

KRMD ANTENNA SYSTEM DESCRIPTION

PHYSICAL DESCRIPTION & FCC FILING DATA

The proposed radiator will consist of an electrical portion of a Landmark Corporation, 440' (134.1 meter) self supporting, tower with an 18" face FM broadcast band lambda tower section 57' feet (17.4 meter) in height, plus beacon assembly, for a total height AGL of 499' (152 meters). The structure is correctly described in FCC tower registration #1209322. The tower has three legs 100' across at the base and sits on a small parcel of land approximately 150' by 250'. Due to the small land area, and large tower dimension, a standard buried ground system is not feasible.

The tower will be excited by a six wire skirt feed system (shunt feed). The excited portion of the structure is located between the 54.9 meter and 106.7 meter elevations on the grounded tower and will be 51.8 meters in length or 83.4 electrical degrees at 1340 kHz. The area between 106.7 meters and 134.1 meters will have a second six wire skirt resonated at the base with a motor driven vacuum variable capacitor. The capacitor will be adjusted to detune (electrically isolate) the portion of the tower located above the 106.7 meter elevation on the tower at 1340 kHz. A full proof of performance will be conducted on the antenna system to confirm that the radiation efficiency is equal to an unattenuated radiated field of 241.4 mV/m at one kilometer.

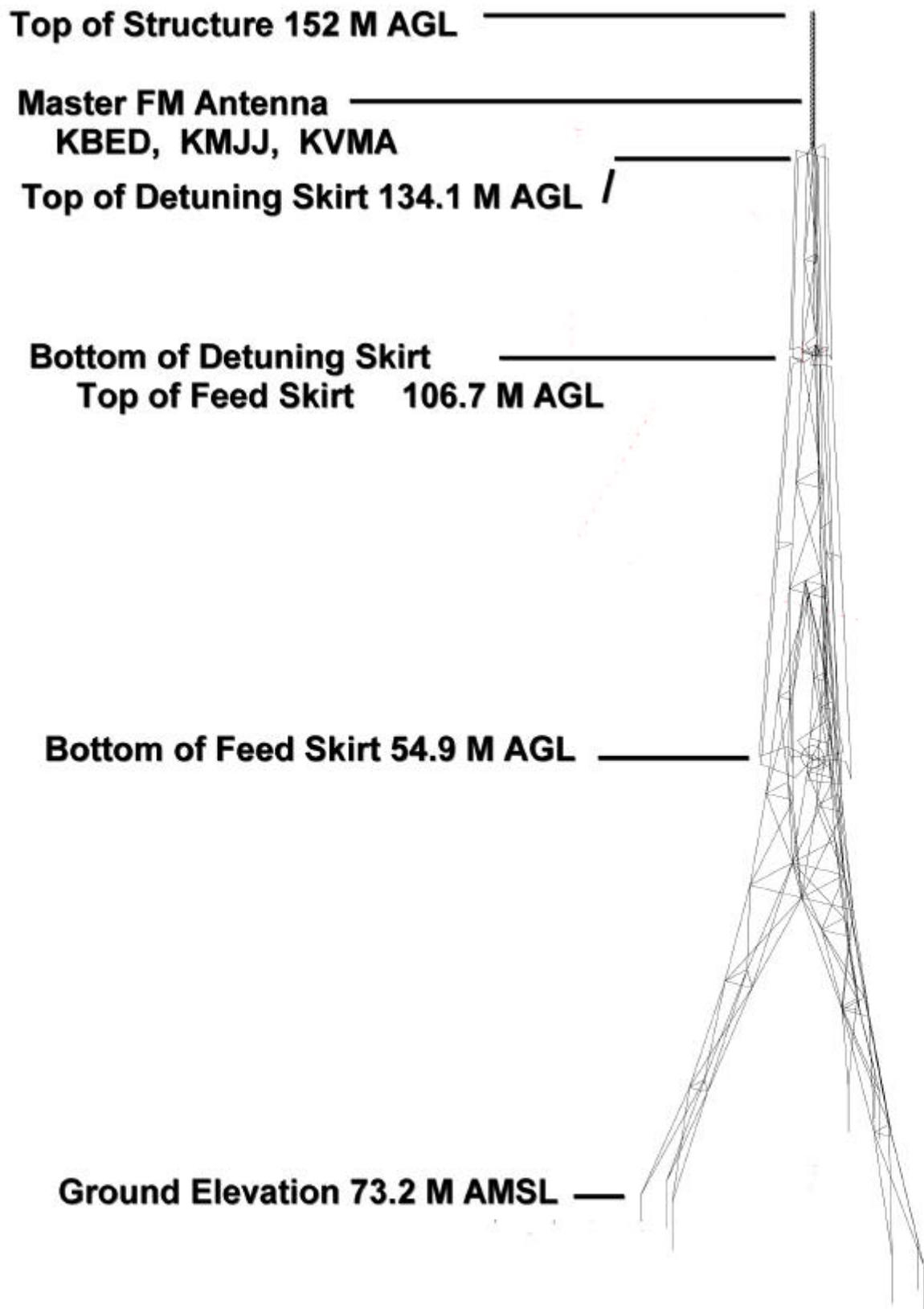
THEORY OF OPERATION & VALIDATION

The traditional vertical monopole antenna consists of a vertical radiator above a ground plane and is the functional equivalent of a vertically polarized, half wave, dipole. The free space gain of a quarter wave monopole above a 1/4 wave, lossless, ground plane is equivalent to the gain of a half wave, vertically polarized dipole.

The KRMD antenna design is a vertical dipole. The bottom 54.9 meters of the tower is the lower half of the 1/2 wave dipole with the upper 51.8 meters the upper half of the dipole. The bottom of the skirt at 54.9 meters AGL is the antenna feed point.

Cumulus has retained Communications Technologies, with Professor AL Christman from Grove City College, for computational design and validation and Joseph Bellis of RMF Associates, Cape Girardeau, Missouri for facility inspection, supervision and adjustment. Mr. Bellis has decades of successful experience in skirt feed systems, for both detuning and excitation, and his input concerning skirt configuration for the wire models was invaluable.

Professor Christman utilized EZNEC Pro with NEC-4 engine for all calculations. The vertical plan sketch attached is a print out of the wire model with skirts. A reference quarter wave monopole over buried radial ground system consisting of 120, equally spaced, quarter wave radials was used for comparison. The wire model for the full tower, as proposed herein, exhibited an input impedance near 50 ohms as desired, radiation efficiency modestly below the 1/4 wave reference and an elevation pattern similar to the reference antenna and free from undesired lobes or other undesirable artifacts. It is the conclusion of all those involved in the design process that the performance of the proposed antenna system is, for all practical purposes, the equivalent of a 83.4 degree vertical monopole above a standard 120 radial buried ground system.



**Vertical Plan Sketch
KRMD 1340 kHz 1 kW U
Shreveport, Louisiana
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