IK3VIG Giuseppe Campana

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Differenza tra Radio Gestita e Radio Definita dal software

- Gestita
  - Controllo da PC di hardware definito (un pannello frontale virtuale)
- Definita
  - Demodulazione, Modulazione e il controllo dell'hardware per mezzo del software, quindi le caratteristiche della radio in costante evoluzione

Massimizzare il Software….
Minimizzare l' Hardware

- Continua evoluzione del Sistema
- Performance Non Possibili in Analogico
- Meno Analogico –> Più Linearità
- Radio per qualsiasi Modo o Stile operativo
- Open Source GPL –> Molti sviluppatori

SDR-1000 è il primo e unico

OPEN SOURCE

Software Defined Transceiver

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“Un SDR-1000 vecchio non esiste. Abbiamo una radio nuova ad ogni nuova versione del software.”

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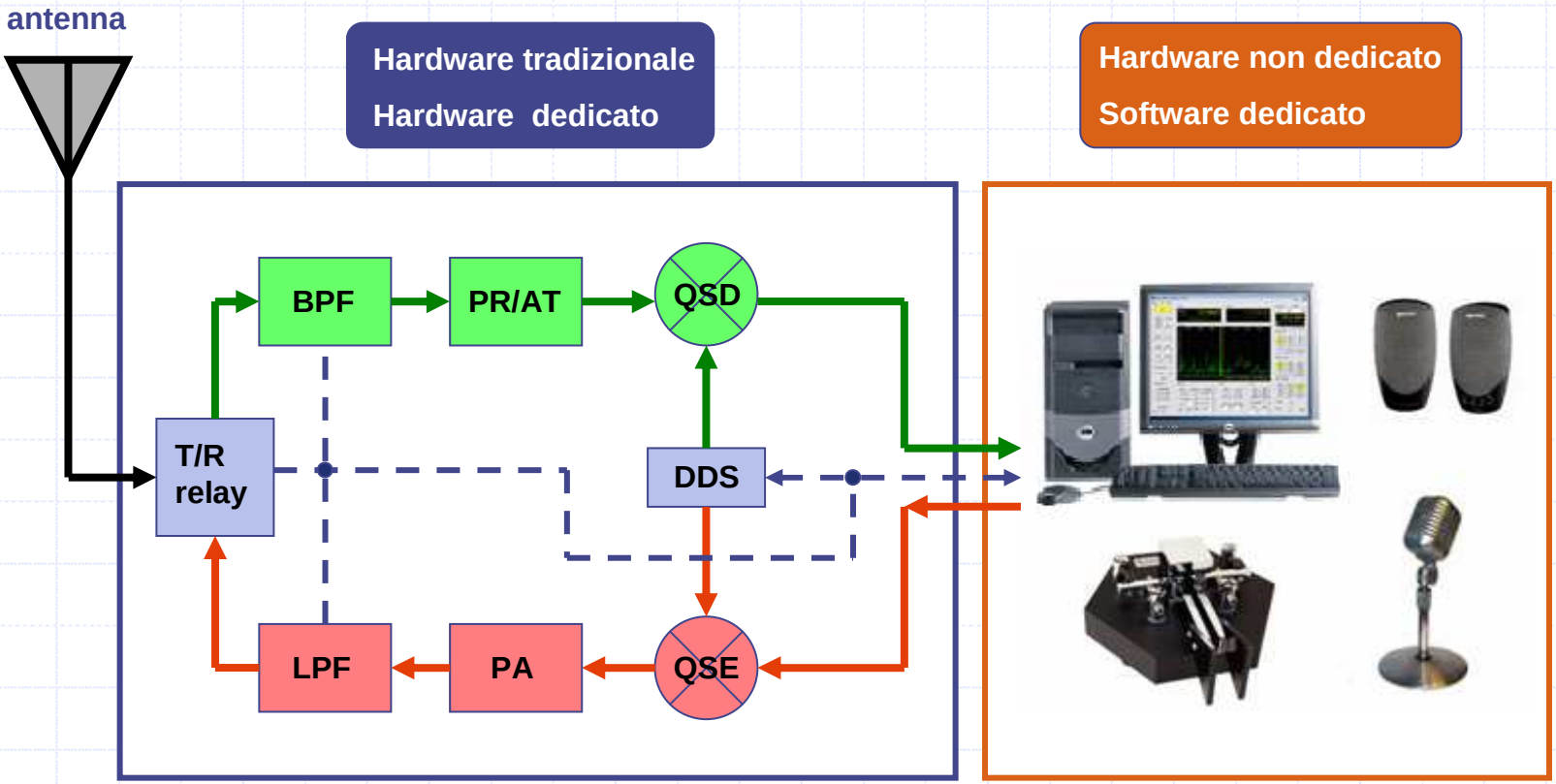
Composizione di un transceiver SOFTWARE DEFINED RADIO



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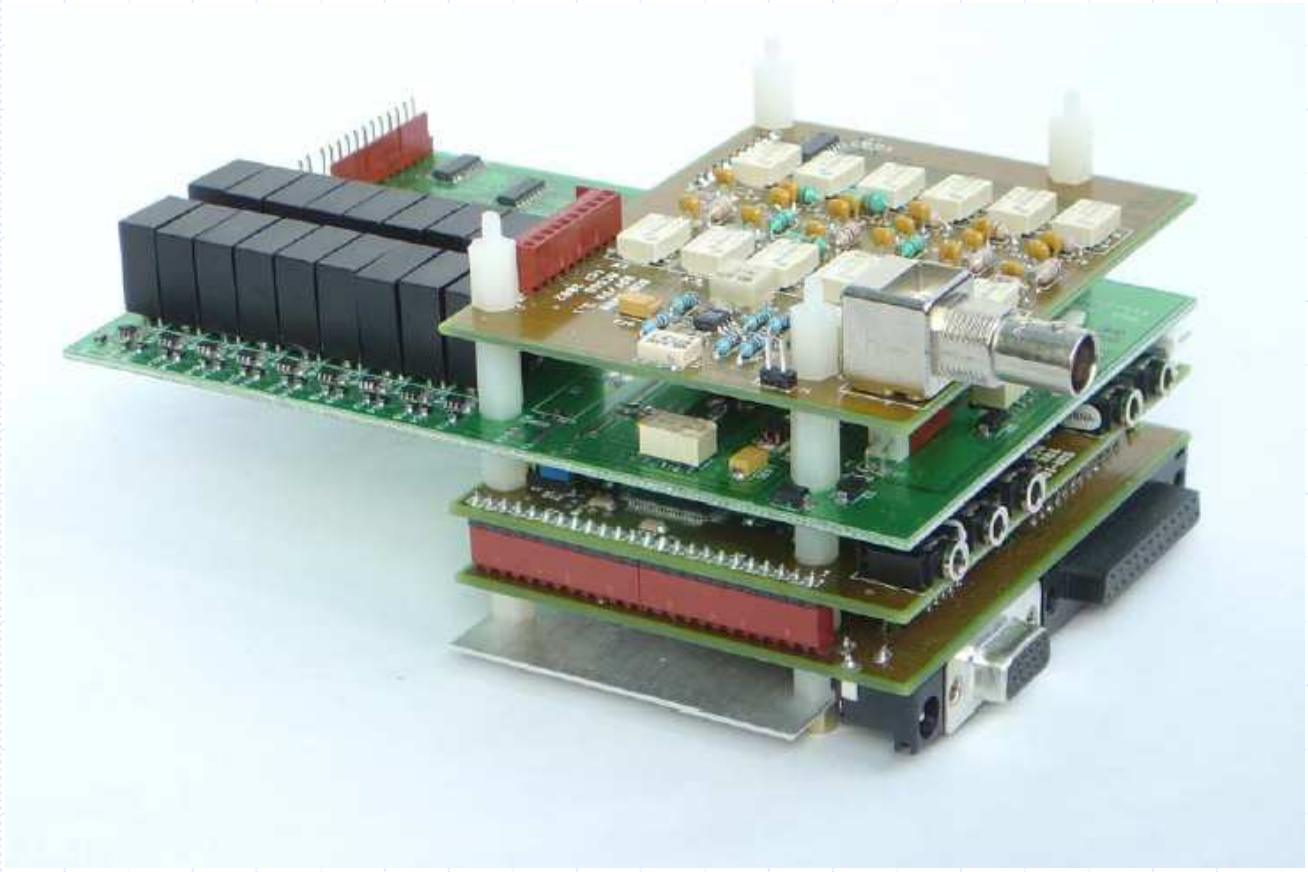
SDR-1000 Modulo RF



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SDR-1000 caratteristiche gen.

- 11KHz – 65MHz a copertura continua
- AM SAM FM SSB DSB CWL/U DRM*
- 160M – 6M TX (2M XVTR IF Opt)
- Stack memorie di banda
- TX 100W HF opzionale, 500mW 6m
- Accordatore automatico opzionale

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Il ricevitore dell'SDR-1000

- 98dB 2KHz Two Tone Dynamic Range!
- 27dBm IP3 2Khz Two Tone Spacing
- Filtri a fattore di forma 1.05:1 @ 500Hz
- Ricevitore secondario (nello spettro)
- N/Blanker a sottrazione di impulsi
- Autonotch – NR – PBT – Spur Reducer
- Sintonia "Drag or Point and Click"

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Il test dell'ARRL

I risultati del test pubblicato su QST 10/2005 sono stati ottenuti con un SDR-1000 collegato ad una scheda audio supportata dalla FlexRadio Systems, in questo caso una **M-Audio Delta-44** installata su un PC Pentium 4 / 3.0Ghz.

Le caratteristiche della radio sono direttamente proporzionali all'hardware del PC, e soprattutto alla qualita AD / DA della scheda audio

FlexRadio SDR-1000

Manufacturer's Specifications	Measured in the ARRL Lab
Frequency coverage: Receive, 0.01-65 MHz; transmit, 1.8-2, 3.5-4, 5.33-5.4, 7-7.3, 10.1-10.15, 14-14.35, 18.068-18.168, 21-21.45, 24.89-24.99, 28-29.7, 50-54 MHz.[1]	Receive and transmit, as specified.
Power requirement: Receive, 1.0 A max; transmit, 25 A (max).	Receive, 0.9 A; transmit, 15 A. Tested at 13.8 V.
Modes of operation: SSB, CW, AM, FM.	As specified.

Receiver	Receiver Dynamic Testing
CW sensitivity, 500 Hz bandwidth, 26 dB INA setting: –141 dBm.[3]	Noise floor (mds), 500 Hz filter: *Preamp* *off* *low* *med* *high*[2] 1.0 MHz **–99** **–110** **–122** **–132 dBm** 3.5 MHz **–97** **–109** **–122** **–132 dBm** 14 MHz **–98** **–109** **–121** **–130 dBm**
AM sensitivity, 10 dB S/N: Not specified.	1 kHz tone, 30% modulation: *Preamp* *off* *low* *med* *high*[2] 1.0 MHz **51** **18** **4.4** **1.5 µV** 3.8 MHz **65** **20** **4.8** **1.7 µV**
FM sensitivity, 12 dB SINAD: Not specified.	For 12 dB SINAD: *Preamp* *off* *low* *med* *high* 29 MHz **31** **9.6** **3.2** **1.0 µV**
Blocking dynamic range: Not specified.	500 Hz filter: Spacing 20 kHz (5 and 2 kHz data identical) *Preamp* *off* *low* *med* *high* 3.5 MHz **105** **105** **111**[6] **111**[6] **dB** 14 MHz **108** **109** **111**[6] **110**[6] **dB**
Two-tone, third-order IMD dynamic range 500 Hz filter, 90 dB.	Spacing 20 kHz (5 and 2 kHz identical) *Preamp* *off* *low* *med* *high* 3.5 MHz **81** **83** **97** **96 dB** 14 MHz **86** **85** **99** **98 dB**
Third-order intercept: Not specified.	Spacing 20 kHz (5 and 2 kHz identical) *Preamp* *off* *low* *med* *high* 3.5 MHz **+24** **+14** **+24** **+15 dBm** 14 MHz **+31** **+20** **+26** **+17 dBm**
Second-order intercept: Not specified.	*Preamp* *off* *low* *med* *high* **+70** **+73** **+75** **+74 dBm**
FM adjacent channel rejection: Not specified.	20 kHz channel spacing, preamp high: 29 MHz, **36 dB**.
FM two-tone, third-order IMD dynamic range: Not specified.	20 kHz channel spacing, preamp high: 29 MHz, 37 dB.

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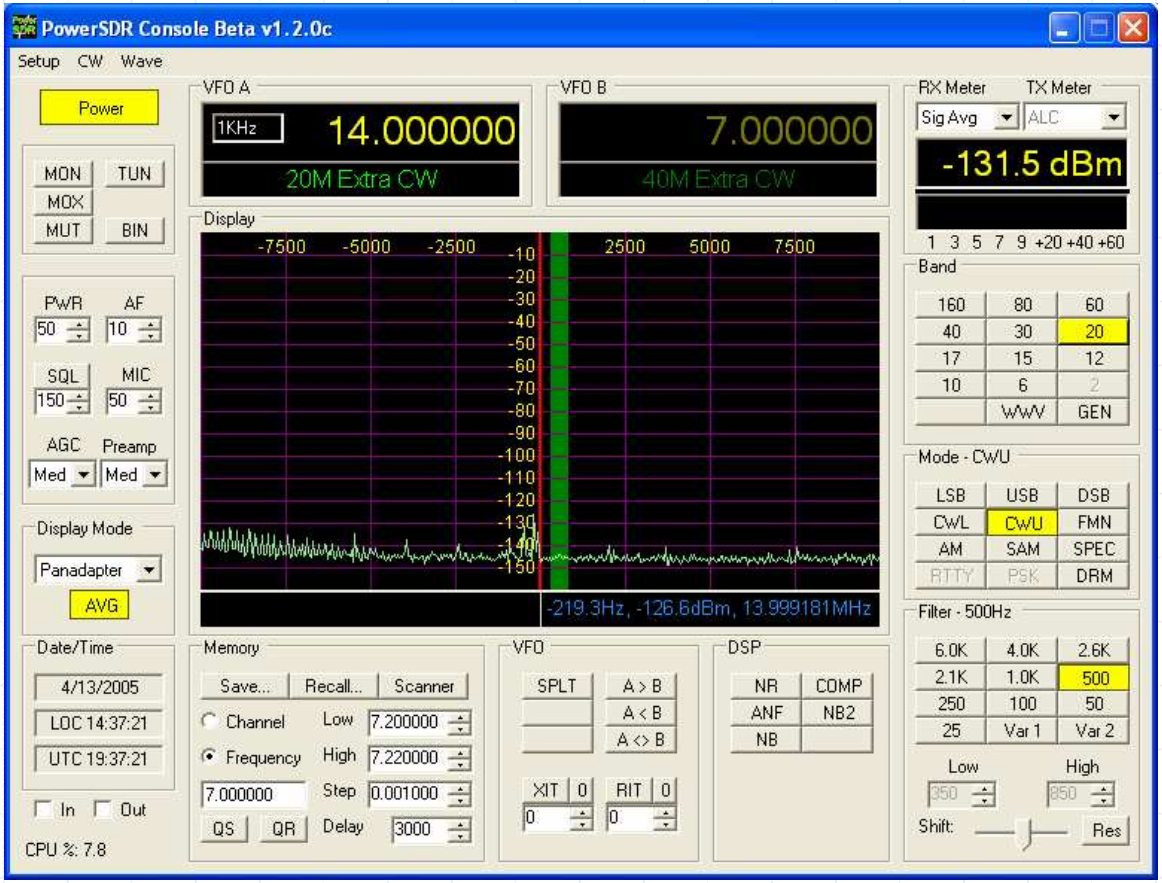
2KHz IMD Dynamic Range

Radio	MDS	IMD DR3
SDR-1000	-130 dBm	98 dB
TenTech Orion	-127 dBm	93 dB
Icom IC-7800	-126 dBm	80 dB
Elecraft K2	-129 dBm	80 dB

SDR-1000, preamp/high con M-Audio Delta 44 sound card. Gli altri dati sono dichiarati sul sito della Sherwood Engineering.

MDS – Medium Preamp



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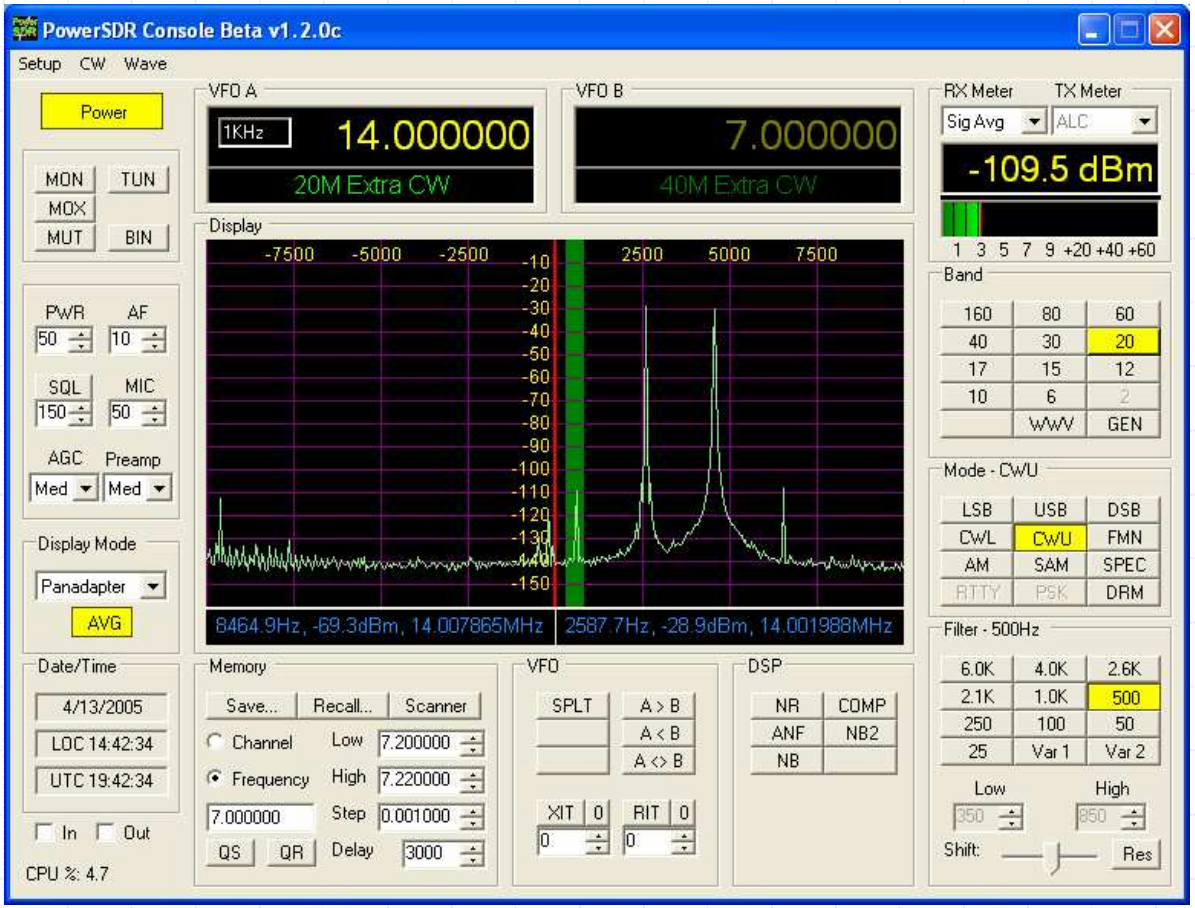
2KHz Spacing 3rd Order IMD



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SDR-1000 test dei filtri (DK7XL)

2.6 kHz Filter

-3 dB BW	-60dB BW	shape factor
2587 Hz	2756 Hz	1.06

500 Hz Filter

-3 dB BW	-60dB BW	shape factor
487 Hz	660 Hz	1.35

50 Hz Filter

-3 dB BW	-60dB BW	shape factor
65 Hz	223 Hz	3.43

25 Hz Filter

-3 dB BW	-60dB BW	shape factor
58 Hz	204 Hz	3.51

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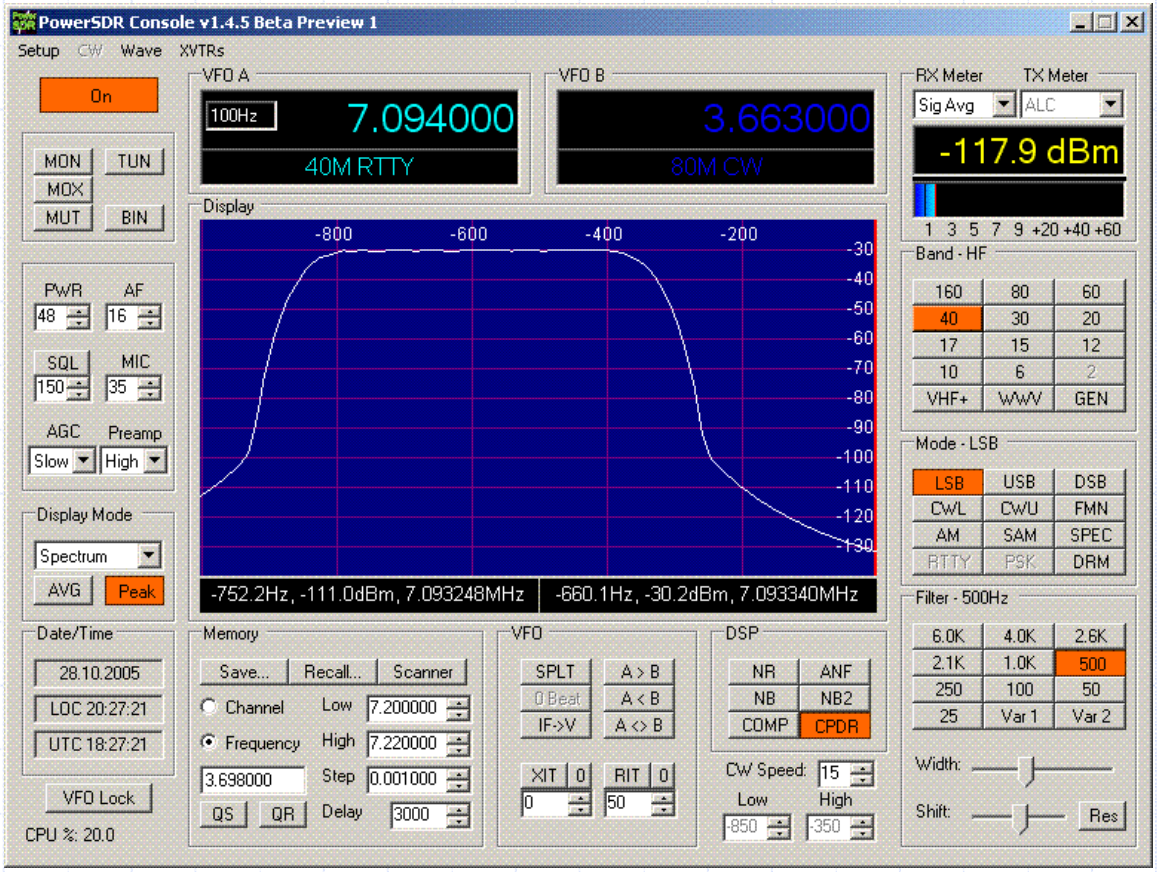
500 Hz Filter SF=~1.05!



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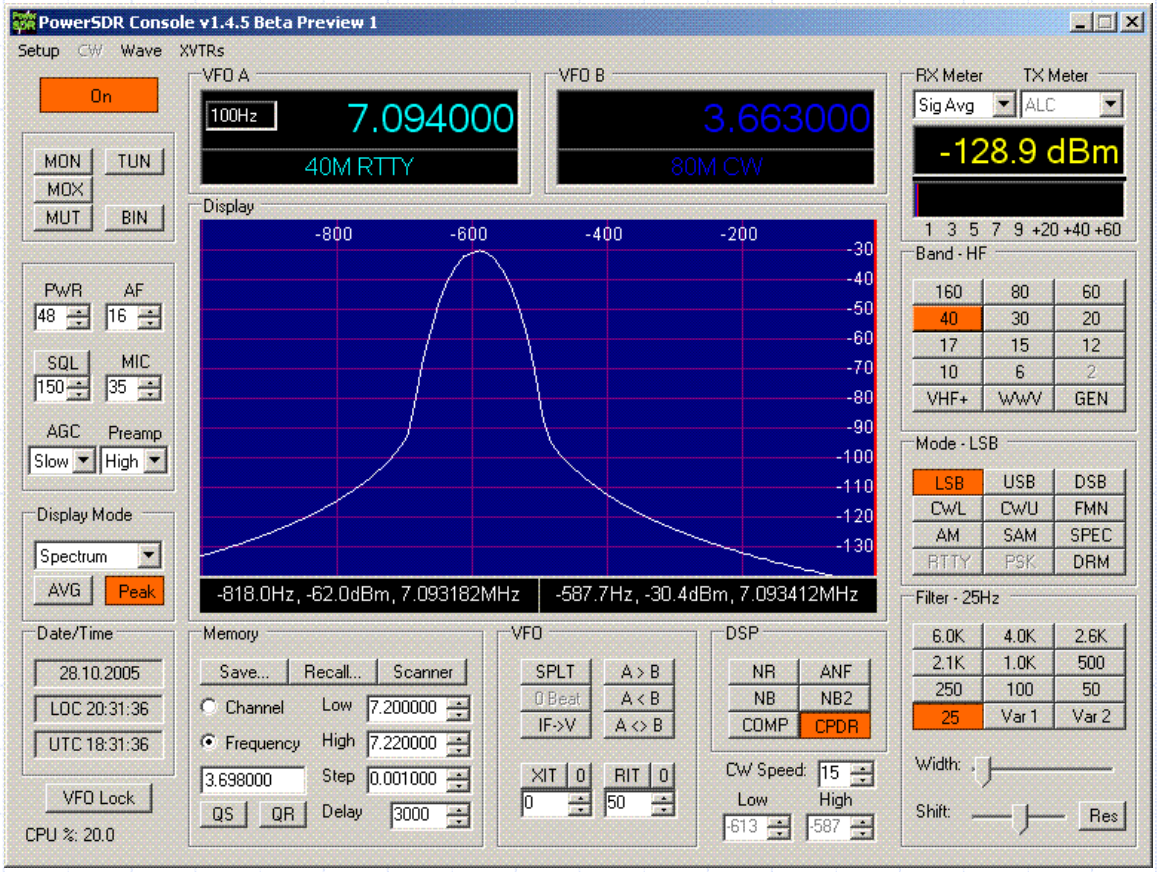
25Hz Filter Spectrum



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Modo CW

- Variabile Pass Band Tuning
- Sintonia OFFSET > VFO
- Auto tuning sulla nota
- Filtri a 25, 50, 100, 250, 500, 1KHz
- 2 filtri variabili a piacere
- Keyer da Memorie, Tastiera, Paddle o da altro software

Modo SSB

- Equalizzatore grafico
- Filtro di TX variabile in tempo reale
- ALC e Compressore NO SPLATTER
- Compander a bassa distorsione
- Filtri preimpostati o personalizzabili
- Comando per Amplificatore Lineare

Trasmissione: l'equalizzatore e il filtro variabile

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Trasmissione: il Keyer e CAT per amplificatore

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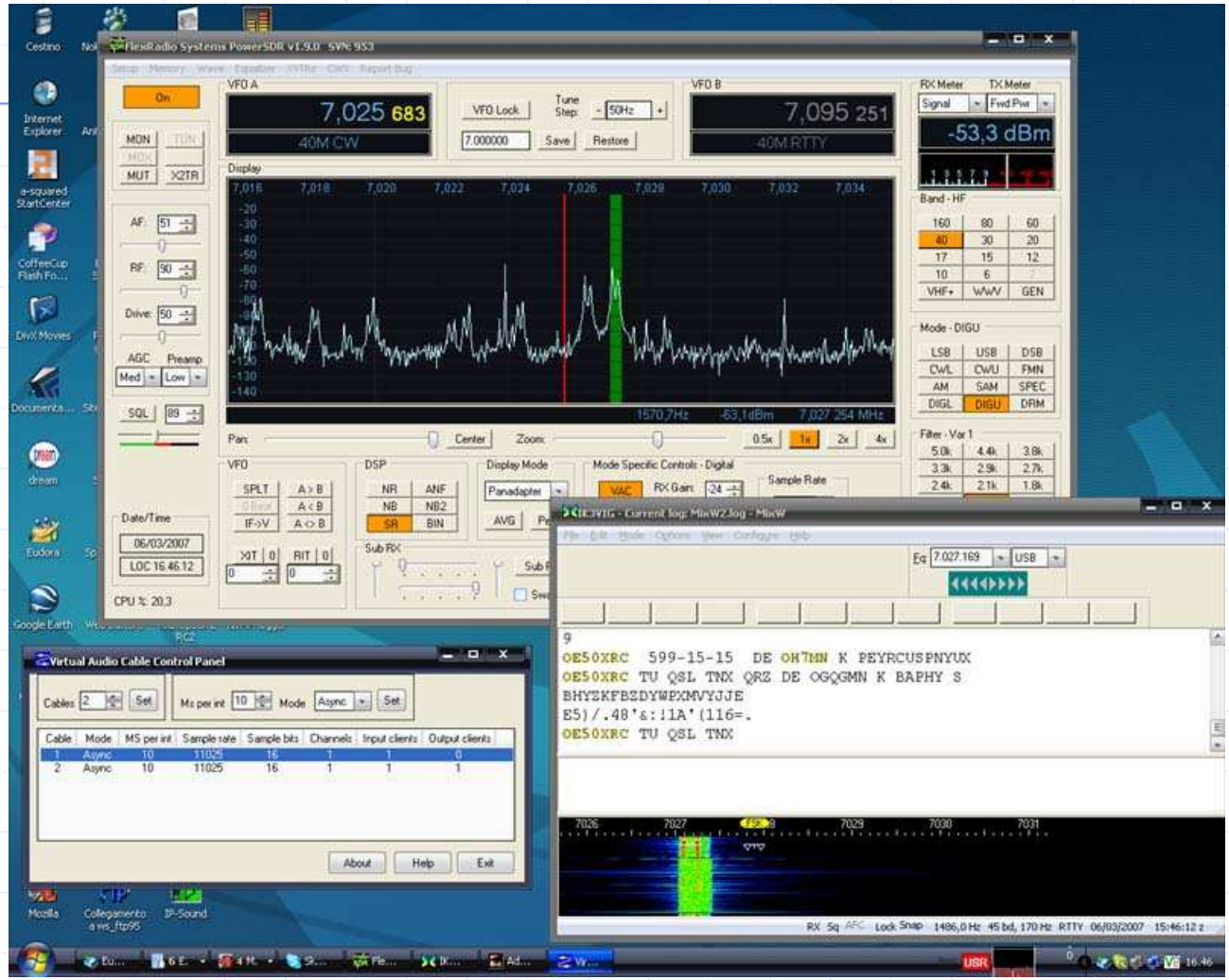
Modi DIGITALI

- Elevata selettività
- Assenza effetto “AGC”
- Visualizzazione e sintonia “Waterfall”
- CAT RTX tramite Virtual Serial Cable
- Uso scheda audio dedicata
- Supporto per Virtual Audio Card (VAC)

Modi DIGITALI con VAC e N8VB serial cable



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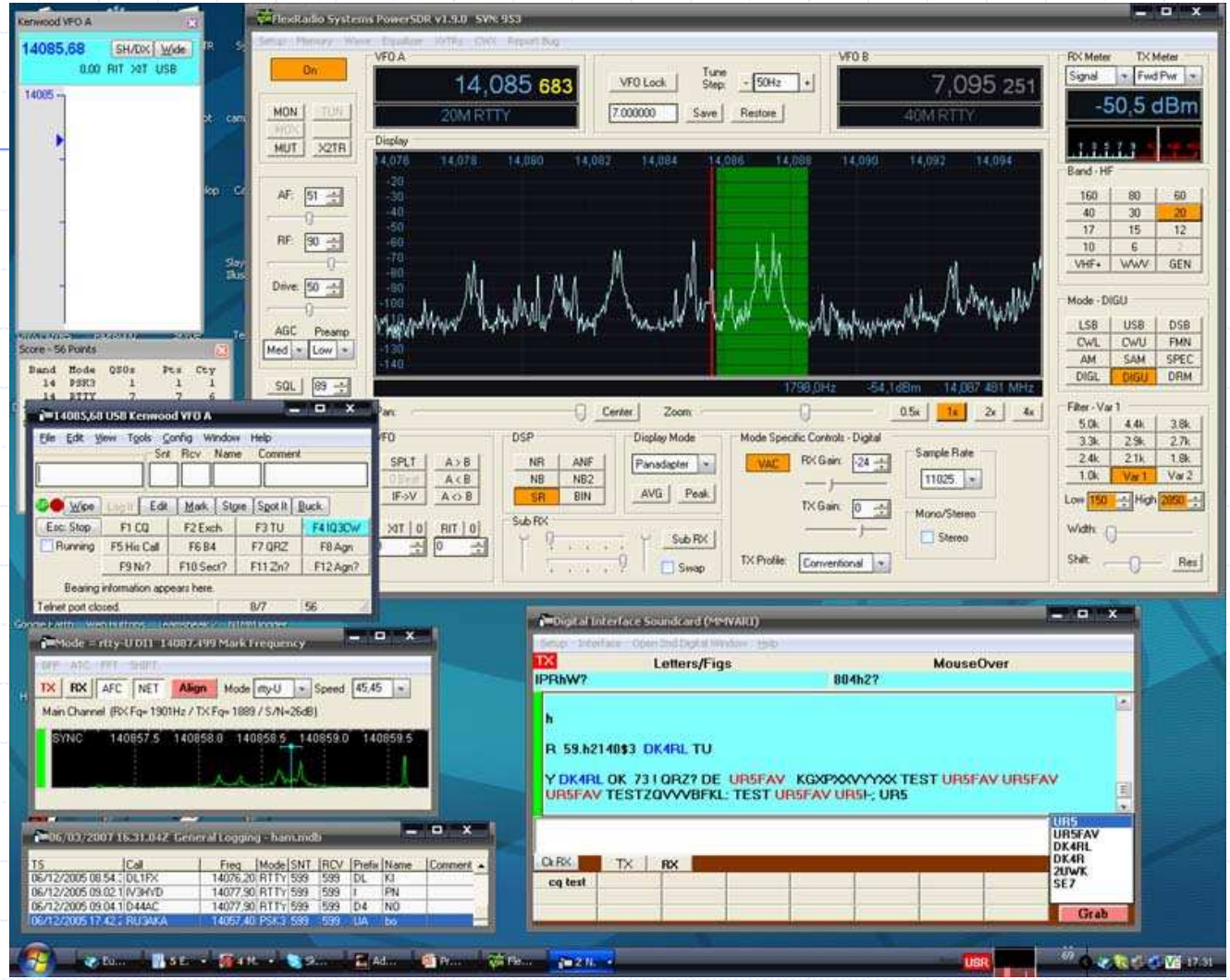
DX/Contesting

- Elevata selettività
- Alta dinamica
- CAT & Logging con Virtual Serial Cable
- Sintonia “Point and Click” sullo spettro

CONTEST: esempio con N1MM



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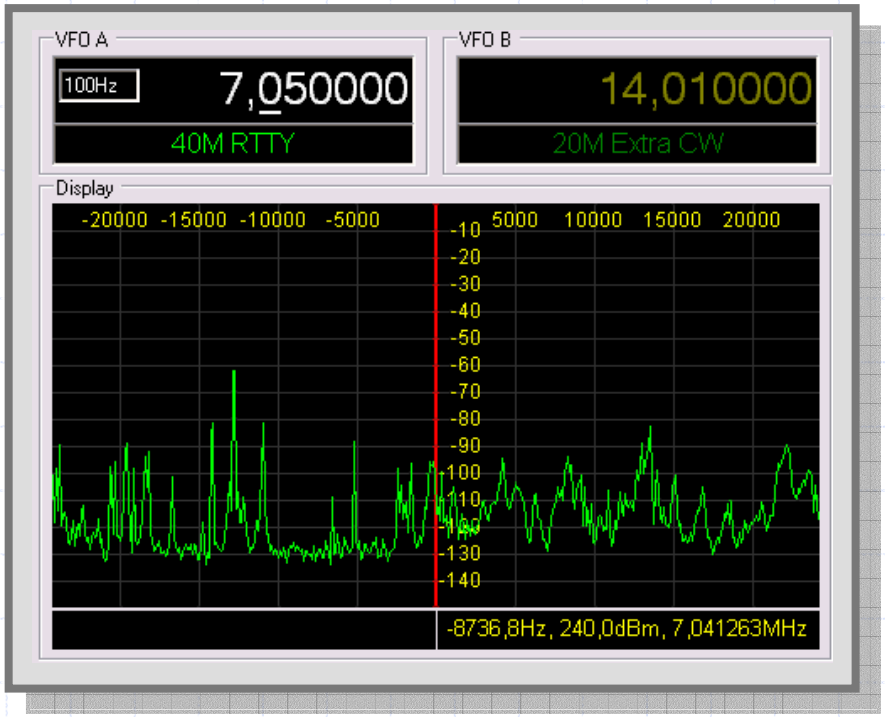
Funzioni speciali dell'SDR-1000



- Registrazione su HD dello spettro e trasformazione dominio FREQ / TEMPO
- Registrazione del segnale processato e ritrasmissione

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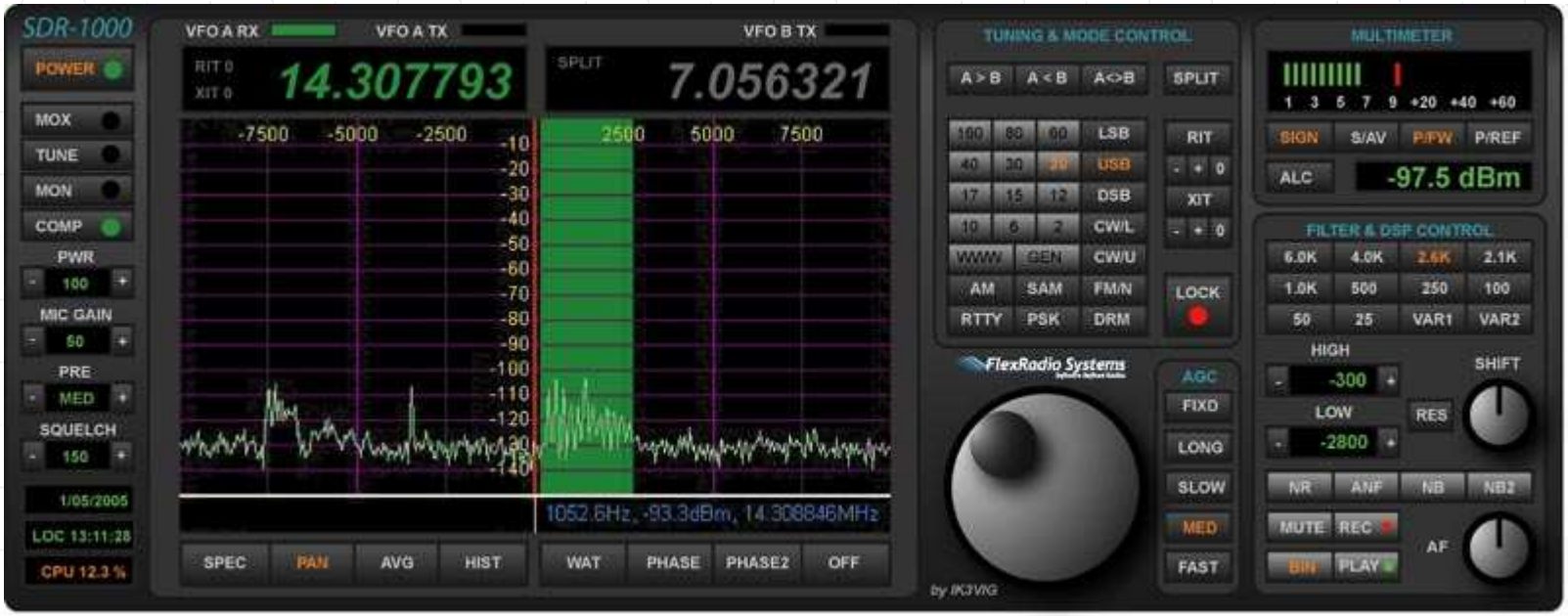
Alcuni sviluppi programmati del software

- 160 KHz Real Time Panadapter
- Overlaid Panadapter Spots DX
- "N" ricevitori contemporanei
- Versioni del software "su misura"
- Controllo remoto integrato
- Supporto per operazioni SO2R
- Modi digitali integrati
- Supporto Virtual Sound Card propietario
- Supporto Universal Controller Board

Prossima versione del software



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Stazione tipica SDR-1000

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La “Black Box” SDR-1000

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SDR-1000 layout interno

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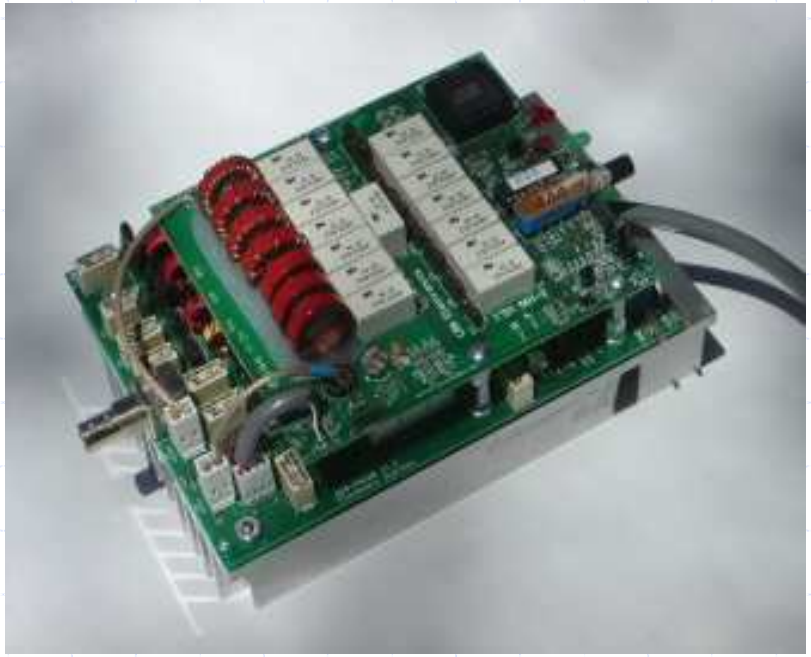
SDR-1000 upgrade hardware: 100W PA & ATU



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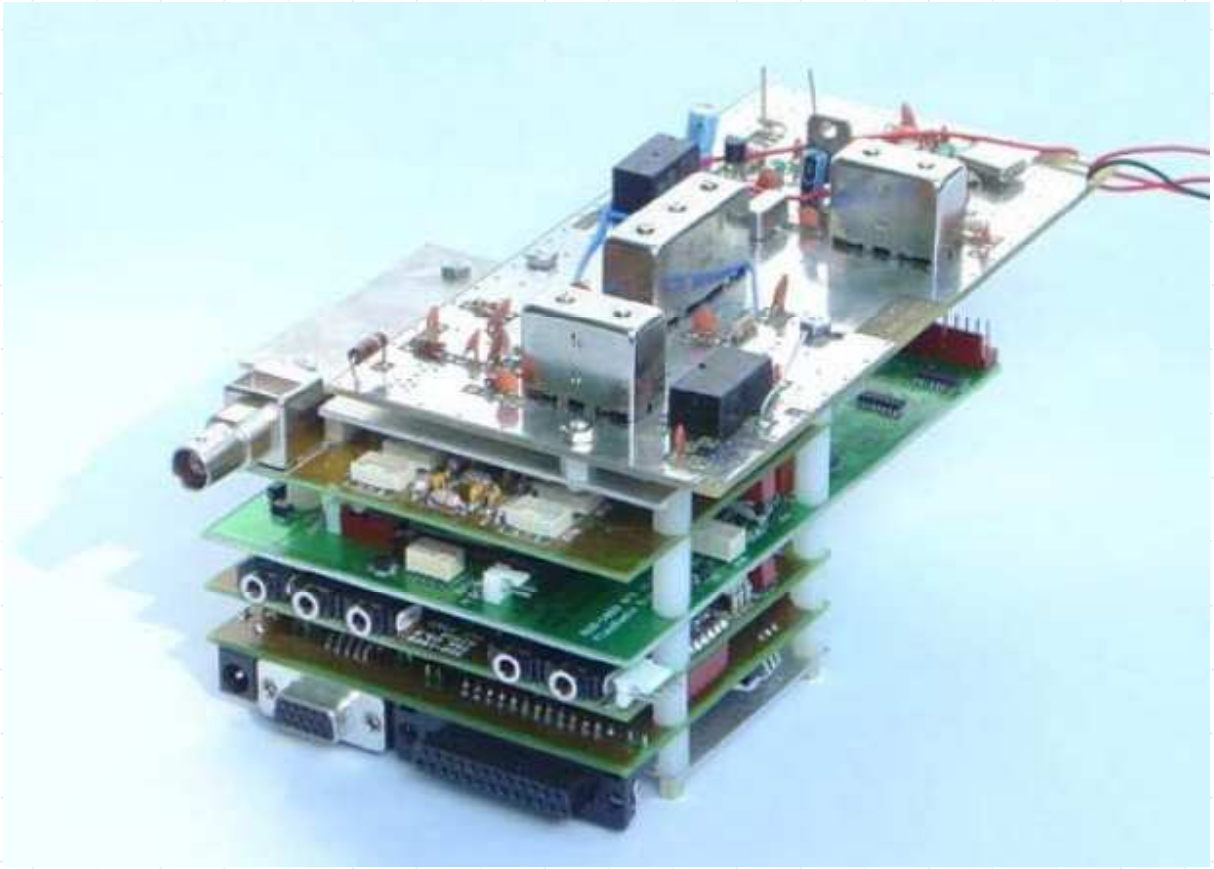
SDR-1000 upgrade hardware: transverter 2M



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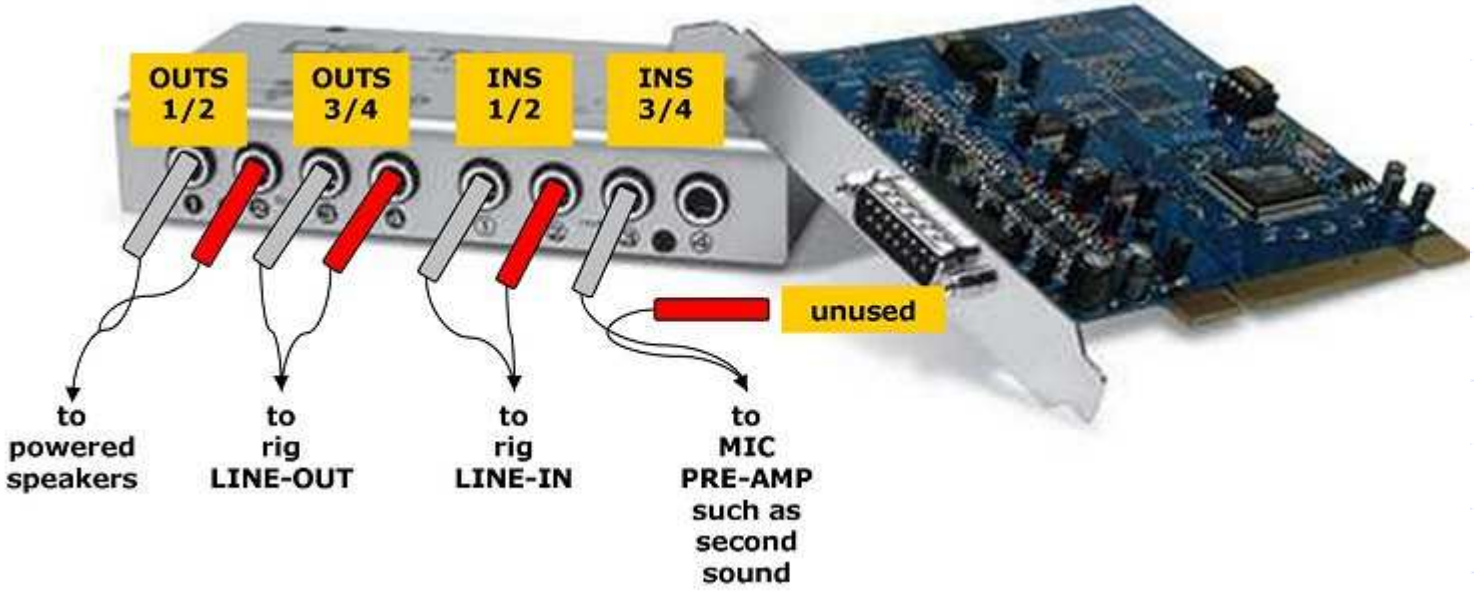
SDR-1000
audio card M-AUDIO DELTA 44



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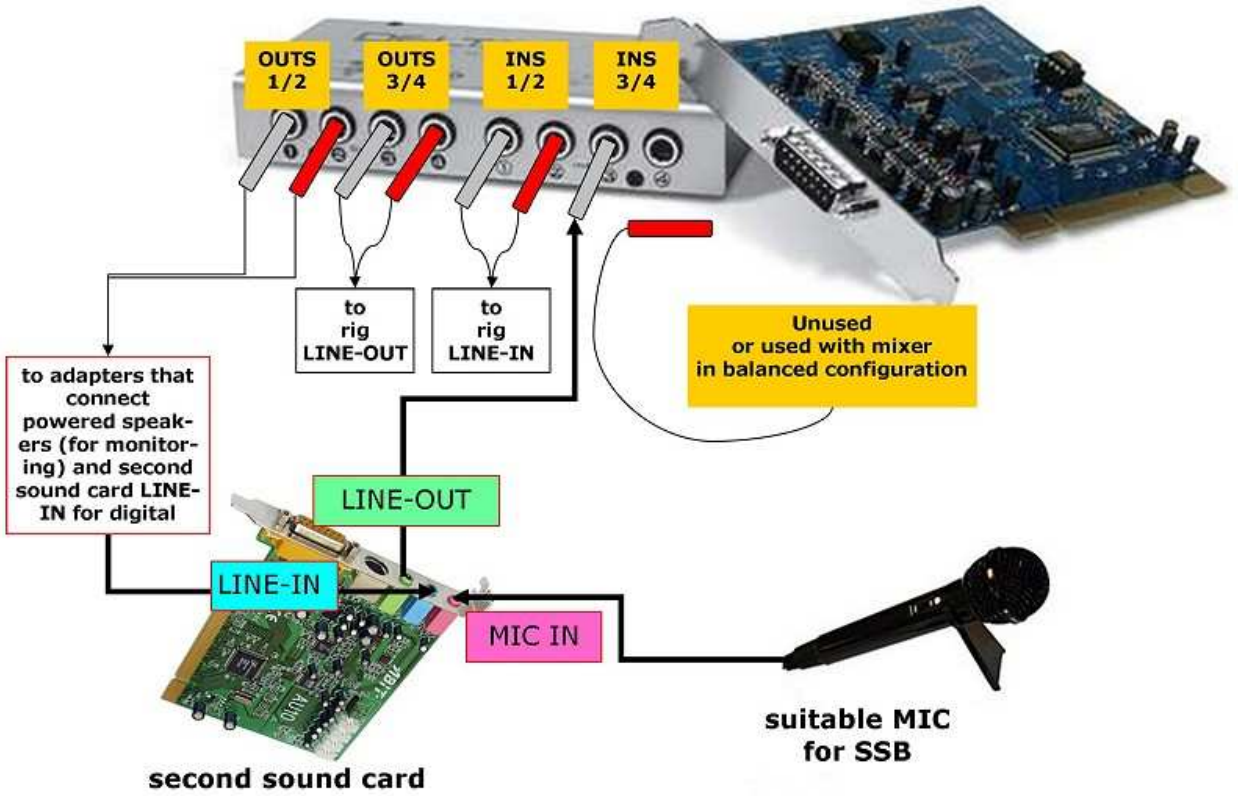
SDR-1000
configurazione 2 schede audio



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SDR-1000 accessori: Powermate & ShuttlePro

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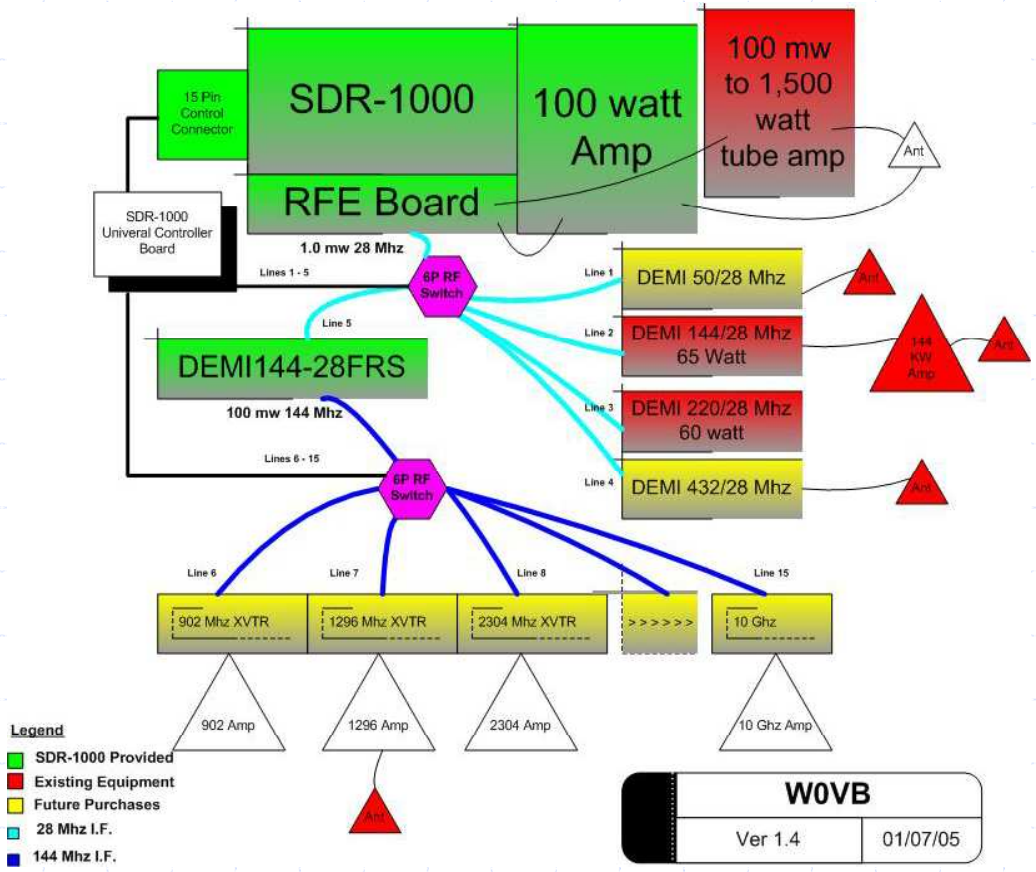
SDR-1000 accessori: Universal Controller Board



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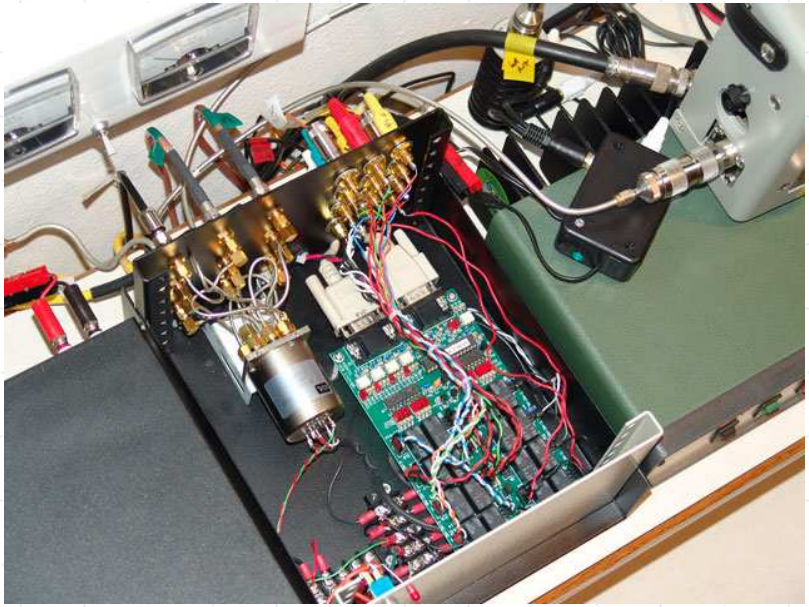
SDR-1000 accessori: Universal Controller Board KM0T setup



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Supporto Tecnico

- www.flex-radio.com
- Forum (anche in Italiano)
- Documentazione sul sito
- Teamspeak (VOI)
- Newsgroup

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