

VIR JAMES P. C.

TIMOTHY C. CUTFORTH P.E., DIRECTOR OF ENGINEERING
BROADCAST ENGINEERING CONSULTANTS
965 S. IRVING ST. · DENVER, CO · 80219
(303) 937-1900

DIRECTIONAL ANTENNAS
AM - FM - TV
APPLICATIONS
PROOFS
FIELD MEASUREMENTS
AUDIO AND RF ENGINEERING
EMERGENCY REPAIR

ENGINEERING STATEMENT

Concerning an amendment to an application increase power for KRCM Shenandoah, Texas.

The FCC staff has requested clarification and additional details on the application. This amendment provides the requested additional information for the proposed facility.

CONDUCTIVITY TEST MEASUREMENT FACILITIES

The conductivity measurements submitted were taken from a location on the transmitter site adjacent to the access road close to the location shown on the plat for tower 2. A trailer mounted crank up guyed tower was used with a mast attached to the top for a height of 36.6 m above ground overall. A full 120 radial ground system was laid on the surface of the ground with a radius of 53m average radial length. The tower was equipped with a unipole feed so the whole height above ground is considered to be the radiator for an electrical height of 60.6 electrical degrees. The testing was initially approved for the expanded band with a Special Field Test Authorization. However just as the measurements were about to commence the Construction Permit was granted for KRCM to move to that site and so it was determined to make the measurements on 1380 kHz with essentially the same facilities approved in the Construction permit even though the tower was a temporary installation. After the measurements had been made at all of the useable points the temporary tower was dismantled and removed from the site.

SITE PLAT

The tower site is adjacent to the San Jacinto River east of Tamina, TX. The tower site is shown on the attached plat along with the tower and ground system layout.

MEASUREMENT REFERENCE GRAPHS

The measurements were plotted using a new computer program to generate the graphs. However the computer generated graphs scanned in at a different ratio than the standard graph. The standard graph was rescaled to match the computer generated plots. Please see the attached rescaled graph.

KRCM CLOSE IN MEASUREMENTS

FCC Section 73.186(a)(1) describes the measurements desirable to establish the radial IDF. Please note that paragraph (1) foresees conditions ranging from rural conditions with unlimited open access where 15 measurements on each radial with 7 measurements within the first 3km to city conditions where unobstructed measurements are difficult and no specific interval is repeatable, to cases where the intervening terrain may make close in measurements impossible out to even 8 or 10 km. The KRCM site is more closely described by the third case as it is located adjacent to a river in an area with few roads and subject to intermittent flooding and other restraints to free access that limited close in measurements in several directions. The KRCM site is well away from tall

structures that could distort the nondirectional characteristic of the antenna and the terrain is rather flat for some distance further reducing the possibility of changes in the IDF caused by change in elevation versus direction. The flat land also makes the problem of flooding more severe as a limitation to access. Attached is a running summary of the access conditions to show that the measurements were taken at all accessible on radial measurement points where access was difficult and at a large number of points where access was available.

RADIAL MEASUREMENT ACCESS

The radial measurements for KRCM presented difficulties in access. The KRCM site near Tamina, TX, abuts the San Jacinto River which is a non-navigable body of water so measurements along the river are not practical. The river is just below the Lake Conroe Dam control gates which makes the area subject to drastic flow rate changes without notice. The area south and east of the tower site is closer to the level of Lake Houston below, and receives drainage from the low, flat land in this coastal area. Proximity to the lower lake means this part of the San Jacinto River serves as flood control holding basin for the region. The area of our measurements is often flooded by regular storm drainage from coastal rains and runoff from the highly developed neighborhoods nearby. The area on both sides of the river is heavily wooded and crisscrossed by creeks, sloughs, ponds, and swamps making access difficult. The San Jacinto River has changed course often in the area nearest the tower site, adding to floodplain obstacles that make many areas inaccessible. This area flooded heavily in 1994, putting almost 11' of water over the transmitter site area from the river swelling from regional drainage. This recurrent flooding inhibits development despite pressure from population moving north from Houston, and keeps access to much of the area near the transmitter very limited. Accurate navigation using GPS made possible many of these measurements since the dense woods make it impossible to see any landmarks in most locations. There is little development and few roads of any class near the tower site. Additionally, some of the land of interest is fenced with locked gates or posted "NO TRESPASSING". Tamina is a settlement formed by squatters in the mid 1800's who were recently freed from slavery. They settled on this land, which was later parceled off by the legal landowner and leased ostensibly for oil production to people in northern states just after the oil boom of the early 1900's. The oil leases proved mostly unproductive, and now the descendents of the settlers of much of Tamina cannot sell their property for lack of clear title. This historical injustice, as well as nearby pressure from The Woodlands to develop and expand, causes the landowners to be suspicious of outsiders and to restrict access more than we would think is normal. For that reason all accessible measurement points within the first 5km were used including all points that could be accessed on foot, where permission for access could be obtained. In the few directions where the radials crossed developed areas so that access was practical, many points were measured.

This narrative is for the purpose of showing that all reasonable measurement points were used in areas with limited access and that where more points were available many points were measured. The analyzed IDF fitting the measurement points was consistent on all radials and there were no structures taller than the standard wooden power distribution poles that could cause the radiation pattern to be distorted. Each radial is described out to about 6km.

RADIAL 130 DEGREES

The nearest accessible measurement point on solid ground was on the other side of the river at 1.32km on E. River Rd. Then measurements were possible along the unimproved back roads at 1.83km on Lyric Rd., 2.32km on McGregor Rd., 2.78km on Walker Rd., and 3.52km on Moorehead Rd. River bottom land is extensive in this direction. Coastal flooding backing up into Lake Houston in this area had swollen the river. The next available location was at 6.2km on Northstar Dr..

RADIAL 150 DEGREES

The San Jacinto River crosses radial 150 degrees twice before reaching 6km severely limiting access. From the tower site the first accessible measurement point is on the East side of the river at 2.69km on E River Rd. an unimproved back road. The next point of access was at 3.65km accessed via an unimproved pipeline service road. The third point of access was at 5.71km on the West side of the river accessed by walking in from the end of an unimproved back road. River bottom land is extensive in this direction. Coastal flooding backing up into Lake Houston in this area had swollen the river. Extensive flat river bottom just above a coastal lake made access impossible. The radial then follows the river and the swampy/flooded area along side it to the next accessible point at 12.17km.

RADIAL 170 DEGREES

Points 0.58km, 0.84km, and 1.17km were accessed from the fishing access trails along Rogers Lake and Lee Lake. The river has changed course many times in recent history in this area, leaving lakes and swampland making intermediate readings impossible. The Woodland's construction sand and gravel plant was repeatedly approached for permission to access for FCC readings, and access was repeatedly denied. The next accessible point at 3.75km was accessed from an unimproved fishing trail. The next accessible point is at 8.53km on a service driveway.

RADIAL 190 DEGREES

The area directly south of the transmitter site is swamp for over 0.5km and then is crossed by a meandering creek three times before the first accessible measurement point at 2.22km on Sleepy Hollow Rd. Much of the radial here crosses over small lakes and flooded river bottom. The next accessible point was 2.62km on White Oak Crossing and the next at 3.22km on White Oak Pass. The next accessible point was at 3.75km reached on foot along the banks of White Oak Creek. The next accessible point is at 5.79km reached by the pipeline service road. The next accessible point was at 6.49km.

RADIAL 210 DEGREES

Radial 210 crossed a small development and crossed nearly every road in the area allowing good measurement access. The first accessible measurement point was at 0.53km on Bonney. The measurement at 1.64km was on Trails End Rd. The measurement at 1.88km was on Canyon Cross. The measurement at 2.01km was on Green Mesa Dr. The measurement at 2.53km was on Oak Canyon Dr. The measurement at 2.77km was on Sleepy Hollow Rd. The measurement at 3.12km was on Running Deer St. The measurement at 3.69km and 3.83km were along Scarlet Oak Trail. The measurement at 4.10km was on Creekview Ln. The measurement at 4.31 was on Longleaf Dr. The next accessible measurement was at 6.16km on a service driveway.

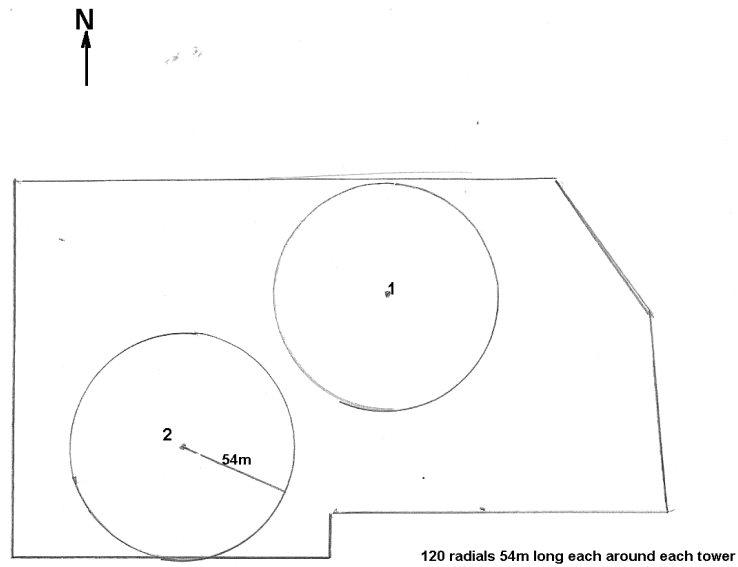
RADIAL 230 DEGREES

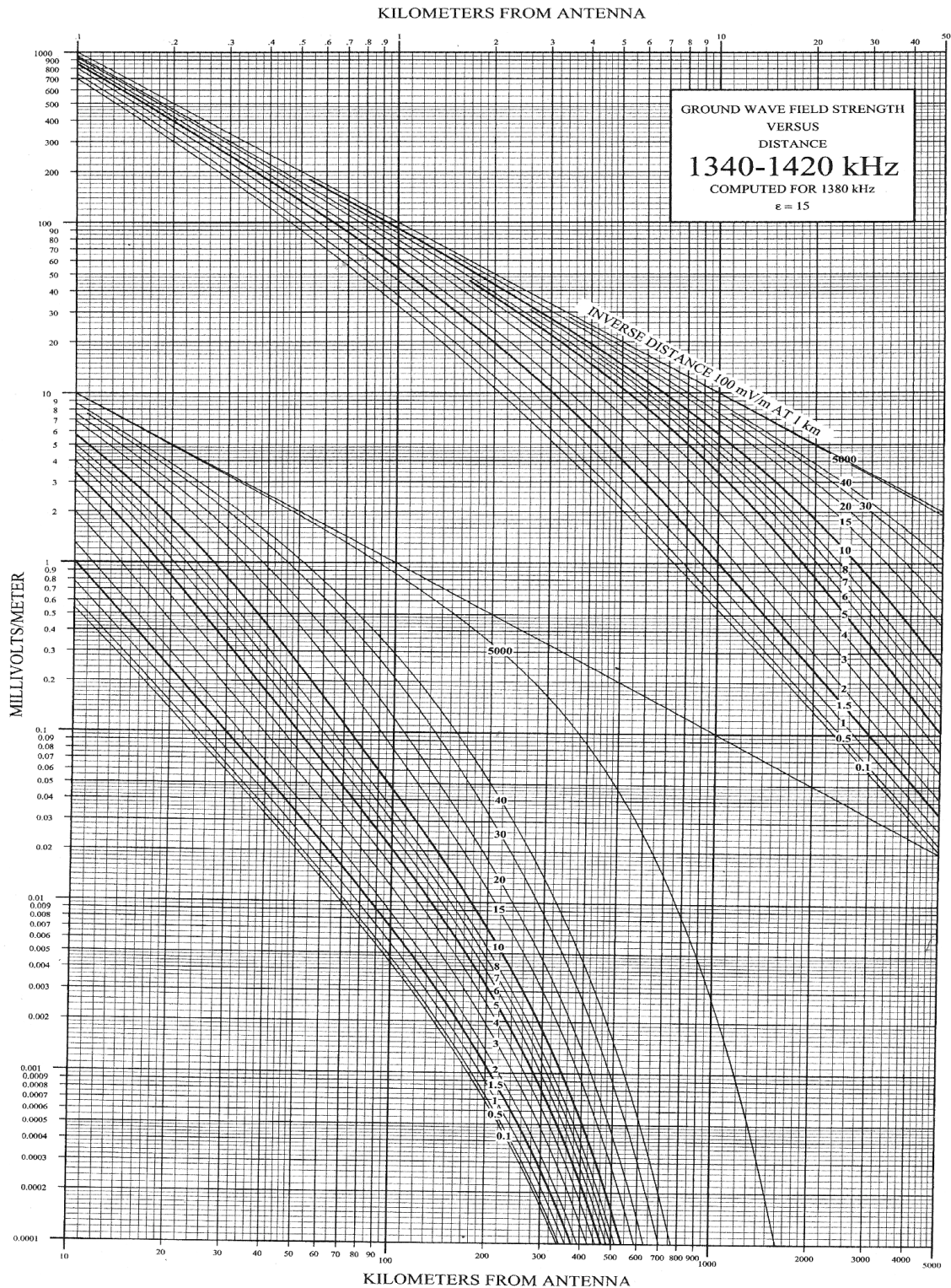
Radial 230 Degrees crossed many roads in developments allowing good measurement access. The measurement at 1.08 was on a service driveway. The measurement at 1.41km was on Trails End Rd. The measurement at 1.80km was on Oak Canyon Dr. The measurement at 1.93km was on Friendship Ln and the 1.98km measurement was on Old Oaks Ln. The 2.37km measurement was on Big Holly Ln. The measurement point at 2.83 km on Pinon Oak Dr. The measurements at 3.41km and 3.46km were measured on foot north of the end of Silver Leaf Ct. The measurement at 4.17km was on Sleepy Hollow Rd. The measurement point at 4.92km was on Pinewood Dr. The Measurement Point at 5.99km was accessed by driving along the side of the railroad tracks. The measurement point at 6.15km was on Blueberry Hill Dr.

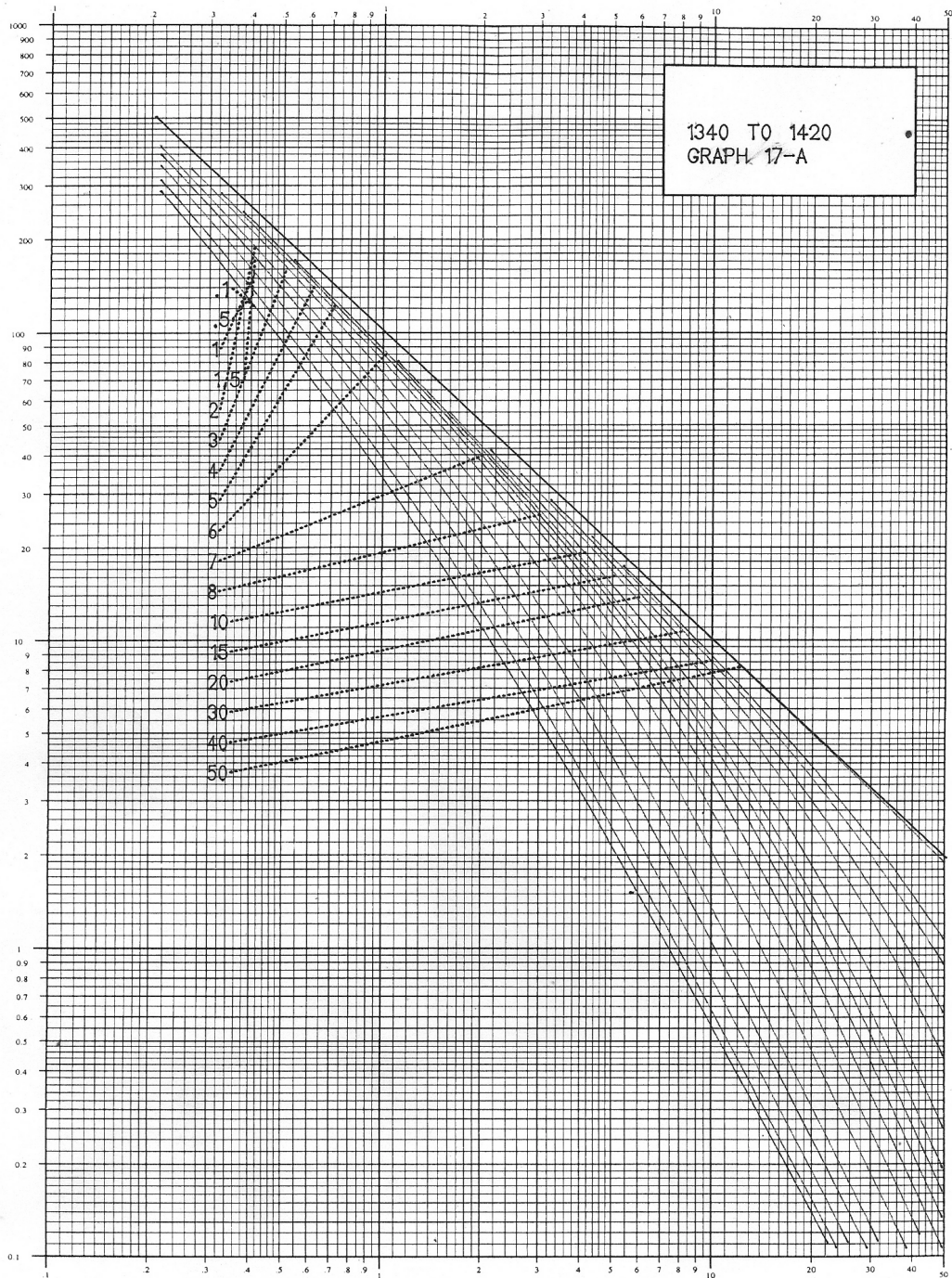
RADIAL 250 DEGREES

Radial 250 degrees crosses the site access road twice nearby and then crosses a large undeveloped area with very limited access due to swamp and heavy woods for several km then enters the community of Tamina. The first measurement point at 0.87km was on Clark Ln. The measurement point at 1.19km was on Trails End Rd. From this point, the land is heavily wooded on this radial, with a large lake, and posted private property up to a neighborhood on Broadway. The measurement point at 4.73km was on Broadway Ave. The measurement point at 5.05km was on Bimms Dr. The measurement point at 5.38km was on Johnson Rd. The measurement at 5.95km was on David Memorial Dr. And the point at 6.45km was on Southwood.

PLAT OF SITE AND GROUND SYSTEM







73.186(a)(1) Beginning as near to the antenna as possible without including the induction field and to provide for the fact that a broadcast antenna is not a point source of radiation (not less than one wave length or 5 times the vertical height in the case of a single element, i.e., nondirectional antenna or 10 times the spacing between the elements of a directional antenna), measurements shall be made on six or more radials, at intervals of approximately 0.2 kilometer up to 3 kilometers from the antenna, at intervals of approximately one kilometer from 3 kilometers to 5 kilometers from the antenna, at intervals of approximately 2 kilometers from 5 kilometers to 15 kilometers from the antenna, and a few additional measurements if needed at greater distances from the antenna. Where the antenna is rurally located and unobstructed measurements can be made, there shall be at least 15 measurements on each radial. These shall include at least 7 measurements within 3 kilometers of the antenna. However, where the antenna is located in a city where unobstructed measurements are difficult to make, measurements shall be made on each radial at as many unobstructed locations as possible, even though the intervals are considerably less than stated above, particularly within 3 kilometers of the antenna. **In cases where it is not possible to obtain accurate measurements at the closer distances (even out to 8 or 10 kilometers due to the character of the intervening terrain), the measurements at greater distances should be made at closer intervals.**