

WRMI TECHNICAL SUMMARY

Location: The property is in an agricultural part of rural Okeechobee County, about two and a half hours north of Miami and about 20 miles north of Lake Okeechobee. (North Latitude 27 degrees, 27 minutes, 30 seconds. West Longitude 80 degrees, 56 minutes, 00 seconds.) The property is around 660 acres, just a little more than a standard section. In round numbers, it is about one square mile..

Climate: Semi-tropical with a high incidence of thunderstorms during the summer months.

Terrain: Relatively flat pastureland, swampy in places.

Mains Power: 60 Hz, 22,800 volts stepped down to 480 volts

Transmitters: Twelve 100,000 watt and one 50,000 watt. All are high-level plate modulated (some include supplementary screen and control grid modulation). Some are entirely air-cooled; some also use water cooling and vapor-phase cooling. The transmitter building is 16,000 square feet. The 13 transmitters consist of two 100 kW Continental 418-Ds, and eight composite-construction 100 kW transmitters based on the 418-D but built by WYFR. One of the transmitters has been retrofitted with a solid state modulator and could be converted to DRM digital operation. There are three older Gates/Harris transmitters (1 x 50-kilowatt and 2 x 100-kilowatt). All of the 100-kw transmitters can also be operated at 50 kilowatts, and one of them is able to operate at a continuously-variable power level up to 100 kilowatts.

Antennas: Twenty-three in all, they consist of four sizes of double rhomboids (a cousin to the rhombic), three types of log periodic antennas, and one dipole curtain with passive reflecting screen. The attached plot plan of the property shows the locations of the main building and the various antennas. Looking at the plot plan, starting with the Eastern North America antennas and working clockwise, the antennas are as follows:

- 355 A and B medium range log periodics (Eastern North America)
- 44C 2 X 4 long range curtain antenna (Europe)
- 44 A & B long range nested double rhomboids (Europe)
- 87 long range nested double rhomboids (Africa, centered on Lagos in West Africa)
- 140 A long range log periodic (Brazil and northern South America)
- 142 A medium range nested double rhomboids (Brazil and northern South America)
- 151 A medium range log periodic (southern Caribbean and northern South America)
- 160 A medium range nested double rhomboids (northwest South America and western South America)
- 160 B long range log periodic (northwest South America and western South America)
- 181 short range log periodic (main service to Cuba with some auxiliary service to Central America and northwest South America)
- 222 A & B medium range log periodics (Central America and southern Mexico)
- 285 A & B medium range log periodics (northern Mexico and western USA)
- 315 A & B medium range log periodics (Western North America)

Note: The numeric designation of an antenna gives its orientation in degrees from true North.

Antenna Details:

* Nine medium-range log periodic antennas, TCI model 516-6. All of these were fabricated by WYFR except one original from TCI. These antennas are each supported by two 180-foot towers and by one 90-foot and

two 60-foot wood poles. (355A, 355B, 151A, 222A, 222B, 285A, 285B, 315A, 315B) Nominal take-off-angle is 14 degrees; gain is about 14.5 dbi; half-power azimuthal beamwidth is about 68 degrees. Nominal frequency coverage is 5.8 to 17.9 MHz for 2:1 VSWR. Beamwidth is 68 degrees.

* Two medium-to-long-range log periodic antennas, TCI type 527-6-100 -- one from TCI and one fabricated by WYFR. These antennas are each supported by two 180-foot steel towers. (140A, 160B) The 527 is two type 516s mounted side by side. This narrows the azimuthal beamwidth, adding almost 3db of gain over the 516.

Frequency coverage and take-off-angle will be nearly the same as the 516. Take-off angle ranges from 20 degrees at 6.2 MHz to 13 degrees at 25 MHz. In the elevation plane, UHPP at 6.2 MHz is 33 degrees; LHPP at 6.2 MHz is 10 degrees; UHPP at 25 MHz is 20 degrees; LHPP at 25 MHz is 6 degrees. Azimuthal beamwidth between half-power points is nominally 36 degrees. Gain ranges from 16.5 dbi at 6.2 MHz to 18.2 dbi at 25 MHz. Frequency range is 5.95-26.1 MHz for 2:1 VSWR. Beamwidth is 36 degrees.

* One short-range TCI type 515-3 log periodic antenna fabricated by WYFR. This antenna is supported by two 120-foot steel towers. Has 45-degree takeoff angle. (181) The take-off-angle is 45 degrees. Azimuthal beamwidth is 90 degrees. Gain is about 12 dbi. Frequency range is 3.9 to 18 MHz for 2:1 VSWR. Beamwidth is 90 degrees

* One long-range 2x4 TCI type 611 curtain antenna (2/4/1). This antenna is supported by four 180-foot steel towers. (44C) Frequency range is 11.65 to 21.9 MHz. Nominal take-off-angle is 7 degrees. Gain is 19.5 dbi. Half-power azimuthal beamwidth is about 45 degrees.

* Six long-range Type 1 double rhomboid antennas fabricated by WYFR. These antennas are nested in sets of two, with each set suspended from eight steel towers, seven of them 180 feet long, one of them 160 feet. (44A, 44B, 87 - two each) All frequencies covered, though not equally well. Nominal take-off-angle is about 8 degrees; gain about 20 dbi; half-power azimuthal beamwidth is about 10 degrees, with considerable fill from additional lobes.

* Four Type 2 double rhomboid antennas fabricated by WYFR. These antennas are nested in sets of two with each set suspended from eight steel towers, seven of them 140 feet, one of them 120 feet. (142A, 160A - two each) All frequencies covered, though not equally well.

Nominal take-off-angle is about 10 degrees; gain about 18 dbi; half-power azimuthal beamwidth is about 15 degrees, with considerable fill from additional lobes. Additional details regarding double rhomboid antennas: Mid-band elements are at about 60 meters above earth. Gain is nominally 20 dbi. Nominal take-off-angle is about 8 degrees. Short leg length is 168 meters; long leg length is 223 meters. Angle between major rhomboid axis and short leg is 36 degrees. The DRs are based on the Laport double rhomboid, but the specific configurations were worked out by WYFR. Feedpoint height: DRI nominally 55 meters; DRII nominally 43 meters. Short leg length: DRI nominally 168 meters; DRII nominally 94 meters. Angle between major rhomboid axis and short leg: DRI 36 degrees; DRII 52.2 degrees. Angle between major rhomboid axis and long leg: DRI 29.6 degrees; DRII 37.7 degrees. Long leg length: DRI nominally 223 meters; DRII nominally 160 meters. Termination heights are the same as feedpoint heights. All steel towers are about two feet wide on the face. Most of them are from Path Products.

Feedlines: The transmitter building is in the center of the property. The transmission lines are shown running from the building to the antennas. Each antenna is fed by an open-wire balanced feedline nearly

half a mile in length. They are constructed of four wires side-connected to form a two-conductor line with characteristic impedance of 300 ohms. These transmission lines were fabricated by WYFR.



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