

TRANSVERTERS

WHAT IS A TRANSVERTER
AND HOW DO WE USE IT IN HAM RADIO

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DEFINITION

- Wikipedia's definition -
- In radio engineering, a transverter is a radio frequency device that consists of an upconverter and a downconverter in one unit. Transverters are used in conjunction with transceivers to change the range of frequencies over which the transceiver can communicate.

TRANSVERTER USE IN AMATEUR RADIO

- A transverter used for Amateur Radio enables an HF transceiver to operate on VHF, UHF or even higher frequencies.
- If you own an HF transceiver, purchasing a transverter is normally more cost effective compared to purchasing an additional all-mode radio for VHF/UHF frequencies.
- There are many companies offering transverters that will allow HF transceivers to operate from 50 MHz up to 1.3 GHz. An Internet search will show many sources.

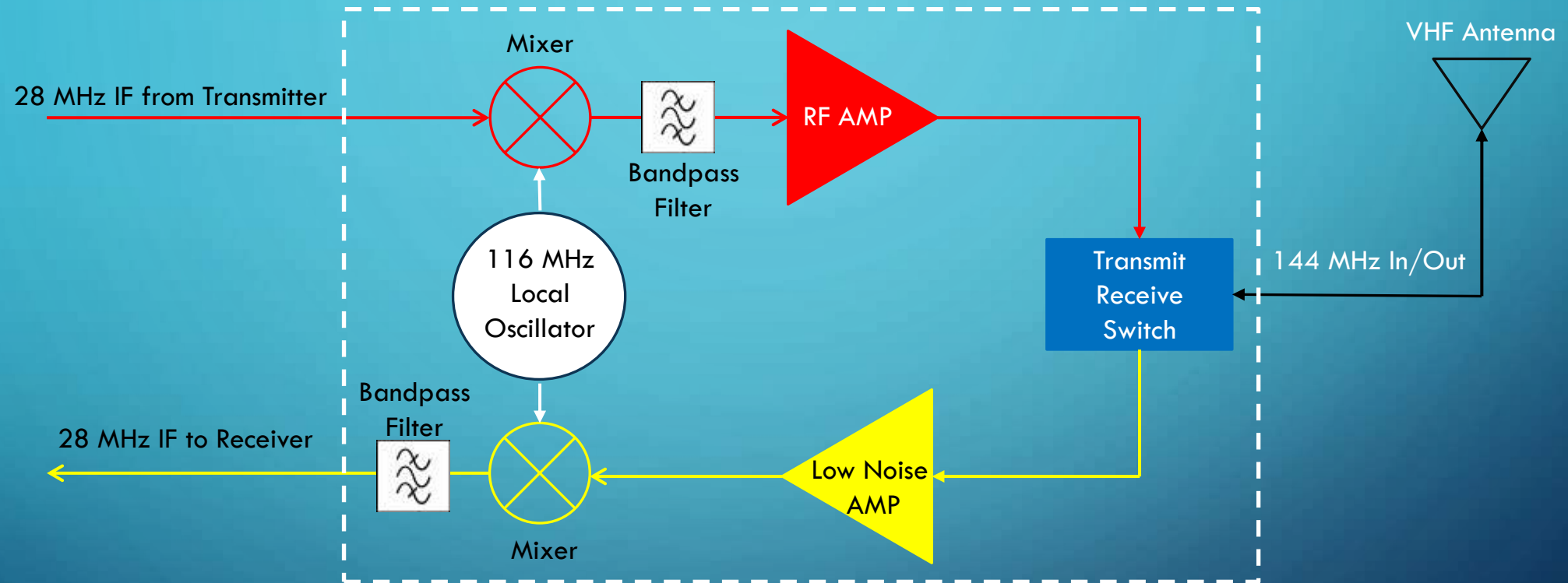
MY PERSONAL USE OF A TRANSVERTER

- I have a Flex Radio model 6400M which covers the 80 Meter through 6 Meter bands. The radio has a receiver input port and a low-level exciter out port on the back. The exciter port produces a frequency of 28 MHz – 32 MHz depending on the VFO setting. That is known as the Intermediate Frequency (IF).
- These connections allow my particular transverter, which is a Dual Band model to operate on 2 Meters (144 -150 MHz) as well as 70 cm (432 MHz – 438 MHz).
- The local oscillator (LO) in the transverter produces a frequency of 116 – 118 MHz on 2 Meters and 404 – 406 MHz on 70 cm.

PERSONAL USE CONTINUED

- A mixer is used to up-convert or down-convert the RF frequency. Mixers produce both a sum and difference frequency of the two mixed frequencies. Filters are used to pass the wanted frequency and prevent the passing of the unwanted frequency.
- With a 28 MHz IF from my radio, the transverter's mixer combines the radio's 28 MHz output with the transverter LO frequency of 116 MHz to produce a new transmit frequency of 144 MHz ($28 \text{ MHz IF} + 116 \text{ MHz LO}$). This is the frequency addition performed in the mixer.
- The same principle works on the receive side where the 144 MHz receive signal is mixed with the LO frequency of 116 MHz ($144 \text{ MHz} - 116 \text{ MHz}$) to output a 28 MHz IF to the radio's receiver. This is the frequency subtraction performed in the mixer.

2 METER TRANSVERTER SIMPLIFIED BLOCK DIAGRAM



UR3LMZ DUAL BAND 2M/70CM TRANSVERTER



Transverter Front Panel

OUT 28 MHz
IN 28 MHz
Band LEDs & TX LED
F+ (Increases LO By 2 MHz)
BND (selects 144 MHz or 70 cm)
ON (Power on/off button)



Transverter Back Panel

ANT (144 MHz or 70 cm antenna)
12v DC (Power Connector)
PTT (to radio for transverter keying)

Maximum IF Input = 0 dBm (1 milliwatt)
Maximum RF Input = 11.7 dBm (14 milliwatts)
Maximum Output : 12 Watts on 144 MHz, 3 Watts on 70 cm

