30 Meter Digital Group Join in on 10.140 +/- 1000



30 Meter Band

If you are asking these questions:

- Where on the 30 Meter Band is there activity?
- What different activity or modes are used on the 30 meter band?
- How do I find more information or links to the Internet for help on getting involved in different 30 Meter Activity or different modes?

Then please read on, jump in, and have some fun on this no contest WARC band that has propagation unlike any other. Since it sits between the 40 Meter and 20 Meter band it boasts paths open most anytime. At times acts Like 40 meters, yet also opens to DX like 20 meters. Not much going on 30 Meters? Think again! GL on the 30 Meter Band!

30 METER DIGITAL GROUP (30MDG) ALL ARE WELCOME PLEASE JOIN IN:

HTTP://WWW.30METERDIGITAL.ORG

Live Propagation

http://www.projectsandparts.com/30m/ (Special Thanks to Sholto KE7HPV)

http://www.30meterdigital.org/30mspot.html

http://www.propnet.org/

http://psk.gladstonefamily.net/pskmap.html

http://wsprnet.org/drupal/wsprnet/map

http://www.obriensweb.com/sked/

http://hfradio.org/propagation.html

Prediction Propagation Software

http://www.dxzone.com/catalog/Software/Propagation/

http://www.g4ilo.com/voaprop.html

http://www.voacap.com/hamcap-guide.html

http://www.dxlabsuite.com/propview/





€ 19:00 **> | ▶** 3.5 7 10 14 18 21 24 28

Params 🗷 Chart 💽 Map 🕏 Settings 🕇 Ant

THE 30 METER BAND AT A GLANCE

(Note: We are SECONDARY USERS of the 30 Meter Band...the following information is NOT official, but based on observations from Internet sources and those active on 30 Meter Band.)

| CW QRP |
|---|
| CW DXpeditions (of course varies with each) |
| CW IOTA |
| CW HFPack |
| CW FISTS |
| CW Straight Key Century Club (slow speed CW) |
| SSB Calling Frequency (OC-VK,AS - AF) |
| CW County Hunting Net |
| WINLINK-Pactor I & 2 |
| EMCOMM |
| SSTV-N (MP73-N <500hz) |
| Feld HELL |
| OLIVIA |
| Feld HELL |
| Feld HELL Net 0000z to 0200z CDT Sundays |
| Feld HELL (Region I) |
| OLIVIA |
| MEPT/WSPR (Beacons) |
| County Hunting Net |
| JT65 (WSJT) |
| QRP Digital Modes |
| PROPNET (PSK) |
| WSPR (QSO MODE-WSJT) |
| PSK (DX) |
| 30MDG Sunday Night PSK (possible Net soon) |
| MFSK (other Wider <500hz Digital Modes) |
| Dxpendition RTTY (of course varies with each) |
| DX RTTY |
| WINLINK - Pactor 3 (WINLINK IO.140-IO.150?) |
| SSTV-N (MP73-N <500hz) |
| ALE-400hz |
| ARRL SkipNet |
| ALE-2Khz |
| PSKMail/APRS |
| APRS |
| |

IARU (IO MHz band)

Region-I:

IOIOO-IOI4O = CW IOII6 = centre of QRP activity IOI4O-IOI5O = narrow band modes, digimodes

Region-II:

IOIOO-IOI3O = CW IOII6 = centre of QRP activity IOI3O-IOI4O = narrow band digimodes IOI4O-IOI5O = all digimodes (no phone)

Region-III:

IOIOO-IOI57.3 = CW IOII6 = centre of QRP activity IOI4O-IOI57.3 = narrow band activity (CW, RTTY, FAX, digi-modes).

Note:

CW Q50's are accepted across all bands, except beacon segments which are discouraged on 30 Meters since we are secondary users of this band. (Rec. DC05_C4_Rec_I3).

Please Check Your Country's Rules/Regulations and/or BAND PLAN

(Make sure you are in compliance with your country's license rules and regulations)

http://www.ac6v.com/frequencies.htm

http://hflink.com/bandplans/

http://hflink.com/bandplans/IOmhz/

THE 30 METER BAND IN MORE DETAIL (with references links)

CW 10.100 to 10.130

IO.II5 IOTA

http://www.rsgbiota.org

10.106-10.116 QRP

http://www.qrparci.org/

IO.IIO DXpeditions CW

IO.II75 HFPack

http://www.HFpack.com

10.118 FISTS

http://www.fists.org

10.120 SSB Calling Frequency

(Oc-VK,AS -AF)

IO.1225 County Hunting Net

http://ch.w6rk.com/

10.129 EMCOMM

http://www.wrrl.org/n_∈_t_s_.asp

CW Software:

http://www.dxsoft.com/

http://www.dxzone.com/catalog/Software/Morse Code Decoders/

http://www.polar-electric.com/Morse/MRP40-EN/

Best decode is the human ear

CW H∈lp:

http://www.arrl.org/FandES/ead/learncw/

http://www.netwalk.com/~fsv/CWguide.htm

http://morsecode.scphillips.com/jtranslator.html

http://www.dxzone.com/catalog/Operating Modes/Morse code/



SSTV-N (MP73-N Narrow <500hz)

IO.132 SSTV (MP73-N - NA)

IO.142 SSTV (MP73-N - outside NA)

What does SSTV sound like?

http://www.qsl.net/g4hbt/sounds.htm



SSTV-N Software:

http://mmhamsoft.amateur-radio.ca/mmsstv/index.htm (use MP73-N <500hz see Help Link)

SSTV-N Help:

http://www.obriensweb.com/narrowsstv.htm

RTTY

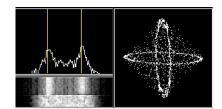
10.130-10.140 RTTY

IO.141 Dxpendition RTTY

10.140-10.145 DX RTTY

What does RTTY sound like?

http://www.kb9ukd.com/digital/



RTTY Software:

http://mmhamsoft.amateur-radio.ca/mmtty/

http://www.dxsoft.com/en/products/truetty/

http://www.dxzone.com/catalog/Software/RTTY/

http://www.rckrtty.de/

RTTY Software (Multimode):

http://www.mixw.net/

http://www.ham-radio-

deluxe.com/Programs/DigitalMaster780/tabid/89/Default.aspx

http://f6cte.free.fr/index anglais.htm

http://www.wlhkj.com/Fldigi.html

http://mmhamsoft.amateur-radio.ca/MMvari/

http://homepage.mac.com/chen/w7ay/cocoaModem/index.html

http://www.dxlabsuite.com/winwarbler/

RTTY Help:

http://www.aa5au.com/rtty.html

http://www.arrl.org/news/features/2003/0I/03/I/

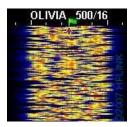
http://www.dxzone.com/catalog/Operating_Modes/RTTY/

http://groups.yahoo.com/group/MMTTY/

OLIVIA (great weak signal mode)

10.134-10.140

10.1345



IOI34.5 USB dial freq [Olivia 500/I6 Audio Center Freq=750 Hz] or [Olivia IOOO/32 Audio Center Freq=IOOOHz] (proposed Olivia calling freq for IARU Region 2 and Region 3)

What does OLIVIA sound like?

http://myweb.tiscali.co.uk/g4ucj/html/digital modes.html

OLIVIA Software (Multimode):

http://www.mixw.net/

http://www.ham-radio-

deluxe.com/Programs/DigitalMaster780/tabid/89/Default.aspx

http://f6cte.free.fr/index anglais.htm

http://www.wlhkj.com/Fldigi.html

http://nlsu.com/olivia/

OLIVIA Help:

http://hflink.com/olivia/olivia.html

http://groups.yahoo.com/group/digitalradio/

http://groups.yahoo.com/group/oliviadata/

http://forums.ham-radio.ch/index.php

FELD HELL

CQ CQ CQ DE IZ8BLY IZ8BLY IZ8BLY DE IZ8BLY IZ 1/2682 f^12861798 '128804 '128804 '128617'00' ' ** IZ8BLY IZ8BLY DE IZ8BLY IZ8BLY IZ8BLY

10.137

IO.138 NA Feld HELL Net 0000z to 0200z CDT Sundays

IO.144 (Region I)

What does Feld HELL sound like?

http://www.wb8nut.com/digital.html

Feld HELL Software (Multimode):

http://xoomer.alice.it/aporcino/

http://www.mixw.net/

http://www.ham-radio-

deluxe.com/Programs/DigitalMaster780/tabid/89/Default.aspx

http://f6cte.free.fr/index anglais.htm

http://www.wlhkj.com/Fldigi.html

Feld HELL Help:

http://sites.google.com/site/feldhellclub/Home

http://www.qsl.net/zllbpu/FUZZY/starting.htm

http://uk.groups.yahoo.com/group/feldhellclub/



JT65 (WSJT - Great Weak signal mode)

10.139 JT65

What does JT65 sound like?

http://myweb.tiscali.co.uk/g4ucj/html/digital modes.html

JT65 Software:

http://physics.princeton.edu/pulsar/KIJT/



http://groups.yahoo.com/group/wsjtgroup/

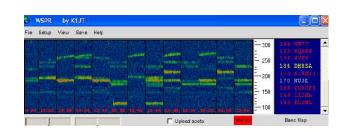
http://www.obriensweb.com/bozoguidejt65a.htm

http://www.hflink.com/jt65a/

http://www.para.org.ph/membersarticles/WSJT/

WSPR (WSJT)

10.140 WSPR



What does WSPR sound like?

http://sv2dcd.blogspot.com/2008/05/oy3je-4m-qso-now-online.html



WSPR Software:

http://physics.princeton.edu/pulsar/KIJT/

http://f6cte.free.fr/index anglais.htm

WSPR Help:

http://physics.princeton.edu/pulsar/KIJT/WSPR Quick Start.TXT

http://wsprnet.org/

http://wsprnet.org/meptspots.php

http://wsprnet.org/drupal/wsprnet/map

http://www.pe2pe.eu/images/WSPR.htm

http://groups.yahoo.com/group/digitalradio/

http://groups.yahoo.com/group/multipsk/

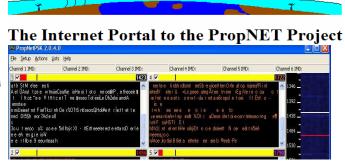
PROPNET-PSK

IO.1405 PROPNET-PSK

i.∈. IO.I389 + O.OOI500 = IO.I404MHz. NA

AF-OC = IO.I389 + O.OOI300 AS-EU = IO.I389 + O.OOI400 NA = IO.I389 + OOI500

SA = 10.1389 + 001600



PROPNET Software:

http://www.n7yg.com/propnetpsk/index.html

PROPNET Decoder of string (power, height, etc):

http://www.pearhead.org/PropNET_PHG_decoder

PROPNET Help:

http://www.n7yg.com/propnetpsk/index.html

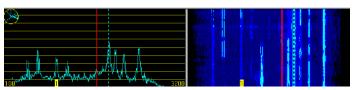
http://propnet.org/index3faq.shtml

http://propnet.org/index3rp.shtml

http://groups.yahoo.com/group/PropNET-Online/

PSK

10.140 - 10.142 PSK



(All flavors of PSK, most used is BPSK3I...but also BPSK63,QPSK3I/63,etc and as another note as you will see below <u>PSK seems to be the most popular mode used</u> on the 30 Meter Band – it is NOT the best weak signal mode so have other modes at the ready)

What does PSK sound like?

http://www.wb8nut.com/digital.html

PSK Software (Multimode):

http://www.digipan.net/ (those new to digital/psk try Digipan first-easy to use)

http://www.dxlabsuite.com/winwarbler/

http://www.mixw.net/

http://www.ham-radio-deluxe.com/Programs/DigitalMaster780/tabid/89/Default.aspx

http://f6cte.free.fr/index anglais.htm

http://www.wlhkj.com/Fldigi.html

http://mmhamsoft.amateur-radio.ca/MMvari/

http://homepage.mac.com/chen/w7ay/cocoaModem/index.html

http://www.logger32.net/

Too many to list go to larger sites or Google `PSK Software'

http://ac6v.com/software.htm

http://www.dxzone.com/catalog/Software/PSK3I/

http://www.westmountainradio.com/links.htm

http://www.buxcomm.com/soundcardsoftware.html

PSK Help:

http://groups.yahoo.com/group/30meterPSKGroup/?yguid=63426369

http://groups.yahoo.com/group/digitalradio/

http://www.bpsk3l.com/

http://www.aintel.bi.ehu.es/software.html

http://www.mymorninglight.org/ham/psk.htm

http://www.qsl.net/wm2u/psk3l.html

http://groups.yahoo.com/group/psk3I/

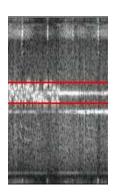
http://www.youtube.com/watch?v=ZaAXMzGIUGA (New to digital ? Watch This!)

http://www.youtube.com/watch?v=qHNvp7FfP6E

MFSK (good weak signal mode)

10.142 - 10.143 MFSK

What does MFSK sound like? http://www.wb8nut.com/digital.html



MFSK Software (Multimode):

http://www.qsl.net/zllbpu/MFSK/

http://www.mixw.net/

http://www.ham-radio-deluxe.com/

http://f6cte.free.fr/index anglais.htm

http://www.wlhkj.com/Fldigi.html

http://homepage.mac.com/chen/w7ay/cocoaModem/index.html

Note: MFSK can send pictures (SSTV) too! (Takes longer so adjust picture sizes to be smaller - see help link below)

http://f6cte.free.fr/SSTV IN MFSKI6 EASY WITH MULTIPSK.doc

MFSK Help:

http://www.qsl.net/zllbpu/MFSK/

http://www.qsl.net/wm2u/mfsk.html

http://groups.yahoo.com/group/MFSK/

http://www.arrl.org/FandES/field/regulations/techchar/MFSK.html

http://sharon.esrac.ele.tue.nl/mirrors/zllbpu/MFSK/software/help.htm

http://www.dxzone.com/catalog/Operating Modes/MFSK/

ARRL SkipNet

10.145 ARRL SkipNet

SkipNet Help:

http://www.uspacket.org/hfnets.htm

ALE (ALE2K and ALE400)

10.143 ALE400

10.1455 - 10.1481 ALE2k

What does ALE sound like?

http://www.kb9ukd.com/digital/

ALE Software:

http://f6cte.free.fr/index_anglais.htm

http://hflink.com/pcale/

ALE Help:

http://groups.yahoo.com/group/multipsk/

http://groups.yahoo.com/group/HF-LINK/

http://hflink.com/

http://hflink.com/channels/

http://hflink.com/automaticlinkestablishment/

http://hflink.com/hardware/

PSKMail/APRS/

10.1478 - 10.1482 PSKMail/APRS

PSKMail/APRS Software:

http://pskmail.wikispaces.com/Download

PSKMail/APRS Help:

http://pskmail.wikispaces.com/

http://aprs.net/

WINLINK

IO.I239 WINLINK Pactor I or Pactor 2

IO.1412 WINLINK Pactor 3

10.140 - 10.150 WINLINK (?)





WINLINK Software and Help:

http://www.winlink.org/

http://www.zerobeat.net/bandplan-dissent.html

http://groups.yahoo.com/group/wl2kemcomm/

http://www.arwatch.com/watch/w winlink.htm

APRS/PACKET

10.1491 - 10.1495 APRS

APRS/PACKET Software:

http://www.agwtracker.com/

http://www.sv2agw.com/

http://www.ac6v.com/opmodes.htm#APRS

http://f6cte.free.fr/index_anglais.htm

APRS/PACKET Help:

http://www.ac6v.com/opmodes.htm#APRS

http://www.ac6v.com/software.htm#PACK

http://www.scs-ptc.com/

Other Digital Modes (Experimenting Welcome)

Other Digital Mode Software:

http://www.westmountainradio.com/links.htm

http://www.buxcomm.com/soundcardsoftware.html

http://xoomer.alice.it/aporcino/Chip64/index.htm

http://www.weaksignals.com/jason

(Many others too! New Digital modes on the horizon all the time!)

Other Digital Mode Help:

http://www.obriensweb.com/chip64help.htm

http://rv3apm.com/

http://www.bcar.us/Digital%20Signals.htm

http://www.eham.net/reviews/products/28

Digital Mode Clubs that include 30 Meters 3

(Note: Member Count/Number as of Sep08)

30 Meier Digital Group

30MDG: 30 Meter Digital Group http://www.30meterdigital.org/index.html

Members = 1,109

30 Meter Digital Group Join in on 10,140 +/- 1000

EPC: European PSK Club http://eu.srars.org/index.php

Members = 4,492

EUROPEAN PSK CLUB

O70: PODXS O70 Club http://www.podxsO7Q.com/

Members = 838

PODXS Ø7Ø Club

DMC: Digital Modes Club http://www.digital-modes-club.org/index.htm

Members = 1,481

orghanode tub free littles in the land

FH: Feld-Hell Club http://feldhellclub.org/index.php

Members = 1,125

OMC: Olivia Modes Club http://www.oliviamodesclub.net/index.php

Members = 254

Olivia Belgium Club
Digital Mode

CDG: Croatian Digital Group http://www.hamradio.hr/9alepc/index.htm

Members= 98

CROATIAN DIGITAL GROUP

DQSO: Digital QSO Club http://dqso.net/index.htm

Members = 115

Digital QSO Club

OBC: Olivia Belgium Club http://www.freewebs.com/on6cml/index.htm

Members= 81



BDM: Belgium Digital Modes Club http://server.mbonline.be/~on3vhf/BDM/index.htm

Members= 53

Belgium digital mode

BCS: Belgium Club SSTV http://on8ga.qsl.nu/BelgiumClubSstv/belgiumclubsstv

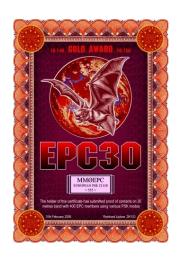
Members= 340

BELGIUM CLUB SSTV

AWARDS

(Get on the 30 Meter Band, participate, and have some fun! Please note these Awards are for FUN, contacts are NOT all confirmed, it is NOT a contest-no time limits/dates/etc, the only winners are those that have fun. Get on the band and promote the use of the 30 Meter Band and good will among other Digital Hams with like interests throughout the World...DX to Ragchew it is all here on 30 Meters)







http://www.30meterdigital.org/30mAwards.html

http://www.zl3rg.com/30MDG%20HP.html (Special Thanks to Rob ZL3RG)

http://www.zl3rg.com/30MDG%20Award%20Rules.html

http://zl3rg.com/Ultimate30MDG.html

(Special Thanks to John OE3JPK - Creator of Ultimate3OMDG Award Software)

http://eu.srars.org/index.php?option=com_content&task=view&id=IOI&Itemid=I36

http://www.podxs070.com//endorsements/070 EndorsementRules.html

http://sites.google.com/site/feldhellclub/Home/awards

http://www.digital-modes-club.org/awards.htm

http://www.arrl.org/awards/dxcc/

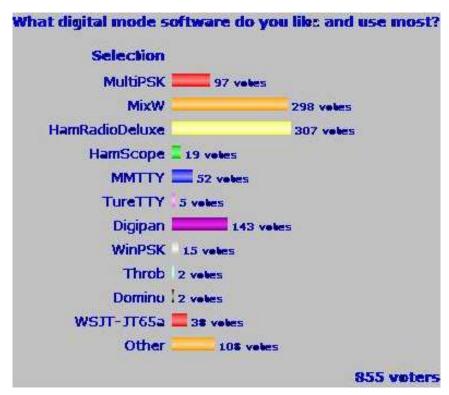
http://www.arrl.org/awards/dxcc/news/20020904.html

http://www.hamradio.de/cgi-local/award.pl?action=showaward&awardnr=235

" Please note all Surveys/Polls below are from the 30MDG website that started December 2007 to Current August 2008

30M Survey - Digital Software

http://www.30meterdigital.org/30msoftware.html



References below In Order as Rated by Digital Ops (top picks only):

#I Rated DM780 with Ham Radio Deluxe

http://www.ham-radio-

deluxe.com/Programs/DigitalMaster780/tabid/89/Default.aspx

#2 Rated MixW

http://www.mixw.net/

#3 Rated Digipan

http://www.digipan.net/

#4 Rated Multipsk

http://f6cte.free.fr/index anglais.htm

Rated best for Linux (also now for Windows)....FLDIGI give it a try! (When Poll first introduced Linux was not in the Poll-our error only including Windows) http://www.wlhkj.com/Fldigi.html

Winwarbler

http://www.dxlabsuite.com/winwarbler/

MMVARI

http://mmhamsoft.amateur-radio.ca/MMvari/

Rated best for MAC users...COCOAMODEM
(When Poll first introduced MAC was not in the Poll-our error only including Windows)

http://homepage.mac.com/chen/w7ay/cocoaModem/index.html

User Yahoo Help Groups on the above software:

http://groups.yahoo.com/group/ham-radio-deluxe/

http://groups.yahoo.com/group/mixw/

http://groups.yahoo.com/group/digipan/

http://groups.yahoo.com/group/multipsk/

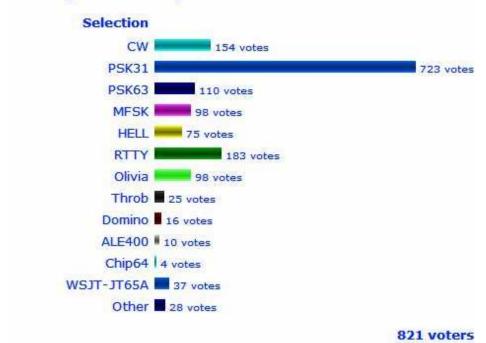
http://rss.groups.yahoo.com/group/digitalradio/rss

http://groups.yahoo.com/group/linuxham/

30M Survey on Most Used Digital Modes

http://www.30meterdigital.org/30msoftware.html

What Digital Modes do you use the most on 30 Meters?



Top rated software and supported modes

| Software | Ham Radio Deluxe | MixW | DigiPan | MultiPSK | FLDigi | MMVari | Cocoamodem |
|------------|------------------|------|---------|----------|--------|--------|------------|
| Mode | | | | | | | |
| PSK | | | | | | | |
| RTTY | | | | | | | |
| CW | | | | | | | |
| Olivia | | | | | | | |
| MFSK | | | | | | | |
| HELL | | | | | | | |
| WSJT(JT65) | | | | | | | |
| Throb | | | | | | | |
| Domino | | | | | | | |
| ALE | | | | | | | |
| Chip64 | | | | | | | |
| SSTV | | | | | | | |
| FAX | | | | | | | |
| MT63 | | | | | | | |
| | = Supported | | | | | | |

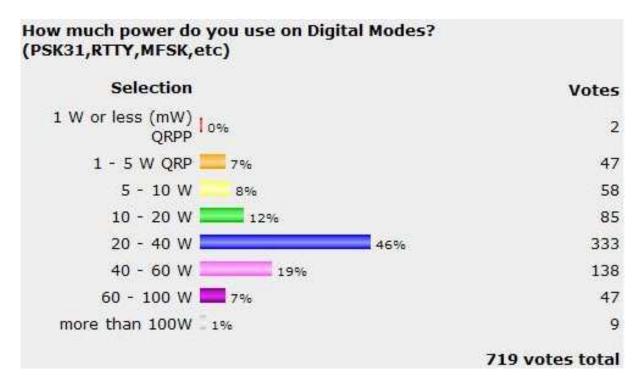
(Thanks to Richard PA3GWH for this software vs digital mode supported chart)

Some comparison numbers from Tony K2MO comparing different digital modes are toward the end of this document...this is a must read! Please experiment with different digital modes and 30 Meters is a great place to do just that and find others that are willing to experiment along with you!

30M Survey on Power Used

Note: Almost 75% of digital operators are using 40w or less power. Please do NOT harm your radio by running IOO% power on a IOO% duty cycle mode (50% power or 50w or lower advised not only for your rig but also for a clean signal on the band so all can use the band (no ALC!). If you experiment using IOOw then compare copy to 40w or less you will find little to no difference in copy. Either the band is open for the current propagation/path using your current mode/antenna at hand or it's not and no copy. If you want to increase your chances of contacts on a poor propagation/path then switch to another mode and/or different antenna!

http://www.30meterdigital.org/30msoftware.html



Don't transmit a poor signal on the band and if you see one please help each other and let others know of a poor quality signal (we would all want to know that).

http://www.psb-info.net/samples.html

http://www.ssiserver.com/info/pskmeter/

http://www.wlhkj.com/Modes/pskbad.htm

Not everyone can have a 599 signal, please give proper and accurate signal reports:

http://www.hamuniverse.com/rst.html

http://www.radioing.com/hamstart/rst.html

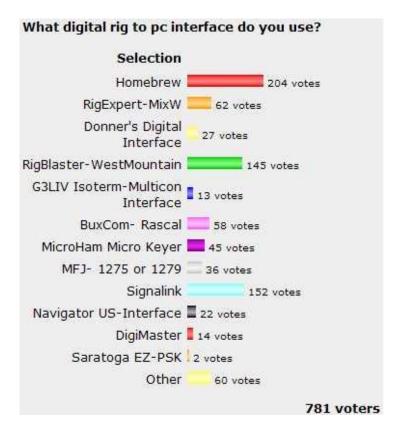
http://www.psb-info.net/RSQ-discussion.html

http://groups.yahoo.com/group/rsq_signal_reporting/

http://www.psb-info.net/IMD-Measurement.html

30M Survey on Rig to PC Interfaces

http://www.30meterdigital.org/30msoftware.html



http://www.qsl.net/wm2u/interface.html

http://www.tigertronics.com/

http://www.westmountainradio.com/

http://www.rigexpert.com/

http://buxcommco.com/

http://home.att.net/~n8st/

http://www.n3fjp.com/rigcw.htm

http://www.waypoint.com/users/~discobay/Sound_Card_Presentation.htm

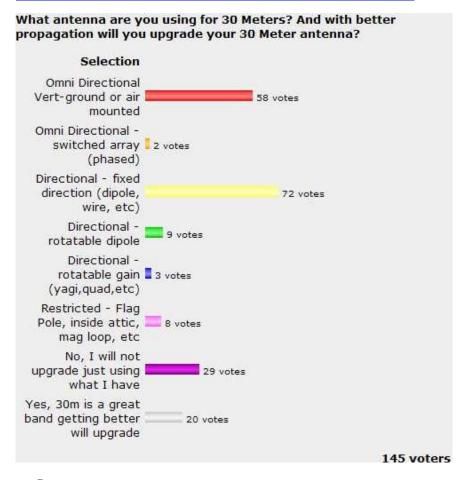
http://www.mfjenterprises.com/Search.php?searchit=interface

http://www.eham.net/reviews/products/28

(Many other interfaces homebrew or Commercial so please Google to search for more)

30M Survey on 30M Antennas

http://www.30meterdigital.org/30msoftware.html



30M Antennas

The most important part of your Amateur Radio Station is your ANTENNA! Your antenna can limit or increase your activity on a band. We have folks that are having decent luck on the 30 Meter Band even those with restrictions using inside antennas to those that are upgrading to better antennas for more 30 Meter action. Please use what you have at hand and give 30 Meters a try....inside ant/loops/dipoles, low to the group wires, outback verticals, hamstick dipoles, G5RVs, OSF Windoms, etc all making contacts, so use what you have until you can upgrade to a better antenna. Those that want to increase their log and coverage might want to dedicate a couple antennas for 30 Meters for different coverage from a wire simple dipole for closer in propagation to a vertical for DX. There are too many antenna designs and ideas to cover here but we will give a few antenna links all the same... see you on the waterfall!

Dipoles work! Dedicate a 30 Meter Dipole cut to band and give it a try!

http://www.hamuniverse.com/dipivcal.html

http://www.chem.hawaii.edu/uham/30.html

http://www.eham.net/articles/19877

http://www.eham.net/articles/19626

Loops also work well:

http://kalfsb.home.att.net/loopcalc.html

http://www.dxzone.com/catalog/Antennas/Loop/

http://www.dxzone.com/catalog/Antennas/30M/

If you can't put up that Yagi or Quad for 30 Meters (which most of us can't) then get that **DX take off angle using a VERTICAL** that can fit in most any yard/garden:

http://www.forcel2inc.com/

http://www.zerofive-antennas.com/

http://www.dxengineering.com/Parts.asp?ID=22I9&PLID=274&SecID=II3&DeptID=22&PartNo=DXE-30VE-I

http://www.k7su.com/verticalpage.html

http://www.arrl.org/tis/info/Vertical-H.html

http://www.new-tronics.com/main/html/base hf.html

http://www.bencher.com/ham/index.php?main_page=product_info&products_id=I4

http://www.gapantenna.com/

A few other sites with loads of antennas ideas/links

http://members.fortunecity.com/xelbef/hf-antennas.htm

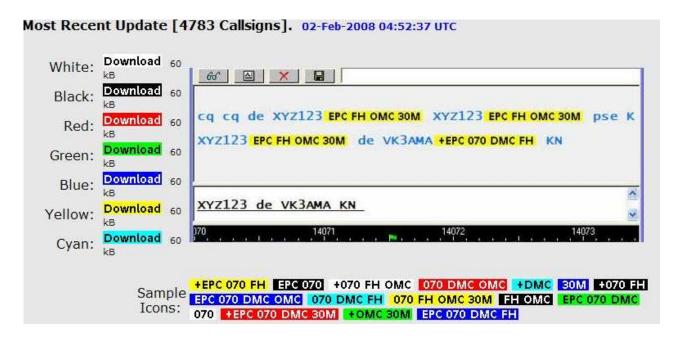
http://www.ac6v.com/antprojects.htm

If you can put up that 30 Meter Rotatable Dipole then do so if you are lucky like a few on the Band and can put up a 30 Meter Yagi or Quad then great! Those with those big stations will help the smaller stations pulling them in. If you are on the 30 Meter Digital Band much you will eventually hear or work Rob ZL3RG and others with 30 Meter Quads or larger antennas.

http://zl3rg.com/quad.html

30M VK3AMA Icons for Digital Mode Software

http://www.vk3ama.com/memberlists.php (Special Thanks to Laurie VK3AMA)



30M Beacons

(Please note Beacons are discouraged on 30 Meters yet we seem to have a few operating on 30 Meters...remember we are Secondary Users and must yield to Primary Users)

http://www.dxzone.com/catalog/DX_Resources/Beacons/Beacon_stations/

30 meter beacons

| 10114 | N4QA | I8 mw | P |
|---------|---------------------------|-------------------------------|-----------------------|
| 10125 | KLIIF Springfield MO E | M37I€ IO I/4 GP | Omni Al PT |
| 10130 | OKIIF JO40 |)HG 0.5 | AI ? |
| 10132 | VE3TO Nr Ottawa f | FN25EG 5 I/4 Ver | t Omni Al 24 |
| | | MON-f | -RI |
| 10134 | OKOEF Nr Kladno | JO70BC .I/.2/.5 I/2 V€ | rt Omni Al 24 |
| 10135.9 | HPIRCP Cerro Jefe F | JO9HD 2.5 SlopeDip | Omni Al 24 |
| 10139.6 | PY3PSI Porto Alegre (| 3F49KX I.6 Hor. Dip | N-S AI IRREG |
| 10140.0 | sub-audible QRPP/QRS | 53 beacons around here | i e |
| 10140.1 | including IIYRB, IWOHK, I | IK4IDP, G3ZJO, IIDFS,I | Q4FJ |
| 10140.6 | DL5KZ Numbrecht | JO30SU O.I Dipole | AI ? |
| 10141.8 | IK3NWX Nr MonseliceP | D JN55VF 4.2 Rot. | Dip. €-W Al 24 |
| 10144.0 | DKOWCY Scheggerott | JO44VQ 30 Dipo | le Al,psk 24zz |
| | | rt | ty |
| 10149.7 | IZ8BZX Torre del Grec | :oJN70€5 .I/.5/I whip | Omni hi/QRSSEXP |

SWL - Yes we welcome ALL SWL'ers

http://www.xs4all.nl/~nl9222/

http://myweb.tiscali.co.uk/g4ucj/

http://www.n2ty.org/seasons/tara_dpx_swl.html

http://www.ac6v.com/swl.htm

http://www.dxzone.com/catalog/Ham Radio/Clubs/Technical Specialty/Digital Modes Clubs/

http://www.eu.srars.org/index.php?option=com content&task=view&id=75&Itemid=I53

30M Digital Mode Help

Digital Operation Suggestions from 30 Meter Digital Group Ops:

*** Please remember that on 30 Meters we are SECONDARY USERS so we must give way to primary users of the band ***

Suggestion by Darin VE30IJ

How about "allow enough time between cycles of your CQ macro that people can get a word in to let you know they're returning your call"? One of the greatest frustrations of digital operation is the operator who has his CQ macro set for 5 second recycles so he spends his time transmitting right over top of your desperate attempts to call him.

Suggestion by Loren KC7CWQ

Whether using RST or RSQ, give and ask for valid signal reports. If I am wide, let me know, don't give me the standard 599. Good operators want to know how their signal appears on the waterfall. Loren 30MDG #0023 KC7CWQ

Suggestion by Don KB9UMT

Do NOT use mic processor, do NOT have any ALC

DO use low power...20w to 30w will do as well as 50w and your rig finals will thank you for it and run cooler

Do NOT use 100% full 100w power

Do ask for TRUE/REAL signal reports and if your report is poor DO look into why you have a poor signal report

If the band is busy DO USE narrow digital modes (be kind to your neighbors) DO HAVE FUN on 30m and take the time to ragchew and get to know others as we are here today and SK tomorrow

Suggestion by Jesse WB5NPW

"it's happened to me more than once but if I'm answering someone's cq with "his-call de my-call" don't call me. give me chance to work the person I'm working first.."

Suggestion by Cliff KU4GW

I think cutting the rig's mic gain or the PC soundcard output back til no ALC shows on the rig's ALC meter is the single most important thing to know operating PSK3I." 73 de Cliff KU4GW 3OMDG#865

Suggestion by Daithi GI70MY

First of all - find an empty spot in the band, watch it for a while to make sure it is empty. If no station is calling CQ, but the band seems open, find a clear frequency and listen for a bit, if clear, then send QRL? QRL asks is the frequency busy? If someone responds with QRL, no need to respond and clutter up the frequency. If no response to your QRL, repeat a couple of times and then call CQ. Sending just QRL without your callsign is against the rules, but most do it anyway.

If you answer a CQ call, QSY off at the end - don't start calling CQ - the guy you just worked may have been there for some time and you're forcing him to hunt for an empty spot - he may have spent some time finding his spot at the start and he's not going to be happy if you push him off it.

If you see a call area that you want in QSO, do NOT call them as soon as they finish - wait for one of the two stations to send QRZ or CQ. The guy you want might not be the one operating on that spot and will have QSYed off (or should have)

Have a list of Abbreviations, Prefixes, and Q-Signals handy. Some DX stations cannot converse in English but you both can get the essentials across with Q-Signals.

Listen for a DX station calling CQ or wait until they have finished with a QSO.

Good operators will send KN as a turn over, which is "go ahead, over, others keep out." Sending just K opens it for others to break in and this is OK if that is desired. SK is the signoff that should be used or CL ("clear") or 'QRT' if closing your station.

Give a call DXIIDX DE WZ9UUU WA9UUU AR (AR means that I am through with this transmission). The DX station knows their call, so send it once. Sending your call twice allows the other station to hear it, then confirm it. If you make the connection, the usual follow up is his or her signal report, repeated twice if the contact is shaky and weak, then your name and QTH. Don't send more than that on the first round. Turn it back to the DX with a K or KN. This will allow the two of you to evaluate if a QSO is sustainable or desirable. On the next over, ask about QSL information if you want it, before the band slips out. A signoff looks like this: DXIIDX DE WF6TTT, FB VLAD TNX NICE QSO HPE CUL VY 73 GM SK DXIIDX DE WF6TTT Use SK or CL (Closing Station) on your final transmission not AR or K (N)

Tail-ending. Wait until another QSO is complete, and then call the station you want to contact. If the frequency is being used by the other station, you'll find out fast because he will start to call CQ over your signals - always check first, transmit after. Also, if there is a pileup, don't fire up a call right on the heels of someone else - the originating station does need to be able to transmit and if everyone is calling him without a break, he isn't going to get a chance to call you or anyone else

Do not break into a QSO - even if you can't hear one of the stations involved, it doesn't mean they aren't there. Wait for the SK at the end of the one you can hear, wait a minute for the other station to sign off and then call in. Just make sure that the one you are calling is the one who was originally using the frequency.

If you hear a station calling another, it doesn't matter whether you are dying to have that prefix in your log - YOU are NOT the one being called so do NOT dive in with your call.

Do not give into the temptation to increase the RF power for a weak station. Even if you get him, remember that there are a lot of other stations operating inside that 3 KHz band and what you WILL do is to swamp their signals and, if they are operating a weak station, you are wiping them out. If you can't work him on 50 Watts max - forget it and try later.

Another suggestion - do NOT run a high power tuning signal in the middle of the band - low power and take it up to the 3KHz marker

*** Some tips for Digital Mode users:

Power Level - for digital modes, limit your power output to one half ($\frac{1}{2}$) the radio's maximum rated output. Most sound card digital modes use a "IOO% duty cycle", which means that your radio will be transmitting at all times, even when characters are not being sent. Most radios were not designed for IOO% duty cycles, especially at full power. So reduce your transmitter power.

HF Radio Settings

Tuning - PSK3I benefits from a radio that can tune in very small steps, e.g. I Hz. If your radio can't do this, use the RIT (receiver incremental tuning) feature of the radio. The automatic frequency compensation feature in PSK3I software also helps.

Filters – use them on a busy band or unwanted signal...more on this to come (will update soon)

Speech Compression -- should be OFF.

ALC (Automatic Level Control) - watch the ALC meter to make sure it is below the maximum. In general, you don't want to 'overdrive' the radio with sound card audio levels that would create 'splatter' (unintended signals) on adjacent frequencies.

AGC (Automatic Gain Control) - does not affect receive audio when it is being pulled from a fixed-level audio pin in the radio's ACC or DATA jack.

VOX - If you prefer, or if you don't have a spare serial / COM port on your PC, you can use the VOX feature of your radio for PTT control. Activate VOX in your transceiver, and set the level, delay and anti-trip controls, as you would when using microphone (voice) input. Remember however that if you have your microphone connected to the radio, any incidental noise in the room can also be transmitted when using VOX.

Microphone - If you are using the ACC jack to control transmissions, you may need to disconnect your microphone from the radio to avoid sending room noise along with digital signals

"" I would not recommend using the speech compressor for digital modes....the mic gain on the rig along with the soundcard output adjustments work together to produce wattage out and correct levels-varies depending on soundcards/pc etc...So again NO SPEECH COMP, but YES you need some mic gain levels

http://www.qsl.net/wm2u/psk3l.html *** WM2U's TIP LIST

- Set sound card sampling rate to IIO25Hz
- This must be at least a 16 bit sound card.
- No Signal observed? Check your WAVE slider is not zero.
- Set Rx and Tx frequencies to IOOOHz.

NOTE: This value will get you up and running but if you plan on using a filter change it to the center frequency.

- If using LSB check the "Inverted QPSK" box.
- Too much noise! Try using a narrow CW filter.
- Using a Word Processor, write your buffered messages and save them as .txt files, placing em! in a folder called 'buffers' created in the main PSK3I folder.

NOTE: This is NOT a form of type ahead buffer. It is simply a method to pre write 'Standard' messages hence saving you keyboarding time.

***** MORE HELP TIPS**

- o Your sound card output must NOT overdrive your Mic Input.
- o Do not overdrive the sound card input from the Radio.
- o Get used to the Waterfall/Phase indicators for tuning.
- o Do not use your Speech Processor.
- o Be patient. This is a new mode. You will not find all the features you are used to yet!

30 Meter Band Specific Digital Mode Help

- The 30 Meter Band is open 24x7 somewhere-be patient
- The 30 Meter Band doesn't die at night like some might think (it is open somewhere it is just a matter if someone is on the air where it is open)
- Do have different digital mode software ready or use a multimode software so if other digital modes are seen/heard or needed you are ready
- If you don't have a specific 30 Meter antenna DO use what you have and give 30 Meters a try
- Once you decide to dedicate more time on the 30 Meter Band a better antenna cut for 30 Meters could prove helpful, or better yet having 2 antennas for different propagation paths (i.e. wire for domestic and vertical for DX)
- Do call CQ on the 30 Meter Band and not assume it is dead or no one is around....calling CQ is the first step to gain new contacts/friends on the band
- Do use the 30 Meter Digital SPOT Page and have fun or experiment with other digital modes with other digital operators with the same interests
- Do try more than just a few times for contacts and be patient, this is not the 20
 Meter Band with many years of known digital activity but then again 30 Meters we
 hope remains with good digital operators and not over crowded like other
 bands...again casual use please

Digital Mode HF Path Simulations

Complied by **Anthony Bombardiere**, **K2MO** dxdx@optonline.net

Path Simulator by Moe Wheatley, AE4JY

Digital mode Software

Fldigi MixW MMVari Multipsk Jason

Baseline Sensitivity Test Minimum SNR (no Ionospheric distortion)

In this test, the minimum SNR is reached when all the text being fed through the simulator is decoded without error.

A direct path (no ionospheric distortion) was used to establish a baseline SNR for each mode.

The "Quick Brown Fox" Pangram was used for each test.

| Jason Turbo (Fast) | |
|--------------------|---------------|
| PSKAMIO | 20db |
| PSKIO | -I8 db |
| Contestia 500/32 | -I5 db |
| Domino∈X-4 | I 5db |
| FEC-3I | I5db |
| THROBX-4 | I5db |
| MFSKI6 | I4db |
| THORII | I4db |
| RTTYM* | I3 db |
| Contestia 500/16 | I3db |
| CW 20 WPM** | ІЗdЬ |
| THORI6 | -I2 db |
| Olivia 500/I6 | I2db |
| MFSK3I* | I2db |
| Olivia 500/8 | -IO db |
| | |

| PSK3I | -IO db |
|--------------------|---------------|
| CHIP-64 | 8db |
| Domino∈X-II | -8 db |
| MT63 IK | 8db |
| Olivia 500/4 | 8db |
| PSK63 | 7db |
| Feld Hell | 7db |
| CHIP-I28 | 5db |
| RTTY 45 | 5db |
| PAX2 | 2 db |
| HFPacket (300baud) | + I db |
| | |

^{*} Intermittent "bug" with RTTYM MixW Software

Ionospheric Simulations

Simulation: High Latitude Magnitude: Moderate

Path Delay: 3ms

Frequency Spread: IOHz SNR: -8db (weak signal)

| Contestia 500/16 | IOO% |
|--------------------|-------------|
| CW 20 WPM | IOO% |
| MFSKI6 | IOO% |
| MFSK3I** | IOO% |
| Olivia 500/I6 | IOO% |
| Olivia 500/8 | IOO% |
| RTTYM 500/32 | IOO% |
| Olivia 500/4 | 90% |
| Feld Hell* | 90% |
| ThrobX-4 | 70 % |
| Chip-64 | No Copy |
| Chip-I28 | No Copy |
| Domino∈X 4bd | No Copy |
| Domino∈X IIbd | No Copy |
| FEC-31 | |
| PSK3I | No Сору |
| Jason Turbo (fast) | No Copy |
| PSKIO | No Copy |
| PSKAMIO | No Copy |
| PSK63 | No Сору |
| RTTY45 | No Copy |
| THOR-II | No Copy |
| THOR-16 | |
| MT63 | No Copy |
| | . – |

^{**} Subjective morse speed dictates SNR

| Chip64 | 90% |
|-------------------|-------------|
| Chip-I28** | |
| Feld Hell* | 90 % |
| Olivia 500/4 | 90 % |
| RTTY45 | 90 % |
| ThrobX-4 | |
| Domino∈X 4bd | |
| Domino∈X IIbd | |
| FEC-31 | No Copy |
| PSK3I | No Copy |
| Jason Turbo(fast) | |
| PSKIO | |
| PSKAMIO | No Copy |
| PSK63 | |
| THOR-II | |
| THOR-16 | No Copy |
| MT63 | No Copy |
| | |

^{*}diffuse text - readable

Simulation: High Latitude Magnitude: Disturbed Path Delay: 7ms

Frequency Spread: 30Hz

SNR: -3db (weak signal)

| Contestia 500/I6 | IOO% |
|---|--|
| CW 20 WPM | |
| Olivia 500/16 | IOO% |
| Olivia 500/8 | IOO% |
| Olivia 500/4 | |
| RTTYM" | 95% |
| MFSK3I | 90 % |
| MFSKI6 | 75 % |
| RTTY | 40 % |
| | |
| Chip-64 | IO % |
| Chip-64Chip-128** | |
| Chip-I28" | no copy no copy |
| Chip-I28** | no copy no copy |
| Chip-I28" | no copy no copy no copy |
| Chip-I28" DominoEX-4 FEC-3I | no copy no copy no copy |
| Chip-I28" DominoEX-4 FEC-3I Jason Turbo (Fa | no copy no copy no copy no copy |
| Chip-I28" DominoEX-4 FEC-3I Jason Turbo (Fa MT63IK PSKIO PSKAMIO | no copyno copyno copyno copyno copyno copy |
| Chip-I28" DominoEX-4 FEC-3I Jason Turbo (Fa MT63IK PSKIO | no copyno copyno copyno copyno copyno copy |

[&]quot;Intermittent decode problem with Chip-I28

| PSK63 | no copy |
|-----------|---------|
| Thor-II | no copy |
| ThrobX-4 | no copy |
| Feld Hell | |

| IOO % |
|--------------|
| 9 0 % |
| 75 % |
| 75 % |
| 50 % |
| No Copy |
| No Сору |
| No Copy |
| No Copy |
| |

^{*} diffuse print - readable

Simulation: Mid-Latitude Magnitude: Disturbed Path Delay: 2ms

Frequency Spread: IHz

SNR: -8db SNR (weak signal)

| Contestia 500/16 | IOO% |
|------------------|---------------|
| MFSKI6 | IOO% |
| Olivia 500/16 | IOO% |
| Thor-II | IOO% |
| Thor-I6 | IOO% |
| CW 20 WPM | 9 0 %* |
| Domino∈X 4bd | 90% |
| Feld Hell | 90% |
| MFSK3I | 90% |
| MT63 IK | 90% |
| Olivia 500/8 | 90% |
| Olivia 500/4 | |
| RTTYM 500/32 | |
| ThrobX-4 | |
| Domino∈X IIbd | |

[&]quot; Intermittent decode problem Chip-I28

| FEC-31 | 70 % |
|--------------------|-------------|
| PSK3I | 70 % |
| PSK63 | 50 % |
| PSKAMIO | 50 % |
| Jason Turbo (Fast) | 35% |
| RTTY45 | 20% |
| PSKIO | 20% |
| Chip-64 | 20% |
| Chip-I28** | 00 |
| | |

| Domino∈X IIbd | IOO% |
|--------------------|--------------|
| Feld Hell* | IOO% |
| F€C-3I | IOO% |
| MT63 | IOO% |
| Olivia 500/4 | IOO% |
| THOR-II | IOO% |
| THOR-I6 | IOO% |
| ThrobX-4 | IOO% |
| SK63 | 95% |
| Chip64 | 9 0 % |
| PSK3I | 90% |
| PSKAMIO | 90% |
| RTTY45 | 9 0 % |
| Domino€X 4bd | 9 0 % |
| Chip-I28** | 00 |
| Jason Turbo (fast) | No Сору |
| PSKIO | No Copy |

^{*} diffuse print - readable

Simulation: Low-Latitude

Magnitude: High Path Delay: 6ms

Frequency Spread: IOHz

SNR: -8db SNR (weak signal)

Contestia 500/I6......IO0%
MFSKI6......IO0%
MFSK3I......IO0%
Olivia 500/I6.....IO0%
RTTYM 500/32....IO0%
CW 20 WPM......90%
Olivia 500/8......90%
Olivia 500/4......90%

^{**} Intermittent decode problem Chip-I28

| Throbx-4 | 70 % |
|---------------------|-------------|
| Feld Hell | Poor Copy* |
| Chip-64 | No Copy |
| Chip-I28 | No Copy |
| Domino∈X 4bd | No Copy |
| Domino∈X IIbd | No Сору |
| FEC-31 | No Copy |
| Jason Turbo (Fast). | No Copy |
| MT63 lk | No Copy |
| PSKIO | |
| PSKAMIO | |
| PSK3I | No Copy |
| PSK63 | No Copy |
| RTTY45 | No Copy |
| Thor-IIbd | No Copy |
| Thor-I6bd | No Copy |

| Olivia 500/4 | IOO% |
|--------------------|---------------|
| Feld Hell | 9 0 %* |
| Chip64 | 9 0 % |
| Chip-I28 | PP** |
| RTTY45 | 70 % |
| ThrobX-4 | No Сору |
| Domino∈X 4bd | No Copy |
| Domino∈X IIbd | По Сору |
| FEC-3I | No Copy |
| PSK3I | No Copy |
| Jason Turbo (fast) | No Сору |
| PSKIO | No Copy |
| PSKAMIO | No Copy |
| PSK63 | No Copy |
| THOR-II | No Copy |
| THOR-I6 | No Copy |
| MT63 | |
| | |

^{*} Characters diffuse difficult to read.

N.V.I.S.

Near Virtical Incidence Skywave Simulation: Mid-Latitude NVIS

Magnitude: High Path Delay: 20ms' Frequency Spread: IHz

[&]quot; Intermittent decode problem Chip-I28

'NVIS waves penetrate deeper into the ionosphere than waves that are beamed at low angles. The increased interaction with the plasma tends to slow the wave down increasing the time-of-flight. NVIS sky wave echoes can take up to 20ms to return and can often mix with ground waves due to the close proximity of NVIS stations. Multi-path timing delays of this magnitude can cause internal timing issues for some digital modes.

The 20ms path delay used in this simulation is most likely the worse case scenario.

SNR: +IOdb

| IOO % |
|---------------|
| IOO % |
| IOO % |
| IOO % |
| IOO % |
| .IOO % |
| IOO % |
| .IOO % |
| .IOO % |
| 95% |
| 95% |
| 95% |
| 85 % |
| 80 % |
| 80 % |
| 75 % |
| 60 % |
| 60 % |
| IO% |
| IO% |
| li |
| l |
| nil |
| |
| IO % |
| nil |
| nil |
| nil |
| nil |
| |

^{*} Hellschreiber Text Ghosting - difficult to read print

ARQ Modes

Minimum SNR Test (Direct Path no Ionospheric distortion)

PAX (UNPROTO).....-Ildb ALE400 (UNPROTO)....--8db PAX2 (Unproto)....-7db HF Packet (300 baud Unproto)....+Idb

Simulation: High-Latitude PathSim Title: Moderate Magnitude: Moderate

Criteria: Complete Pangram Decode

(*)Indicates partial decode

Partial Decode Criteria: => 50% decode

ALE400 (Unproto).....-Idb / -6db*
PAX (Unproto)....--4db / -IOdb*
PAX2 (Unproto)....-+2db / Odb*
HF Packet (Unproto 300bd).....NO DECODE

*Partial Decode

Simulation: High-Latitude PathSim Title: Disturbed

Magnitude: High

Criteria: Complete Pangram Decode

(*)Indicates partial decode

Partial Decode Criteria: =>50% Copy

Simulation: Mid-Latitude
PathSim Title: Disturbed

Magnitude: Low

Criteria: Complete Pangram Decode

(*)Indicates partial decode

Partial Decode Criteria: => 50% Copy

ALE400 (Unproto).....-2db / -6db*
PAX (Unproto)....-4db / -10db*
PAX2 (Unproto).....+1db / -2db*
HF Packet (Unproto 300bd).....NO DECODE

Simulation: Low-Latitude PathSim Title: Disturbed Magnitude: High Criteria: Complete Pangram Decode (*)Indicates partial decode Partial Decode Criteria: =>50% Copy ALE400 (Unproto)......Odb / -5db* PAX (Unproto)......Odb / -6db* PAX2 (Unproto).....NO DECODE HF Packet (Unproto 300bd).....NO DECODE RSID and Video I.D.Tests (MutliPSK Software by F6CTE) Minimum SNR (no Ionospheric distortion) RSID..... -25db Video ID..... -2db High-Latitude Moderate RSID.....No Decode Video.....Partial Decode* * Difuse text difficult to read regardless of SNR High-Latitude Disturbed RSID.....No Decode Video.....No Decode* *Text completely difuse Mid-Latitude Disturbed RSID.....-25db Vid€o..... +3db Low-Latitude Disturbed RSID.....No Decode

Video......Partial Decode*

Difuse text difficult to read regardless of SNR (Big thank you to Tony K2MO for letting us publish his findings here!!)

30 Meter Digital Group Facts

- The 30 Meter Digital Group was officially formed November 21st 2007
- The group was formed to increase and support more digital activity on the 30 Meter Band
- Membership is well over I,IOO Members (as of 9/I/O8) World Wide in months and still growing with many interested in learning more about the 30 Meter Band and digital modes
- Membership is FREE to anyone and there are no hoops to jump to get in this Club just join in. Give 30 Meter Digital a try...and have fun on the band is all we ask
- Do you have to be a member of the 30MDG to gain access to our website, forum, awards or information? NO, please join in on the 30 Meter Band our group is secondary but our primary goal is to increase digital activity on the 30 Meter Band or produce more `core´ digital users of this great band.
- 30MDG promotes other digital groups as published in this informational document (we all have like interests using digital modes, ours is just a little different than others and geared for using digital modes on 30 Meter Band)
- 3OMDG promotes good operating habits and digital mode procedures
- 30MDG supports all types digital modes but also focuses on using the least power needed and least wide digital mode to make the contact (please be kind to others using the limited space on this band...remember we are SECONDARY USERS and MUST give way to primary users of this band)
- 30MDG does NOT promote contesting on the 30 Meter Band...this is a WARC Band and a safe haven for casual operation from Ragchew to experimenting to working casual DX
- This group welcomes those new to digital modes or new to the 30 Meter band to promote good will...please do ask questions and join with us
- How is the 30 Meter Digital Group supported both site costs and awards? By average Hams just like you that volunteer their time and those once a year that volunteer to donate a few bucks for site costs

THANK YOU FOR JOINING IN ON THE 30 METER BAND...HAVE FUN AND HOPE THIS INFORMATION WAS HELPFUL...73 DE 30MDG

HTTP://WWW.30METERDIGITAL.ORG

