

**Before the
Federal Communications Commission
Washington, D.C. 20554**

In the Matter of)
)
Auction of Licenses in the 747-762 and 777-) DA 02-260
792 MHz Band Scheduled for June 19, 2002)
)
Comment Sought on Adding to Auction)
Inventory and Further Modifying Package)
Bidding Procedures)
)

To: Chief, Wireless Telecommunications Bureau

**REPLY COMMENTS OF SPECTRUM EXCHANGE GROUP, LLC
AND ALLEN & COMPANY INCORPORATED**

Spectrum Exchange Group, LLC and Allen & Company Incorporated (“Spectrum Exchange/Allen”) hereby submit these reply comments in response to the Wireless Telecommunications Bureau’s (“Bureau’s”) February 4, 2002 Public Notice (“Public Notice”) seeking comment on adding to the auction inventory and further modifying package bidding procedures in an auction (“Auction No. 31”) of licenses in the 747-762 and 777-792 MHz band (“Upper 700 MHz Band”) to commence on June 19, 2002.¹

In our comments filed on February 19, 2002, we urged the Commission to refrain from establishing an aggregate reserve for Auction No. 31 and from increasing the previously established minimum opening bids. This continues to be our recommendation.

¹ *Auction of Licenses in the 747-762 and 777-792 MHz Band Scheduled for June 19, 2002; Comment Sought on Adding to Auction Inventory and Further Modifying Package Bidding Procedures*, Public Notice, DA 02-260 (WTB, rel. Feb. 4, 2002).

Our purpose today is to amplify our initial comments about other aspects of the auction rules, especially the rules for setting minimum bids for new packages.

The main purpose of minimum bids and activity rules is to force bidders to place meaningful bids during the early stages of the auction. This facilitates the price discovery role of the ascending auction and accelerates the pace of the auction. Without effective rules of this sort, bidders will hide as “snakes in the grass” in the early stages of the auction. Initial theoretical and experimental results suggest that the package auction could then take a very long time to complete—perhaps several times longer than simultaneous multiple round auctions without package bidding. As a consequence, the present design for Auction No. 31 includes several rules aimed at preventing the kinds of strategies that can conceal intentions and prolong the auction. Unfortunately, there is no easy way to eliminate such strategies within the framework of the Commission’s current auction design without also disrupting the most straightforward strategies that could be adopted by non-strategic bidders.

Among the rules that the Commission has adopted to reduce the potential length of the auction are (1) limits on the number of packages that a bidder may name, (2) activity rules, and (3) strict minimum bids. Until very recently, much of the analytical effort focused on improving package auction designs consisted of attempts to refine this set of rules, or rules very much like it. One such effort was the use of approximating linear programs to estimate package prices that might be used to set minimum bids. This is based on the hope that these prices might be close to the market clearing prices, although a close analysis shows that substantial errors are possible that could lead to seriously inefficient auction outcomes. Compounding the problem is that prices set using a linear program could be quite unstable, and strict activity requirements combined with prices spinning around out of control could cause a series of potentially winning bidders all

to lose bidding eligibility. That might result in inefficient allocations, uncompetitively low license prices, or both.

In its Option 1, the Commission proposes a narrower use of the prices based on linear programming approximations: the prices would apply only to a bidder's initial bid on any package. Even for this limited application, oscillating prices can be damaging, because bidders can take advantage of temporarily low prices to make low initial bids for packages, as part of a "parking" strategy. To mitigate this danger, the Commission employs several devices. One is the smoothing of the linear programming prices to reduce round-to-round oscillations. Unfortunately, such smoothing is less effective against oscillations that persist for two or three rounds, as well may happen. Another mitigating device is the setting of aggressive minimum bids on packages, which can limit parking but only at the cost of interfering with the legitimate strategies of straightforward bidders.

We have seen no reports on the severity of the minimum price oscillations that are possible in the linear programming strategy. It is clear, however, that Option 2 avoids such oscillations entirely. Moreover, the choice of a simple "points" system based on bandwidth alone for the twelve licenses in Auction No. 31, while surely imperfect, does not pose any special problems.

The linear programming approximation approach is not only inferior for the present use; it also sets the FCC on the wrong path. There is a much better approach to the whole problem—one in which bidders delegate some of their bidding responsibility to proxy bidders. "Proxy bidders" are electronic agents that execute bidding instructions given in a particular form.²

² Further details on the proxy agent approach and the associated results are contained in previous submissions we have made to the Bureau, including: presentation on "Ascending Auctions with Package Bidding", available on the FCC website at http://wireless.fcc.gov/auctions/conferences/combin2001/papers/ausubel-milgrom-wye-river_1.ppt; (continued on next page)

Designs using proxy agents have many advantages. First, the speed of the proxy bidders can completely eliminate any concern about the number of rounds in the auction and with that any need to adopt “mitigating devices” which, as we have explained, interfere with simple straightforward bidding strategies. Second, because properly designed proxy agents accept only a limited set of bidder instructions (ones that reflect possible bidder values and constraints), they exclude the kinds of retaliatory strategies that bidders have employed in past FCC auctions to bully other bidders, reducing competition and prices. Third, our game theoretic analysis predicts that a particular ascending proxy auction leads to outcomes that are efficient and earn competitively high revenues for the seller.³

Our analysis leads us to recommend that the Commission’s use the simpler, stabler Option 2 to determine minimum bids for new packages in Auction No. 31. The Commission should also quickly examine how it can most effectively implement proxy bidding for future package auctions, so that the current morass of rules can be drastically simplified for the bidders, auctions can be run in reasonable time, and straightforward bidders are allowed to execute their simple strategies without counterproductive impediments.

and “Comments on the Second Wye River Package Bidding Conference,” available on the FCC website at <http://wireless.fcc.gov/auctions/conferences/combin2001/papers/combin2001-comments.pdf>.

³ More precisely, outcomes of the ascending proxy auction are contained in the core of the coalitional form game that is associated with the seller of and bidders for the licenses. A mathematical analysis and proof of this proposition is contained in the research paper, “Ascending Auctions with Package Bidding,” downloadable at: <http://www.milgrom.net/PATW-PackageBidding.pdf>.

For the reasons set forth last week and above, Spectrum Exchange Group, LLC and Allen & Company Incorporated respectfully urge the Commission: (1) to refrain from establishing an aggregate reserve for the Upper 700 MHz Band licenses and from increasing the previously established minimum opening bids; and (2) to adopt Option 2 for its calculations of minimum acceptable bids. We reiterate our own previous conclusion: “Because Option 1 entails known risks and uncertain benefits and because it begins the FCC down a path toward an inferior implementation of package bidding, we advocate the adoption of the simpler Option 2.”

Respectfully submitted,

**SPECTRUM EXCHANGE GROUP, LLC
AND ALLEN & COMPANY INCORPORATED**

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February 26, 2002