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	Downlink GndId: 05 AirId: 158 FlightId: AIC302						
88	/AKLCDYA.ADS.CC-						
		9470199E0000438E38947000E69A8	E1C0000F6791A580001034BF5DFCD	D78E			
	ADS-C message:	HACARS mode: 2 Aircraft re	a: .CC-BGL				
(NSW)	Basic report: Lat: -47.3948479		6 Msg. no: M03A Flight id: LA0801				
iitaa	Lon: -158.8909721	Message content:-	5 5				
	Alt: 37996 ft	SCEL,NZAA,191227,-52.51,-1	41.97,36000,280,-103.9, 43500				
	Time: 3459.250 sec past hour (:57:39.250)	/CG 017.30/CI 00042/PH ****	*/FEL 023870/FER 023719/GW 02022	231/ZFW 0159043			
<b>10</b> X	Position accuracy: <0.05 nm						
	NAV unit redundancy: OK		45.07,35999,281,-101.0, 42200				
	TCAS: OK	/CG 017.30/CI 00042/PH ****	*/FEL 024539/FER 024383/GW 02008	98/ZFW 0159043			
	Predicted route:						
	Next waypoint:		48.03,36000,282,- 98.1, 40800				
401	Lat: -47.0000267	/CG 017.30/CI 00042/PH ****	/FEL 025210/FER 025049/GW 01995	63/ZFW 0159043			
<u> </u>	Lon: -160.0000763						
01 V	Alt: 38000 ft ETA: 409 sec		150.90,37975,269,-103.9, 39500				
	Next+1 waypoint:	/CG 017.30/CI 00042/PH ***	*/FEL 025911/FER 025745/GW 01981	167/ZFW 0159043			
	Lat: -45.0000000						
	Lon: -170.0000381		53.70,38000,269,-100.9, 38300	00 /7514/ 01 500 42			
	Alt: 38000 ft	/CG 017.30/CI 00042/PH *****	/FEL 026552/FER 026381/GW 01968	688/ZFW 0159045			
	Earth reference data:	SCEL NZAA 191342 -48 24 -1	56.35,38001,269,-100.3, 37000				
	True track: 297.2 deg		*/FEL 027188/FER 027012/GW 01956	24/ZFW 0159043			
144	Ground speed: 451.5 kt	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	,,,,				
192	Vertical speed: 0 ft/min	SCEL NZAA 191357-47.40-1	58.87,38000,269,- 97.1, 35500				
10	Air reference data:		/FEL 027828/FER 027646/GW 01943	47/ZFW 0159043			
1014/5	True heading: 291.3 deg Mach speed: 0.8430						
1.01	Vertical speed: 0 ft/min	/NZAA.AFN/FMHLAN801.CC-E	GL,E80452,150849/FPOS44544W170	427.1/FCOATC.01/FCOADS.01FFF3			
3.6	Meteo data:	,					
		11BPRG/TS151036.190422/DTNZA	A,05R,466,171035,041/FNLAN801162	26			
1 N	True wind direction: 355.8 deg						
5-1 <b>5</b> 16	Temperature: -64.50 C		.ATSXCXA 191416	ATSXCXA 191507			
	HACARS model 2. Alizzanth some CC RCI		CFD	CFD			
	HACARS mode: 2 Aircraft reg: .CC-BGL Message label: H1 Block id: 8 Msg. no: F00A Flig	abt id: 1 0.0801	AN .CC-BGL/FI LA0801/MA 826A - #CFCFG231500	AN .CC-BGL/FI LA0801/MA 882 - #CFEFFDE			
	Message content:-		- #CFCFGZ31300	- #CFEFFDE			
0.000 [MHz]	#M1BPOSS45001W170001,S45000W170000,1504	130.380.CI.154410.GUMKO.M64.23	e0.654/TS150430.1904220194				
Decoding		k GndId: 05 AirId: 158 FlightId: AIC302					
			Modem f	frequency filter OFF <b>PROCITEC</b>			

#### 5583.0 kHz Auckland Air, New Zealand

Cruise sector data downlink from aircraft CC-BGL (LATAM Airlines Boeing B787-9)

12 hours SCEL - NZAA across the Southern Ocean without an alternate airport ... Note that all those famous flight tracking webpages such as Flightradar 24 have ZERO real-time data for the 10+ hours cruise sector of this flight; they simply visualize some great-circle extrapolation ... while it's all here on HF - updated every 15 minutes - if you know when and where to look! Now you can easily calculate the fuel consumption: 191357 - 191227 = 90 Minutes; 202231 - 194347 = 7884 kg corresponding to the rounded 43500 - 35500 = 8 tons; this makes around 5 tons per hour up there at FL 360 - FL 380 ... See our hotfrequencies webpage for the explanation of very special abbreviations, procedures and terms - particularly for avionics - and a primer on ATS Facilities Notification, codes of FIRs providing data link services - different from ICAO location indicators! -, and codes of ACARS and HFDL Message Labels • The Basic or Periodic Report gives position - trajectory intent - speed vector data plus the Figure of Merit code or data for navigational accuracy • TS = Time Stamp 19 APR 2022 1504 UTC

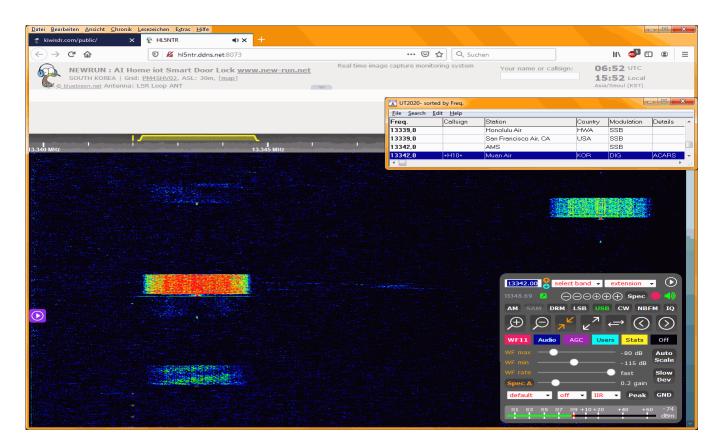
# 2.9 Internet-controlled Software-Defined Radios (Web-SDR)

In urban areas all over the world, shortwave radio listeners experience an increasing level of man-made noise by around-the-corner and in-house digital techniques such as cheap electronic goods from China, powerline communication (PLC), plasma television screens, and so on. The radio spectrum is polluted, and that makes HF reception impossible in certain places. Constructing a state-of-the-art listening post far away in the "quiet" countryside, and controlling it via the Internet, is the optimal solution to this problem that has been successfully adapted by e.g. Christoph Ratzer OE2CRM in Austria. His Remote DX Blog at *https://remotedx.wordpress.com* reports incredible receptions from far-away and weak shortwave (and mediumwave!) broadcast radio stations all over the world.

Fortunately, there's a much less expensive solution. Currently (2024), more than six hundred (!) Kiwi-SDRs worldwide covering the complete 0-30 MHz spectrum are linked at *www.kiwisdr.com* and *www.ve3sun.com/KiwiSDR*. This is the Open Web RX project of András Retzler HA7ILM with the superb Kiwi-SDR user interface for the Beagle Bone computer board. It is simply great for the reception of HF utility radio stations, and even NAVTEX on MF, from interesting locations all over the world. What's more, many radio amateurs, radio clubs, researchers, and universities have made available their SDRs via Internet. Dozens of such projects are linked e.g. at *www.websdr.org*. The frequency bands covered are usually certain amateur radio bands  $\pm$  a few kHz beyond. Consequently, the antennas used are optimized for these bands, and their performance decreases sharply for frequencies beyond. Anyway, a good starting point is the University of Twente's Web-SDR in the Netherlands that covers the entire MF and HF band from 0 to 29 MHz.

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go2SIGNALS' superb DANA allows direct input of a Kiwi-SDR signal (here ex PT2FHC) into the go2MONITOR decoder • Up to 32 decoding channels are provided!
 A specially formatted sample Klingenfuss frequency database is perfectly integrated in the go2MONITOR GUI • 12711.0 kHz Brazilian Navy Rio de Janeiro, Brazil



Kiwi-SDR in Daegu, South Korea (left: Muan 13342.0 kHz - right: Auckland 13351.0 kHz) Perfect HFDL PSK-aggregate data bursts - note the pilot tone at 1440 Hz!

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Message content:- QUTPEODC11     Message content:- 42 DISPATCHER MSG     3M01 OPNORM 0329/31 OERK/VIDP HZ-NS57       PLS REF ANALYSIS BY ECON SPEED CI250 FROM FIX LPB X FLI G HT R ELE A SE     THANK YOU KINDLY. MY PLEASURE TO ASSIST YOUR FLIGHT. NAME: EIKO HARU/ TITLE: DISPATCH - FLT CNTRL / DESK: 7-9523       OPP 18/0/1     CAL075     RCTP TO LIRF     IFR 31/12/23       COMPUTED 19062 ETD 19052 TWX PROG 3118     IN: LPDUs = 1 Ground station ID MUAN - SOUTH KOREA NOT SYNCHED Altrice ID 19052 SCHED ARR 0645Z     Nr. LPDUs = 1 Ground station ID MUAN - SOUTH KOREA NOT SYNCHED Altrice ID 00 0103 0106 0109       SCHED DEP 1525Z     SCHED ARR 0645Z     Max Bit rate 1200 bpUR) = 0 (RR) yeer = 0 Max Bit rate 1200 bpUR) = 0 (RR) yeer = 0 Max Bit rate 1200 bpUR) = 0 (RR) yeer = 0 Max Bit rate 1200 bpUR) = 0 (RR) yeer = 0 Max Bit rate 1200 bpUR) = 0 (RR) yeer = 0 Max Bit rate 1200 bpUR) = 0 (RR) yeer = 0 Max Bit rate 1200 bpUR) = 0 (RR) yeer = 0 Max Bit rate 1200 bpUR) = 0 (RR) yeer = 0 Max Bit rate 1200 bpUR) = 0 (RR) yeer = 0 Max Bit rate 1200 bpUR) = 0 (RR) yeer = 0 Max Bit rate 1200 bpUR) = 0 (RR) yeer = 0 Max Bit rate 1200 bpUR) = 0 (RR) yeer = 0 Max Bit rate 1200 bpUR) = 0 (RR) yeer = 0 Max Bit rate 1200 bpUR) = 0 (RR) yeer = 0 Max Bit rate 1200 bpUR) = 0 (RR) yeer = 0 Max Bit rate 1200 bpUR) = 0 (RR) yeer = 0 Max Bit rate 1200 bpUR) = 0 (RR) yeer = 0 Max Bit rate 1200 bpUR) = 0 (RR) yeer = 0 Max Bit rate 1200 bpUR) = 0 (RR) yeer = 0 Max Bit rate 1200 bpUR) = 0 (RR) yeer = 0 Max Bit rate 1200 bpUR) = 0 (RR) yeer = 0 Max Bit rate 1200 bpUR) = 0 (RR) yeer = 0 Max Bit rate 1200 bpUR) = 0 (RR) yeer = 0 Max Bit rate 1200 bpUR) = 0 (RR) yeer = 0 Max Bit rate 1200 bpUR) = 0 (RR) yeer = 0 Max Bit rate 1200 bpUR) = 0 (RR) yeer = 0 Max Bit rate 1200 bpUR) = 0 (RR) yeer = 0 Max Bit rate 1200 bpUR) = 0 (RR) yeer = 0 Max Bit rate 1200 bp	TIACARS mode. 2 Anciant reg. b-10501		^					
<sup>1</sup> OUTFEDDCL-1 DEAR CAPT PLS REF ANALYSIS BY ECON SPEED C1250 FROM FIX LPB X FLIG HT R ELE AS E OFP 18/0/1 CAL075 RCTP TO LIRF IFR 31/12/23 OFP 18/0/1 RCTP AND ROAD FIB/IFR II: VINB/0/10 PV NAD/1 PV NAD/0 PV O A350-900 / RR TRENT XWB-84 / B-18901 / CG 32.00% 								
PLS REF ANALYSIS BY ECON SPEED CI250 FROM FIX LPB X FLIG HT T RELEA SE       THANK YOU KINDLY. MY PLEASURE TO ASSIST YOUR FLIGHT. NAME: EUKO HARU / TITLE: DISPATCH - FLT CNTRL / DESK: 7-9523         OFP 18/0/1 CALOTS       RCTP TO LIRF       IFR 31/12/23         COMPUTED 1906Z ETD 1905Z WX PROG 3118       Nr LPDUs = 1 Ground station ID MUAN - SOUTH KOREA NOT SYNCHED Aircraft ID 27         SCHED DEP 1525Z SCHED ARR 0645Z       Mak Bit rate 1200 bps U(R) = 0 UR(R)vect = 0 (LPDU UNNUMBERED ACKED DATA FM AIR VN0970 TO GND]         A350-900 / RT TRENT XWB-84 / B-18901 / CG 32.00%       HACARS mode: 2 Aircraft reg: VN-A511 (PDU UNNUMBERED ACKED DATA FM AIR VN0970 TO GND]         *** EDTO FLIGHT ***       Message content:- 3501 SUMMRY 0971 / VVNB/VIDP VN-A511 //OFF 1133/FOB 0179 //OFF 1133/FOB 0179 //OFF 1133/FOB 0030         FUEL TIME FUEL	QUTPEODCI-1	42 DISPATCHER MSG	3M01 OPNORM 0329/31 OERK/VIDP HZ-NS57					
FLIGHT RELEASE     THANK YOU KINDLY. MY PLEASURE TO ASSIST YOUR FLIGHT. NAME: BLO HARLU / TITLE: DISPATCH - FLT CNTRL / DESK: 7-9523       OFP 18/0/1     CALO75     RCTP TO LIRF     IFR 31/12/23       OGD P18/0/1     CALO75     RCTP TO LIRF     IFR 31/12/23       OFP 18/0/1     CALO75     RCTP TO LIRF     IFR 31/12/23       SCHED 00 0103 0106 0109     Nr LPDUs = 1 Ground station ID MUAN - SOUTH KOREA NOT SYNCHED Aircraft ID 27     Out Way 1000 103 0106 0109       SCHED DEP 1525Z     SCHED ARR 0645Z     Mas Bit rate 1200 bps U(R) = 0 UR(R)vect = 0 Mas Bit rate 1200 bps U(R) = 0 UR(R)vect = 0 Mas Bit rate 1200 bps U(R) = 0 UR(R)vect = 0 Mas Bit rate 1200 bps U(R) = 0 UR(R)vect = 0 Mas Bit rate 1200 bps U(R) = 0 UR(R)vect = 0       SPEED SKD CLB-320/.85 CRZ-CI250 DSC-300/.85 APMS +02.5 LBS     Message content:- 30501 SUMMRY 0971/ VVNB/VIDP VN-A511 /OUT 1122/FOB 0178 /OTF 1132/FOB 0178 /OTF 1132/FOB 0178 /OTF 1132/FOB 0178 /OTF 1132/FOB 0048 /TKO CAPT /CRW     SA01 OPSCTL 0329/31 OERK/VIDP HZ-NS57 /RVST 1930 002       HACARS mode: 2 Aircraft reg: SV-SMJ Message content:- /LONATXA.TIZ/FEGCC ARR ATIS N 1920Z ARRIVAL RWY 23R RWY23R RUNWAY CONDITION CODES:5/5/S WET/WET/WET DEPTH:NR/NR/NR COVERAGE:100%/100%/TAPY 700% /CHK     SJ01 DSPTCH 0329/31 OERK/VIDP HZ-NS57 /CH	DEAR CAPI	** NO ACK REQ **						
OFP 18/0/1     CAL075     RCTP TO LIRF     IFR 31/12/23       COMPUTED 1906Z ETD 1905Z WX PROG 3118     Nr LPDUs = 1 Ground station ID MUAN - SOUTH KOREA NOT SYNCHED Aircraft ID 27       SCHED DEP 1525Z SCHED ARR 0645Z     Gots Requested medium = 0 Low = 0 Max Bit rate 120 bps U(R) = 0 UR(R)vect = 0 (LPDU UNUMBERED ACKED DATA FM AIR VN0970 TO GND) HACARS mode: 2 Aircraft reg: VN-A511       *** EDTO FLIGHT ***     Hacsage iabel: 30 Block id: 6 Msg. no: M00A Flight id: VN0970 Message content:-       SPEED SKD CLB-320/.85 CR2-Cl250 DSC-300/.85 APMS +02.5 LBS     ////////////////////////////////////		THANK YOU KINDLY. MY PLEASURE TO ASSIST YOUR FLIGHT.						
COMPUTED 1906Z ETD 1905Z WX PROG 3118           3121 0100 0103 0106 0109           SCHED DEP 1525Z SCHED ARR 0645Z           A350-900 / RR TRENT XWB-84 / B-18901 / CG 32.00%           *** EDTO FLIGHT ***           SPEED SKD CLB-320/.85 CRZ-CI250 DSC-300/.85 APMS +02.5 LBS           FUEL TIME           TRIP LIRF           FUEL TIME           A1:roat 110 27           SIO1 SUMMRY 0971 / VNB/VIDP VN-A511           OUT 27/F08 9100           FUEL TIME		NAME: EIKO HARIU / TITLE: DISPATCH - F	LT CNTRL / DESK: 7-9523					
3121 0100 0103 0106 0109       Aircraft ID 27         Sched Dep 15252       Sched Dark 06452       Slots Requested medium = 0 Low = 0         A350-900 / Rr TRENT XWB-84 / B-18901 / CG 32.00%       Httate 1200 bps U(R) = 0 U(R) yeet = 0         A350-900 / Rr TRENT XWB-84 / B-18901 / CG 32.00%       Httate 1200 bps U(R) = 0 U(R) yeet = 0         Max Bit rate 1200 bps U(R) = 0 U(R) yeet = 0       Max Bit rate 1200 bps U(R) = 0 U(R) yeet = 0         Max Bit rate 1200 bps U(R) = 0 U(R) yeet = 0       Max Bit rate 1200 bps U(R) = 0 U(R) yeet = 0         A350-900 / Rr TRENT XWB-84 / B-18901 / CG 32.00%       Httata 5200 bps U(R) = 0 U(R) yeet = 0         Max Bit rate 1200 bps U(R) = 0 U(R) yeet = 0       Max Bit rate 1200 bps U(R) = 0 U(R) yeet = 0         Max Bit rate 1200 bps U(R) = 0 U(R) yeet = 0       Max Bit rate 1200 bps U(R) = 0 U(R) yeet = 0         Max Bit rate 1200 bps U(R) = 0 U(R) yeet = 0       Max Bit rate 1200 bps U(R) = 0 U(R) yeet = 0         Message label: 30 Biock id: 4963 NGM 5860NAM DOW 311618       // N 1624/F08 0050         AIT II RA 5128 00.23       LIMIT / PLANNE       // ARW / RW / RW / RW / RW / RW / RW / R								
Alfcfart ID 27 Siched DEP 1525Z SCHED ARR 0645Z A 350-900 / RR TRENT XWB-84 / B-18901 / CG 32.00% A 350-900 / RR TRENT XWB-84 / B-18901 / CG 32.00% A 350-900 / RR TRENT XWB-84 / B-18901 / CG 32.00% +** EDTO FLIGHT *** SPEED SKD CLB-320/.85 CRZ-CI250 DSC-300/.85 APMS +02.5 LBS FUEL TIME TRUE LIFME TRUE LIFM E TRUE LIFM								
SCHED DEP 15252     SCHED ARR 06452     Max Bit rate 1200 bps U(R) = 0 UR(R)vect = 0 [LPDU UNNUMBERED ACKED DATA FM AIR VN0970 TO GND]       A350-900 / RR TRENT XWB-84 / B-18901 / CG 32.00%     HACARS mode: 2 Aircraft reg: VN-A511       **** EDTO FLIGHT ***     Message content::       SPEED SKD CLB-320/.85 CRZ-CI250 DSC-300/.85 APMS +02.5 LBS     ////////////////////////////////////	3121 0100 0103 0106 0109	Aircraft ID 27						
A350-900 / RR TRENT XWB-84 / B-18901 / CG 32.00% 	SCHED DEP 1525Z SCHED ARR 0645Z							
HACARS mode: 2 Aircraft reg: 9V-SMJ CONT 3% 4513 00.22 LIMIT / PLANNE //ERR HACARS mode: 2 Aircraft reg: 9V-SMJ CONT 3% 4513 00.22 LIMIT / PLANNE //ERR HACARS mode: 2 Aircraft reg: 9V-SMJ CONT 3% 4513 00.22 LIMIT / PLANNE //ERR HACARS mode: 2 Aircraft reg: 9V-SMJ Message label: A9 Block id: 0 [Uplink] Message content: JLONATXA.TI2/EGCC ARR ATIS N 1920Z ARRIVAL RWY 23R RWY23R RUNWAY CONDITION CODES:5/5/5 WET/WET/WET DEPTH:NR/NR/NR COVERAGE:100%/100%/100%/100%/100% TRANSITION-LEVEL FL 70 Z3010KT 180V240 8000 3000E RA BKN012 BKN024 06/06 Q098 Decoding HFDL	4350 000 / DD TRENT VWR 84 / P 19001 / CC 33 00%	[LPDU UNNUMBERED ACKED DATA FM AIR VN0970 TO GND]						
Image: Control Content Control Control Control Control Control	ASSO-9007 RR TRENT AWB-047 B-109017 CG 52.00%							
SPEED SKD CLB-320/.85 CRZ-CI250 DSC-300/.85 APMS +02.5 LBS         /OUT 1122/FOB 0178         /OFF 1133/FOB 0179           Image: Control of the state stat	*** EDTO FLIGHT ***							
FUEL TIME         FUEL FUEL FUEL FUEL FUEL FUEL FUEL FUEL	SPEED SKD CLB-320/.85 CRZ-CI250 DSC-300/.85 APMS +02.5 LBS							
TRIP LIRF         150443 11.58         4963NGM         5860NAM         DOW 311618         //ON         1624/POB 0030           ALTN LIRA         5128 00.23         108NGM         108NAM         PAYLOAD 21948         //TKO CAPT //CRW         PAVON FL290           FINALRES         4598 00.30         108NGM         108NAM         PAYLOAD 21948         //TKO CAPT //CRW         PAVON FL290           CONT 3%         4513 00.22         LIMIT / PLANNE         //APP N //RWY //RVR         /ALT         ETA 2131 4.8           HACARS mode: 2         Aircraft reg: .9V-SMJ         //CPT         //FO         BJ01 DSPTCH 0329/31 OERK/VIDP HZ-NS57           Message label: A9         Block id: O         [Uplink]         //S01         /S02         BJ01 DSPTCH 0329/31 OERK/VIDP HZ-NS57           Message content:         //LONATXA.112/EGCC ARR ATIS N 1920Z         //CHK         /CHK         BJ01 DSPTCH 0329/31 OERK/VIDP HZ-NS57           .000         [MHC]         23010KT 180/2408         CONTATION CODES:5/5/5 WET/WET/WET DEPTH:NR/NR/NR COVERAGE:100%/100%/100%         JSACK           0.000         [MHC]								
ALTN LIRA         5128 00.23         108NGM         108NAM PAYLOAD 21948         //IN 168//PD 0045         3A01 0PSCTL 0329/31 0ERK/VIDP HZ-NS57           FINAL RES         4698 00.30         //IN 168//PD 0045         //IN 168//PD 0045         3A01 0PSCTL 0329/31 0ERK/VIDP HZ-NS57           FINAL RES         4698 00.30         //INT 168//PD 0045         //INT 168//PD 0045         3A01 0PSCTL 0329/31 0ERK/VIDP HZ-NS57           FINAL RES         4698 00.30         //INT 168//PD 0045         //INT 168//PD 0045         1921 FOB 9400           HACARS mode: 2 Aircraft reg: .9V-SMJ         //ERR         //ERR         RQST 1930 WX           HACARS mode: 2 Aircraft reg: .9V-SMJ         /CPT         /FO         RQST 1930 WX           Message label: A9 Block id: 0 [Uplink]         /S01 /S02         J01 DSPTCH 0329/31 0ERK/VIDP HZ-NS57           Message content:         /LONATXA.112/EGCC ARR ATIS N 1920Z         /CHK         RUY23R RUNWAY CONDITION CODES:5/5/5 WET/WET DEPTH:NR/NR/NR COVERAGE:100%/100%/100%         J01 DSPTCH 0329/31 0ERK/VIDP HZ-NS57           0.000         [M+C]         Z3010KT 180V240 8000 3000E RA BKN012 BKN024 06/06 Q098         EV200         SU0495 /Double Slot								
Image: Provide the state of the state	ALTN LIRA 5128 00.23 108NGM 108NAM PAYLOAD 21948							
Image: Construct of the standard of the								
Image: Construction of the co	CONT 3% 4513 00.22 LIMIT / PLANNE							
HACARS mode: 2. Aircraft reg: 9V-SMJ         /CPT         /FO           Message label: A9 Block id: 0 [Uplink]         /S01         /S02           Message label: A9 Block id: 0 [Uplink]         /CHK         SU01 DSPTCH 0329/31 OERK/VIDP HZ-NS57           Message content:-         /LONATXA.TI2/EGCC ARR ATIS N 1920Z         /CHK         PLS ACK           0.000         Mere:         23010KT 180V240 8000 3000E RA BKN012 BKN024 06/06 Q098         PLS ACK           Decoding         HFDL	and the second		RQST 1930 WX					
Message label: A9 Block id: 0 [Uplink]         /S01         /S02         \$J01 DSPTCH 0329/31 OERK/VIDP HZ-NS57           Message content:-         /LONATXA.TI2/EGC ARR ATIS N 1920Z         /CHK         RQT VIDP/VAAH W/X           ARRIVAL RWY 23R         RWY23R RUNWAY CONDITION CODES:5/5/5 WET/WET DEPTH:NR/NR/NR COVERAGE:100%/100%/100%         FLSACK           0.000 FWH:         23010KT 180/240 8000 3000E RA BKN012 BKN024 06/06 Q098         202401-01709:15:02.260Z Data Rate: 300bps / Double Slot	HACARS mode: 2 Aircraft reg: .9V-SMJ							
Image: Construct Text of the second		/SO1 /SO2						
RWV23R RUNWAY CONDITION CODES:5/5/5 WET/WET DEPTH:NR/NR/NR COVERAGE:100%/100%/100%           0.000         [MHz]           0.000 Hrst         23010KT 180/240 8000 3000E RA BKN012 BKN024 06/06 Q098           Decoding         HFDL		/СНК						
Decoding         HFDL								
0.000 [M+2] 0000 M+2         23010KT 180V240 8000 3000E RA BKN012 BKN024 06/06 Q098           Decoding         HFDL	TRANSITION-LEVEL EL 70	NR/NR/NR COVERAGE:100%/100%/100%	_					
Decoding         HFDL	0.000 [MHz] 232040//T 4220/242 20202 DA B// 10212 B// 1024 05/05 0222							
		: 15:02.260Z Data Rate: 300bps / Double Slot						
			Modem frequency filter OFF <b>PROCITEC</b> ®					

Perfect decoding of the Kiwi-SDR's signal above 10060.0 kHz Muan Air, South Korea



### Web-SDRs Twente, Netherlands, and Crimea, Russian Federation

This screenshot - made 7 March 2015 at 1642 UTC - shows the difference between a professional project like Twente, above, and an amateur project elsewhere, below. The strong FSK signal in the centre of the spectrum is Hamburg Meteo on 10100.8 kHz. On the right is the amateur radio band with many digital signals. On the left is the aeronautical mobile band with HFDL aggregate bursts at 10081 kHz USB (Shannon), and 10087 kHz USB (Krasnoyarsk). On the other hand, Crimea is as deaf as a dodo: it receives just Hamburg and nothing else, neither in the amateur band nor in the aeronautical band where Krasnoyarsk would be just one propagation hop away ... What's more, the frequency displayed is 3 kHz too high!

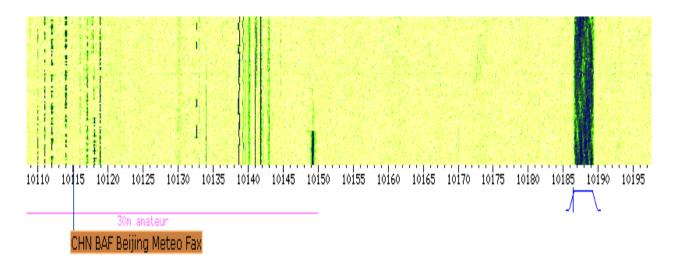
Twente is often accessed by 400+ users at the same time. It allows perfect decoding of sophisticated digital data signals, even if your Internet connection delivers only a real-life data rate of 400-500 kB/s. A chatbox allows a discussion of the project, and comments on the stations received. At *http:// websdr.ewi.utwente.nl:8901/m.html*, there is a Web-SDR version for mobile devices such as smartphones and tablet computers. Be sure to use the latest versions of modern browsers such as Chrome, and select HTML5 instead of Java.

fildigi ver4.1.00 - WWW.KLINGENFUSS.ORG				۲ Spot		
ZCZC ML34		(		- spor		
50953 LT APR 2024		The 2024 Supe	Frequency List			
AIPHONG RADIO HPNAV1684		Databases <u>T</u> ext fi	es Additional text files and screenshots	About		
		OldFreq	Formerly active frequencies			
UNG BIEN : NAM DINH						
EN LUONG: HAI THINH		UT2024	Utility stations 2024			
		012024				
HIET LAP KHU VUC THI CONG VA PHUONG TIEN THI CONG CONG TRINH			Broadcast stations 2024			
AO VET DUY TU LUONG HANG HAI HAI THINH NAM 2023 NHU SAU:		<u>B</u> C2024				
KHU VUC THI CONG NAO VET						
KHU VUC NAO VET LUONG HANG HAI HAI THINH: DOAN LUONG TU CAP HAO SO 1, 2 DEN CAP PHAO SO 9, 10.	LINE LITE					
KHU VUC HO CHUA TAM, LUONG TAM: NAM BEN TRAI LUONG HANG HAI		024- sorted by Freq.				
AI THINH, CACH PHAO SO 8 VE PHIA HA LUU KHOANG 220M, DUOC GIOI		earch <u>E</u> dit <u>H</u> elp				
AN BOI CAC DIEM DAC TRUNG CO TOA DO NHU SAU:	Freq.	Callsign	Station	Country	Modulation	Details
	4209,9		NBDPT NAVTEX frequency		DIG	
N-2000: 20-00.33N 106-11.68E	4209,1		Svalbard R. Spitsbergen	NOR	DIG	SITOR
/GS-84: 20-00.27N 106-11.79E	4209,9		ACG Buenos Aires	ARG	DIG	SITOR
EM D :	4209,5		USCG Apra Harbour	GUM	DIG	SITOR
I-2000: 20-00.36N 106-11.65E	4209,9	SUZ	Serapeum R	EGY	DIG	SITOR
GS-84: 20-00.30N 106-11.77E	4209,9	i SVH	Iraklion R	GRC	DIG	SITOR
	4209,5	5 TAH	Istanbul R	TUR	CW/DIG	SITOR
N-2000: 20-00.36N QYYAQQMUEE	4209,9	i XSG	Shanghai R	CHN	DIG	SITOR
/GS-84: 20-00.30N 106-11.84E IEM F :	4209,9	i xsa	Guangzhou R	CHN	DIG	SITOR
EMP : N-2000: 20-00.40N 106-11.70E	4209,5	i XSV	Tianjin R	CHN	DIG	SITOR
GS-84: 20-00.34N 106-11.81E	4209,9	i XVG	Hai Phong R	VTN	DIG	SITOR
KHU VUC CHUA CHAT NAO VET: KHU DAT PHIA NAM CUA CUM CONG TRINH		· · · · · · · · · · · · · · · · · · ·			<u> </u>	·
JONG QUA CUA SONG NINH CO.	3- TEN PHUON	G TIEN: NAM I	HAL2			
CAC PHUONG TIEN THI CONG	SO DANG KY:	NB-9899				
TEN PHUONG TIEN: LONG HAI 38	CHUNG LOAI:	TAU HUT PHU	N			
D DANG KY: NB-8429			INGAY 15;/2024.			
HUNG LOAI: SA LAN DAT CAU	CACKMHUONO	TIEN THIY HO	DAT DONGTREM LUONG	HANG H	AI HAI THIN	IH LUUV
TEN PHUONG TIEN: LONG HAI 27						
	BAN IN DO TO	NG CONG TYV	OAO DAM AN TOAN HAN	g nai mi	EN BAC CI	JN CAP.
DANG KY: NB-8788						
D DANG KY: NB-8788 HUNG LOAI: SA LAN VAN CHUYEN CHAT NAO VET	NINININI					
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D DANG KY: NB-8788 JUNG LOAI: SA LAN VAN CHUYEN CHAT NAO VET TEN PHUONG TIEN: NAM HAI 2						
D DANG KY: NB-8788 HUNG LOAI: SA LAN VAN CHUYEN CHAT NAO VET TEN PHUONG TIEN: NAM HAI 2 CQ H ANS H QSO H KN II SK II Me/Qth	) Brag )		T/R Tx 🏓	Rx II		тх М
O DANG KY: NB-8788 HUNG LOAI: SA LAN VAN CHUYEN CHAT NAO VET • TEN PHUONG TIEN: NAM HAI 2			Т/R Тх <b>)</b> 2000	Rx II		тх <b>Н</b> 2500
O DANG KY: NB-8788 HUNG LOAI: SA LAN VAN CHUYEN CHAT NAO VET - TEN PHUONG TIEN: NAM HAI 2 CQ M ANS M QSO M KN III SK III Me/Qth	) Brag )			Rx II	,	
O DANG KY: NB-8788 HUNG LOAI: SA LAN VAN CHUYEN CHAT NAO VET - TEN PHUONG TIEN: NAM HAI 2 CQ M ANS M QS0 M KN III SK III Me/Qth	) Brag )			Rx II	j	
O DANG KY: NB-8788 HUNG LOAI: SA LAN VAN CHUYEN CHAT NAO VET - TEN PHUONG TIEN: NAM HAI 2 CQ M ANS M QS0 M KN III SK III Me/Qth	) Brag )			Rx II	j	
O DANG KY: NB-8788 HUNG LOAI: SA LAN VAN CHUYEN CHAT NAO VET - TEN PHUONG TIEN: NAM HAI 2 CQ M ANS M QSO M KN III SK II Me/Qth	) Brag )			Rx II	· · · · ·	
O DANG KY: NE-8788 HUNG LOAI: SA LAN VAN CHUYEN CHAT NAO VET - TEN PHUONG TIEN: NAM HAI 2 CQ M ANS M QSO M KN II SK II Me/Qth 	) Brag )		2000	Rx Ⅱ	ΓT/R	2500

#### Kiwi-SDR Hanoi, Viet Nam 4209.5 kHz Hai Phong Radio, Viet Nam

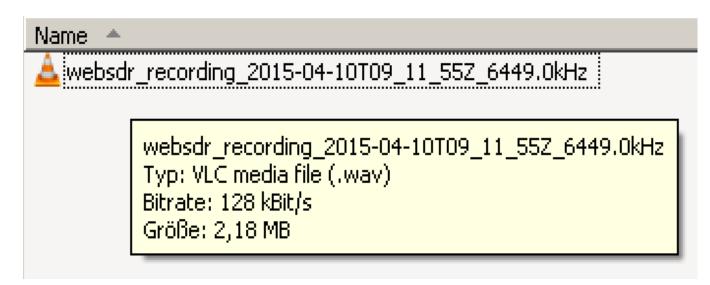
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Downlink GndId: 01 AirId: 255 FlightId:	VIV104					
	36/AC0301	-// TXN PA02		/836/AC0301 ^		
CYVR/YVR 08L RWY COND: 5-GOOD			EPARTS TO PDX FROM GA			
			EPARTS TO PHX FROM GA			
INPUTS - RUNWAY AND ATMOSPHERE: LDA 9219 WIND 073/06		FLIGHT AC6277 D	EPARTS TO NRT FROM GA	TE AT Z AND LCL		
ELEV 13 HW/XW 5/1			EPARTS TO SEA FROM GA			
OAT 17 QNH			EPARTS TO YYF FROM GA EPARTS TO YLW FROM GA			
30.07		FL				
INPUTS - TECHNICAL: MEL NO REVERSERS NO				E80 AT 19:05Z AND 12:05LCL		
CONST NO NON-NORMAL NO			TE E73 AT 19:05Z AND 12:05LCL TE D52 AT 20:00Z AND 13:00LCL			
WEIGHT 176.0 VREF ADD 5		FLIGHT AC0308 DEPARTS				
Ουτρυτ:			TE C51 AT 20:30Z AND 13			
LDG WT 176.0 REV NO RECOMMENDED BRAKE				TE D55 AT 20:35Z AND 13:35LCL TE E76 AT 00:55Z AND 17:55LCL		
CO			EPARTS TO HNL FROM GA			
OLING TIME:		75 AT 00:55Z AND				
FLAP 25: OPLD TPL GROUND MAX MAN BRK 6506 4000 67		FLIGHT AC0279 D	TE C46 AT 04:00Z AND 21:00LCL			
AUTO BRK 1 *11037 47		PART 2 OF 2				
AUTO BRK 2 *9405 56 AUTO BRK 3 8416 2572 61				de: 2 Aircraft reg: .JA877A pel: RA Block id: J [Uplink]		
AUTO BRK 4 7341 3647 65			Message con	ntent:-		
Αυτο ΜΑΧ				TO HVY TRAFFIC AND RAMP ORTAGE AT APO UPON ARR,		
6614 4000 68 VREF25+5:155KT			MARSHA	LLER MAY NOT BE AVAIL WHEN		
VREP25+5:155K1	6953 3978 59 AUTO MAX 6251 4000 62		B/I. IN TH	IAT CASE, PLS STBY B/I.		
FLAP 30: OPLD TPL GROUND MAX MAN BRK 6175 4000 62	VREF30+5:150KT		6.9			
AUTO BRK 1 *10402 39						
AUTO BRK 2 8879 2052 50 AUTO BRK 3 7956 2975 54	STD MA CLB WAT: NON-STD MA FLAP KG/1000 FLAP FT/NM P		MESSAGES: NO			
0.000 [MHz] AUTO BRK 4	25 256.4 25 419 6.9					
0.00 MHz	30 255.2 30 419		END			
1 Decoding HFDL	Downlink GndId: 01 AirId: 255 FlightId: VIV10	14				
			Modem frequ			

Kiwi-SDR Keelung, Taiwan, Democratic Republic of China 6559.0 kHz San Francisco Air CA, United States of America Vancouver runway 08L landing data and transfer flight connections uplink to aircraft C-FGDX (Air Canada Boeing B787-9) Tokyo-Narita ramp chaos uplink to aircraft JA877A (All Nippon Airways Boeing B787-9) Just for the record ... the "Station information" from certain databases displayed in some Web-SDR's "Frequency labels" is totally outdated and misleading. It includes hundreds and thousands of users that ceased transmissions on HF several decades ago. What's more, most radio amateurs simply do not know even the most common professional digital data modes, stations, and frequencies ...



## "CHN BAF Beijing Meteo Fax" on 10117 (not 10115!) kHz closed way back in 2002 ... while real-time data such as the strong FUG PSK aggregate on 10187.9 kHz is listed only in up-to-date publications such as our GUIDE TO UTILITY RADIO STATIONS - Professional HF Communication Today and on our SUPER FREQUENCY LIST ON CD!

For standard digital data transmission systems, the required data rates on your e.g. SDR  $\leftrightarrow$  PC  $\leftrightarrow$  Internet  $\leftrightarrow$  WebSDR connection are not too demanding. Example: Recording WAV files from a WebSDR. With the channel bandwidth set to around 3 kHz for e.g. PACTOR-FEC, the data amounts to approximately 930 kB/min or 16 kB/s. This means that even complex PSK aggregate signals such as STANAG 4285 - let alone 10-kHz-wide DRM! - do require just a few dozen kB/s which is easily achieved with even those "slow" DSL connections somewhere in the countryside.



# 2.10 Automatic monitoring using wide-band SDRs

State-of-the-art radio monitoring tools now allow continuous automatic classification of emissions monitored over a wide frequency spectrum.

StepMode_D7         Stop Soft         Results         Ensistens         Prequencies         Resources         Task activity         Prespective           REAL Delata Loop Discone         If WHZ         If No         If Columbia         If Columb		R [Automatic mode] perating mode Help												
XAAD Debe Loop Discone         Image: Second Secon			1	s 🌍 Emissio	ns 🔛 Frequ	encies 👩 M	lissions 🔒 Reso	urces	A Task activity	) f	Perspective			
Image: State in the second state is the second state in the second state is		_	:							5	- · ·			
: GRVLAN Deta Loop Discore       • Frequency:       8'460 kHz :			81	/Hz 🖹 🗶 🖇	Gain:	0 dB1 (0)	istom GUI							
public       GRXLAN Delta Loop Discone       Frequency:       8'460 kHz       >       >       >       Starter in the starterin the starter in the starter in the starte		<u> </u>		- <u>·</u> · · ·										
5:59:40.000       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       - <td< td=""><td></td><td></td><td>-</td><td></td><td>ko lu 🖹</td><td></td><td>- Litte fronting</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></td<>			-		ko lu 🖹		- Litte fronting							
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Ceiver active [Range: 8410.00 - 8510.00 kHz, Bandwidth: 100 kHz]         Second State       Second State         ID       Name       Type       Active       Triggered       Started       Dropped       Image: Started       Image: Started       Dropped       Image: Started       Name       Reload       Cl         100452       OFDM CP       Search       0       9       9       0       Name       Description			Morse Morse			STALIAG ANAG 1285/148					TANAG 4285/443 (PSK) STANAG 285/4431 (PSK)			
ID Name Type Active Triggered Started Dropped 100452 OFDM CP Search 0 9 9 0 0 Name Description	-	8.41		8.43 K2 W#55Mors						Double (				.51
100452 OFDM CP Search 0 9 9 0 Name Description	-1 ceiver active [I	8.41 F5K2	MolFs	K2 MFSMors	e i Mc7ch P	5K2A ST	ANAG 4285/4481 (S	TANAG 4	285/4481 (PSK)		OFDM prse )Morse )AG 4285/4481 (P5			.51 [MHz]
Name Description	-1 eiver active [I	8.41 F5K2	MolFs	K2 MFSMors	e i Mc7ch P	5K2A ST	ANAG 4285/4481 (S	TANAG 4	285/4481 (PSK)		OFDM prse )Morse )AG 4285/4481 (P5			.51 [MHz]
1004E2 Vaice Search 0 4091 6 4042	-1 eiver active [I activity ID	8.41 <u>F5K2</u> Range: 8410.00 - 8510 Name	Mo <u>FS</u> D.00 kHz, Ban Type	K2 WF5Mors dwidth: 100 kHz] Active	e IWC7ch P Triggered	SK2A ST Started	ANAG 4285/4481 (5 문 × Dropped	TANAG 4:	285/4481 (PSK)		OFDM 5rse NMorse 1AG 4285/4481 (P5	K) 81 (PSK)	Morse	.51 [MH2]
	-1 eiver active [I activity ID 100452	8.41 F5K2: Range: 8410.00 - 8510 Name OFDM CP	MolFS D.00 kHz, Ban Type Search	K2: WF5Mors dwidth: 100 kHz] Active	e <u>WZrch P</u> Triggered 9	SK2A: ST Started 9	ANAG 4285/4481 (5 8 × Dropped 0	Missio	285/4481 (PSK) ns		OFDM prise MMorse )AG 4285/4481 (P5	K) <u>81 (PSK)</u> Re	Morse	.51 [MH2]
	-1 teiver active [l activity ID 100452 100453	8.41 F5K2 Range: 8410.00 - 8510 Name OFDM CP Voice	More D.OO kHz, Ban Type Search Search	K23 WF5Mors dwidth: 100 kHz] Active 0 0	e <u>N/27ch P</u> Triggered 9 4081	Started 9 6	ANAG 4285/4481 (5 6 × Dropped 0 4042	TANAG 4: Missio	285/4481 (PSK) ns		OFDM prise MMorse )AG 4285/4481 (P5	K) <u>81 (PSK)</u> Re	Morse	.51 [MHz]
100435 nign Prio Search U 350 344 6	-1: ceiver active [l activity ID 100452 100453 100454	8.41 <u>F5K2</u> Range: 8410.00 - 8510 Name OFDM CP Voice data	Type Search Search Search Search	K23 WF5HMors dwidth: 100 kHz Active 0 0 4	e <u>M/7ch P</u> Triggered 9 4081 4480	Started 9 6 734	ANAG 4285/4481 (5 Dropped 0 4042 3620	TANAG 4: Missio	285/4481 (PSK) ns Name HF TETRAPOL		OFDM prise MMorse )AG 4285/4481 (P5	K) <u>81 (PSK)</u> Re	Morse	.51
	-1 sceiver active [I k activity ID	8.41 F5K2 Range: 8410.00 - 8510 Name OFDM CP Voice	More D.OO kHz, Ban Type Search Search	K23 WF5Mors dwidth: 100 kHz] Active 0 0	e <u>N/27ch P</u> Triggered 9 4081	Started 9 6	ANAG 4285/4481 (5 6 × Dropped 0 4042	TANAG 4: Missio	285/4481 (PSK) ns Name HF TETRAPOL		OFDM prise MMorse )AG 4285/4481 (P5	K) <u>81 (PSK)</u> Re	Morse	.51 [MHz]

PROCITEC go2MONITOR displays a 100 kHz wide sonagram between 8410 and 8510 kHz and continuously classifies all emissions in realtime

All those fascinating digital data signals visible here in the sonagram are perfectly identified and listed in our latest publications!

## PACTOR-2-FEC scan

#### Summary

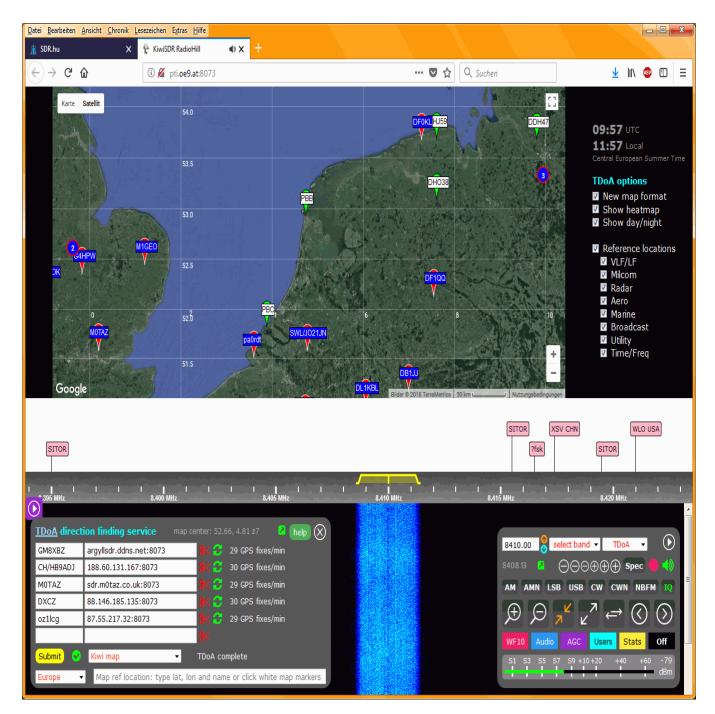
Task overview

General Type: Wideband Signal Search with Live Processi	Actions Live processing: Narrowband channel configuration: default Signal processing duration: 30 s Use modem list from trigger: Yes Using channel type: All channels Allow fast triggering from classification results						
Name: PACTOR-2-FEC scan Description: Priority: Normal							
Enabled: Yes	Ø Setti	ings					
Activation Time: No activation criteria	Gene	ral	Result Storage				
<b>Region:</b> 0 regions defined	⊡ De	Delete results automatically					
Signal Input: Receiver, Stream or File Input		velete non-archived results after: 120					
Frequencies: 1 frequencies defined PrequencyRange_1, 4.0000 MHz - 25.0000 MH	Iz, Search						days
Start Trigger		Miss	ion Details				
Modem: PACTOR II FEC Modem trigger type: Trigger if not excluded			me:		2-FEC scan		
Energy:			e production channels in e GUI perspective:	Realtime	mode		~
snr: >10 Bandwidth from: 0 Bandwidth to: 5000		Tas	s	AutoBack	kgroundProces kgroundProces Processing 1W	ssing2WB	
Triggering from wideband classfier emissions			0 🗟 🦉 🖗	<ul> <li>Autolival</li> </ul>	Processing2W		
			Nan	ne <u>JK</u>			
		PA	CTOR-2-FEC scan			Enabled	

Mission activation and task definition with the go2MONITOR decoder allows specified search for e.g. strange PACTOR-2-FEC signals monitored only recently in certain maritime bands Х

# 2.11 Direction-finding using the Kiwi-SDR system

The location of unidentified radio stations can now be measured with a precision of up to 5 - 10 kilometres. This Kiwi-SDR software feature is called Time Difference on Arrival (TDOA). Similar to the established GPS system, it measures the time-difference of signals received from at least three radio stations and, via cross correlation, calculates the geographical location on the Earth's surface by simple triangulation. (Note that GPS requires at least <u>four</u> satellites for calculating the <u>altitude</u> as well.) The following screenshots demonstrate the complete workflow.



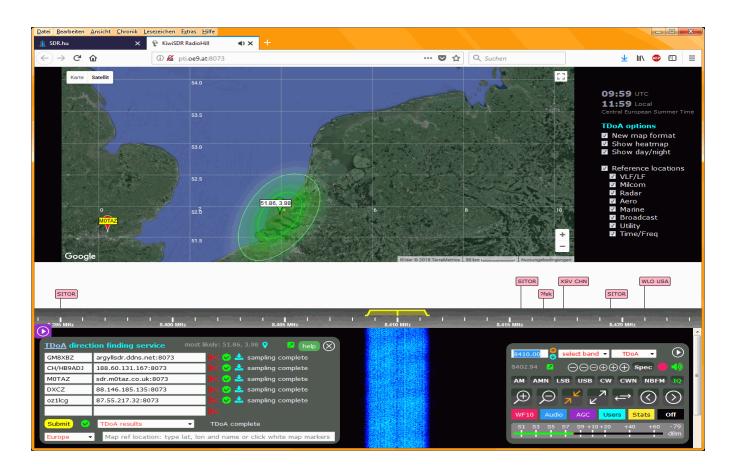
Select In-Phase-and-Quadrature (I/Q) demodulation Select at least three GPS-locked Kiwi-SDRs around the presumed location Each of these must provide good reception of the desired signal!



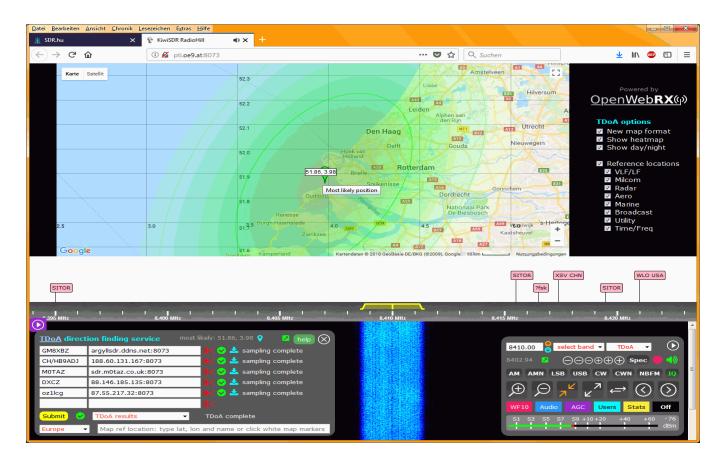
## The I/Q data stream sampling process takes around 30 seconds ...



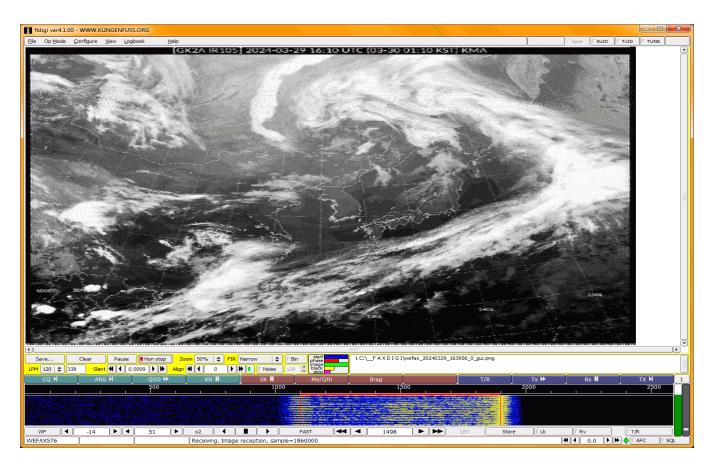
The TDOA calculation process takes 1-2 minutes ...



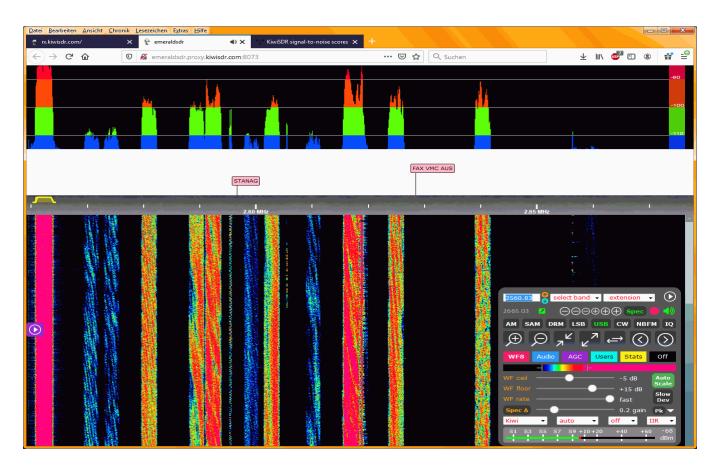
### The possible location is shown on the map ...



... and identified as the Dutch Navy on Goeree Island, Netherlands!



9165.0 kHz Soul Meteo, South Korea • Satellite image



2615 ± 50 kHz • many STANAG 4285 signals on a Kiwi-SDR ©