

Federal Communications Commission,
Office of Science and Technology

In the matter of:
APPLICATION FOR LICENSE IN THE
EXPERIMENTAL RADIO SERVICE

EXHIBIT No. 1
Response to Form 442, Item 10

The applicant is currently experimenting with low-power long wave transmitter construction and operation under Part 15 of the Rules. I request permission to experiment with the power limits proposed for the Amateur Radio Service in RM-9404: up to 200 watts peak output, but not to exceed 2 watts peak EIRP.

Within the 160-190 khz range, the frequency would be chosen to avoid current Part 15 narrow-band beacon experiments and other Part 5 stations within close range (e.g. file 0213-EX-PL-2001, KA2XUK, et al). Most experimentation would be done on this band, near 176.0 khz.

A frequency in the 135.7-137.8 khz range would be chosen to avoid Canadian station CFH and foreign Amateur stations (Regions 1 and 2); a typical spot frequency would be near 136.0 khz. Activity would be minimized, and only A1 mode would be used (generally 0.04 or 0.4 Word Per Minute, plus assigned call at 18 WPM).

Any interference to power-line carrier would be handled per footnote US294 to the table of frequency allocations.

The station would identify by its assigned Part 5 call, in voice or telegraphy.

Some fields of interest to me:

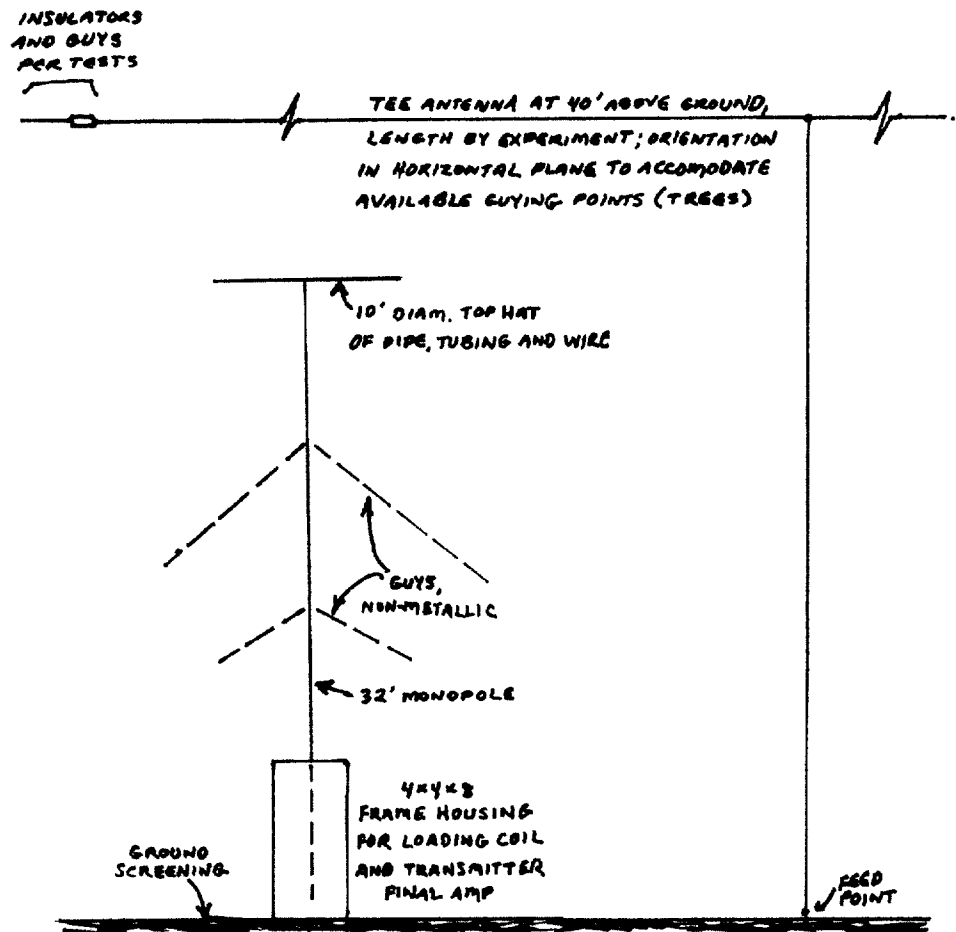
1. **Safety precautions in the near field; sizing of insulators; avoidance of arcing;** effects of high RF voltages on the physically-short antennas typical at these wavelengths.
2. **Adequate harmonic filtering.** The physically-short antennas are electrically resonant at HF. In Australia, a 19th harmonic of a long wave Amateur station was reported several miles away.
3. **Voice and data distortion with increased bandwidth; dealing with severe limits in the speed of information exchange.** At long wave, even a slight change in frequency involves a considerable change in wavelength. Compromises in the Q of the antenna system would allow broader modes, but reduce coverage. The highest data rate proposed is 1200 baud, using SSB.
4. **Testing larger antennas at long wave.** Part 15 limits the antenna length (15 meters), while Amateur antennas might be limited by EIRP (proposed at 2 watts peak in RM-9404).
5. **Testing various grounding and above-ground screen methods.** R_g losses severely limit long wave coverage.

Respectfully submitted,


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EXHIBIT No. 2

Response to Form 442, Item 12



Monopole with capacitive top hat is 10 meters tall; Tee antenna is 12 meters tall.

**PROFILE OF ANTENNAS
FOR PROPOSED PART 5
LONG WAVE STATION
AT CARMEL, NEW YORK**