

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

In the Matter of)
)
Comment Sought on Modifying) DA 00-1075
the Simultaneous Multiple Round)
Auction Design to Allow)
Combinatorial (Package) Bidding)

To: The Commission

COMMENTS OF SPECTRUM EXCHANGE GROUP, LLC

Spectrum Exchange Group, LLC (“Spectrum Exchange”) hereby submits these comments in the above-captioned proceeding.¹ Spectrum Exchange fully supports the Commission’s efforts to modify the simultaneous multiple round auction design to allow combinatorial bidding for licenses in the 747-762 and 777-792 MHz bands.² Such a modification in the auction design would substantially increase the likelihood that the spectrum in the 700 MHz band will be put to efficient use as compared to the present rules.³ We recommend that the Commission implement combinatorial bidding in substantially the form proposed in Public Notice DA 00-1075.

¹ Public Notice, Comment Sought on Modifying the Simultaneous Multiple Round Auction Design to Allow Combinatorial (Package) Bidding, DA 00-1075, WT Docket No. 99-168 (rel. May 18, 2000).

² Service Rules for the 746-764 and 776-794 MHz Bands, and Revisions to Part 27 of the Commission’s Rules, First Report and Order, WT Docket No. 99-168, FCC 00-5 (rel. Jan. 7, 2000).

³ *Auction No. 31 Procedures Public Notice*, 15 FCC Rcd at 2943-44.

I. BACKGROUND

As the record in this proceeding clearly demonstrates, the potential of the 700 MHz band to produce benefits for consumers is enormous. Because of its location in the electromagnetic spectrum and its excellent propagation characteristics, this band is ideally suited for next generation (3G) mobile or high-speed broadband services. These services will intensify competition for all communication services and yield tremendous benefit to the public, particularly if the services are speedily deployed to their highest value uses.

Spectrum Exchange has previously commented on the Commission's 700 MHz proceeding, in connection with our proposal to speed deployment by organizing a voluntary private market process that is designed to facilitate efficient clearing of the 700 MHz band while minimizing the reduction in over-the-air reception of television broadcast signals.⁴ To this end, Spectrum Exchange has recommended that the Commission promulgate various rules and language facilitating private market transactions,⁵ including: reaffirmation and strengthening of existing language supporting private transactions between incumbent broadcasters and new licensees;⁶ relocation rules facilitating the movement of incumbent broadcasters to lower television channels;⁷ and rules maintaining cable carriage for television broadcasters

⁴ The details regarding Spectrum Exchange's proposed private band-clearing auction have been outlined in filings on the record in this proceeding. See "Opposition of Spectrum Exchange Group LLC to Petitions for Reconsideration," in WT Docket No. 99-168, filed March 10, 2000; see also Letters dated December 17 and December 29, 1999 from Kathleen Q. Abernathy and letters dated April 3, April 7 and April 11, 2000 in WT Docket No. 99-168 from Jonathan V. Cohen, counsel to Spectrum Exchange, to Magalie Roman Salas, FCC Secretary, regarding *ex parte* presentations made by Spectrum Exchange.

⁵ Recognizing the need for, and the importance of, band-clearing, the Commission indicated in its *First Report and Order* in this proceeding that it will "consider specific regulatory requests needed to implement voluntary agreements reached between incumbent licensees and new licensees in these bands." *Service Rules for the 746-764 and 776-794 MHz Bands, and Revisions to Part 27 of the Commission's Rules*, WT Docket No. 99-168, *First Report and Order*, FCC 00-5 (released Jan. 7, 2000), 65 Fed. Reg. 3139 (Jan. 20, 2000), at ¶ 145.

⁶ *Ex parte* letter dated May 3, 2000 in WT Docket No. 99-168 from Peter C. Cramton to the Honorable William E. Kennard, FCC Chairman.

⁷ "Opposition of Spectrum Exchange Group LLC to Petitions for Reconsideration," in WT Docket No. 99-168, filed March 10, 2000, and "Petition for Rule Making by Spectrum Exchange Group LLC Concerning Rules To Facilitate Clearing of the 746-806 MHz Band," in WT Docket No. 99-168, filed April 24, 2000.

transitioning early to DTV-only transmissions.⁸ Spectrum Exchange continues to urge that the Commission follow all of these recommendations.

Spectrum Exchange has also taken a central role in crafting a consensus design for introducing combinatorial bidding into the FCC's auction of licenses in the 747-762 and 777-792 MHz bands, scheduled for September 6, 2000. The FCC proposal, "Comment Sought on Modifying the Simultaneous Multiple Round Auction Design to Allow Combinatorial (Package) Bidding," is based largely on a paper presented by Stanford University Professor Paul R. Milgrom (Co-President of Spectrum Exchange) at the Conference on Combinatorial Bidding jointly sponsored by the Federal Communications Commission, the Stanford Institute for Economic Policy Research and the National Science Foundation, that took place on May 5-7, 2000 at the Aspen Institute's Wye River Conference Center.^{9,10} In turn, this paper built upon many earlier themes in the literature on combinatorial auctions, and reflected the ideas of many other participants in the Wye River conference.

II. SPARRING SYNERGIES: THE NEED FOR COMBINATORIAL BIDDING

It is uncontested in the record of this proceeding—and evident from our discussions with potential bidders—that two types of synergies are in all likelihood present in the 700 MHz band. For some bidders, the important synergy is that the 700 MHz band offers a unique location on the spectrum to introduce the next generation (3G) mobile telecommunications service on a nationwide basis. However, this opportunity is present only if a bidder is able to acquire a national footprint: spectrum (and, preferably, at least 20 MHz of spectrum) in all six regions into which the United States has been divided. For other bidders, the important synergy is that the 700 MHz

⁸ "Opposition of Spectrum Exchange Group LLC to Petitions for Reconsideration," in WT Docket No. 99-168, filed March 10, 2000, and *ex parte* letter dated May 3, 2000 in WT Docket No. 99-168 from Peter C. Cramton to the Honorable William E. Kennard, FCC Chairman.

⁹ Public Notice DA 00-1075, footnote 3, WT Docket No. 99-168 (rel. May 18, 2000).

¹⁰ Paul R. Milgrom, "FCC-SIEPR-NSF Wye Woods Conference: Lessons plus a Simple Proposal," presented on May 7, 2000. Downloadable at <http://combin.fcc.gov/papers.html>.

band offers a unique location on the spectrum to introduce new high-speed broadband services: the third broadband pipe to the home. However, this opportunity is present only if a bidder is able to acquire a full 30 MHz of spectrum in a given region of the United States.

Unfortunately, both in theory and in practice, the simultaneous multiple round auction format adapts poorly to significant conflicting synergies and encourages a too-fragmented assignment of auction winnings. If there are some bidders for whom licenses may be substitutes, other bidders may respond by “demand reduction”: bidders have incentive to demand a smaller quantity of licenses than optimal, in order to accommodate the substitutes bidders and reduce the price paid on the remaining licenses.¹¹ Empirically, previous spectrum auctions in which many licenses may have been substitutes were observed to yield fragmented winnings.¹² Even when there are no bidders for whom licenses are substitutes, inefficiencies may arise in two ways. First, bidders may be deterred from bidding aggressively by the fear of winning only some of the licenses needed for efficient operation. Then, packages that should be formed in an efficient assignment may not be formed. Second, bidders who are not deterred may find themselves forced to bid more than their values, again leading to inefficient assignments. This second pattern occurred frequently in the recent FCC-sponsored auction experiments.¹³

The apparently large synergies in the 700 MHz band raise these concerns to pre-eminence in the auction design. They support the conclusion that the simultaneous multiple round auction should be modified to permit bids for combinations of licenses that realize the synergies.

A simple, yet correct, way to conceptualize the proposed combinatorial bidding design is as a competitive procedure for determining the relative importance of the two sparring synergies.

¹¹ Lawrence M. Ausubel and Peter Cramton, “Demand Reduction and Inefficiency in Multi-Unit Auctions,” Working Paper No. 96-07, University of Maryland, July 1996.

¹² See Lawrence M. Ausubel, Peter Cramton, R. Preston McAfee, and John McMillan, “Synergies in Wireless Telephony: Evidence from the Broadband PCS Auctions,” *Journal of Economics and Management Strategy*, Vol. 6, No. 3, Fall 1997, pp. 497-527, for an empirical treatment of synergies in spectrum auctions.

¹³ “An Experimental Comparison of the Simultaneous Multiple Round Auction and the CRA Combinatorial Auction,” report to the FCC by Cybernomics, Inc, March 15, 2000.

If it was known, *a priori*, that the synergies from a national footprint were dominant, then a combinatorial auction design would be unnecessary. Instead, the FCC could simply auction the 700 MHz band as national licenses (as many European countries are doing with their UMTS licenses). Conversely, if it was known, *a priori*, that the synergies from 30 MHz of bandwidth were dominant, then a combinatorial auction design would also be unnecessary. Instead, the FCC could simply auction the 700 MHz band as 30 MHz regional licenses.

The proposed combinatorial bidding design gives the market an opportunity to determine which of the two types of synergies are dominant. This is closely reflected in the definition and logic of “retained bids” in Section II.B of Public Notice DA 00-1075. A national package bid is retained “if it would be part of the provisional winning set determined by limiting consideration to national packages and individual license bids, but excluding global and regional packages.” In effect, a fictional “subauction” is being conducted in which only the synergies associated with a national footprint are being recognized. A regional package bid is retained “if it would be part of the provisional winning set considering regional packages and individual license bids, but excluding global and national packages.” In effect, a second fictional “subauction” is being conducted in which only the synergies associated with 30 MHz of bandwidth are being recognized. The winning bids come from whichever of these two sparring subauctions yields higher revenues. Or, from the global package (which combines each of the two types of synergy), if that yields still higher revenues.

III. COMMENTS ON SPECIFIC ISSUES OF AUCTION PROCEDURE

Spectrum Exchange submits the following comments on specific issues of auction design and procedure raised in Section II of Public Notice DA 00-1075. We find the remaining proposals on auction design and procedure contained in Section II of Public Notice DA 00-1075 to be relatively uncontroversial and unobjectionable, and not to require specific comments at this

time. We defer commenting on the additional auction design considerations contained in Section III of Public Notice DA 00–1075 at least until our reply comments.

A. SIMULTANEOUS MULTIPLE ROUND WITH PACKAGE BIDDING

Spectrum Exchange strongly endorses the proposal contained in “II.A Simultaneous Multiple Round with Package Bidding.” While we would generally favor allowing a larger collection of packages than the nine enumerated here, we can easily understand why the Commission may wish to limit the complexity of the initial use of a combinatorial auction. This is especially the case given the considerable information that is known about the synergies in the 700 MHz band. Moreover, we note that many of the other facets of the design—for example, the specific definition of retained bids—are driven by the choice of allowable packages, so this aspect of the design should not be changed in isolation.

B. WINNING AND RETAINED BIDS

Spectrum Exchange equally endorses the proposal contained in “II.B Winning and Retained Bids” as appropriate for the auction of the 700 MHz band.

C. MINIMUM ACCEPTED BIDS AND BID INCREMENTS

Spectrum Exchange believes that several of the alternatives discussed in “II.D Minimum Accepted Bids and Bid Increments” are meritorious and should be considered. As much as possible, the Commission should avoid tying its hand—from both a legal and software viewpoint—until some further analysis and testing can be done of these alternatives.

We recommend that some variant on “click box” bidding be used, for the usual reasons of deterring bid signaling activities and avoiding bidder error. We further endorse the proposal to restrict the global package bid to be increased by only a single increment. However, we believe that there may be some merit to allowing the bids for the smaller packages (national packages

and regional packages) to be increased by somewhat more than one increment, in order to increase opportunities for relative prices of the packages to change.

Given that “click box” bidding with few allowable increments may lead to relatively frequent tie bids, the Commission may wish to consider tie-breaking procedures other than strict time priority. Also, given that the ultimate winning prices in the auction may be considerably above the minimum opening bid, the Commission may wish to set the initial minimum bid increment at ten or fifteen percent—rather than at the five percent proposed.

D. ACTIVITY RULES AND ELIGIBILITY

Spectrum Exchange strongly supports accounting for mutually exclusive bids in the computation of activity, but we believe that the language intended to account for mutually exclusive bids in the second paragraph of “I.E Activity Rules and Eligibility” is ambiguous and possibly defective. In its place, we suggest the following:

A bid is considered an “active bid” in the current round if it is either a retained bid from the previous round or an accepted bid in the current round. The “activity” of a given bidder in the current round is determined by the following calculations:

- (a) Exclude all regional package bids of the given bidder and determine the set, A , of all licenses included in one or more of the remaining active bids of the given bidder. Calculate the number, N_A , of bidding credits associated with the set, A , of licenses.
- (b) Exclude all national package bids of the given bidder and determine the set, B , of all licenses included in one or more of the remaining active bids of the given bidder. Calculate the number, N_B , of bidding credits associated with the set, B , of licenses.
- (c) Take the maximum of N_A and N_B .

This language intends that global package bids are not excluded in determining the sets A and B (and, so, any active global package bid would automatically yield activity of exactly

252,000,000 units). This language also assumes that explicit “or” bids are not permitted, and would need to be modified accordingly in the event that “or” bids are allowed.

E. BID REMOVAL AND BID WITHDRAWAL

Spectrum Exchange also endorses the proposals contained in “II.G Bid Removal and Bid Withdrawal.” We agree that the previously-announced special 30 MHz nationwide bid withdrawal procedure should be abandoned. We also agree that, once package bidding is introduced, the benefit associated with precluding withdrawals outweighs the harm.

F. ROUND STRUCTURE

Spectrum Exchange favors the proposal contained in “II.J Round Structure” of maintaining the current round structure, so as to minimize the modification to the simultaneous multiple round auction design.

IV. CONCLUSION

We emphasize that a modification of the simultaneous multiple round auction design to allow combinatorial bidding will be only secondary in determining the success of the 700 MHz auction. Creating a favorable environment for band clearing will overwhelmingly be the primary determinant of success. Nevertheless, there are still compelling public interest reasons for introducing combinatorial bidding for licenses in the 747-762 and 777-792 MHz bands. First, there is sufficient record in the proceeding to conclude that substantial synergies are present. Second, an environment with only 12 licenses is a simple one in which to introduce combinatorial bidding, minimizing the risk of failure and offering a promise of enormous additional value. Third, scored by Congress at \$2.6 billion, the 700 MHz band is sufficiently valuable to justify the expense of changing the auction format. Moreover, the design proposed by the Commission is both sound and feasible.

WHEREFORE, Spectrum Exchange respectfully recommends that the Commission implement combinatorial bidding in substantially the form proposed in Public Notice DA 00-1075.

Respectfully submitted,

SPECTRUM EXCHANGE GROUP, LLC

2920 Garfield Terrace, NW
Washington, DC 20008
(tel) 301.405.3495
(fax) 202.318.0863

By: Lawrence Ausubel
Lawrence Ausubel, Co-President
Peter Cramton, Chairman
Paul Milgrom, Co-President

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