



IX Reunión Anual de los Entusistas de las Microondas

MicroMeet 2025

Radio-Comunicaciones ▪ Experimentación ▪ Técnica ▪ EME ▪ AmateurDSN





LOS NES-TRANSVERTERES MICROONDAS INSTANTÁNEAS

Luis Cupido (CT1DMK)

NESTRANSVERTERs

Instant microwaves.

Just add solder !

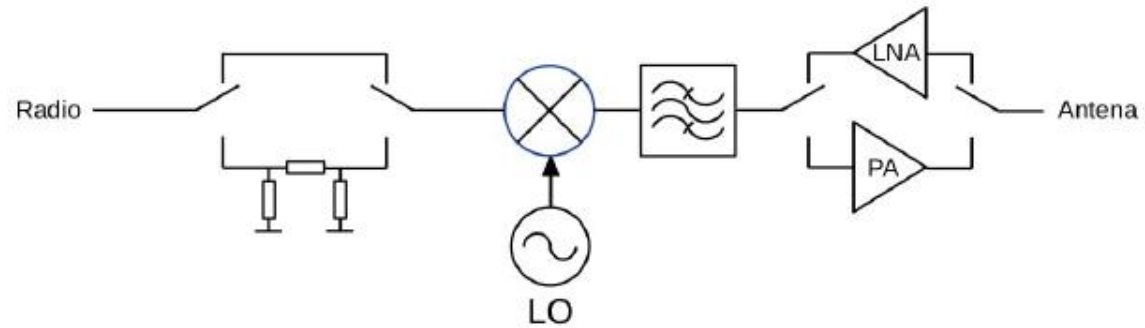
MICROMEET – 2025
L. Cupido - CT1DMK

“Le superflu, chose très nécessaire” Voltaire

What is a Transverter ?

(a brief intro for those of other hobbies)

It is a frequency converter that operates for both TX and RX



What frequencies are possible ?

- All, from VHF to light !!!

Can we buy them ?

- Yes

Can we make them ?

- Yes

Is it difficult ?

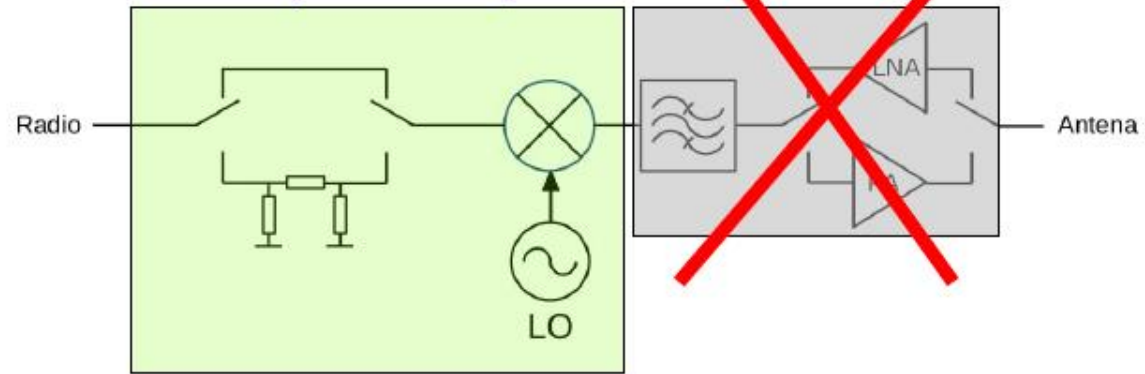
- Depends !

Are there simple ones I can build ?
everybody.

- YES, and easy for

What is the very minimum experimental Transverter I can build ? *(in a winter night...)*

This part only



What frequencies ?

- All, but better at 10GHz and above

Even high microwaves ?

- Yes

But has no LNA and no PA !!!

- True

Still usefull ?

- Yes, many QSOs are possible

Expensive parts ?

- No, it is less than 80€

Is is difficult ?

- No, it is Super easy

... still not sure if it is worth !

- Your choice to make QSOs or not.

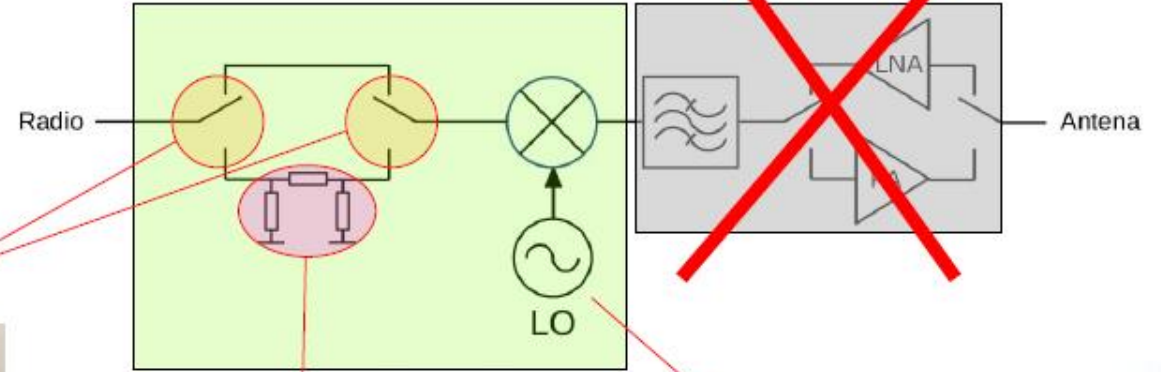
Lets go Step by Step, piece by piece.

Suggestions:

DPDT Relay,
TQ2/Panasonic.
Small, Cheap, good for
144 and 432MHz IF



Attenuator, Just resistors.
Any shape is fine. Small
connections if at 432MHz IF



Local Oscillator, a single chip
PLL demo board. Low cost
CN manufacture.

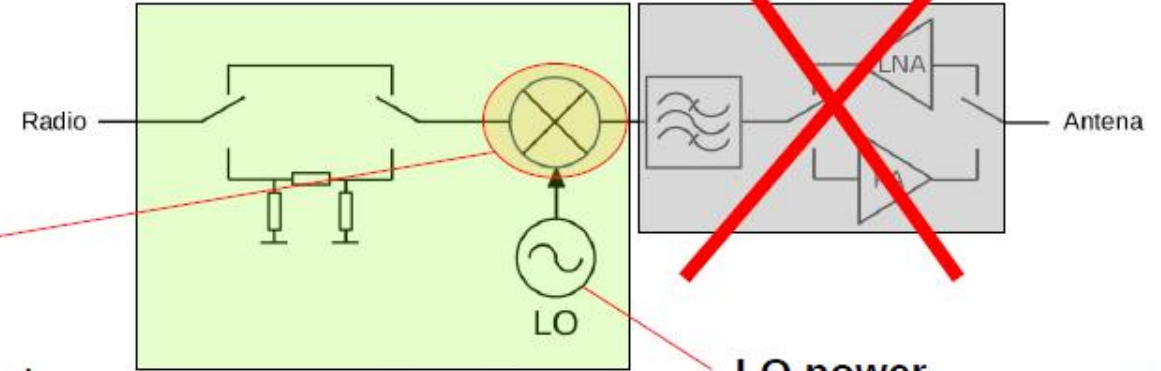
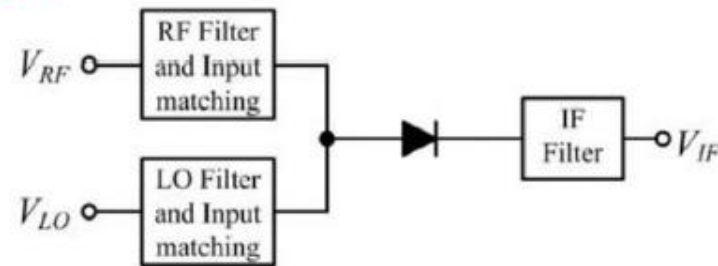


Lets go Step by Step, piece by piece.

Suggestions:

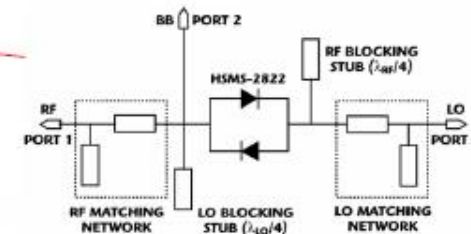
Mixer.

- Fundamental.
 - single balanced
 - double balanced
- Sub Harmonic
 - LO/2 (two diodes)
- Harmonic
 - LO/n (one or two diodes)



LO power

- According to mixer needs
- usually $> 7\text{dBm}$

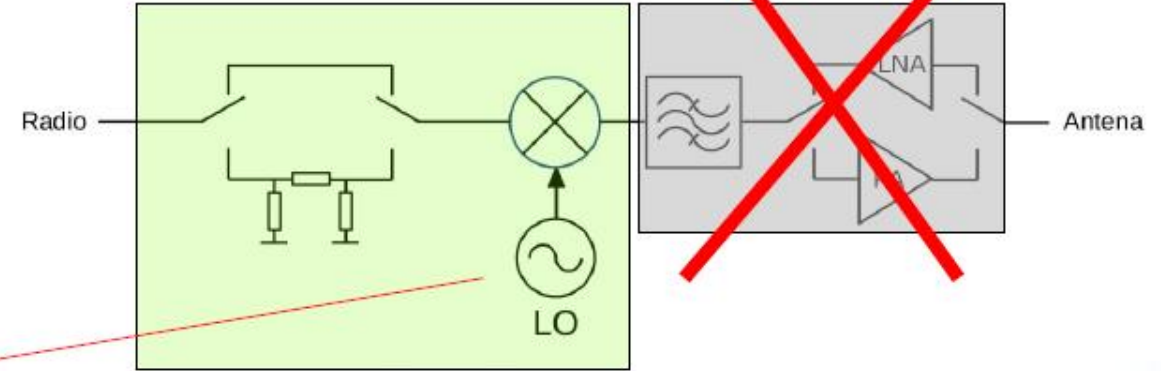


One SHmixer for 10GHz



Lets go Step by Step, piece by piece.

Suggestions:



LO power

- According to mixer needs... usually $> 7\text{dBm}$
- PLL demo boards have too little power aprox 4dBm
An amplifier is necessary, just one MMIC (CN pcb board, for example)

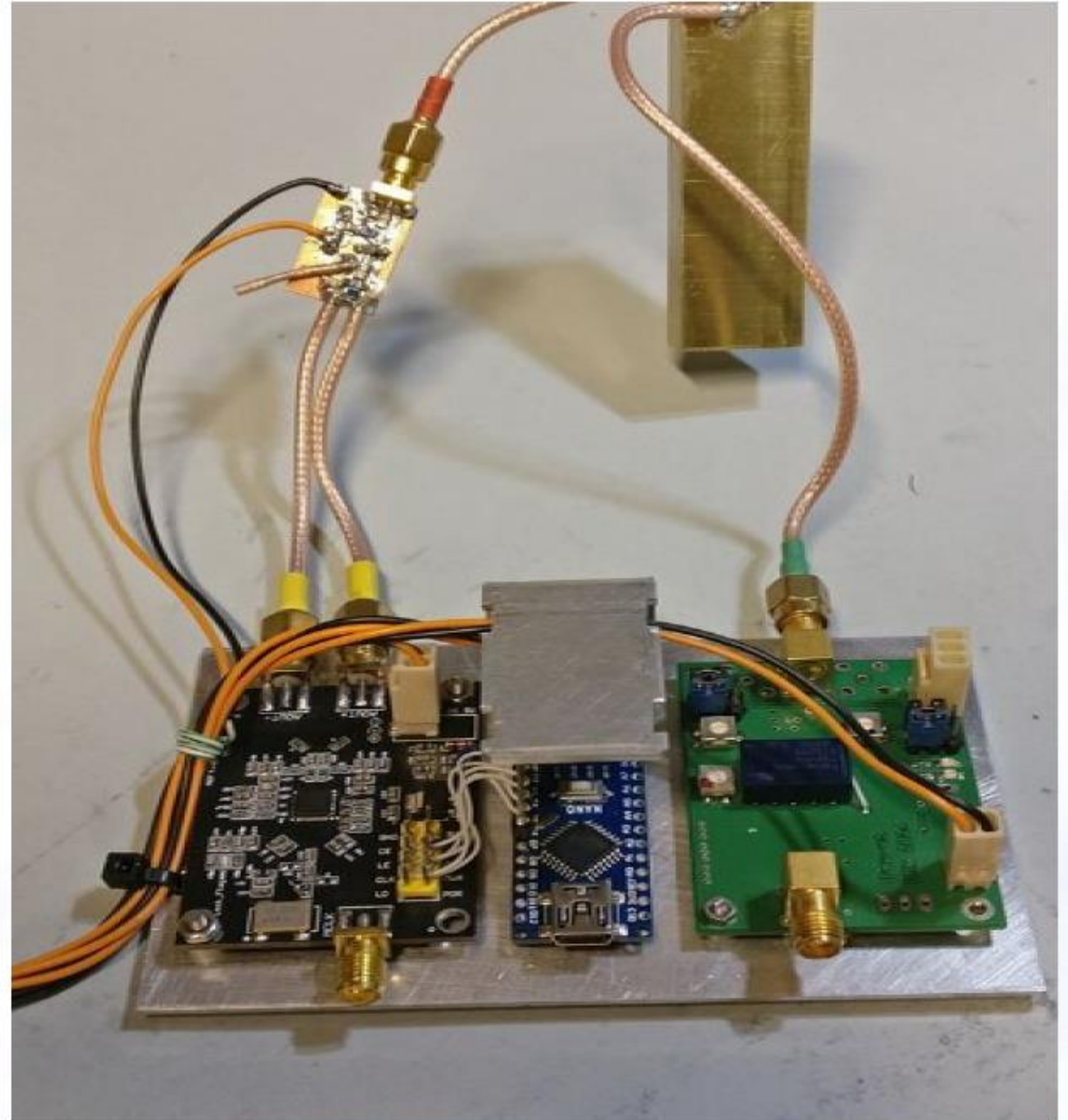


- Dual output boards make easy frequency doublers possible.



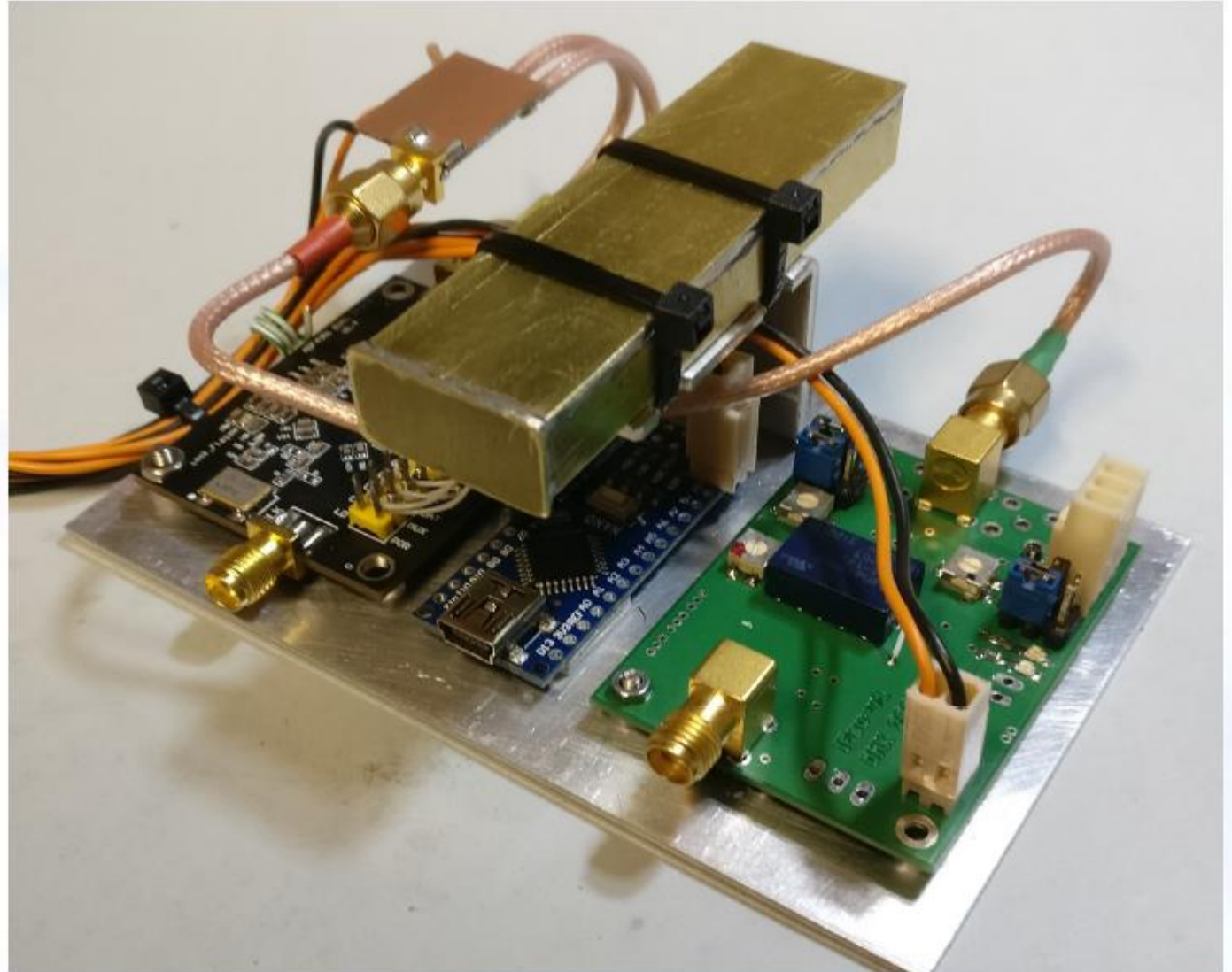
An instant prototype:

- ADF4350 demo board
- Arduino nano
- IF relay/att board
- SH mixer with 2 diodes



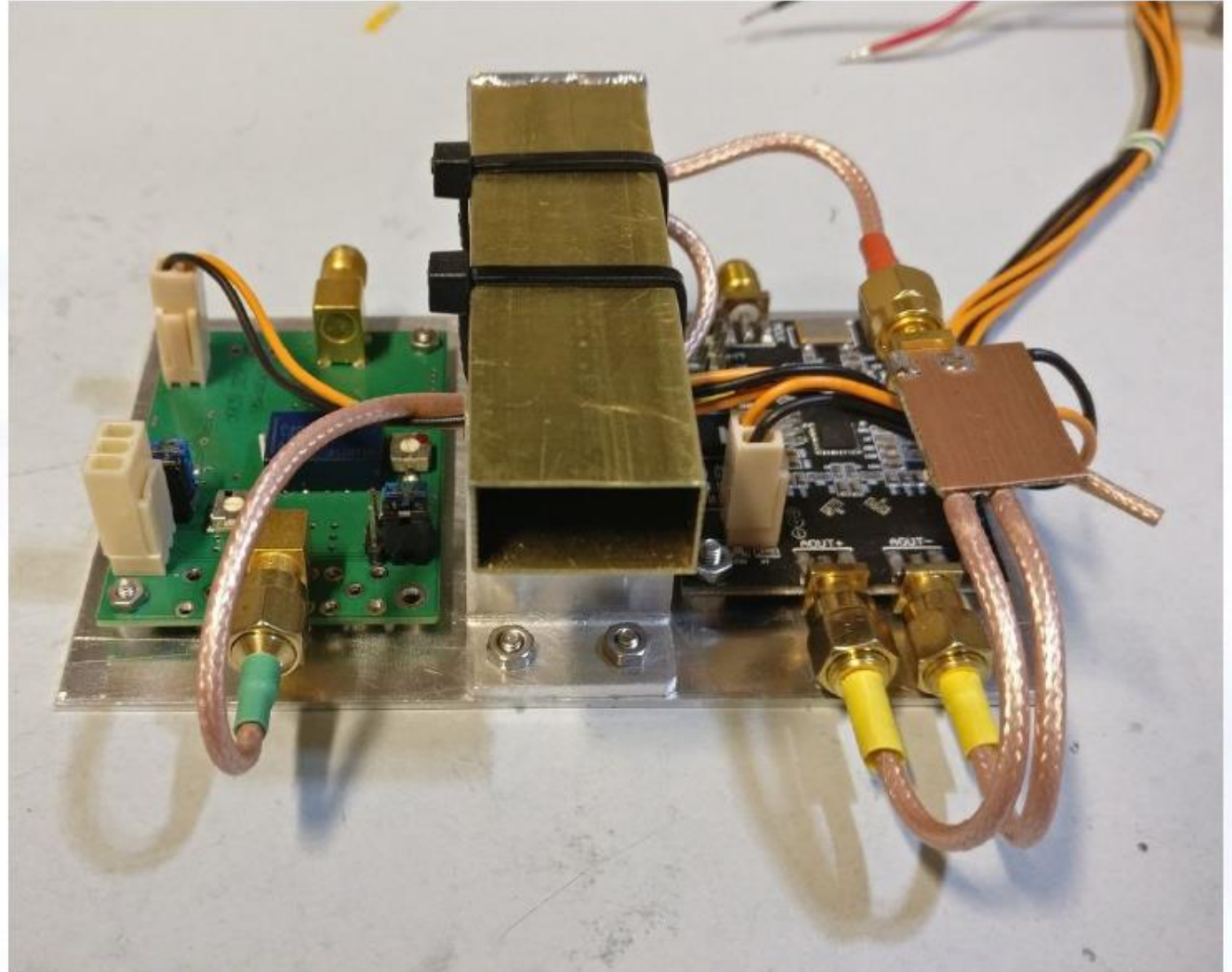
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An Instant Transverter – Quick way to a few QSOs

Summary

- Simple transverter is possible to build with few components and low cost PLL boards.
- Mixer + LO board + IF switch, makes a very simple and functional transverter.
- Many Km distance QSO are possible with just the mixer as frontend (both TX and RX)
(back in the late eighties I made a QSO exceeding 120kM on 24GHz with this concept)
- On the lower microwave bands less than 100€ of parts can get you QRV instantly
(+ a long Saturday evening/night of work)
- Image rejection filter can be added to this experimental setup.
- LNA and Power Amplifier can also be added
< A full performance transverter will result >
- The concept can be easily applicable to any of the mmW bands (>24GHz).
- Many of the top transverters above 47GHz actually use Harmonic mixers as frontend.



Gracias

Obrigado

Thanks