

G3USF's Worldwide List of HF Beacons

Latest Update March 29 2010

Freq Call Town Loc ERPw Ant Direct Mode Status

IARU Region 1 discourages beacon operation on 1.8MHz

1810.5 YR2TOP 80k SSW Resita KN04RU 100/10/1 A1 24
 1836.2 SK50AU KP04LQ
 1837 IW3FZQ Monselice PD JN55VF 8 Dipole TEST
 1840 OK0EK Kromeriz JN89QG 4 Vertical Omni A1 T NonOp
 1843.157I1DFS Nr La Spezia JN54AC QRSS3
 1843.167I1YRB Torre Bert (TO)JN35UB 0.2 Vertical Omni QRSS3 24
 1853 OK0EV Near Prague JN79EV 0.1 25m Vert Omni A1 PT
 1995.6 XE3EOL EL51HH A1

IARU Region 1 discourages beacon operation on 3.5MHz

3530 DK2CF Olsberg JO41GG 0.5 Dip@20m F2 EXP/night
 3540.25 I1YRB Torre Bert (TO)JN35UB 0.2 Vertical Omni QRSS3 24
 3550 ER1AAZ Nr Kishinev KN47IB 4 Dip@25m A1 EXP/night
 3571.1 ON6RL 0.5 ?
 3577.0 IZ3DVW Monselice JN55VF 1.1 Inv V A1 24
 3579 DK0WCY Scheggerott JO44VQ 30 Dipole A1 PT/zz
 3579.8 SM2IUF Kalix KP15NU QRPP 15-07UT
 3594.5 OK0EU Pruhonice JN79GX 1 Mag Loop N-S A1 24qq
 3600.0 OK0EN Nr Kladno JO70AC 0.15 Corner Dip 90/270A1 24
 3694.0 VK6SH E Cannington WA 3 80m [Loop@12m](#) A1 24
 24
 5077 VX9MRC ?
 5195.0 DRA5 Scheggerott JO44VQ 30 dipole A1,psk 24zz
 rty
 5258.6 OK1IF 5 ?
 5290.0 GB3RAL Nr Didcot IO91IN 10<158uw Vertical A1 zzz
 5290.0 GB3WES Cumbria IO84QN 10<158uw Vertical A1 zzz
 5290.0 GB3ORK Orkney IO89JA 10<158uw Vertical A1 zzz

IARU Region 1 discourages beacon operation on 7MHz

7023} ZS6SRL Johannesburg KG33WV 0.4 IRREG
 7023} ZS6YI Johannesburg KG33XH 0.4 IRREG
 7023} ZS4BFN Bloemfontein KG30DV 0.4 IRREG
 7023} ZS1AFU KF07HN 0.4 IRREG
 7023} ZS2LAW Grahamstown KF36GQ 0.4 IRREG
 7023} ZS1HMO Somerset West JF95PN 0.4 IRREG
 7025 ZS1AGI George Airport KF16EA 0.2 1/2 Dipole E-W A1 QRT?
 7032 PU2N JL Guarulhos SP GG66RM ?

7035 VA3NDO qrp ?
7038.500OK0EU Pruhonice JN79GX 1 Mag Loop N-S A1 24
7039.6 IZ3DVW Monselice JN55VF 0.5 Inv V A1 24
7050 HK3QQ Bogota FJ24XR 10 Dipole A1
7080.50 I1YRB Torre Bert (TO)JN35UB 0.2 Vertical Omni QRSS3 24
7095 PY2SFY?

IARU Region 1 discourages beacon operation on 10MHz (DK0WCY excepted)

10123 HP1AVS Cerro Jefe FJ09HD 2.5 Slope Dip Omni A1 24
10129.5 W0ERE HighlandsvilleMO EM36HX 3 G5RV E-W A1 INT
10130 OK1IF Liberec JO40HG 0.5 A1 ?
10132.0 VE3TO Nr Ottawa FN25EG 5 1/4 Vert Omni A1 24
10133 SK6RUD Oxaback JO67KI 0.5 1/4 GP Omni A1 24
10134 OK0EF Nr Kladno JO70BC .1/.2/.5 1/2 Vert Omni A1 24
10137.2 IK3NWX Nr MonselicePD JN55VF 4.2 Rot. Dip. E-W A1 24
10138.7 many WSPR beacons here
10139V IZ0NHW JN61VL 0.2
10139.6 PY3PSI Porto Alegre GF49KX 1.6 Hor. Dip N-S A1 IRREG
10139.7 SV8GXC KM17UW 0.08
10140.0 Numerous sub-audible QRPP/QRSS3/WSPR beacons around here
10140.1 including I1YRB, IW0HK, IK4IDP, I1DFS,IQ4FJ,
10140.1 9H1LO Malta 25mw Horiz Dip fsk 24
10140.1 IK0IXI 45mw dipole ?
10140.07IQ2DP San Donate MI JN45PJ 0.4 Vertical Omni 24
10140.6 DL5KZ Numbrecht JO30SU 0.1 Dipole A1 ?
10141.05IKHGI Tricati JN45IK 0.1 Dipole QRSS3 24
10144 DK0WCY Scheggerott JO44VQ 30 Dipole A1,psk 24zz
rtty
10149.7 IZ8BZX Torre del GrecoJN70ES .1/.5/1 whip Omni QRSS EXP
10150 IZ5ILH Firenze JN53PS 2 ?

14050 XE1KPB EK09KM A1
14062 UA1AVA St Petersburg KO59EW 0.1 1/2 Dip A1 06-15UTC
14097 WSPR beacons around here
14099 IZ0HCC Rome JN61FT ?
14100.0 4U1UN UN NY FN30AS 100-0.1 Vertical Omni A1 IBP cycle
14100.0 VE8AT Eureka,Nunavut EQ79AX 100-0.1 Vertical Omni A1 IBP cycle
14100.0 W6WX Mt Umunhum CA CM97BD 100-0.1 Vertical Omni A1 IBP cycle
14100.0 KH6WO Laie, Oahu BL11AP 100-0.1 Vertical Omni A1 IBP cycle
14100.0 ZL6B Nr Masterton RE78TW 100-0.1 Vertical Omni A1 IBP cycle
14100.0 VK6RBP Rolystone OF87AV 100-0.1 Vertical Omni A1 IBP cycle
14100.0 JA2IGY Mt Asama PM84JK 100-0.1 Vertical Omni A1 IBP cycle
14100.0 RR9O Novosibirsk NO14KX 100-0.1 Vertical Omni A1 IBP cycle
14100.0 VR2B Hong Kong OL72CQ 100-0.1 Vertical Omni A1 IBP cycle
14100.0 4S7B Colombo NJ06CR 100-0.1 Vertical Omni A1 IBP nonop
14100.0 ZS6DN Pretoria KG44DC 100-0.1 Vertical Omni A1 IBP cycle
14100.0 5Z4B Kiambu KI88MX 100-0.1 Vertical Omni A1 IBP cycle
14100.0 4X6TU Tel Aviv KM72JB 100-0.1 Vertical Omni A1 IBP cycle
14100.0 OH2B Lohja KP20BM 100-0.1 Vertical Omni A1 IBP cycle

14100.0 CS3B Santo da Serra IM12OR 100-0.1 Vertical Omni A1 IBP cycle
14100.0 LU4AA Buenos Aires GF05TJ 100-0.1 Vertical Omni A1 IBP cycle
14100.0 OA4B Lima FH17MW 100-0.1 Vertical Omni A1 IBP cycle
14100.0 YV5B Caracas FK06NK 100-0.1 Vertical Omni A1 IBP cycle
14101.0 R1ANF S.Shetland ANT GC07 100-0.1 ?
14161 I1YRB Torre Bert JN35UB 0.2 Vertical Omni QRSS3 24

18095.5 HP1AVS Cerro Jefe FJ09HD 2.5 Inv Vee A1 24
18100 IK6BAK Montefelcino JN63KR 1 Inv Vee Omni A1 24
18100 9H1LO Hosta, Malta JM75FV 0.5 G5RV psk 24
18101 VE3RAT Thornhill ONT FN03GL 1 Vertical Omni A1 24
18102 I1M Bordighera JN33UT 10 5/8 Vert Omni A1 24
18104.6 Many WSPR beacons around here
18109.25IQ3VO Verona JN55LL 5 GP Omni A1 24
18110 DL0AGS Kassel JO41NL 10 GP Omni A1 24
18110.0 4U1UN U. Nations NY FN30AS 100-0.1 Vertical Omni A1 IBP cycle
18110.0 VE8AT Eureka,Nunavut EQ79AX 100-0.1 Vertical Omni A1 IBP cycle
18110.0 W6WX Mt Umunhum CA CM97BD 100-0.1 Vertical Omni A1 IBP cycle
18110.0 KH6WO Laie, Oahu BL11AP 100-0.1 Vertical Omni A1 IBP cycle
18110.0 ZL6B Nr Masterton RE78TW 100-0.1 Vertical Omni A1 IBP cycle
18110.0 VK6RBP 28k SE Perth OF87AV 100-0.1 Vertical Omni A1 IBP cycle
18110.0 JA2IGY Mt Asama PM84JK 100-0.1 Vertical Omni A1 IBP cycle
18110.0 RR9O Novosibirsk NO14KX 100-0.1 Vertical Omni A1 IBP cycle
18110.0 VR2B Hong Kong OL72CQ 100-0.1 Vertical Omni A1 IBP cycle
18110.0 4S7B Colombo NJ06CC 100-0.1 Vertical Omni A1 IBP cycle
18110.0 ZS6DN Pretoria KG44DC 100-0.1 Vertical Omni A1 IBP cycle
18110.0 5Z4B Kiambu KI88MX 100-0.1 Vertical Omni A1 IBP cycle
18110.0 4X6TU Tel Aviv KM72JB 100-0.1 Vertical Omni A1 IBP cycle
18110.0 OH2B Lohja KP20 100-0.1 Vertical Omni A1 IBP Cycle
18110.0 CS3B Santo da Serra IM12OR 100-0.1 Vertical Omni A1 IBP Cycle
18110.0 LU4AA Buenos Aires GF05TJ 100-0.1 Vertical Omni A1 IBP cycle
18110.0 OA4B Lima FH17MW 100-0.1 Vertical Omni A1 IBP Cycle
18110.0 YV5B Caracas FK60NK 100-0.1 Vertical Omni A1 IBP cycle
18112.4 IQ0LT ?
18140.1 9H1LO Malta 2 Horiz Dip psk31 24

21050 XE1KPB EK09KM A1
21052.3 DL5KZ Numbrecht JO30SU 0.25 3-el Yagi 180 A1 EXP 24
21094.6 WSPR beacons around here
21133.5 LU1DWE La Plata 4 1/2 Dip A1 24
21145.7 IZ3DVW Nr Monselice PDJN55VF 2.6 Inv. V Dip A1 24
21149.5 IW9HMQ Test
21150.0 4U1UN UN New York FN30AS 100-0.1 Vertical Omni A1 IBP cycle
21150.0 VE8AT Eureka,Nunavut EQ79AX 100-0.1 Vertical Omni A1 IBP cycle
21150.0 W6WX Mt Umunhum CM97BD 100-0.1 Vertical Omni A1 IBP cycle
21150.0 KH6WO Laie, Oahu HI BL11AP 100-0.1 Vertical Omni A1 IBP cycle
21150.0 ZL6B Masterton RE78TW 100-0.1 Vertical Omni A1 IBP cycle
21150.0 VK6RBP 28k SE Perth OF87AV 100-0.1 Vertical Omni A1 IBP cycle
21150.0 JA2IGY Mt Asama PM84JK 100-0.1 Vertical Omni A1 IBP cycle
21150.0 RR9O Novosibirsk NO14KX 100-0.1 Vertical Omni A1 IBP cycle

21150.0 VR2B Hong Kong OL72CQ 100-0.1 Vertical Omni A1 IBP cycle
21150.0 4S7B Colombo NJ06CC 100-0.1 Vertical Omni A1 IBP cycle
21150.0 ZS6DN Pretoria KG44DC 100-0.1 Vertical Omni A1 IBP cycle
21150.0 5Z4B Kiambu KI88MX 100-0.1 Vertical Omni A1 IBP cycle
21150.0 4X6TU Tel Aviv KM72JB 100-0.1 Vertical Omni A1 IBP cycle
21150.0 OH2B Lohja KP20 100-0.1 Vertical Omni A1 IBP cycle
21150.0 CS3B Santo da Serra IM12OR 100-0.1 Vertical Omni A1 IBP cycle
21150.0 LU4AA Buenos Aires GF05TJ 100-0.1 Vertical Omni A1 IBP cycle
21150.0 OA4B Lima FH17MW 100-0.1 Vertical Omni A1 IBP cycle
21150.0 YV5B Caracas FK60NK 100-0.1 Vertical Omni A1 IBP cycle
21151.0 IIM Bordighera JN33UT 10 2 5/8 Vert Omni A1 24
21155.5 IQ0LT Latina LT JN61KL ?
21171 KA5FYI Austin TX EM10 1.25 1/4 Vert Omni A1 INT
21241.50I1YRB Torre Bert (TO) JN35UB 0.2 Vertical Omni QRSS3 24
21393.8 PY3PSI Porto Alegre GF49KX 4 Dipole N-S A1 INT

24912 SK6RUD Oxaback JO67KT 0.5 GP Omni A1 24
24915.0 IQ6FU Fano PU JN63MU 5 Inv Vee Omni A1 24
24920.0 IY4M Bologna JN54QK A1 H+30>H+60m
24930.0 4U1UN UN NY FN30AS 100-0.1 Vertical Omni A1 IBP cycle
24930.0 VE8AT Eureka,Nunavut EQ79AX 100-0.1 Vertical Omni A1 IBP cycle
24930.0 W6WX Mt Umunhum CA CM97BD 100-0.1 Vertical Omni A1 IBP cycle
24930.0 KH6WO Laie, Oahu HI BL11AP 100-0.1 Vertical Omni A1 IBP cycle
24930.0 ZL6B Nr Masterton RE78TW 100-0.1 Vertical Omni A1 IBP cycle
24930.0 VK6RBP 28k SE Perth OF87AV 100-0.1 Vertical Omni A1 IBP cycle
24930.0 JA2IGY Mt Asama PM84JK 100-0.1 Vertical Omni A1 IBP cycle
24930.0 RR9O Novosibirsk NO14KX 100-0.1 Vertical Omni A1 IBP cycle
24930.0 VR2B Hong Kong OL72CQ 100-0.1 Vertical Omni A1 IBP cycle
24930.0 4S7B Colombo NJ06CC 100-0.1 Vertical Omni A1 IBP cycle
24930.0 ZS6DN Pretoria KG44DC 100-0.1 Vertical Omni A1 IBP cycle
24930.0 5Z4B Kiambu KI88MX 100-0.1 Vertical Omni A1 IBP cycle
24930.0 4X6TU Tel Aviv KM72JB 100-0.1 Vertical Omni A1 IBP cycle
24930.0 OH2B Lohja KP20 100-0.1 Vertical Omni A1 IBP cycle
24930.0 CS3B Santo da Serra IM12OR 100-0.1 Vertical Omni A1 IBP cycle
24930.0 LU4AA Buenos Aires GF05TJ 100-0.1 Vertical Omni A1 IBP cycle
24930.0 OA4B Lima FH17MW 100-0.1 Vertical Omni A1 IBP cycle
24930.0 YV5B Caracas FK06NK 100-0.1 Vertical Omni A1 IBP cycle
24931 DK0HHH Hamburg JO53AM 10 Dipole Omni A1 24
24986 JE7YNQ Fukushima QM07 5 Dipole A1 24
24990.0 I1YRB Torre Bert(TO) JN35UB 0.2 Vertical Omni QRSS3 24

28050 XE1KPB EK09KN A1 ?
28110 F5KCK A1 ROBOT
28167.2 LU3DBJ Quilmes BA GF05UG 3 Vertical Omni A1 24
28170 VA3XCD Oshawa ON FN03 1.5 1/2 Vert Omni A1 24?
28175 VE3TEN Ottawa ON FN25 10 GP Omni A1 24
28176 PY2RFF Sco Pedro SP GG67AL 1.5 1/4 Vert Omni A1 24
28176.9 HP1RCP Cerro Jefe FJ09HD 5 Slope Dip A1 24
28179 XE2AT Aguascalientes DL51UU A1 ?

28180.3 IIM Bordighera JN33UT 5/20 2x5/8 Vert Omni A1 30/60min
28182.4 SV3AQR Amalias KM07QS 4 GP Omni A1 24
28183 XE1KK Mexico City EK09JI A1 24 ?
28185 PU5ATX V.N.Imbituba GG51 A1 ?
28185 VA3SRC Burlington ON 5 Dipole A1 PT
28187 VK5KV Woomera SA PF88JT 24?
28187.6 VE7KC Penticton BC A1 OP?
28188 JE7YNQ Fukushima QM07 50 Stack Dip Omni A1 OP?
28188 OE3XAC Buschberg JN78SB 10 7/8GP@792m Omni A1 24
28188.9 SV5TEN KM46CK 24
28190 LU3HFA Cordoba CD FF78 24?
28190.5 VA3ROR Orillia ON FN04EQ 5 Whip Omni A1 24
28192 LU8EML Ensenada BA GF18AD A1 ?
28192.9 VE4ARM Austin MB EM09HW 5 GP Omni A1 24
28195.1 IY4M Bologna JN54QK 20 5/8 GP Omni A1 H>H+30m
28215.3 VA3ITA Bramton ON A1 ?
28196.1 LU4JJ Concordia ER GF08XO A1 24?
28196.7 LU5FB Rosario SF FF97PB A1 24
28196.8 I0KNQ Genzano di Roma JN61FU 2 Turnstile Omni A1 24
2 ?
28197.0 VE7MTY Vancouver BC CN89 5 Vertical Omni A1 24
28198.5 LU3ESO La Plata BA GF15AB 10 Dipole A1 24
28199.3 LU1FHH El Trebol SF A1 24
28199.9 LU9FE Rafaela SF FF98GS A1 ?
28200.0 4U1UN UN New York FN30AS 100-0.1 Vertical Omni A1 IBP cycle
28200.0 VE8AT Eureka,Nunavut EQ79AX 100-0.1 Vertical Omni A1 IBP cycle
28200.0 W6WX Mt Umunhum CA CM97BD 100-0.1 Vertical Omni A1 IBP cycle
28200.0 KH6WO Laie, Oahu HI BL11AP 100-0.1 Vertical Omni A1 IBP cycle
28200.0 ZL6B Nr Masterton RE78TW 100-0.1 Vertical Omni A1 IBP cycle
28200.0 VK6RBP 28k SE Perth OF87AV 100-0.1 Vertical Omni A1 IBP cycle
28200.0 JA2IGY Mt Asama PM84JK 100-0.1 Vertical Omni A1 IBP cycle
28200.0 RR9O Novosibirsk NO14KX 100-0.1 Vertical Omni A1 IBP cycle
28200.0 VR2B Hong Kong OL72CQ 100-0.1 Vertical Omni A1 IBP nonop
28200.0 4S7B Colombo NJ06CC 100-0.1 Vertical Omni A1 IBP cycle
28200.0 ZS6DN Pretoria KG44DC 100-0.1 Vertical Omni A1 IBP cycle
28200.0 5Z4B Kiambu KI88MX 100-0.1 Vertical Omni A1 IBP cycle
28200.0 4X6TU Tel Aviv KM72JB 100-0.1 Vertical Omni A1 IBP cycle
28200.0 OH2B Lohja KP20 100-0.1 Vertical Omni A1 IBP cycle
28200.0 CS3B Santo da Serra IM12OR 100-0.1 Vertical Omni A1 IBP cycle
28200.0 LU4AA Buenos Aires GF05TJ 100-0.1 Vertical Omni A1 IBP cycle
28200.0 OA4B Lima FH17MW 100-0.1 Vertical Omni A1 IBP cycle
28200.0 YV5B Caracas FK60NK 100-0.1 Vertical Omni A1 IBP cycle
28201 N0AMY ColoradoSprings DM78OU A1 24
28202 N6DXX Sacramento CA CM98FM 5 Ringo@18' Omni A1 24
28202 RX0AT Krasnoyarsk NO65KX ?
28202.5 ZS1J PlettenburgBay KF15PF A1 24
28202.5 N2RIT Newark NJ FN20VR A1 24?
28203 PY2WFG Ipisanga SP GG66PO A1 ?
28203.5 K6SOA Mission Viejo CADM13EO A1
28204 WA2NTK Big Flats NY FN12NE A1 24

28204 W6CF San Francisco CM87UU A1 24
38204 K3WJR Wattsburg PA FN02CA 0.85 A99 Vert Omni A1 ?
28205.0 DL0IGI Hohenpeissenb'gJN57MT Varies 1/4 Vert Omni A1 24
28205 W9EFJ Milwaukee WI EN63AC A1 24
28205.2 N3NIA Nr Ridgway PA FN01PK 4 Dipole A1 24
28206.1 VA3GRR Brampton ON FN03 1.75 1/2 Vert Omni A1 24
28206.5 HP1RIS Panama City 3 Vert Dip Omni A1 24
28208 KE6TE Elk Grove CA CM98HK A1 24
28208 AK2F Randolph NJ FN20QT A1 share
28208 WN2A Budd Lake NJ A1 WN2A
28208.1 JR0YAN Nr Toyama PM86JW 25 Hor.Loop A1 24+++
28208.2 IZ3LCJ S.Lucia di PiaveJN65DU 5 1/4GP@15m Omni A1 24
28208.6 EI0TEN Cobh, Co. Cork IO51UU 50 Dipole NW/SE A1 TNonOp
28209 KH6AP Kikei Maui HI BL10SS 20 3/8 Vert Omni A1 TNonOp
28209.5 K9CW Thomasboro IL EN50WF 2 AR99@15' Omni A1 24
28210 3B8MS Quatre Bornes LG89TO 7 1/2 Vert Omni A1 24
28210 K4DPC Wilmington NC FM14 3 A99 U'ground ? A1 24
28210 KB9WGA Oak Lawn IL EN61CR A1 ?
28210.5 VE4TEN Winnipeg MB EN19 2 1/2 Vert Omni A1 24
28211 DB0FKS Nr Frankfurt/M 0.2 DV27 Vert Omni A1 24
28211 K5ARC Galvez LA EM40 20 Vertical Omni A1 24
28211.1 LA4TEN Sotra I. JP20LG 250 Vertical Omni A1 24
28212.5 K0KP Fredenberg MN EN36VW 0.5 GP Omni A1 24
28212.6 LU7DQP Lanos Oeste BA F05TH A1 24
28213 KA7TBU PE Ell WA CN86NU A1 ?
28213 PT7BCN Fortaleza CE A1 OP?
28213.2 DM0ING Ingelheim JN49AX 10 GP Omni A1 24
28213.5 KE4KAA Big Stone GapVAEM86OV 5 A1 24
28214 N4PAL Longwood FL EL98HQ 5 Vert@4.5m Omni A1 24
28215 LU5EGY Buenos Aires A1 24
28215 KA9SZX Paxton IL EN50VD 1 Antron99 Omni A1 24
28215 W4JPL Liberty NC FM05FV A1 24
28215 GB3RAL Nr Didcot IO91IN 25 HorizDip Omni F1 24
28215.3 XE3D Merida YUC EL50EG A1 24
28215.5 KD5CKP Olive BranchMS EM54 A1 24
28216 K3FX Neptune City NJFN20XE 7 1/2 Vert Omni A1 24
28217 WB0FTL Alden MN EN33FP 5 AR10@25' Omni A1 24
28217.5 WA1LAD West Warwick RIFN41FQ 4.5 J-Pole Omni A1 24
28218 IQ1SP Monte VerrugoliJN44VC 3 1/2 Vert Omni A1 24
28218.5 W5RDW Murphy TX EM12QX 5 AR10@25' Omni A1 24
28219 KA4RRU Catlett VA FM18EN A1 24
28219.9 KB9DJA Mooresville IN EM69RO 35 GP Omni A1 24
28220 5B4CY Zygi KM64PR 26 GP Omni F1 24
28220 W8VO Sterling Hts MIEN82NU 5 Vert@50' Omni A1 24
28220.3 ER1AAZ Chisinau 4 GP A1 ?
28220.4 WK4DS Trenton GA EM74FU 2 Dipole NE-SW A1 24
28221.5 KC0TKS Sedalia MO EM38IQ 5 J-poleVert Omni A1 24
28222 TP2CE JN38UO ?
28222.5 K2SIT Buffalo NY FN02OU 5 GP Omni A1 24
28223 WY5B Biloxi MS EM50NK A1 24

28223 9H1LO Malta JM75 8 GP A1 24
28223 KP3FT Ponce PR A1 24
28223.2 KC6UFE Chico CA CM99BS 20 VertDip@30' Omni A1 TNonOp
28224 F5SN Dole JN27RB 5 3-el Yagi 240 Multi 24
28224 LU7JCN La Plata GF15AB A1 ?
28224.2 YB9BWN Denpasar, Bali OJ13FK 2 Dipole EU/VK A1 24
28224.7 HA5BHA Nr Budapest JN97KO 5 Omni 24
28224.8 KW7Y Marysville WA CN88SD 4 Vertical Omni A1 24
28225 CS5BTEN Cacem, Sintra IM58IS 10 Vertical Omni A1 24
28225 K6FRC Tracy CA CM97GP Vertical Omni A1 24££
28225 K5GJR CorpusChristiTXEL17HR A1 24
28225 XE3D Merida EL50 A1 24?
28225.5 W2DLL Buffalo NY FN02OU 5 Vertical Omni A1 24
28226.6 KC6WGN Las Vegas NV DM26LD 10 Omni A1 24
28226.9 IT9EJW Catania JM77NN 3 24
28227.7 IW3FZQ Monselice PD JN55VF 5 J-Pole@20m Omni A1 24
28227.8 N2NXZ Canadea NY FN02WJ 3 Vertical N-S A1 24
28228 ZL3TEN Rolliston RE66 20 1/2 Vert Omni A1 24
28229 ZL2MHF Nr Wellington RE78NU 10 1/2 Vert Omni F1 24
28229 WA3ZKO Baltimore MD FM19RI A1 OP?
28229 NR5A Box Elder SD DN84LC 1 Vertical Omni A1 24
28229.5 NV7
28230 WA4ZKO Dry Ridge KY EM78PP 4 A99 Omni A1 24
28230 OH5RAC Kouvola KP30HV 6 H Dipole 20/200 F1 24
28230 IQ8CZ Catanzo JM88HV 10 GP Omni A1 24
28230? KI4AED Ocoee FL EL98FN 5 Antron 99 Omni A1 24
28230 KQ4TG Leland NC FM40XF A1 24
28230.5 HP6RCP Santiago EJ98MB 3 AR99 Omni A1 24
28231 K7YSP A1 OP?
28232 N1FSX Simla CO DM89AC 5 Vertical Omni A1 24
28232 KI7AB Rio Mancho NM DM65QG A1 ?
28232.6 N9BPE Tuscaloosa IL EM59UT 2 1/2Dip@20' Omni A1 24
28232.7 N2MH West Orange NJ FN20UT A1 24
28233 N2UHC St Paul KS EM27 4 Vert Dip Omni A1 24
28233.5 N9RET N Riverside IL EN61BU 7 IndoorDip A1 24
28234 K4DP Covington VA FM07AR A1 24
28234 KA0SWT Pueblo CO DM78QG 10 A1 24
28234.9 EA2ZRA Zaragoza IN91NP A1 ?
28235 KI4AED Ocoee FL EL98FN 5 Antron 99 Omni A1 24
28235.2 VE1CBZ KeswickRidge NBFN65 2 A99 Vert Omni A1 24
28235.5 W4GZV Southlake TX EM12KW 5 A1 24
28235.6 VE3GOP Mississauga ON FN03GD 0.2 A99 Vert Omni A1 24
28236 W8YT Martinsburg WV FM19AJ 5 Vertical Omni A1 24
28236.5 W0KIZ Nr Denver CO DM79 5 Vertical Omni A1 24
28237 N7JS Ogden UT DN41AE 2 Horiz Whip Omni A1 24
28237.6 LA5TEN Nr Oslo JO59JP 15 1/2 Vert Omni A1 24
28237.8 N4ES Clearwater FL EL83PA 20/2/.2/02 Vert Omni A1 24
28238 KB2SEO Eton GA EM74OT 5 1/4 GP Omni A1 24
28239 VA7PL Kelowna BC DM09 A1 24
28239 IZ2DAY Cernusco MI JN45PM 10 GP Omni A1 24

28239.2 AL7FS Anchorage AK BP51AD 3 1/2 Vert Omni A1 PT
28239.7 AB5WG Bulverde TX EM12 4 Omni A1 24
28239 IK0ZRR Rome JN61FU 5 Vertical Omni A1 EXP
?
28240 XE3OAX Ocotlan, OAX EK17PA 0.5? + sev.spurii A1 24?
28240.5 N2DWS PortRepublicNJ FM29SM A1 24
28242 IZ8DXB Naples JN70LN ?
28240.6 YO2X Timisoara KN05PS 2 GP Omni A1 09-15UT
28240.7 AJ8T Sturgis MI EN71HS A1 24
28241 KH6XS Pahrump NV DM26 20 A1 ?
28241.5 F5ZUU Malataverne JN24IL 5 1/2 Vert Omni A1 24
28241.5 K5DZE Dry Ridge KY EM78QS 5 A1 14
28242.5 WD9CVP Elgin IL EN52UA A1 24
28243 KB1QZY Springfield MA FN32QC 3 Imax2000 V Omni A1 24
28243 KC4TM N.Fort MyersFL EL96BQ 10 GP Omni A1 24
28243 F5ZWE Foix JN02TW 15 Vert Dip Omni A1 24
28243.3 F5TMJ Nr Toulouse JN03SM 5 Horiz Loop Omni A1 TNonOp
28244.0 WA6APQ Long Beach CA DM13 30 Vertical Omni A1 24
28244.8 IT9DTV Messina JM78SD 8 GP Omni A1 24
28245 N8RT BlairsvilleGA EM84 5 GP Omni A1 24
28246 VE9BEA Crabbe Mntn NB FN66 6 AR10@43' Omni A1 24
28246.0 KG2GL Nutley NJ FN20UT 5 R5Vert @40'Omni A1 INT
28247 K4DYR Newbern TN EM56JB A1
28247.9 N1ME Bangor ME FN54PS 5 A1 24
28248 K1KUZ Winsted CT A1 ?
28248.5 K5DDJ San Antonio TX EL09 0.5 GP Omni A1 24
28249 N7LT Bozeman MT DN45LQ 4/.4/.04 1/2 GP Omni A1 24
28249.5 PY3PSI Porto Alegre GF49KX 2.8 GP Omni A1 IRREG
28249.8 K8NDB Somerton AZ DM22QQ 4 1/4 Vert Omni A1 24
28249.9 W3ATV Trevoise PA FN20 1 Dipole A1 24
28250) N4ES Tampa FL EL88TA 20/2/.2/.02 Horiz A1 SYNCH)n
28250 N4ESS Zephyrhills FL EL88VG A1 SYNCH)n
28250) WB4WOR Greensboro NC FM06BT 20/2/.2/.02 Hor A1 SYNCH)n
28250) K7EK Graham WA CN87TB 25 1/2 Vert Omni A1 SYNCH)n
28250) N4ES Clearwater FL EL88PA 20/2/.2/.02 Horiz A1 SYNCH)n
28250 K6FRC Tracy CA CM97GP 100 Vertical Omni A1 24££
28250 K0HTF Des Moines IA EN31DO 3 Inv.V@10' A1 24
28250 EA3TEN Lleida JN01VO 10 5/8 Vert. Omni A1 24
28250.1 Z21ANB Bulawayo KG47 8 GP Omni F1 24
28250.8 W3IK Gray TN EM86 0.5 Vert@10' Omni A1 TNonOp
28251 N5ZTW DrippingSprings TX A1 ?
28252.3 K8ATI IL 2 Ringo@12' Omni A1 24
28252.5 W6PC/4 Ocala FL EL89VD 10 Dipole Omni A1 24
28253 KG4YUV Crandall GA EM74OW 7 A99 Vert Omni A1 24
28253 K8HWW Warren MI
28254.3 N1FCW ME A1 ?
28254.5 K5AHH Broken Bow OK EM24PA 5 AR10@20' Omni A1 24
28255 NN6AA Redding CA CN80SN A1 ?
28255 RN3ARA ?
28255 N0AR St Paul MN EM73SW 0.125 1/2 Vert Omni A1 24

28255.5 K8HWW Warren MI EN82MN A1
 28256 C30P Andorra JN02SM 10 R5 Vert@2m Omni A1 24
 28256.5 VK3RMH 25kNEMelbourne QF22OH 20/2 1/2 Vert Omni A1 24
 28256.5 K9JHQ O'Fallon IL EM58AM 10 Vertical Omni A1 24
 28257V KB4UPI Bessemer AL EM63MG A1 24
 28257.5 DK0TEN Konstanz JN47NT 20 GP Omni F1 24
 28257.8 WY5I Port St KucieFLEL96 5 7db Coll. Omni A1 07-2200LT
 28257.9 NV4B RussellvilleAL EM64DM Vert@60' Omni A1 24
 28258 WB5QYT Albuquerque NM DM65RD 5 Vert Dip Omni A1 24
 28259 AB8CL Arcanum OH A1
 28259 KC6WLS FRanklin TN A1 24
 28259 F5ZVM Valenciennes59 JO10PA 5 3dbi Vert Omni A1 24
 28259.3 VK5W1 Adelaide PF95HG 10 GP Omni A1 24
 28260 AD5KO Mena AR EM24VS 20 Vert@20' Omni A1 24
 28261.0 N7LF Corbett OR CN85VI A1 24
 28261.5 N4VBV Sumter SC EM93TW 5 Attic Dip A1 24
 28261.8 VK2RSY Sydney QF56MH 25 1/2 Vert Omni A1 24
 28262.3 K8TK Clarklake MI EN72TC 2 GP@15' Omni A1 24
 28262.5 KI4UCK Altamonte EL95HP 6 InvVee@25' A1 24
 Springs FL
 28263 EA4Q Cuneca IN80WC 80 GP Omni A1 24
 28263.5 W4JPL Liberty NC FM05EW 4 A1 24
 28264.0 AB8Z Parma OH EN91DJ 5 5/8 Vert Omni A1 24
 28264 VK6RWA Carine WA OF78WB 20 5/8 Vert Omni A1 24
 28264.5 K7NWS Kent WA CN87TK 1 GP Omni A1 24
 28264.5 W5ZA Shreveport LA EM32DJ 3 Vert Dip Omni A1 24
 28265 DF0ANN Moritzberg Hill JN59PL 5 Dipole E-W A1 24
 28265.4 KR4HO Lake City FL EM80QG A1 ?
 28265 NC4SW Zebulon NC FM05 A1 24
 28266.5 KA1EKS Millinocket ME FN55OO 4 A99 GP Omni A1 24
 28266.6 WN5KNY RadiumSpringsNMDM62LP A1 24
 28267 VK7RSC Hobart TAS QE37MA 10 Vartical Omni A1 24
 28267.5 W5EFR Houston Tx EL29EW 2.75 A1 24
 28267.6 OH9TEN Pirttikoski KP36OI 20 1/2 GP Omni A1 24
 28268 KB0QZ Centralia MO EM39WE 5 Vertical Omni A1 24
 28268.3 VK8VF Darwin NT PH57KP 25 1/4 Vert Omni A1 24
 28268.5 KG4GXS CoralSpringsFL EL96UG 3 Dip@23' E-W A1 24
 28268.6 K7ZS Hillsboro OR CN85MM A1 24
 28268.9 AA1TT Claremont NH FN33 5 A1 24
 28269.5 W3HH Nr Ocala FL EL89VB 6 Hamstick Omni A1 24
 28270 VK4RTL Townsville QH30JS 5 Vertical Omni F1 24
 28270.9 N1KON Centerville IN EM79LT 5 Vertical Omni A1 24
 28273.0 PY4MAB Pocos de CaldasGG68RE 2 Dipole A1 24
 28271.7 W4TIY Dallas GA EM73OW 4 1/4over5/8 Omni A1 24
 28272.5 K5BTV Cumming GA EM74 0.25 HF6V Vert Omni A1 24
 28273} AC4DJ Apopka FL EL98GP 50 A99 Vert Omni A1 24
 28273) KK4HAM Apopka FL EL98 50 Ringo@50' Omni A1 24
 28273} KK4HAM/AC4DJ share:Callsigns alternate daily
 28274 WA5DGI Casper WY DN62TT 5 5/8 Vert Omni A1 24?
 28274.7 N0UD Halliday ND DN87SH A1 24

28275 K6FRC Mt Diablo CA A1 24ff
28275 KG4GVV Summerville SC EM93 Vertical Omni A1 24
28275.7 XE1AKM Alvarez(Colima) A1 24
28276} K4UKB Danville KY EM77NP 10 5/8 Vert Omni A1 SYNCHx
28276} K4FUM Stone Mntn GA A1 SYNCHx
28276.5 XE2YBG Victoria TamaulipasEL03 A1 ?
28277 WB7RBN Pasco WA A1 24
28277 WD8AQS Fremont MI EN73AL A1 24
28277.3 KD4MZM Sarasota FL EL87RG 3 Ringo@15' Omni A1 24
28277.6 DM0AAB Kiel JO54GH 10 GP Omni F1 24
28278.5 WA6MHZ Crest CA Ringo@20' Omni A1 24
28279 DB0UM Schwedt JO73CE 2 SlopeDipV Omni A1 24
28280 KA3NXN CharlottesvilleFM08SA A1 24
28280.0 K5AB Goldthwaite TX EM10DH 20 5/8 GP@45' Omni A1 24
28280 PU5AAD Nova Brasilia GG51PS 10 A1 OP?
28280 N6SPP Concord CA CM97 10 Vert Dip Omni A1 24
28280 VK3DOG TEST
28280.5 WB6FYR Quartz Hill CA DM04VP 10 5/8 Vert Omni A1 24
28281 W8EH Middletown OH EM79TL 7.5 Vert@40' Omni A1 24
28281.5 W4HEW MilledgevilleGA EM94LX A1 24
28282 LA6TEN Kirkenes KP49XQ 10/1/.1 Omni A1 OP?
28282 XE2ES Mexicali DM22RP A1 24
28282.5 KD0GZJ Loveland CO DN70KJ A1 24
28282.6 OK0EG Hradec Kralove JO70WE 10 GP Omni F1 24
28282.8 W0ERE Fordlan MO EM36 5 Vertical Omni A1 24
28283 K7YSP Gainsville GA EM84AH A1 24
28283.6 KC9GNK Madison WI EN53 4 Inv Vee A1 24
28284 K2XG Monticello KY EM76NU V.Dip@25' Omni A1 24
28284 IZ0CWW JN61VL 3 A1 24
28284.5 KB9NK Hudsonville MI EN72BU A1 TNonOp
28284.8 WD8AQS Fremont MI EN73AL 5 A1 24
28285.0 VP8ADE Adelaide I. FC52WK 10 1/4 Vert Omni A1 24
28285.8 WA4ROX Largo FL EL87 0.75 A1 24
28286 WI6J Bakersfield CA DM05JJ 5 Vertical Omni A1 24
28286 N5AQM Chandler AZ DM43AH 2 Vertical Omni A1 24
28286 W0ILO ND A1
28287 W6WTG Bakersfield CA DM05MJ A1 24
28288.0 WA7LNW Hurricane UT DM37ID 5 FWave LoopEU/PAC A1 24
28288 K4LJP W Palm BeachFL EL96 5 AR99@30' Omni A1 24
A1 ?
28289 KB9WA Egg Harbor WI A1
28289.0 WJ5O Nr Columbus AL EM72NE 2 Yagi NE A1 24
28289.5 N1KXR Medway MA FN32 5 A1 24
28289.8 VR2TEN Hong Kong OL72 5 1/4 GP Omni A1 24
28290 N6UN San Diego CA DM12 5 A1 24
28290.4 SK5AE Strangnas JO89KK 50 GP Omni A1 24
28290.3 WB4WOR Randleman NC FM06BT 3 Vertical Omni A1 24
28291.7 KO6BB Merced CA CM97SH 12 A99 Omni A1 TEST
28292.0 VA3VA Windsor ON EN82 5 Horiz Dip A1 24

28292.5 KM4GS KentuckyLakeKY EM56 0.5 Vertical Omni A1 24
 ?
 28292.5 SK0CT Sollentuna JO89XK 10 GP Omni A1 24
 28292.8 K7GFH Damascus OR CN85SJ 3 Attic Dip A11 24
 28293.4 ND4Z Gilbert SC EM94JA 5 5/8@40' Omni A1 24
 28293.7 W4DJD Woodbridge VA FM18HP A1 ?
 28294 SM5HUA Uppsala JP80WA 100 Vertical Omni 24
 28294 KE4IAP Woodbridge VA FM18HP A1 24
 28295 KD1ZX CentralFallsRI FN41HV 4 Vert@10' Omni A1 24
 28295 PU5ATX Santa Catarina GG51PR Dipole A1 06-2350
 28295.1 SK2TEN Kristineberg KP08FC 5 Vertical Omni A1 24
 28295.5 K4IT Flatwoods KY EM64RQ 3.5 Dipole A1 24
 28295.5 IZ0CWW Cervaro FR JN61VL 24
 28295.8 W3APL Laurel MD FM19NE 10 Hor.Dipole NE/SW A1 24
 28296 KA7BGR CentralPointOR CN82 A1 24
 28297.1 NS9RC Winnetka IL EN62DC 8 1/2 Vert Omni A1 24
 28297.5 SK7TEN Lonneberga JO77UM 15 GP Omni A1 24
 28298.0 V73TEN Roi Namur I RJ39RJ Horiz OA50 Omni 24
 28298 K5TLL Hattensburg MS 5 Vertical Omni A1 24
 28298.5 K7FL BattleGroundWA CN85SS 4 Horiz Loop A1 24
 28298.6 K4JDR Raleigh NC FM05 10 Vertical Omni A1 24
 28299 N1SCA Palm Bay FL EL97QX A1 ?
 28299.5 N3TW Jim Thorpe PA
 28300 K6FRC Sutters Mntn CACM99 A1 24££
 28300 UX1UX ?
 28300.1 IW0HBY Rome JN61DM 10 ?
 288300 KF4MS Tallahassee FL EM70VM 1 10m Ringo Omni A1 24
 28301.0 PI7ETE Amersfoort JO22QD 0.5 Vertical Omni F1A 24
 28320.97IZ8HUI Pignola PZ JN70VN 0.4 Windom ?
 28321.00I1YRB Torre Bert (TO)JN35UB 0.2 Vertical Omni QRSS3 24
 28321.2 IS0GOV Cagliari JM49NF 0.3 Vertical Omni QRSS3 24
 28321.2 IK3ERY Vittorio VenetoJN62RA
 28321.47IZ1GJH Casarza Lig GE JN44RG 0.1 Vertical Omni QRSS3 24
 28321.65IN3KLQ Nr Trento JN56RG 0.3 Vertical Omni QRSS3 24
 28321.7 IW4EMG Ferrara JN54RU 0.1 QRSS3 24
 28321.8 I3GNQ Tencarola PD JN55VJ 0.4 GP Omni QRSS3 24
 28321.85IK0IXI Aprilia LT JN62VB 0.1 Dipole@30m NE/SW A1/F1 24
 28321.86IZ8JFA Cosenza JM89CH 0.3 N/NE QRSS3 24
 28321.93IK1ZYW Torino JN35TC 0.01 Vertical Omni QRSS3 24
 28321.94IW9BAJ Sicily JM77NO 1 QRSS3 24
 28321.95IW0HK Civitavecchia JN52WD 1/.1 Dipole Omni QRSS3 24
 28321.98I1DFS Nr La Spezia JN54AC 0.1 Dipole NW QRSS3 24
 28322.01IW1QIF Davagna-Genova JN44LL 0.1 Long Wire QRSS3 24
 ?
 28322.04IT9YAF Canicatti JM67WI 0.1 Vertical Omni QRSS3 24
 28322.05IK1HGI Trecate JN45IK 0.1 Dipole NNW/SSE QRSS3 24
 28322.08IS0GSR Nr Cagliari JM49IN 0.1 Dipole N-S QRSS3 24
 28322.11IK8YTN Salerno JN70LG 0.1 Inv V E-W QRSS3 24
 28322.18IZ0HCC Roma JN61FT 0.1 Vertical Omni QRSS3 ?
 28322.2 IK8SUT Salerno JN70JQ 0.1 Inv V E-W QRSS3 24

28322.2 IW7DEC Nr Bari JN81GF 0.1 1/2 Vert Omni QRSS3 24
 28322.32IW9FRA Trapani,Sicily JM68HA 0.1 Dipole N-S QRSS3 24
 38322.36IW3SGT Trieste JN65VP QRSS3 24
 28322.45IW4EMG Nr Ferrara JN54RW Vertical Omni QRSS3 ?
 28322.5 F1VJT StGermain/Puoh JN33 0.1 ?
 28322.62IK1BPL Novara JN45HK 0.1 GP NNW/SSE QRSS3 24
 28322.63IK0VVE Nr Latina JN61KN 0.1 Dipole NNW/SSE QRSS3 24
 28800 OH5TEN Kouvola KP30HV 3 H Dipole 120/300 A1 ?

?= Activity uncertain INT= Intermittent PT=Part-time IRREG= Irregular
 UC=Under Construction (T)NonOp=(Temporarily)NotOperational OP?=Operational?
 V= Varies EXP=Experimental WkEnd=Weekends during daylight LT=Local Time
 SYNCH= frequency sharing synchronised beacons: SYNCHn current sequence
 N4ESS(0.00seconds), N4ES(0.20) WB4WOR (0.30) K7EK(0.40) N4ES(0.50). SYNCHx:
 K4UKB ID at 00 seconds and K4FUM at 30 seconds. ££ K6FRC transmits on 28245,
 28250, 28300

+++ 10 minutes constant carrier followed by ID

zzz These beacons transmit in sequence at 15-minute intervals: GB3RAL on the
 hour and H+15m, H+30, H+45. GB3WES at H+1, H+16 etc and GB3ORK at H+2, H+17
 etc. Transmissions have a stepped power sequence and a 30-second sounder
 sequence of 0.5ms pulses at 40Hz prf

Schedule of IBP/NCDXF Beacon Transmissions

Country	Call	Frequency					
		14100	18110	21150	24930	28200	
United Nations	NY 4U1UN	00.00	00.10	00.20	00.30	00.40	
Northern Canada	VE8AT	00.10	00.20	00.30	00.40	00.50	
USA (CA)	W6WX	00:20	00.30	00:40	00.50	01:00	
Hawaii	KH6WO	00.30	00.40	00.50	01.00	01.10	
New Zealand	ZL6B	00.40	00.50	01.00	01.10	01.20	
West Australia	VK6RBP	00.50	01.00	01.10	01.20	01.30	
Japan	JA2IGY	01.00	01.10	01.20	01.30	01.40	
Siberia	RR9O	01.10	01.20	01.30	01.40	01.50	
China	VR2HK	01.20	01.30	01.40	01.50	02.00	
Sri Lanka	4S7B	01.30	01.40	01.50	02.00	02.10	
South Africa	ZS6DN	01:40	01.50	02:00	02:10	02:20	
Kenya	5Z4B	01.50	02.00	02.10	02.20	02.30	
Israel	4X6TU	02:00	02:10	02:20	02.30	02:40	
Finland	OH2B	02:10	02:20	02:30	02:40	02:50	
Madeira	CS3B	02.20	02.30	02.40	02.50	00.00	
Argentina	LU4AA	02:30	02:40	02:50	00.00	00:10	
Peru	OA4B	02.40	02.50	00.00	00.10	00.20	
Venezuela	YV5B	02:50	00.00	00:10	00:20	00:30	

IBP = International Beacon Project. Beacons transmit for ten seconds on each

frequency in turn in the sequence shown above. They send callsign at 22 wpm and 100 watts, then four 1-second dashes at 100w, 10w, 1w and 0.1w. Equipment is TS-50, Cushcraft R-5 multiband vertical and a Trimble Navigation GPS receiver to ensure synchronization, with a control unit built by NCDXF.

DK0WCY/DRA5

zz DK0WCY 3579 operates 0720-0900UTC and 1600-1900UTC LOCAL time (ie UTC+1 winter and UTC+2 summer) DRA5 and DK0WCY on 10144 are 24/7. Transmissions on 3579 are cw only, with beacon id interrupted at ten minute intervals by a datagram giving the Kiel K, current fof2 and MUF at Juliusruh and indications of current solar-geophysical events. DRA5 and DK0WCY on 10MHz carry the cw datagrams but, at 10 minutes after the hour the datagram transmission is on RTTY and contains additional information on x-ray background and hf2, using RTTY. The H+50 transmission is PSK31(BPSK) is used.

During auroral events the carrier at the end of the ID changes to a series of dots.

See also www.dk0wcy.de.

OK0EU

OK0EU is a cluster of five high-stability transmitters with 4Hz separation, running for multipoint measurement. The callsign is sent 40Hz up to identify ionospheric echoes. Output power 1 watt to dipole radiating N-S. Transmitters are on 3594.492 at Vackov (JO60EF), 3594.496 Diouha Louka (JO60TP), 3594.500 Panska Ves (JO70GM), 3594.504 Pruhonice (JN79GX), 3594.508 Kasperske Hory (JN69SD)

Please notify errors/changes to Martin Harrison G3USF, HF Beacon Coordinator, Region 1 of the International Amateur Radio Union, [g3usf\(@\)yahoo.co.uk](mailto:g3usf@yahoo.co.uk) Copyright Martin Harrison 1995-2008. Free reproduction for non-commercial use, providing acknowledgement made to G3USF.