

Introduction

The classic Butternut[®] HF6V 6-band vertical antenna operates on 75/80, 40, 30, 20, 15 and 10 meters. Designed with corrosion-resistant aluminum tubing, this antenna is very durable and attractive.

The first L/C circuit generates enough reactance to bring the whole HF6V to resonance on 80 meters allowing it to act as a 1/4-wave radiator. It also generates enough *capacitive* reactance to produce another discrete resonance at about 11 MHz. The second, 40 meter L/C circuit generates enough reactance to resonate the whole HF6V allowing it to act as a 1/4-wave radiator. In order to minimize conductor and I²R losses on 80 and 40 meters where the antenna is physically shorter than a 1/4-wave and thus operates with lower values of radiation resistance, large-diameter Hi-Q self-supporting inductors and low loss ceramic capacitors are employed.

Where the height of the HF6V is slightly greater than a 1/4-wave on 30 meters, an L/C series tuned circuit taps onto the 40 meter coil for the extra inductance to pull the earlier 11 MHz secondary resonance down to 10 MHz. At the same time, a portion of the 40 meter coil is shorted out which allows the circuit to resonate on 30 meters. The addition of this circuit also produces additional resonances at 14 MHz and 28 MHz.

On 20 meters the entire radiator operates as a 3/8-wave vertical with much higher radiation resistance and VSWR bandwidth than conventional or *trapped* antennas having a physical height of 1/4-wave or less. Because the 20 meter radiation resistance will be several times as greater as that of conventional vertical antennas, an electrical 1/4-wave section of 75 ohm coax is used as a *geometric mean* transformer to match the approximate 100 ohms of feedpoint impedance on that band to a 50 ohm main transmission line of any convenient length.

The HF6V operates as a slightly extended 1/4-wave radiator on 15 meters, a 1/4-wave stub decoupler providing practically lossless isolation of the upper half of the antenna on that band.

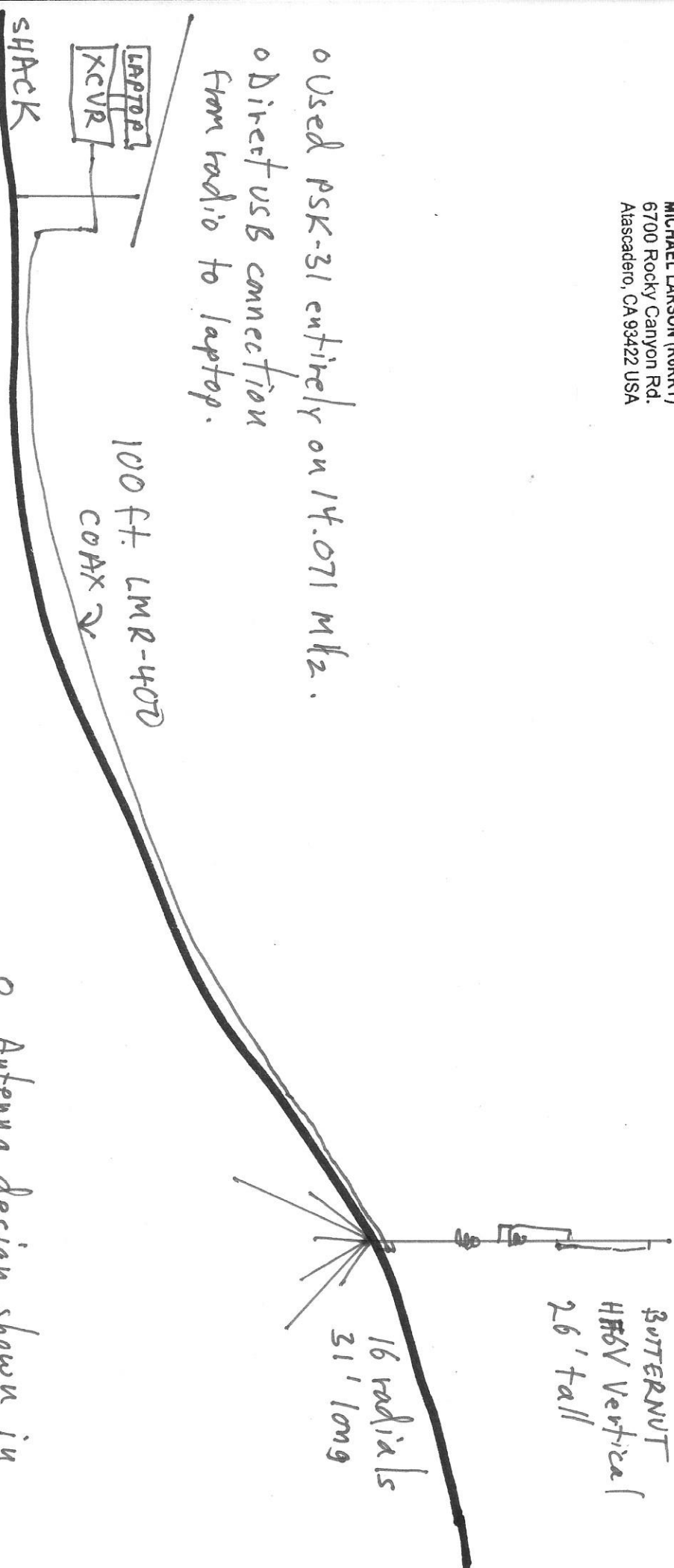
On 10 meters the HF6V becomes a 3/4-wave radiator with considerably greater radiation resistance and efficiency than 1/4-wave trapped verticals.

Features

- Full band coverage for 80, 40, 30, 20, 15 and 10 meters
- Height is 26 feet
- Weight is only 14 pounds
- Feedpoint Impedance is a nominal 50 ohms through the included matching line
- Power handling up to 1,500 W full legal limit on 80/40/20/15/10M, 500 W PEP on 30M
- Wind load 2 ft² (80 mph survivability - no ice)
- VSWR at resonance: 1.5 or less on all bands
- Bandwidth for VSWR 2:1 or less: 30/20/15/10M - entire band.
- Bandwidth for VSWR 2:1 or less: 140-150 kHz on 40M, 25-30 kHz on 75/80M
- Requires radial system

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o Used PSK-31 entirely on 14.071 MHz.
o Direct USB connection
from radio to laptop.



- o Antenna design shown in separate document.
- o HFTA terrain profile attached.
- o Ground conductivity = 8 millimhos.
- o ERP calc: 36.64 watts