

WINMOR

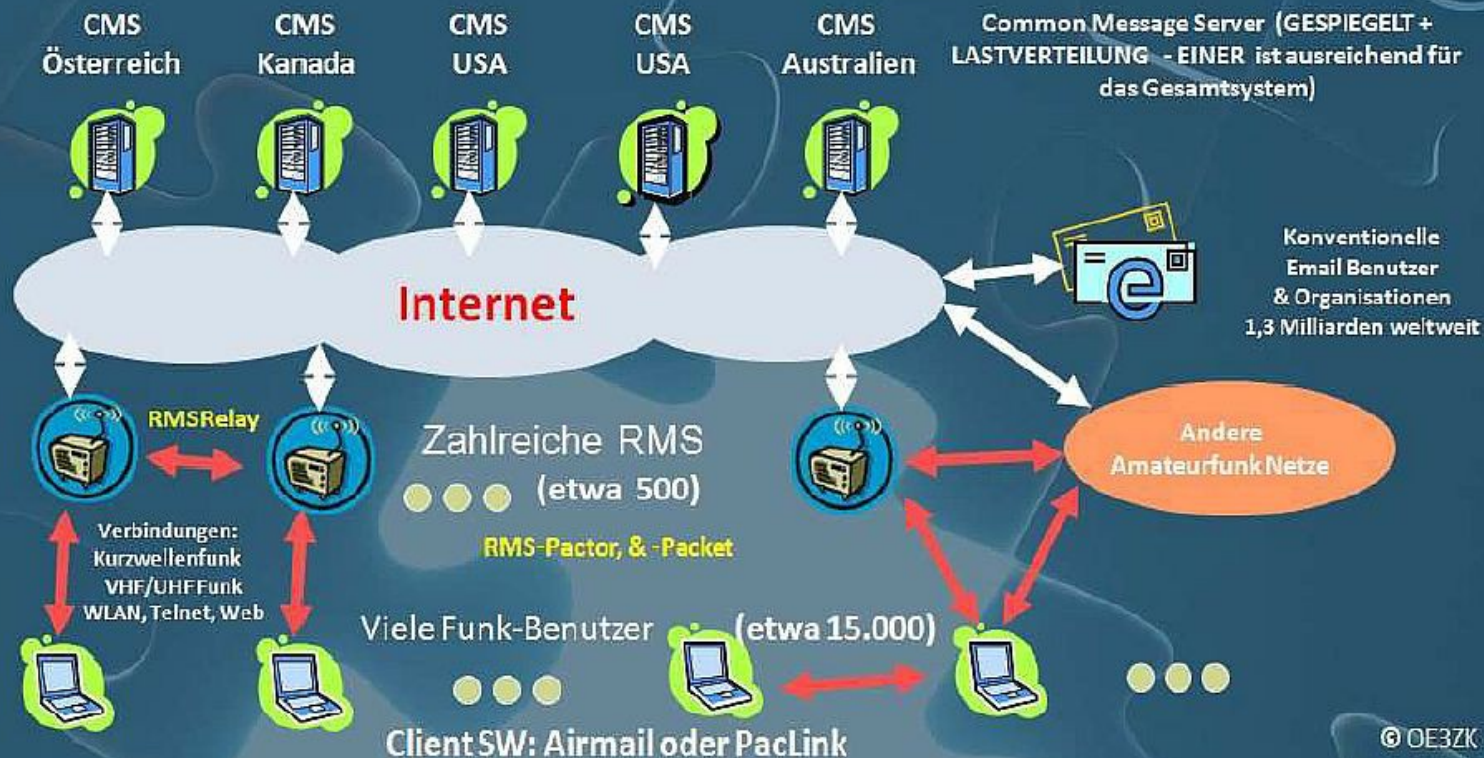
WINlink Message Over Radio

Felix Meyer HB9ABX Nov. 2012

WINLINK WL2K



Winlink 2000 Systemübersicht



Access to Winlink

WINLINK USER SET-UP



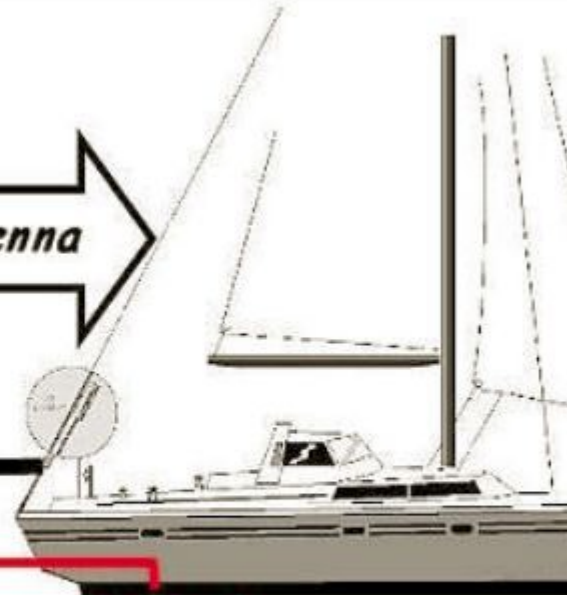
Pactor-3 PTC-IIpro controller



HF/USB transceiver + Antenna tuner



Antenna



Ground

Pactor / WINMOR

- Error free through ARQ with FEC and CRC
- Pactor 1 – 4 (1989, 1993, 2004, 2011)
- WINMOR 500 / 1600 (2009 Beta, 2010)
- Pactor Controller USD 1148 to USD 1849
- Winmor Software **free** (\$ 39 free contribution)
- Winmor Interface USD 25 to USD 150
- Winmor timing not critical
- **Performance Winmor** between Pactor 2 und Pactor 3

The DR-7800 has been optimized for use with the new high-end data transmission mode PACTOR-4. This offers unexcelled fast and robust data links via shortwave; E-mail almost like at home – from any point on earth. The DR-7800 is software compatible to the PTC-II series so that existing PACTOR software (AirMail, RMS Express, Alpha etc) can continue to be used. The elegant design, and the excellently readable and informative OLED display, as well as the easy upgrade possibilities (free updates!) round up the concept of the most modern short-wave modem from SCS, the creators of Pactor

Pactor TNC (USD 1849)



WINMOR TNC (free)

The screenshot displays the WINMOR Sound Card TNC software interface. The window title is "WINMOR Sound Card TNC". The menu bar includes "Settings", "Abort", "Help", "Select Test", and "Cycle OFF".

Connection State: The status is "KN6KB". Below this, there are three buttons: "ISS", "IDLE", and "IRS".

Transmit: The "Xmt Frame:" field is empty. Below it, there are three input fields: "Data bytes queued:" (000000), "Data bytes sent:" (0), and "Data bytes confirmed:" (000000).

Receive: The "Rcv Level:" is shown as a progress bar. The "Offset:" is set to -0.1 Hz, with a range from -200 to +200 Hz. The "Rcv Frame:" is "Long 15 Car QPSK Data" and "Bytes Received:" is 6464. Below this is a row of 15 plus signs: "+ + + + + + + + + + + + + + +".

Waterfall 2KHz: A waterfall plot showing frequency from 500 to 2500 Hz. A red vertical line is positioned at approximately 1250 Hz.

Decode Quality: A progress bar labeled "Decode Quality" from 0 to 100, showing a value of approximately 80. Below it is a 2x2 grid of four waterfall plots, each showing a diagonal signal.

3 Windows

INMOR Sound Card TNC Ver:1.4.3.0 Port:8500

Help Hide Send ID

Connection State

DISCONNECTED


TCP Capture OK

Transmit

0 Avg ACK Percentage 100

Xmt Frame:

Receive

Rcv Level: 

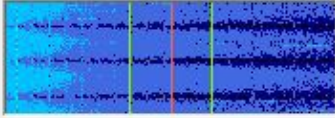
Remote Station Offset: 0 Hz

Rcv Frame:

Busy Detector

Channel Clear

Squelch: 5

Waterfall  Spectrum Disable

500 Waterfall 2KHz 2500 Constellation

Winmor Winlink 2000 Session - HB9ABX

Exit Setup Switch to Peer-to-Peer Session Channel Selection Show

IK0OXK-5 Center Freq. (kHz): 7045 Dial Freq. (kHz):

Favorites: DB0ZAV-5 @ 7048.9 (0) Select Add to favorites

Channel Free In: 0/0 Out: 0/0 BPM: 0/0 Disconnected

RMS Express 1.2.6.0 - HB9ABX

HB9ABX Files Message Attachments Move To: Saved Items Delete Open Session: Winmor WL2K Logs Help

Winmor WL2K session...

	Date/Time	Message ID	Size	Source	Sender	Recipient	Subject
	2012.11.23 10:22	TCF3SDCQQB10	1434	SMTP	SMTP:FELIX-AB...	HB9ABX	test
	2012.11.21 10:06	5UM427X2GQZL	326	SMTP	SMTP:FELIX-AB...	HB9ABX	von zu Hause
	2012.11.21 08:45	B38DMAKGR8Y0	949	DK3CW	DK3CW	HB9ABX	Re:Test erfolgreich
	2012.11.21 08:44	0CQ1Y886G83J	306	DK3CW	DK3CW	HB9ABX	ACK: Re:Test erfolgreich
	2012.11.21 08:30	10G5BE1QML03	807	DK3CW	DK3CW	HB9ABX	Re:test 1722h

Message ID: 4T10R6NL7A4X
Date: 2012.11.20 14:28
From: DK3CW
To: HB9ABX
Source: DK3CW
Subject: Test erfolgreich

Hallo Felix,

Modulation of Winmor: ASK FSK PSK

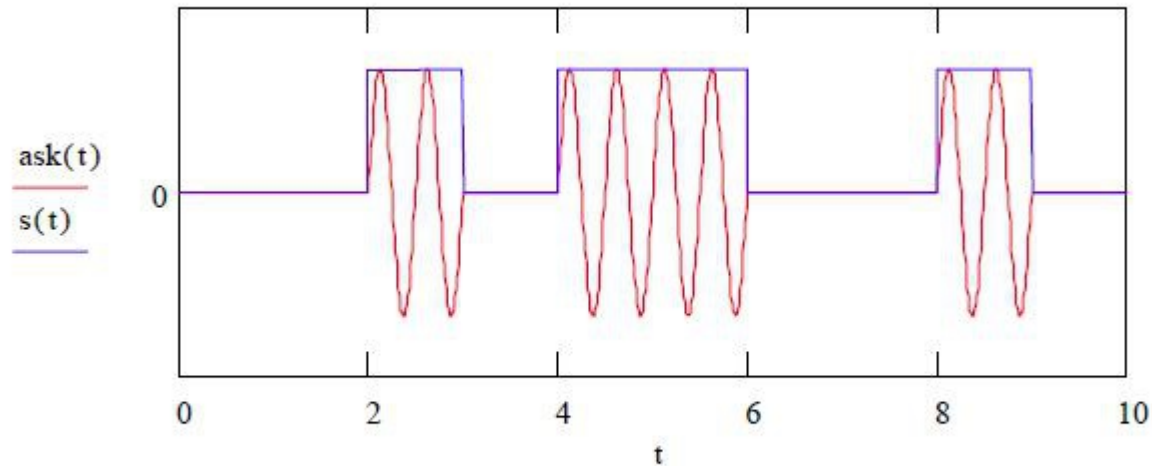


Figure 24 - ASK is definitely not a constant envelope modulation

FSK

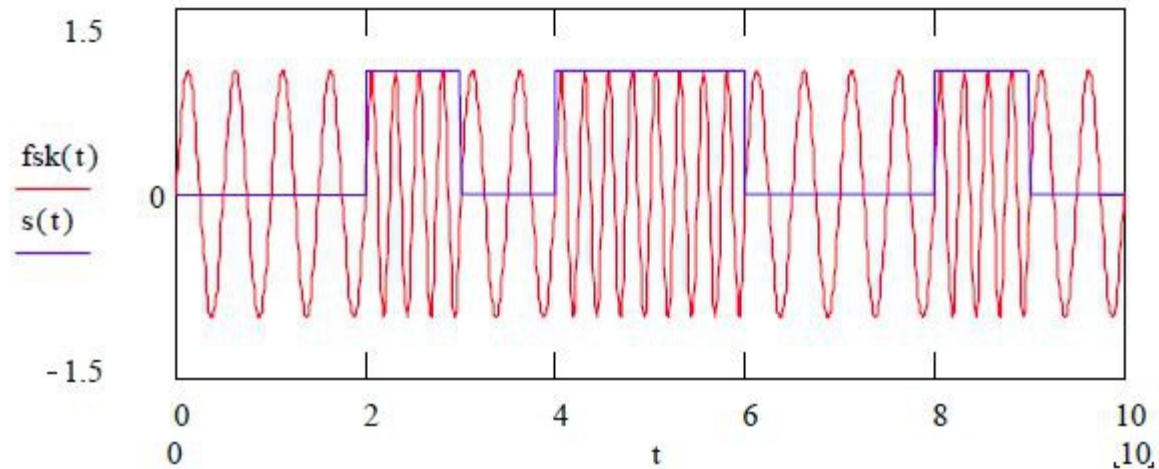
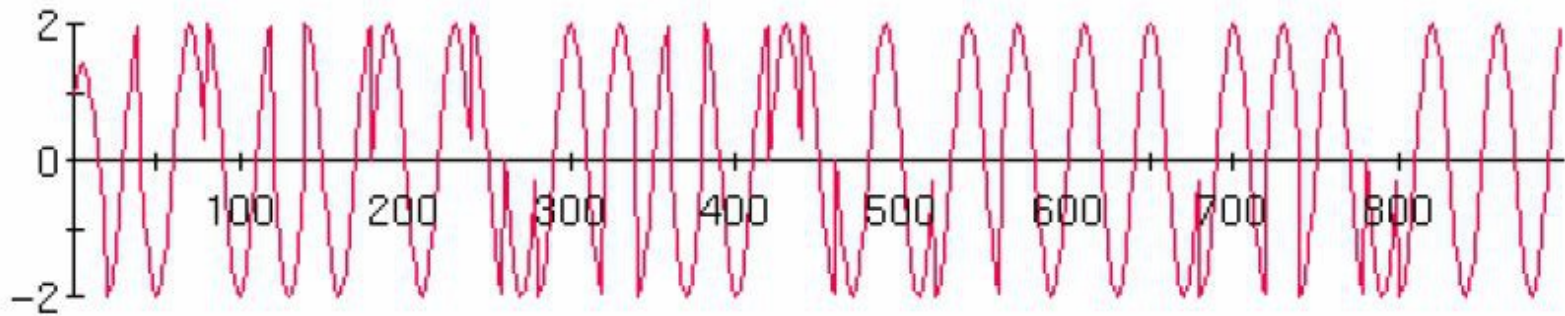
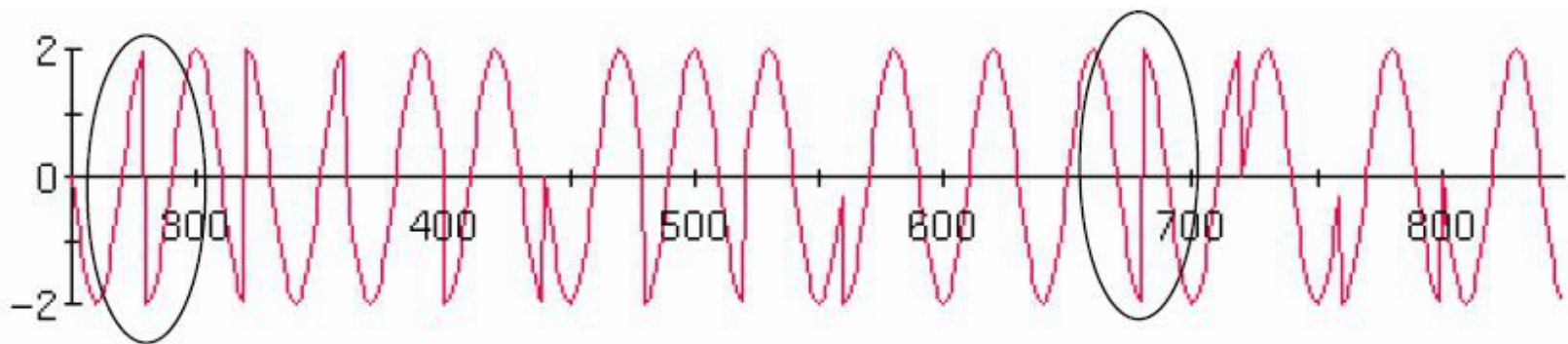


Figure 23 – FSK is definitely a constant envelope modulation.



(a) OQPSK – All phase shifts are 90° .



(b) QPSK - Note the 180° phase shift.

Figure 28 – The phase jumps at the symbol transition for OQPSK are smaller. (Note that the figures above are not of the same scale in time.)

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	
1	'WINMOR 94 Baud Mode Rate Worksheet 500, 1600 Hz BW									Revised: 12/21/2009		Rick Muething, KN6KB							
2																			
3		Info	Samp	Baud	# of	~BW	Raw	Ldr	Ovrhd	Payld	RS-FEC	Frame	Frame		Rx+	Cycle	-----	Net max	-----
4	Mode Description	bits	/sym		car	(Hz)	bps/Hz	(sym)	/Car	/Car	/Car	Length	Length	ACK	Tx+O	Length	Throughput		
5		/sym							(sym)	(sym)	(sym)	(sym)	(sec)	(sec)	(sec)	(sec)	(bits/sec)	(byt/min)	(wrds/min)
6	Connected Modes (ARQ)																		
7	8 Car 16PSK Prag TCM + RS	3	128	93.75	8	1600	1.41	29	24	288	72	413	4.405	0.555	0.3	5.260	1314	9856	3285
8	8 Car 8PSK Prag TCM + RS	2	128	93.75	8	1600	0.94	29	32	288	64	413	4.405	0.555	0.3	5.260	876	6570	2190
9	8 Car 4PSK Prag TCM + RS	1	128	93.75	8	1600	0.47	29	56	272	64	421	4.491	0.555	0.3	5.345	407	3053	1018
10	8 Car 4FSK +RS	2	256	46.88	8	1600	0.47	14	24	88	80	206	4.395	0.555	0.3	5.249	268	2012	671
11	2 Car 16PSK Prag TCM + RS	3	128	93.75	2	450	1.25	29	24	288	72	413	4.405	0.555	0.3	5.260	329	2464	821
12	2 Car 8PSK Prag TCM + RS	2	128	93.75	2	450	0.83	29	32	288	64	413	4.405	0.555	0.3	5.260	219	1643	548
13	2 Car 4PSK Prag TCM + RS	1	128	93.75	2	450	0.42	29	56	272	64	421	4.491	0.555	0.3	5.345	102	763	254
14	2 Car 4FSK +RS	2	256	46.88	2	450	0.42	14	24	88	80	206	4.395	0.555	0.3	5.249	67	503	168
15	Short 2 Car 4FSK +RS	2	256	46.88	2	450	0.42	14	24	24	16	78	1.664	0.555	0.3	2.519	38	286	95
16	2 Car Connect Request (4FSK) +RS	2	256	46.88	2	450	0.42	14	0	28	28	70	1.493						
17	2 Car Coded Control 4FSK + RS	2	256	46.88	2	450	0.42	14	2	2	8	26	0.555						
18	2 Car ACK 4FSK +RS	2	256	46.88	2	450	0.42	14	2	2	8	26	0.555						
19	FEC Modes (Unproto)																		
20	8 Car 4FSK +RS FEC Unproto	2	256	46.88	8	1600	0.47	14	24	88	80	206	4.395	0.000	0	4.395	160	601	100
21	2 Car 4FSK +RS FEC Unproto	2	256	46.88	2	450	0.42	14	24	88	80	206	4.395	0.000	0	4.395	40	150	25
22																			
23	Leader Preamble (93.75B symbols)	20																	
24	Leader extension (93.75B symbols 0-16)	0	See Note 1																
25	Calculated Leader extension (ms)	0																	
26																			
27	Notes:	1) Leader extension up to 16 symbols (171 ms) may be used for slow switchover Transceivers or VOX operated PTT.																	
28		Nominal VOX extension is 12 symbols or 128 ms.																	
29		2) The above modes yield the following speed ranges depending on session bandwidth:																	
30		1600 Hz BW Sessions: 8x16PSK, 8x8PSK, 8x4PSK, 8x4FSK, 2x4PSK, 2x4FSK ~ 19.6:1 speed range																	
31		500 Hz BW Sessions: 2x16PSK, 2x8PSK, 2x4PSK, 2x4FSK ~ 4.9:1 speed range																	
32		3) Session BW is set by Server (answering) station using one of 2 coded ACK frames (500, or 1600 Hz)																	
33		4) All PSK modes use pragmatic Trellis Code Modulation (one redundancy bit/symbol) and use the standard R=1/2, K=7																	
34		(NASA Voyager) Viterbi Encoder/Decoder based on Phil Karns Code.																	
35		5) Rx + Tx + O refers to the receive to transmit, transmit to receive plus software overhead delays and is typical for modern hardware.																	
36		The protocol actually measures the latency due to RX>TX switchover, sound card and CPU processing latency.																	
37		6) Word per minute calculation based on average word of 5 char + space and a 50% compression ratio (typical using B2 compression on mid to large messages). Short messages will be less. FEC unproto based on 2x repeat, 5 char+space/word, no compression.																	
38		7) Ovrhd per carrier includes: Session ID, PSN, ByteCount, SumCheck and 8 symbols for Viterbi Decoder flushing on PSK modes																	
39																			

(details of frame construction for all modes, all bandwidths)

Appendix A: WINMOR Mode Rate Worksheet

smaller. (Note that the figures above are not of the same scale in time.)

WINMOR 8PSK Pragmatic Trellis Code Modulation (PTCM)

Encoding

Frame Data: (Payload + overhead)

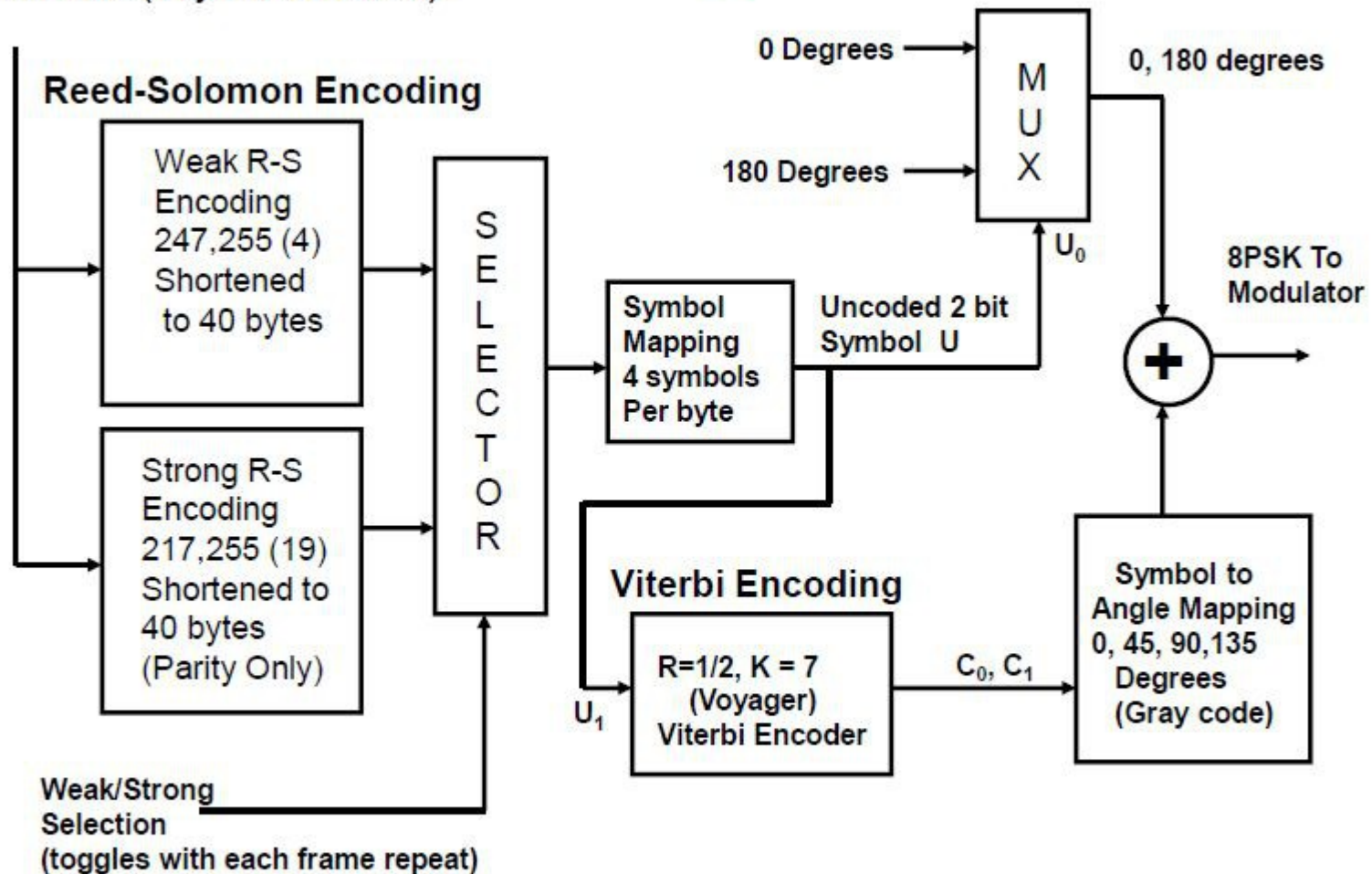


Figure 1 WINMOR 8PSK PTCM Encoder

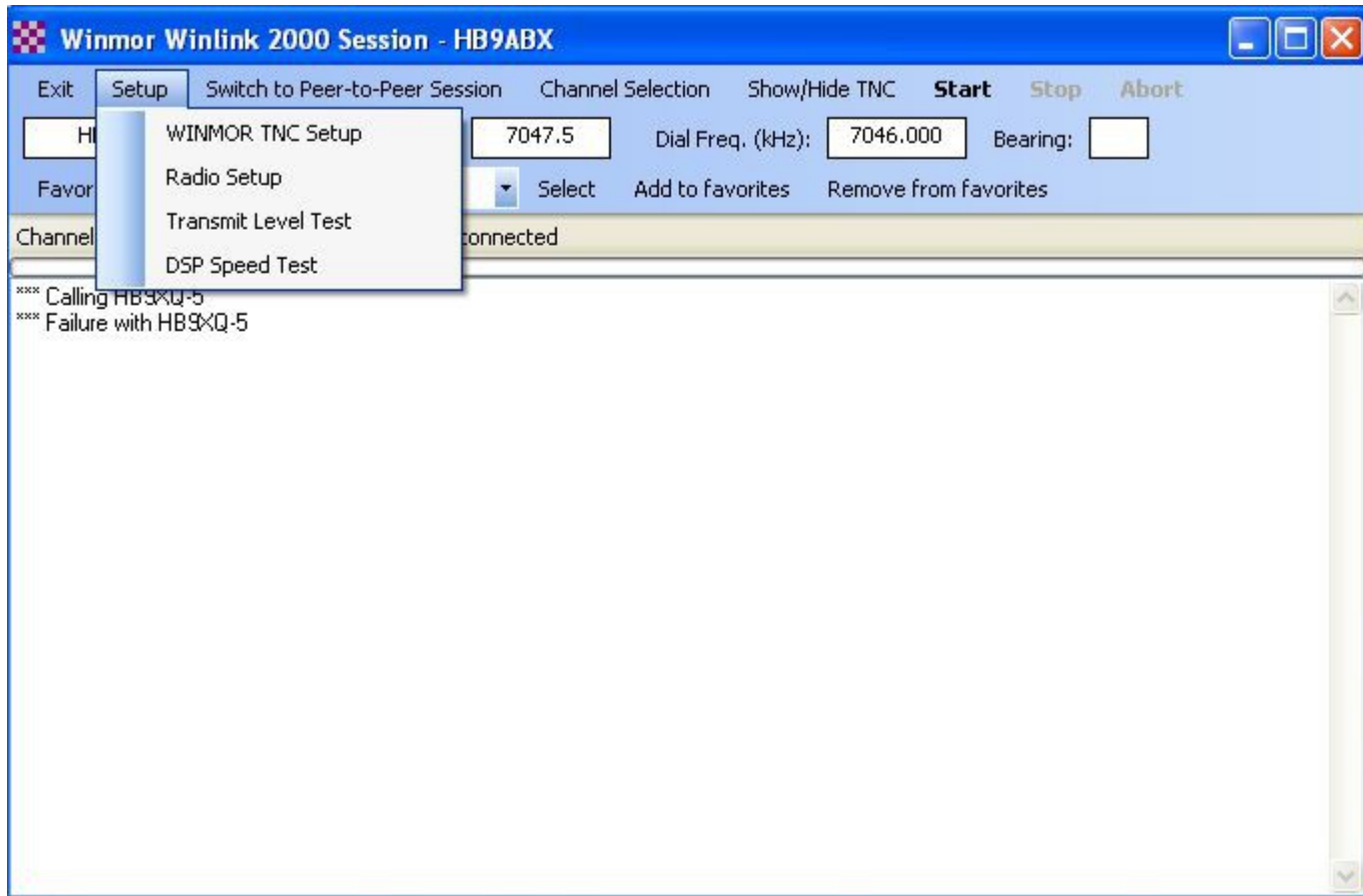
How do I obtain WINMOR ?

- WINMOR is part of RMS Express Software
- Download at: www.winlink.org
- there: Software – Usersoftware click „Winlink FTP site“
- and there: User Programs,
- click „RMS_Express_Setup... .zip“ und save
- Unzip the ZIP into an empty directory
- and click: RMS Express Setup.msi
- install into default directory


First run of RMS Express

- Start „RMS Express.exe“
- - Enter your **Call**
- - Enter your **grid square**
- - click UPDATE
- Behind „Open Session“ select „Winmor WL2K“
- - click „Open Session“
- - Winmor Capture Device: **select Soundcard**
- - Playback Device: **select Soundcard**
- - Inbound Session Bandwidth: select **500** or **1600**
- - click UPDATE


Winmor Session Setup




Winmor TNC Setup


WINMOR Setup 



Identify with Morse Code

WINMOR Capture Device: 

WINMOR Playback Device: 

Virtual TNC host address/name:

Virtual TNC Command Port:  Data Port:

Inbound Session Bandwidth (Hz) :  Drive Level: 

WINMOR Radio Setup



The image shows a Windows-style dialog box titled "Winmor WL2K Settings". The dialog is organized into three main sections: "Radio Selection", "Radio Control Port", and "PTT Port (Optional)".

Radio Selection: This section contains a "Select Radio Model" dropdown menu set to "Manual", an "Antenna Selection" dropdown menu set to "Default", an "Icom Address" text box containing "00", and three radio buttons: "USB" (selected), "USB Digital", and "FM". There is also a "Use Internal Tuner" checkbox which is unchecked.

Radio Control Port: This section contains a "Serial Port to Use" dropdown menu set to "None", a "Baud" dropdown menu set to "9600", and three checkboxes: "Enable RTS" (checked), "Enable DTR" (checked), and "TTL" (unchecked).

PTT Port (Optional): This section contains a "Serial Port to Use" dropdown menu set to "External", a "Baud" dropdown menu set to "9600", and two checkboxes: "Enable RTS" (checked) and "Enable DTR" (checked).

At the bottom of the dialog are two buttons: "Update" and "Close".

Now we are ready for TX/RX test

Adjust **Transmit Level Test** to obtain output power of 45% of Peak Power (PEP). Adjustment is done with **TX** potentiometer of the Interface.
(just no ALC indication)

Set **Receive Level** with **RX** potentiometer, that Receive level bar is about 50% to 80%
(between blue and red).

Important hints for operation

- No RF in Shack
- - Use current balun at antenna feed point and coax cable at transceiver output
- - Keep low SWR (1 : 1)
- Soundcard: deactivate all sound effects (soundcard input and output)
- Unplug microphone when feeding ACC on TCVR
- Prevent ALC clipping
- Monitor modulation in control receiver
- Use always USB for Winmor
- Noise Blanker = OFF, AGC FAST, Compressor OFF
- Dial Frequency = Center Frequency – 1.5 KHz

HF access in Winmor to Winlink (November 2012) valid for Switzerland

- HB9XQ-5 7047.5 all **center**
 - HB9XQ-5 3619
 - DH2LC 7047.5
 - IK0OXX-5 7045 (has always best signal)
 - LA3F 7052
 - OH4KA-5 7046.5
 - OE5XIR-5 3605.5
- Actual see: winlink.org – Reports – RMS Channels - Winmor

Email address in WINLINK

At first connect zu Winlink each user obtains an own Email Address under which he receives and sends email messages.

Email = own call@winlink.org

Therefore my email address is: hb9abx@winlink.org

Others send you email using this email address.

IMPORTANT: The SUBJECT in email must begin with **//WL2K**

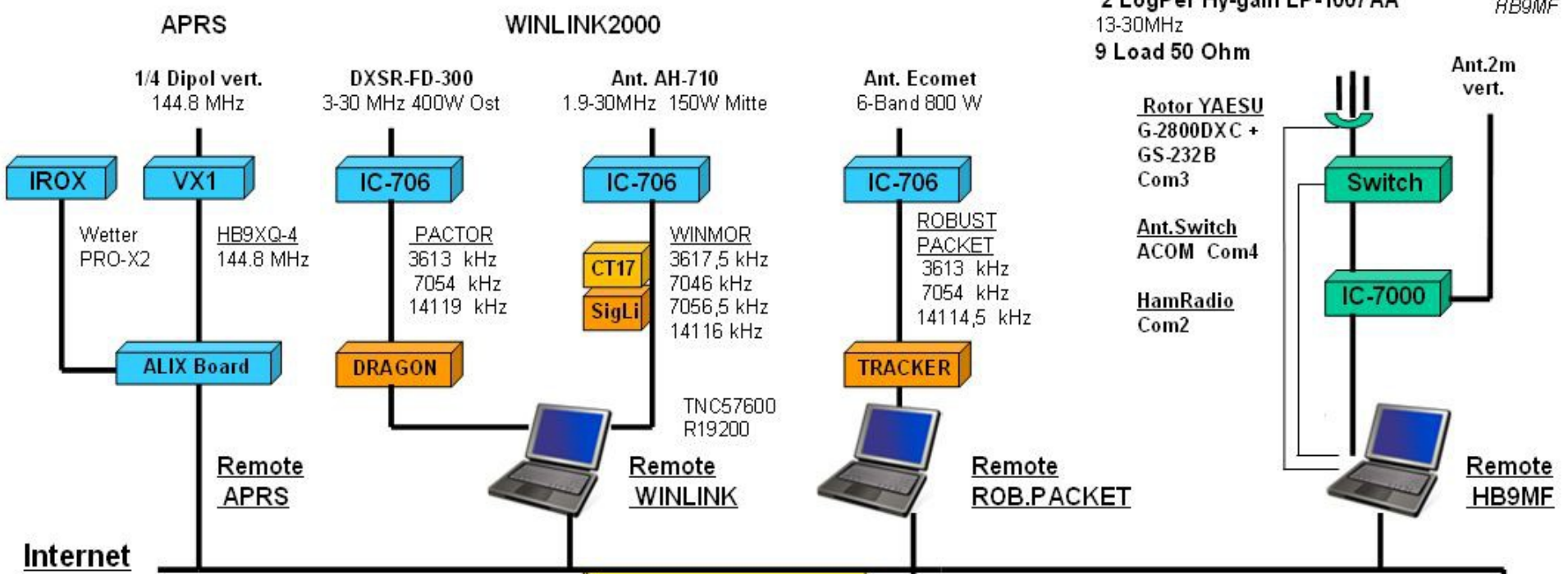
This serves as spam protection. Mail without this header is treated as spam!

LANDSTUHL/NEUENEGG JN36PV
 46 54'01"N 7 19'26"E
 46,9004 N 7,3239 S
 3176 Neuenegg, Natershus 360

HB9XQ

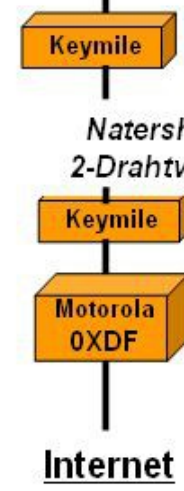
1 Ant.CCBD 3
 (3-30MHz 400/600W)
2 LogPer Hy-gain LP-1007 AA
 13-30MHz
9 Load 50 Ohm

BWD-90
 1,8-30MHz
 700m Koax
 HB9MF



Internet
 WLAN (400m) in Reserve
 LAN Netzwerk

SMS 220V-Netzüberwachung



Funkanlagen auf HB9XQ

HB9XQ Lageplan



Antennenanlagen



Antenne Log.Per.



Natershus 2-Drahtver

Keymile

Motorola 0XDF

Internet

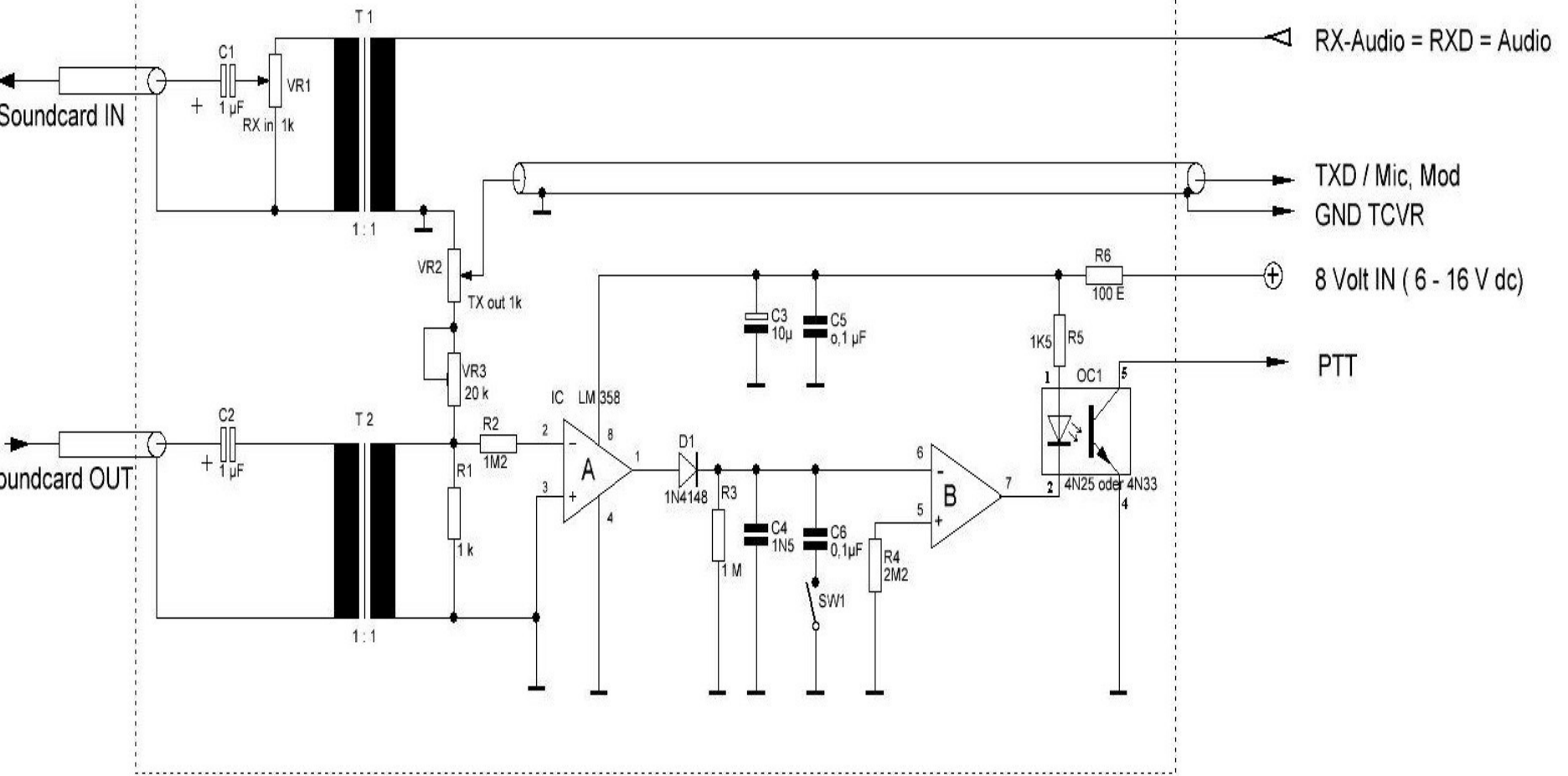
Interfaces to buy:

- Signal-Link USB abt 100 USD
- RigBlaster Advantage (WIMO) 215 Euro
- RigExpert Standard 255 Euro
- Fox Delta SC-2 Interface **Kit** 36 USD (USA)
requires Serial Port or USB-Converter

You need an interface with **RX** and **TX** potentiometer!

Soundcard Interface HB9ABX

- **Design objectives:**
 - - Clear adjustment of the signal
 - - Simple and reliable circuit
 - - Easy cabling , non critical
 - - Wide supply range 6 to 16 Volt, abt 5 mA, from TCVR
 - - For all Digital Modes
 - (PTT from audio) fast - slow
 - - low cost



RX-Audio = RXD = Audio

TXD / Mic, Mod
GND TCVR

8 Volt IN (6 - 16 V dc)

PTT

SW 1 / offen = Schnell / zu = Langsam

Material Lieferanten: für T1 & T2

- Digikey.com 237-1121-ND Fr. 1.90
- Mouser.com 42TL016-RC Fr. 2.20
- Farnell.com 1130841 Fr. 7.80
- Conrad.ch 516686 Fr. 8.45

für's Gehäuse:
pollin.de Kunststoffgehäuse 460003 Euro 3.--

Änderungen		Datum	Name	Bezeichnung: SOUNDKARTEN - INTERFACE HB 9 ABX	Blattzahl:
Datum	Name	gez.: 15.11.2012	F.Meyer		
		gepr.:			Blatt-Nr.:
				Zeichnungs-Nr.:	

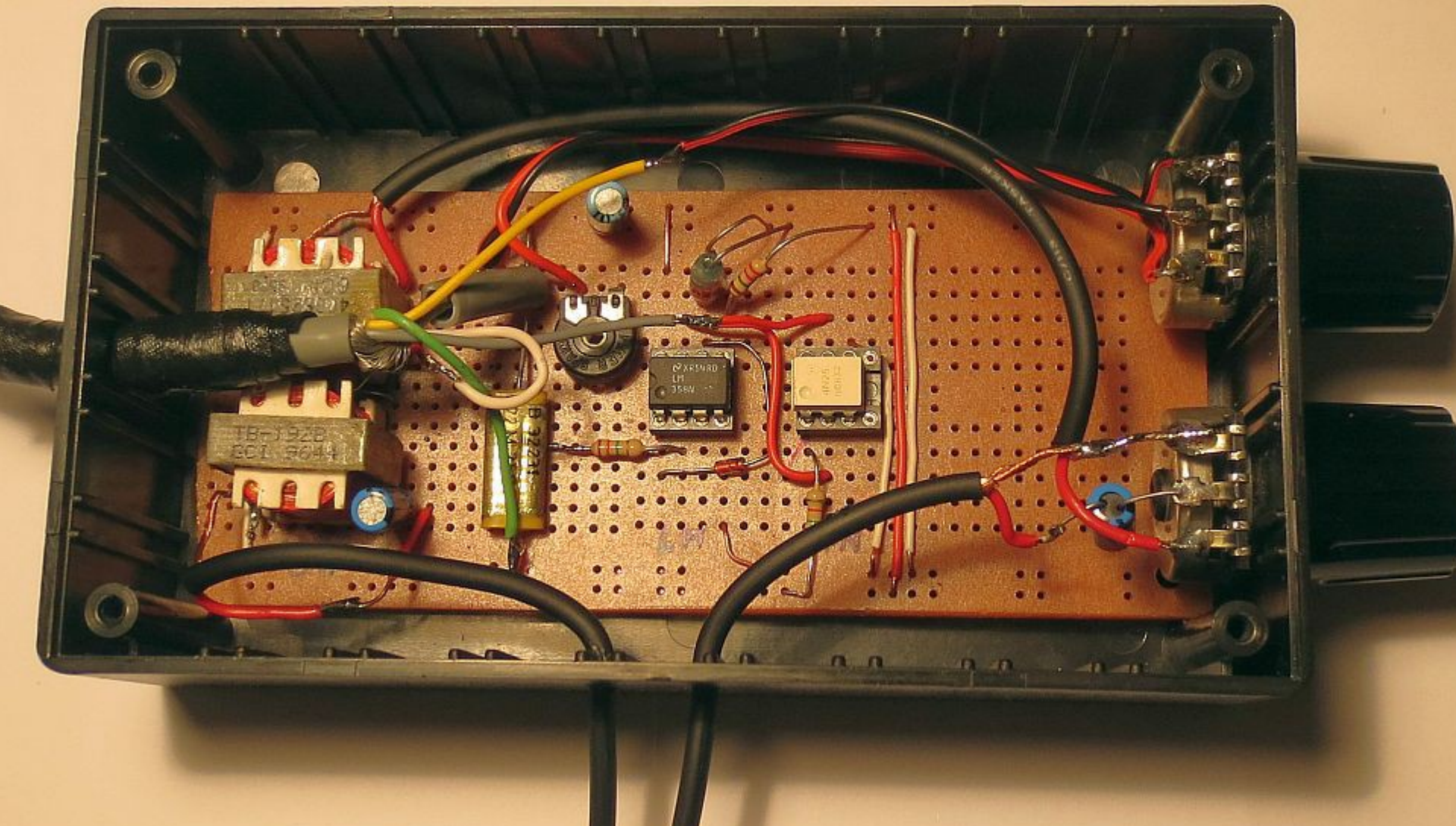
Parts list

T1, T2 = Audio-Transformer 600 Ohm to 600 Ohm, Digikey.com 237-1121-ND (2.20 USD)

- VR1, VR2 = Potentiometer **RX** and **TX**, each one 1 K
- VR3 = Trimmer 20 K, setting to allow easy range of TX level adjustment
- C1, C2 = 1 uF
- C3 = 10 uF
- C4 = 1.5 nF
- C5, C6 = 0.1 uF
- D1 = 1N4148
- R1 = 1 K
- R2 = 1.2 M
- R3 = 1 M
- R4 = 2.2 M
- R5 = 1.5 K
- R6 = 100 Ohm
- IC = LM358
- OC1 = 4N25 or 4N33
- SW1 = Switch slow / fast
- case = pollin.de 460003 (3 Euro)

Important: Ground (shield) of soundcard lines may not be connected
to ground of interface circuit!

Interface inside



**Soundcard
Interface
Digital-Modes**

HB9ABX

RX

TX



Operational experience with WINMOR

In the car on 80m and 40m and 20m

1m long Roomcap antenna on the roof of the car

100W Transceiver TS-50

Notebook (Packard-Bell Easynote TE)

HB9ABX Interface

During all the day **always 3 to 4 HF gateways accessible (in seconds)**

Program: RMS-Express with Winmor

Winmor sound: <http://home.dtc.ch/hb9abx/Winmor-sound.html>

And here you can see the mobile station:

- <http://home.dtc.ch/hb9abx/ant5dez12e.htm>

= **perfect alternative to Pactor !**