84	DH8GV	JO33	94	19	1259	0	0
30	OK1CA	JO70	146	0	1670	0	0	0	85	OK1KRY	JN69	93	23	1350	0	0
31	DL3YEE	JO42	140	0	1574	1728	0	0	86	RX1AS	KN59	93	0	0	0	0
32	ES2WX	KO29	140	17	1232	1415	0	0	87	DK2DB	JN48	92	0	1331	0	0
33	OK1KEI	JO70	138	0	1682	1185	0	0	88	ES2XM	KO29	92	11	1271	1259	0
34	OK1VEI	JO70	136	0	1532	811	0	0	89	DJ1LP	JO64	91	9	1414	0	0
35	DL1SUN	JO53	136	0	1157	1071	0	0	90	DG5NEX	JN49	91	0	1187	0	0
36	SP9FG	JN99	134	25	1660	0	0	0	91	G4LRT	IO92	90	0	1394	410	0
37	OK1KIR/P	JO60	133	28	1773	0	0	0	92	OK1KPA	JN79	89	0	1176	0	0
38	SP9EWU	JO90	133	30	1589	1558	1664	0	93	DK0PX	JN48	89	0	1168	0	0
39	PA0JUS	JO22	130	26	1340	0	0	0	94	OK1OKL	JO60	88	0	1199	0	0
40	OH5LK	KP30	129	0	1386	1196	0	0	95	DJ8ES	JO43	88	12	1087	0	0
41	DL1BKK	JO43	128	0	1513	565	0	0	96	ES2RJ	KO29	87	17	1261	1123	0
42	LA8AK	JO38	124	0	1373	981	0	0	97	DK9RL	JN69	87	0	1185	0	0
43	G6HKM	JO01	124	0	1289	281	0	0	98	OK1DFC/P	JO60	87	20	1179	0	0

99 DK1VI	JN49 87	0 1125	870	0	0	154DL9BDM	JO33 50	0 1278	0	0	0
100IW5AVM	JN52 86	20 1458	0 1670	0	0	155SP2JXN	JO94 49	0 1149	0	0	0
101DG0CAL	JO52 86	0 1160	0	0	0	156S53J	JN75 49	9 688	0	0	0
102DG1VL	JO61 85	15 1245	0	0	0	157ES1JL	KO29 48	11 1324	0	0	0
103UY5HF	KN66 84	0 1670	0	0	0	158ES1RF	KO29 47	10 875	682	0	0
104OE3JPC	JN88 84	0 1132	1450 1469	0	0	159I2FUM/2	JN44 47	0 875	0	0	0
105HB9MIO/P	JN37 84	0 1096	0	0	0	160OM7AQ	JN98 47	13 803	0	0	0
106S50C	JN76 84	18 977	0	0	0	161F50IH/P	JN08 46	5 651	0	0	0
107HB9AOF	JN36 84	15 926	0	0	0	162DL5NEN	JN59 46	13 630	0	0	0
108ES0HD	KO18 83	19 1565	614	0	0	163SM3BIU	JP73 45	3 917	763	0	0
109DC6DY	JO31 83	0 1190	0	0	0	164F5DE	JN05 45	6 740	0	0	0
110DG3XA	JO43 83	13 905	0	0	0	165I3ZVN	JN55 42	12 1197	0	0	0
111 OH2BNH	KP20 82	12 1235	1046	0	0	166OK2KJU	JN89 42	13 731	0	0	0
112F6CKZ	JN09 80	0 1302	0	0	0	167OE1LPW	JN88 41	12 1114	0	0	0
113DF1EQ	JO31 80	0 1249	0	0	0	168OK1HRR	JO70 40	13 765	0	0	0
114ES4EQ	KO39 80	16 1160	907	0	0	169OK2PHM	JN89 39	9 746	0	0	0
115DK0FLT	JN49 80	17 1103	0	0	0	170DK2BJ	JO30 37	9 720	0	0	0
116ES0IW	KO19 79	17 1342	906	0	0						
117OK2KDS	JN99 79	0 1212	0	0	0						
118I4YNO/4	JN54 77	15 886	0	0	0						
119DL5NEN/P	JN59 76	16 964	0	0	0						
120DL1SUZ	JO53 75	17 1218	0	0	0						
121DH3YAK	JO31 75	13 1165	0	0	0						
122F1GTU	JN05 75	0 1114	0	0	0						
123OK1FFD	JO60 74	23 1339	0	0	0						
124DL7YS	JO62 74	17 1100	0	0	0						
125OK1MG	JO70 74	18 1045	0	0	0						
126DG6GP	JN48 74	13 1024	0	0	0						
127OK1KRQ/P	JN69 73	16 1091	0	0	0						
128UR7GN	KN66 70	0 1790	0	0	0						
129OK1SC	JO70 70	0 1310	758	0	0						
130OK2PWY	JN89 70	17 1135	0	0	0						
131OK2PNN	JN89 69	0 918	0	0	0						
132OK1DTG/P	JO70 68	14 1436	0	0	0						
133DL0SP/P	JO62 67	0 1018	0	0	0						
134SM7JUQ	JO65 65	15 1232	0	0	0						
135DL6BF	JO32 64	15 869	882	0	0						
136ES5WE	KO38 62	11 1406	0	0	0						
137DL8AAV	JO52 62	15 914	0	0	0						
138DG7SFL	JN49 61	10 947	0	0	0						
139DL3IAS	JN49 61	12 886	0	0	0						
140DD0VF	JO60 60	17 1106	0	0	0						
141F6FGO	JN25 60	11 1016	0	0	0						
142ES0NW	KO29 59	17 1213	675	0	0						
143ES0SM	KO08 59	20 1202	925	0	0						
144UA4NM	LO48 58	0 1230	1310	0	0						
145OK2UFB	JN99 56	20 1232	0	0	0						
146LA/DB1DI/P	JO37 55	12 1013	0	0	0						
147OK1PG	JO70 54	0 1773	0	0	0						
148Y02IS	KN05 54	0 1020	1741	0	0						
149DH0GHU	JN38 53	12 852	0	0	0						
150OK1VBN	JN78 53	11 753	723	0	0						
151ES3GZ	KO28 52	10 1035	0	0	0						
152DL5BBL	JO42 51	0 841	722	0	0						
153OL5Z	JN89 51	12 761	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 terrestrial 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 relays 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.

DUBUS 1296 MHz Top List

NR	CALL	WW	WKDCODX
1	PA0EZ	JO22132231302	
2	PA0WWM	JO22126231298	
3	PA0RDY	JO22121 01286	
4	DL4VCG	JN39 119 01335	
5	F6DKW	JN18 119 211273	
6	OK1AXH	JO70 118 01444	
7	G3XDY	JO02 117 221341	
8	HB9AMH/P	JN37 114 01351	
9	G3LQR	JO02 114 01274	
10	DB6NT/A	JO50107 01243	
11	SM7ECM	JO65 98 171326	
12	SM6ESG	JO67 97 191445	
13	DB6BX	JO32 97 241120	
14	SP6GWB/PJ	JO80 95 241580	
15	DL6NAQ/P	JO40 92 401253	
16	OK1KIR/P	JO60 92 221208	
17	SP6MLK/P	JO80 91 231580	
18	OE5VRL/5	JN78 91 181524	
19	PA0BAT	JO31 90 191014	
20	F5PAU	IN88 89 191630	
21	G6DER	IO93 86 01306	
22	DL7QY	JN59 86 01261	
23	DK1KR	JO53 85 01097	
24	OZ2OE	JO45 84 01425	
25	DK0OG	JN68 82 01160	
26	DL3YEE	JO42 82 01136	
27	OK1KEI	JO70 81 01316	
28	OZ1IPU	JO57 81 161096	
29	PA4FP	JO33 81 0 939	
30	OK1VEI	JO70 80 01313	
31	OZ7IS	JO65 79 171205	
32	F1HDF/P	JN18 79 9 886	
33	DL1BKK	JO43 77 0 995	
34	HB9AOF	JN36 77 15 975	
35	F5HRY	JN18 74 111064	
36	DL0UL/P	JN48 74 0 962	
37	OK1DFC/P	JO60 73 161176	
38	OZ1DOQ	JO65 71 171322	
39	DK3NAN	JO50 71 01143	
40	OK1AIY/P	JO70 70 01490	
41	OK1CA	JO70 70 01421	
42	PA0JUS	JO22 70 01265	
43	G6HKM	JO01 69 01193	
44	DK5WO	JO30 69 161137	
45	DH9NBB	JN49 69 131016	
46	HB9MIO/P	JN37 69 01000	
47	DL2DR	JO31 68 131158	
48	ON7YK	JO20 68 01079	
49	DC4XH	JO43 67 141090	
50	HB9RG	JN47 67 0 920	
51	DF1EQ	JO31 67 0 908	
52	G4PMK	IO93 66 01302	
53	DL0GTH	JO50 66 151073	
54	OK1VMS	JO70 65 181302	
55	OK1OKL	JO60 63 01177	
56	OK1DKS/P	JO60 62 131207	

57	G4LRT	IO92 62 01152
58	DG5NEX	JN49 61 01060
59	ON4PS	JO20 61 131052
60	ON7WR	JO20 60 141046
61	ON4GG	JO20 60 0 982
62	SP9FG	JN99 58 151492
63	OK1FFD	JO60 58 141058
64	DF9QX	JO42 57 01066
65	ON4ANT	JO20 57 0 914
66	DJ6XV	JO31 56 11 946
67	DC8UG	JO30 56 10 900
68	DC0DA	JO31 55 01034
69	DJ8ES	JO43 55 101025
70	DL1SUN	JO53 54 01162
71	DL3NQ	JN49 51 0 920
72	DB1BX	JO32 51 12 905
73	DL1KDA	JO30 50 12 940
74	LA8AK	JO38 49 01373
75	LY2WR	KO24 49 141026
76	PA2CHR	JO22 49 15 828
77	GW4LXO	IO81 48 0 990
78	DL3IAS	JN49 48 9 769
79	DK0PX	JN48 47 0 942
80	SP9EWU	JO90 46 12 946
81	DK0FLT	JN49 46 10 900
82	F6CGB	JN18 45 0 700
83	DG0CAL	JO52 44 01160
84	HB9BBD	JN47 43 111015
85	DJ1KP	JO40 43 0 698
86	IW5AVM	JN52 42 101036
87	DJ6MB	JO30 42 0 876
88	OE3JPC	JN88 42 0 702
89	HA1YA	JN87 40 13 862
90	ES2RJ	KO29 40 9 765
91	OK1KRQ/P	JN69 39 11 962
92	DK2DB	JN48 39 0 873
93	DC6DY	JO31 39 0 865
94	LA/DB1DI/P	JO37 38 91013
95	F1GTU	JN05 36 0 896
96	YL3AG	KO26 36 9 800
97	IO1VA	JN62 35 01152
98	ES2WX	KO29 35 9 692
99	DK2BJ	JO30 34 10 885
100	DG1VL	JO61 34 7 723
101	S50C	JN76 34 9 626
102	DG6GP	JN48 33 7 732
103	DH3YAK	JO31 33 5 715
104	ES4EQ	KO39 33 9 636
105	ES6RQ	KO37 33 9 600
106	DJ1LP	JO64 30 0 922
107	UR7GN	KN66 30 0 820
108	I2FUM/2	JN44 30 0 779
109	DL1SUZ	JO53 30 12 777
110	ES5WE	KO38 29 71249
111	I3ZVN	JN55 28 91197
112	G7LRQ	IO91 28 8 746
113	DK1VI	JN49 28 0 710
114	UT7GA	KN66 28 0 680
115	DK9RL	JN69 27 0 891
116	I4YNO/4	JN54 27 8 769

117	ES0SM	KO08 26 8 873
118	F6FGO	JN25 26 4 839
119	HB9RUZ/P	JN47 25 9 640
120	OZ8VO	JO56 24 0 951
121	OK2QI	JO80 23 71275
122	OK1VBN	JN78 22 9 950
123	F1FIH	JN23 22 6 605
124	OK1PG	JO70 21 0 985
125	PE1OGF	JO21 21 6 588
126	OH5LK	KP30 20 01349
127	UA3MBJ	KO88 20 0 301
128	OK1KRY	JN69 19 7 865
129	OK1KPA	JN79 19 0 783
130	OK2BBF	JN89 19 8 563
131	F5OIH/P	JN08 17 5 517
132	SP6AZT	JO81 16 0 820
133	OK2VMU	JN99 16 7 472
134	S53J	JN75 16 6 410
135	DL5NEN	JN59 16 16 320
136	IW3HTU	JN55 15 4 838
137	ES1RF	KO29 15 5 506
138	DG7SFL	JN49 15 3 358
139	SM4SJY	JP70 14 3 628
140	ES1AJ	KO29 14 5 531

DUBUS 2320 MHz Top List

NR	CALL	WW	WKDCODX
1	PA0EZ	JO22 79 15 973	
2	PA0RDY	JO22 64 01000	
3	PA0WWM	JO22 63 151022	
4	DB6NT/A	JO50 60 0 1119	
5	G3LQR	JO02 57 01006	
6	DL6NAQ/P	JO40 53 11 932	
7	OK1KIR/P	JO60 51 10 1115	
8	SM6ESG	JO67 47 71054	
9	DL7QY	JN59 47 01018	
10	PA0BAT	JO31 45 12 923	
11	DL1BKK	JO43 45 0 760	
12	OE5VRL/5	JN78 44 111291	
13	G6DER	IO93 44 01265	
14	PA4FP	JO33 44 0 727	
15	OK1AIY/P	JO70 42 01296	
16	DL0GTH	JO50 41 71052	
17	OZ1IPU	JO57 38 71028	
18	SM7ECM	JO65 38 9 942	
19	DC8UG	JO30 35 8 900	
20	OK1OKL	JO60 34 0 830	
21	DF1EQ	JO31 34 0 678	
22	DL0UL/P	JN48 32 0 960	
23	F5HRY	JN18 32 6 785	
24	ON7WR	JO20 32 8 756	
25	OZ2OE	JO45 31 0 876	
26	DC0DA	JO31 31 0 775	
27	DJ1KP	JO40 30 0 454	
28	DL3NQ	JN49 29 0 890	
29	OZ7IS	JO65 29 9 860	
30	ON7YK	JO20 29 0 733	
31	HB9MIO/P	JN37 29 0 694	

32	DL3YEE	JO42	28	0	912	17	DK2DB	JN48	11	0	331	40	G4PMK	IO93	6	0	958
33	G4LRT	IO92	27	0	1022	18	G4PMK	IO93	10	0	845	41	OK1DKS/P	JO60	6	1	318
34	G3XDY	JO02	27	8	947	19	DK0PX	JN48	9	0	632	42	DC8EC/A	JN57	6	0	278
35	DH9NBB	JN49	27	7	654	20	G4LRT	IO92	9	0	509	43	I2FUM/2	JN44	6	0	201
36	DL4VCG	JN39	27	0	553	21	DL0UL/P	JN48	9	0	239	44	OZ2OE	JO45	5	0	679
37	DF9QX	JO42	26	0	915	22	DL0GTH	JO50	7	2	466	45	DJ8ES	JO43	5	5	578
38	DK0PX	JN48	26	0	853	23	DL4VCG	JN39	6	0	339	46	DF1EQ	JO31	5	0	461
39	OZ1DOQ	JO65	25	7	830	24	OZ2OE	JO45	5	0	772	47	F6CGB	JN18	5	0	407
40	I0LVA	JN62	25	0	612	25	DJ8ES	JO43	5	3	578	48	DJ6XV	JO31	5	2	176
41	DK0OG	JN68	24	0	675	26	DJ6XV	JO31	5	3	396	49	DL4VCG	JN39	4	0	339
42	DK0FLT	JN49	24	7	646	27	GW4LXO	IO81	3	0	117	50	PA4FP	JO33	4	0	235
43	G4PMK	IO93	22	0	1249	28	DK0OG	JN68	3	0	78	51	F8UM/P	JN05	4	0	162
44	DK2DB	JN48	22	0	873	29	DF9QX	JO42	2	0	143	52	DK0OG	JN68	4	0	78
45	OK1DKS/P	JO60	22	4	602	30	DF2CA/P	JN57	2	0	24	53	DG1VL	JO61	3	2	191
46	DB1BX	JO32	22	7	525	31	OZ1IPU	JO57	1	1	209	54	OK2VMU	JN99	3	2	180
47	DL3IAS	JN49	21	6	604	32	G8BKE/P	IO80	1	0	114	55	OK1KRY	JN69	3	2	175
48	F1HDF/P	JN18	19	2	621							56	F6CGB/P	JN24	2	0	375
49	I3ZVN	JN55	19	7	603							57	G8BKE/P	IO80	2	0	242

DUBUS 5760 MHz Top List

52	G4DDK	JO02	17	0	969	NR	CALL	WW	WKDCODX	60	GJ6WDK/PJN89	1	0	136			
53	LA/DB1DI/P	JO37	17	7	825	1	HB9AMH/P	JN37	36	0	929	61	OK1KRQ/PJN89	1	1	96	
54	DG5NEX	JN49	16	0	465	2	PA0EZ	JO22	34	8	1017	62	SP6MLK/6	JO70	1	1	1
55	S51WI	JN75	16	4	463	3	SM7ECM	JO65	34	6	960	63	SP6MLK/P	JO80	1	1	1
56	OK1KRQ/PJN69	15	4	350	4	DB6NT/A	JO50	32	0	1000	64	SP6GWB/PJO80	1	1	1		
57	DK1KR	JO53	13	0	792	5	HB9MIO/P	JN37	26	0	694						
58	SP6GWB/PJO80	12	4	587	6	SM6ESG	JO67	25	6	951							
59	DJ6XV	JO31	12	3	396	7	G3LQR	JO02	23	0	949						
60	OK1DFC/P	JO60	11	3	549	8	PA0BAT	JO31	21	7	723						
61	PA0JUS	JO22	10	5	705	9	DL1BKK	JO43	19	0	689	NR	CALL	WW	WKDCODX		
62	IW5AVM	JN52	10	3	552	10	OE5VRL/5	JN78	18	6	901	1	F6DKW	JN18	68	101215	
63	I2FUM/2	JN44	10	0	354	11	OZ1IPU	JO57	18	6	807	2	PA0EZ	JO22	68	131017	
64	OK2BFF	JN89	10	6	308	12	I3ZVN	JN55	18	7	573	3	F5HRY	JN18	56	8	877
65	OK1KEI	JO70	9	0	786	13	PA0WWM	JO22	17	7	863	4	G3WDG	IO92	55	0	1135
66	DL1SUN	JO53	9	0	349	14	F1GHB/P	JN88	17	0	669	5	G4KGC	IO92	53	0	1135
67	SP9FG	JN99	8	4	717	15	F1HDF/P	JN18	17	4	638	6	HB9AMH/PJN37	51	0	939	
68	LA8AK	JO38	8	0	677	16	OK1KIR/P	JO60	17	3	393	7	F1HDF/P	JN18	51	7	867
69	IW3HTU	JN55	8	2	300	17	OK1UWA/PJO70	16	0	998	8	G3LQR	JO02	50	0	1006	
70	OK1CA	JO70	8	0	291	18	F5HRY	JN18	15	4	442	9	SM7ECM	JO65	49	7	1110

DUBUS 10 GHz Top List

10	PA0WWM	JO22	46	13	850
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DUBUS 10 GHz Top List

60	OK1DFC/P	JO60	11	3	549	8	PA0BAT	JO31	21	7	723	NR	CALL	WW	WKDCODX		
61	PA0JUS	JO22	10	5	705	9	DL1BKK	JO43	19	0	689	1	F6DKW	JN18	68	10	1215
62	IW5AVM	JN52	10	3	552	10	OE5VRL/5	JN78	18	6	901	2	PA0EZ	JO22	68	13	1017
63	12FUM/2	JN44	10	0	354	11	OZ1IPU	JO57	18	6	807	3	F5HRY	JN18	56	8	877
64	OK2BFF	JN89	10	6	308	12	I3ZVN	JN55	18	7	573	4	G3WDG	IO92	55	0	1135
65	OK1KEI	JO70	9	0	786	13	PA0WWM	JO22	17	7	863	5	G4KGC	IO92	53	0	1135
66	DL1SUN	JO53	9	0	349	14	F1GHB/P	IN88	17	0	669	6	HB9AMH/P	JN37	51	0	939
67	SP9FG	JN99	8	4	717	15	F1HDF/P	JN18	17	4	638	7	F1HDF/P	JN18	51	7	867
68	LA8AK	JO38	8	0	677	16	OK1KIR/P	JO60	17	3	393	8	G3LQR	JO02	50	0	1006
69	IW3HTU	JN55	8	2	300	17	OK1UWA/P	JO70	16	0	998	9	SM7ECM	JO65	49	7	1110
70	OK1CA	JO70	8	0	291	18	F5HRY	JN18	15	4	442	10	PA0WWM	JO22	46	13	850
DUBUS 3400 MHz Top List																	
NR CALL WW WKDCODX																	
1	PA0EZ	JO22	28	5	835	23	DL3NQ	JN49	12	0	318	11	OE5VRL/5	JN78	45	11	1136
2	DB6NT/A	JO50	27	0	741	24	DC8UG	JO30	11	5	724	12	HB9MIN/P	JN37	45	0	939
3	DL6NAQ/P	JO40	25	4	860	25	OK1AIY/P	JO70	11	0	693	13	DK1KR	JO53	45	0	868
4	G3LQR	JO02	22	0	924	26	OZ7IS	JO65	11	4	593	14	PA0BAT	JO31	45	11	785
5	PA0WWM	JO22	21	5	850	27	DC0DA	JO31	11	0	451	15	DB6NT/A	JO50	40	0	1000
6	PA0BAT	JO31	18	3	568	28	DK2DB	JN48	11	0	315	16	DL3YEE	JO42	40	0	700
7	PA0RDY	JO22	18	0	520	29	DL7QY	JN59	10	0	565	17	G4BRK	IO91	39	0	1115
8	DC0DA	JO31	17	0	660	30	S51JN/P	JN65	10	3	557	18	I6XCK/6	JN63	39	0	702
9	G6DER	IO93	15	0	859	31	OK1OKL	JO60	9	0	611	19	SM6ESG	JO67	37	6	1275
10	DL1BKK	JO43	15	0	703	32	DL6NAQ/P	JO40	9	2	452	20	OK1JKT/P	JO60	37	9	845
11	DL3NQ	JN49	15	0	637	33	OZ1DOQ	JO65	9	4	442	21	LX1DU	JN29	37	0	700
12	DL7QY	JN59	15	0	565	34	DB1BX	JO32	9	4	425	22	DL4EAU/P	JO51	35	9	826
13	DC8UG	JO30	13	6	724	35	DK0PX	JN48	9	0	409	23	I6CXB/6	JN63	35	0	751
14	DF1EQ	JO31	13	0	532	36	DL0GTH	JO50	8	4	674	24	G3GNR	IO70	34	0	1275
15	DB1BX	JO32	12	4	425	37	HB9MIN/P	JN37	8	0	286	25	HB9RG	JN47	34	0	761
16	PA4FP	JO33	11	0	464	38	LA/DB1DI/P	JO37	7	5	746	26	DJ1KP	JO40	34	0	554
						39	IW3HTU	JN55	7	3	300	27	DK0OG	JN68	33	0	524
												28	I0LVA	JN62	32	0	850
												29	DL6NAQ/P	JO40	32	8	656
												30	G4DDK	JO02	31	0	901
												31	DL3NQ	JN49	31	0	712

DUBUS 3400 MHz Top List

NR	CALL	WW	WK	CD	DX
1	PA0EZ	JO22	28	5	835
2	DB6NT/A	JO50	27	0	741
3	DL6NAQ/P	JO40	25	4	860
4	G3LQR	JO02	22	0	924
5	PA0WWM	JO22	21	5	850
6	PA0BAT	JO31	18	3	568
7	PA0RDY	JO22	18	0	520
8	DC0DA	JO31	17	0	660
9	G6DER	IO93	15	0	859
10	DL1BKK	JO43	15	0	703
11	DL3NQ	JN49	15	0	637
12	DL7QY	JN59	15	0	565
13	DC8UG	JO30	13	6	724
14	DF1EQ	JO31	13	0	532
15	DB1BX	JO32	12	4	425
16	PA4FP	JO33	11	0	464

32	DM2AFN	JO61	31	5	662
33	DL1BKK	JO43	30	0	842
34	OZ1IPU	JO57	28	7	941
35	HB9MIO/P	JN37	28	0	694
36	DL0GTH	JO50	28	7	674
37	DL3IAS	JN49	28	9	584
38	DL6NCI	JO50	28	6	481
39	OK1OKL	JO60	27	0	795
40	OK1AIY/P	JO70	25	0	736
41	DK0PX	JN48	25	0	567
42	OK1KIR/P	JO60	25	5	553
43	F1GHB/P	IN88	24	0	669
44	DL1VAA	JO61	24	4	661
45	DK0FLT	JN49	24	7	646
46	DH9NBB	JN49	24	7	646
47	DK4GD/P	JN48	24	0	566
48	ON7WR	JO20	23	9	756
49	OZ2OE	JO45	22	0	789
50	EA6ADW/P	JM19	21	4	850
51	S51WI	JN75	21	5	586
52	I3ZVN	JN55	21	7	573
53	DC8UG	JO30	20	6	753
54	DB1BX	JO32	20	7	705
55	S51JN/P	JN65	20	7	563
56	DL4VCG	JN39	20	0	533
57	DF9QX	JO42	19	0	504
58	DK2DB	JN48	19	0	432
59	G4LDR	IO91	18	0	1118
60	LA/DB1DI/P	JO37	18	6	825
61	DL5NEN/P	JN49	18	6	466
62	DL2DR	JO31	17	4	603
63	DG1VL	JO61	17	3	391
64	DL0UL/P	JN57	17	0	363
65	ON7YK	JO20	16	0	494
66	OK1KRQ/P	JN69	16	3	325
67	HB9AMH	JN37	15	0	567
68	DL7QY	JN59	15	0	492
69	OK1DFC/P	JO60	15	2	490
70	OK1UWA/P	JO70	15	0	434
71	IW5ADB	JN53	14	0	1053
72	G4PMK	IO93	14	0	958
73	DC0DA	JO31	14	0	639
74	I4XCC	JN63	13	0	496
75	OZ1DOQ	JO65	13	5	472
76	PA4FP	JO33	12	0	555
77	GW4LXO	IO81	12	0	309
78	G4KNZ	IO91	12	0	247
79	OK1DKS/P	JO60	11	2	616
80	S50C	JN76	10	3	346
81	DJ6XV	JO31	10	3	285
82	F6CGB	JN18	9	0	677
83	DJ8ES	JO43	9	4	593
84	DC8EC/A	JN57	9	0	297
85	G4LRT	IO92	8	0	824
86	F5HRY/P	JN08	8	2	491
87	DL1KDA	JO30	8	4	477
88	SP6GWB/P	JO80	8	4	457
89	F5PAU	IN88	8	0	264
90	F6CGB/P	JN12	7	0	823
91	DF1EQ/P	JO31	7	0	283

DUBUS 24 GHz Top List

NR	CALL	WW	WKDCODX
1	HB9MIN/P	JN37	12 0 396
2	DC8EC/P	JN57	10 0 301
3	HB9AMH/P	JN37	10 0 286
4	HB9MIO/P	JN37	10 0 172
5	DJ1KP	JO40	8 0 273
6	OE5VRL/5	JN78	8 3 273
7	DB6NT/A	JO50	6 0 301
8	S51JN/P	JN65	6 2 293
9	OK1AIY/P	JO70	6 0 281
10	G4DDK	JO02	6 0 268
11	EA6ADW/P	JM19	6 2 226
12	DK4GD/P	JN48	6 0 184
13	G3WDG	IO92	5 0 392
14	PA0EZ	JO22	5 3 391
15	DL3NQ	JN49	5 0 287
16	IW3EHQ/P	JN66	5 1 278
17	G3LQR	JO02	5 0 261
18	SM6ESG	JO67	5 1 242
19	OK1KIR/P	JO60	5 2 227
20	I3ZVN	JN55	5 2 210
21	DK0OG	JN68	5 0 193
22	OK1OKL	JO60	5 0 185
23	DF2CA/P	JN58	5 0 142
24	PA0BAT	JO31	5 2 131
25	OK1UWA/P	JO70	4 0 188
26	OK1DFC/P	JO60	4 2 185
27	DK0PX	JN48	4 0 168
28	F1GHB/P	IN88	4 0 158
29	G3GNR	IP70	4 0 154
30	DL3YEE/P	JO42	4 0 151
31	DL2DR	JO31	4 1 98
32	DL6NCI	JO50	3 3 280
33	OK1AIY/P	JO60	3 0 227
34	G4KNZ/P	IO83	3 0 120
35	DG1VL	JO61	3 2 113
36	F5HRY	JN18	3 1 82
37	DF1EQ	JO31	2 0 133
38	DL0GTH	JO50	2 1 108
39	DB1BX	JO32	2 1 90
40	DK2DB	JN48	2 0 48
41	ON7YK	JO20	2 0 34
42	G4KGC	IO92	1 0 392
43	DC0DA/P	JO32	1 0 104
44	G8BKE/P	IO80	1 0 100
45	F50IH/P	JN08	1 1 90
46	CT1DMK	IN50	1 1 82
47	CT1FP	IN50	1 1 82
48	SM7ECM	JO65	1 1 79
49	F1HDF/P	JN18	1 1 77
50	DJ6XV	JO31	1 1 76
51	F6CGB/P	JN37	1 0 74
52	OK1OGS/P	JN69	1 0 60

DUBUS 47 GHz Top List

NR	CALL	WW	WKDCODX
1	HB9MIN/P	JN37	8 0 182
2	HB9MIO/P	JN37	8 0 166
3	HB9AMH/P	JN37	5 0 166
4	DK4GD/P	JN47	5 0 123
5	DF2CA/P	JN58	4 0 15
6	OE5VRL/5	JN78	3 2 203
7	DL2DR	JO31	3 1 71
8	I3ZVN	JN55	2 1 179
9	IW3EHQ/P	JN65	2 1 106
10	OK1OKL	JO60	2 0 96
11	OK1UWA/P	JO70	2 0 96
12	OK1AIY/P	JO60	2 0 96
13	DB6NT/A	JO50	2 0 95
14	DL6NCI	JO50	2 2 83
15	DC0DA/P	JO31	2 0 69
16	DK0PX	JN48	2 0 62
17	DF2CA/P	JO60	2 0 59
18	DL3YEE/P	JO42	2 0 45
19	DL/HB9AMH/P	JN48	0 184
20	IW3HTU	JN55	1 1 49
21	DC8EC/A	JN57	1 0 14
22	OK1AIY/P	JO70	1 0 12
23	OK1KIR/P	JO60	1 1 5
24	CT1DMK	IN50	1 1 1
25	SP6MLK/6	JO70	1 1 1
26	CT1FP	IN50	1 1 1

DUBUS 76 GHz Top List

NR	CALL	WW	WKDCODX
1	DK4GD/P	JN47	4 0 114
2	DF2CA/P	JO50	4 0 4
3	HB9MIO/P	JN37	2 0 114
4	DB6NT/A	JO50	2 0 77
5	DC0DA/P	JO50	2 0 48
6	OK1AIY/P	JO70	1 0 12
7	OE9FKI	JN47	1 0 2
8	HB9AMH/P	JN37	1 0 1
9	HB9MIN/P	JN37	1 0 1

DUBUS 145 GHz Top List

NR	CALL	WW	WKDCODX
1	DB6NT/OZ	JO57	1 0 3
2	IW3EHQ/P	JN65	1 1 2
3	DB6NT/A	JO50	1 0 2

DUBUS 241 GHz Top List

NR	CALL	WW	WKDCODX
1	DB6NT/A	JO50	1 0 2
2	DB6NT/OZ	JO57	1 0 0

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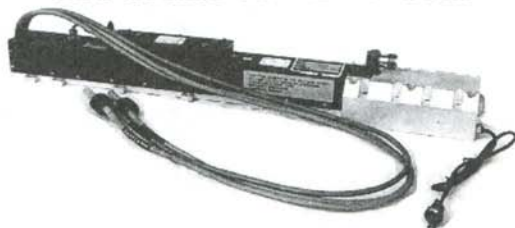
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Technik V/Page 58

BVO-2wl (8 EI.)

Element	Position [mm]	Free SpaceLength [mm]	Length [mm] for 25mm Boom
R	0	1013	1016
DE	327	956	956
D1	534	949	952
D2	1073	934	937
D3	1828	917	920
D4	2687	908	911
D5	3540	903	906
D6	4245	914	917

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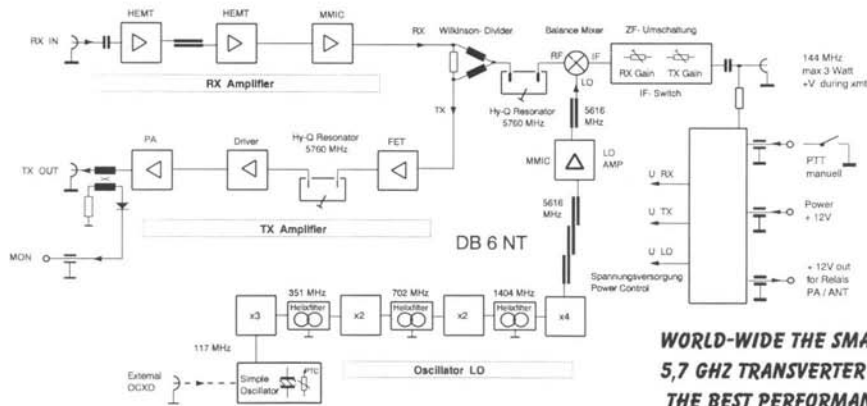
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Payments can be made now together with orders or later.

Bestellung / Order

..... x	DUBUS TECHNIK 1, DM 35,- / USD 25	=		DM/USD
..... x	DUBUS TECHNIK 2, DM 35,- / USD 25	=		DM/USD
..... x	DUBUS TECHNIK 3, DM 35,- / USD 25	=		DM/USD
Total Amount / Gesamtsumme:				= DM/USD

Bestellung einsenden an / Please send order to:

DUBUS, Grützmühlenweg 23, D-22339 Hamburg, Germany

or via e-mail: Joachim@Kraft.net

Name/Call:

Street/Str:

ZIP+Town/PLZ/Ort: