

Request for Experimental Authority

Applicant, Metro Telecom, Inc., seeks experimental authority to test the technical feasibility of and conduct market tests regarding a plan to accommodate the mobile communications needs of the carriers and numerous support services involved in the operation of major airports. Applicant provides mobile radio equipment and services to carriers and support services at three major airports in the New York City area utilizing spectrum assignments designated in Part 90 of the Commission's Rules and Regulations. This spectrum consists of shared channels and is highly congested and subject to extreme interference problems. The conventional spectrum allocations available for mobile communications are nearly exhausted, especially in the major metropolitan areas where large airports tend to be located. In the private radio services, exclusive channels are virtually unavailable, and shared channels are congested to the point of being of minimal value. Moreover, in the typical airport environment, large numbers of users are concentrated in a relatively small area—an area of rather pervasive radiofrequency energy, making low power mobile communications subject to an inordinate amount of electromagnetic interference.

Applicant proposes, on an experimental basis, to modify existing 450 MHz band base stations manufactured by Motorola to operate on certain "split" frequencies between the air-ground channels allocated in Part 22 of the Commission's Rules. As will be described more fully below, this frequencies can be utilized by the base stations with no risk of interference to existing users of the adjacent channels. The mobile units (the vast majority of which are hand-held portables) associated with the base stations will not be modified, but will simply be programmed to receive on the "split" channels. This will give them a receive frequency clear of interference. The mobiles will continue to transmit on traditional shared 450 MHz frequencies, as licensed pursuant to standard (non-experimental) authorizations, but any congestion and interference on this "talk-back" path will be managed on the receiving end at the base station by techniques such as use of directional antennas, antenna placement and shielding, filters, etc.

The essence of Applicant's scheme is that if a clear channel can be provided for the base-to-mobile path, any interference on the mobile-to-base path can be managed by equipment configuration at the base station. This approach has a two-fold benefit: (1) it requires locating only one-half the additional spectrum needed to alleviate congestion, and (2) it allows the continued use of standard, off-the shelf, relatively low cost equipment for the mobile stations.

The spectrum Applicant proposes to use for the base-to-mobile allocations will be "splits" between the mobile frequencies from the UHF air-ground channels allocated in Part 22, Subpart G, of the Commission's Rules. Specifically, Section 22.805 of the Commission's Rules, 47 C.F.R. § 22.805, allocates twelve 454/459 MHz channel-pairs for air-ground radiotelephone service, as set forth in Table 1, below.

Table 1

<u>Ground</u>	<u>Airborne mobile</u>
454.700	459.700
454.725	459.725
454.750	459.750
454.775	459.775
454.800	459.800
454.825	459.825
454.850	459.850
454.875	459.875
454.900	459.900
454.925	459.925
454.950	459.950
454.975	459.975

The channels are allocated on a geographic base stations are allocated geographically, so that ground station channels are typically assigned only at distances greater than 199 miles from the nearest co-channel ground station. 47 C.F.R. § 22.813(c). In addition, the Commission generally authorizes only one channel at a time per carrier, up to a maximum of six channels in any one geographic area. 47 C.F.R. § 22.817. The result of this regulatory structure is that, in any given location, none of the channel pairs will be assigned to ground stations within a rather large radius.

Applicant's 450 MHz base stations are located at three airports in the New York metropolitan area, as follows:

Table 2

<u>Airport/Address</u>	<u>Geographic Coordinates</u>
JFK International Airport Jamaica, New York	40° 46' 14" North Latitude 73° 52' 16" West Longitude
Newark International Airport Newark, New Jersey	40° 46' 29" North Latitude 73° 52' 18" West Longitude
La Guardia Airport Flushing, New York	40° 46' 29" North Latitude 73° 52' 18" West Longitude

Applicant has determined that there are six different sets of adjacent 454/459 MHz air-ground frequency pairs are not assigned within a 100 mile radius of the New York metropolitan area, and most of them are much more distant than that.

As to each adjacent 454/459 MHz air-ground frequency pair that is not assigned in any location proximate to the New York metropolitan area (and, hence, not proximate to any of

applicant's three base stations), applicant proposes to use, on an experimental basis, for the base-to-mobile path, the 12.5 kHz split between the two mobile frequencies. Table 3, below, sets forth Applicant's analysis of the frequencies available under this criterion. The table shows the 12.5 kHz split between the mobile channels of each 454/459 MHz air-ground channel pair, and indicates whether there is sufficient separation between base stations using the two mobile channels immediately adjacent to the split and Applicant's base station locations in the New York metropolitan area. The "cleared" split channels are underlined. As can be seen, as to three of the six selected channels, there are no adjacent channel locations in New York, New Jersey, Connecticut, Rhode Island, Pennsylvania, or Massachusetts. As to the other three selected channels, Table 3 indicates the location and call sign of the nearest adjacent channel station.

Table 3

Ground	Airborne	Split	Separation?
454.700	459.700	459.7125	NO (.700 in Queens)
454.725	459.725	<u>459.7375</u>	OK (KED350 – Elmira NY .750)
454.750	459.750	459.7625	NO (.775 in Queens)
454.775	459.775	459.7875	NO (.775 in Queens)
454.800	459.800	459.8125	NO (.825 in Queens)
454.825	459.825	459.8375	NO (.825 in Queens)
454.850	459.850	<u>459.8625</u>	OK (KCC793 – Framingham MA .850)
454.875	459.875	<u>459.8875</u>	OK (nothing in NY, NJ, CT, RI, PA, MA)
454.900	459.900	<u>459.9125</u>	OK (nothing in NY, NJ, CT, RI, PA, MA)
454.925	459.925	<u>459.9375</u>	OK (nothing in NY, NJ, CT, RI, PA, MA)
454.950	459.950	<u>459.9875</u>	OK (KGC406 – Pittsburgh PA .975)
454.975	459.975		

The risk of interference to the adjacent channel licensees is virtually nonexistent due to numerous factors: (1) As noted above, Applicant's base stations will be located a minimum of 100 miles (and on most channels much further) away from the nearest base station operating on the adjacent 454/479 MHz channel pair. (2) Applicant will be operating on the mobile side (i.e., the 459 MHz side) of the channel pair. The distant adjacent channel base station will be receiving transmissions from airborne stations operating on 459 MHz. Even assuming Applicant's base station transmissions could be received at the distant base stations—which they would not—they would present no significant signal in comparison to the desired airborne mobile stations. (3) While the above two factors alone provide ample protection against interference, Applicant's operating frequencies will be offset from the distant adjacent channel frequencies by 12.5 kHz, further attenuating any signal theoretically receivable at the distant station locations. (4) Finally, applicant will be operating at relatively low power (maximum 50 watts ERP) and at low antenna heights (less than 100 feet). This proposal represents virtually no chance of harmful interference to adjacent channel licensees. Nonetheless, Applicant will immediately terminate operations upon receipt of any interference complaint and will not resume operations unless and until the matter is resolved.

Through technical experimentation and market tests, Applicant hopes to determine the feasibility of this configuration for providing interference free operations in the congested and RF-intensive environment. If successful, this approach will provide for alleviation of interference to vital support communications without increasing interference and while making efficient use of otherwise fallow spectrum. Depending on the results of these experiments, Applicant may then file a developmental application and/or seek changes in the Commission's regulations to standardize this type of configuration for use at other airports. The concept may also be extended to other types of "campus" environments where large numbers of radio users operate in a relatively confined area. There may also be other frequency bands and service allocations to which this approach can be applied. It is therefore in the public interest, convenience, and necessity for Applicant to be authorized to conduct this experimental program.

Applicant will place base stations only at the three transmitter locations specified in Table 2, above, or at locations within a 0.25 mile radius thereof. Mobiles will only be receiving on the experimental frequency. Mobiles will transmit only on standard channels, and they will be separately licensed (regular, non-experimental authorizations) for those transmissions. Base station antennas will be side mounted on existing building structures, and in no event will the base station transmit antenna be more than 100 feet above ground level. Applicant requests flexibility within those parameters so as to be able to experiment with minor adjustments base station antenna location, positioning, and orientation. The maximum base station operating power will be 50 watts ERP. Applicant will, however, attempt to configure the systems to operate at considerably lower power. Indeed, one of the aspects of the configuration to be tested pursuant to this experimental authority will be to determine the lowest power that can be used and still maintain reliable, interference-free communications.

For all of the foregoing reasons, the public interest, convenience, and necessity would be served by prompt and favorable action on this application. Please direct any questions or correspondence concerning this application to counsel for Applicant, as follows:

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