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### **COMMENTS TO HOUSE ENERGY AND COMMERCE COMMITTEE ON THE SPECTRUM POLICY WHITE PAPER OF 4/1/14**

Marcus Spectrum Solutions LLC (MSS) welcomes the opportunity to comment to the House Energy & Commerce Committee on its white paper on spectrum policy.

MSS is the consulting practice of Michael J. Marcus Sc. D., F-IEEE, a retired FCC senior manager perhaps best known for proposing and creating the regulatory foundation for what is now Wi-Fi and Bluetooth<sup>1</sup> and also for the rules that opened up spectrum for commercial use at 60, 70, 80, and 90 GHz<sup>2</sup>. He was elected a Fellow of the IEEE “for leadership in the development of spectrum management policies” and was awarded the IEEE Communications Society’s 2013 Award for Public Service in the Field of Telecommunications “for pioneering spectrum policy initiatives that created the modern unlicensed spectrum bands for applications that have changed our world”. These comments reflect the views of MSS only and not necessarily those of its clients or any other groups.

The suggestions below are intended to be both nonpartisan and neutral with respect to various industries regulated by FCC. While criticism of FCC is presented, the root causes evolved over several decades under leadership of both parties and many chairmen.

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<sup>1</sup> <http://www.marcus-spectrum.com/page4/SSHist.html>

<sup>2</sup> <http://www.marcus-spectrum.com/page5/index.html>

MSS also commends to the Committee the recommendations of IEEE-USA, the US engineering professional society, that are given in two documents he helped draft:

- “Position Statement on Improving U.S. Spectrum Policy Deliberations in the Period 2013-2017”<sup>3</sup> -
- “Clarifying Harmful Interference Will Facilitate Wireless Innovation”<sup>4</sup>

### **Question 1: What structural changes, if any, should be made to the FCC to promote efficiency and predictability in spectrum licensing?**

When FCC was created in 1934 the world was much simpler than today and the FCC had a somewhat different structure than today although it was not reflected in the statute. Like the Interstate Commerce Commission that was the predecessor to the FCC’s Title II jurisdiction, the initial 7 commissioner FCC divided itself into 3 “divisions” of 3 commissioners at creation in 1934 – dealing with: telephone, telegraph, and radio.<sup>5</sup> The original intent was that the whole commission would meet *en banc* for issues affecting multiple industries or key decisions. Note that this was prior to the 1946 Administrative Procedures Act (APA) when the procedures for adopting and enforcing rules lacked today’s checks and balances, but were also much faster. Note also that prior to World War II the maximum frequency of practical use and the number of technological options for radio technology were very limited. While the 1934 FCC Annual Report mentioned in passing the “possibility” of VHF use “above 30 megacycles” or what would be called 30 MHz today, the highest frequency mentioned in actual routine use was 2.5 MHz.

At the same time of the arrival of the APA in 1946 came the postwar rapid explosion of available spectrum for practical use, many new technologies for using that

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<sup>3</sup> <https://www.ieeeusa.org/policy/positions/SpectrumPoilcy1112.pdf>

<sup>4</sup> <http://www.ieeeusa.org/policy/whitepapers/IEEEUSAWP-HarmfulInterference0712.pdf>

<sup>5</sup> <https://www.fcc.gov/reports/1st-annual-report-congress-1935>

spectrum, and an ever expanding categories of uses that have benefited both our economy and our society. But is the FCC, as presently structured able to deal with this workload efficiently? Experience shows that technical spectrum policy decisions are just not keeping up to the pace of today's complex industry. While major players are able to demand timely action on some issues, *e.g.* DTV transition and incentive auctions, even these major players have to choose between which of their actions will get attention in a sort of informal rationing system.<sup>6</sup> Entrepreneurial firms that are the hot bed of innovation in other technical areas just do not have access to much of the FCC's limited decision-making throughput in the spectrum policy area and as a result get turnaround on technical policy issues that discourages investment in wireless technology requiring nonroutine FCC approvals. Even major incumbents are not getting a timely response of new unanticipated types of interference to their systems that need rulemaking action to resolve.

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<sup>6</sup> We believe that the delays in Docket 10-4, discussed below, in resolving a major interference problem to cellular operators were the result of such a rationing effect. Cellular interests could not both get the spectrum they wanted and push for timely action in resolving a new interference source that posed complex policy problems. They probably chose to press for new spectrum and tolerate slow action on the interference so as not to exceed their ration of FCC's attention.

Consider the following table on noncontroversial spectrum dockets to allow incremental use of new technology.

Docket No.	Request	Start	End	Duration
WT 04-143	rulemaking – adding narrower bandwidths to 18 GHz fixed service band	05/04/2001 <sup>a</sup>	12/29/2006	66 mos.
ET 98-156	rulemaking – directional unlicensed power at 24 GHz	10/20/1997	02/13/2002	52 mos.
WT 07-54	rulemaking – smaller antennas in 11 GHz fixed service band	07/14/2004	10/31/2007	39 mos.
ET 99-231	rulemaking – unlicensed Wi-Fi “g” standard (digital modulation devices)	02/17/2000 <sup>b</sup>	07/25/2002	27 mos.
ET 06-195	waiver – UltraVision Security Systems perimeter security device	10/06/2006	11/20/2008	25 mos.
ET 04-373	waiver – SafeView security screening device	08/18/2004	08/04/2006	24 mos.
WT 09-114	rulemaking – conditional licensing on additional channels in 23 GHz fixed service band	11/07/2007	(pending)	23 mos. (to date)
ET 00-47	rulemaking – software-defined radios	03/21/2000	02/04/2002	22 mos.
WP 08-63	waiver – ReconRobotics surveillance robot	01/11/2008	(pending)	20 mos. (to date)
WT 09-114	rulemaking – adding wider bandwidths to 6 GHz fixed service band	02/04/2008	(pending)	20 mos. (to date)
WP 09-2	waiver – L-3 CyTerra public safety radar	02/22/2008	(pending)	19 mos. (to date)
<b>NOTES</b> (a) Date of <i>ex parte</i> statement in IB Docket No. 98-172 proposing 18 GHz channel plan. (b) Date on which Wi-LAN, Inc. filed an Application for Review of denial of certification of an OFDM device under § 15.247. The Commission effectively treated that application as a petition for rulemaking. <i>Spread Spectrum Devices</i> , 16 FCC Rcd 10036 (2002).				

**Figure 1: Duration of Noncontroversial Spectrum Dockets at FCC<sup>7</sup>**

Note that this listing does not include very controversial spectrum issues such as the M2Z/AWS-3 proceeding or the ongoing issue of LightSquared and GPS. It is likely that the speed and transparency issues associated with FCC deliberations on new technologies needing nonroutine approvals are discouraging capital formation for such technologies and thus damaging US technological competitiveness.

<sup>7</sup> Comments of Mitchell Lazarus, Docket 09-157, September 30, 2009<sup>7</sup> at p. 5 )<http://apps.fcc.gov/ecfs/document/view?id=7020039921>

Qualcomm, a major US wireless technology innovator, was incorporated in July 1985. Its original products were satellite-based and did not need nonroutine FCC approvals, but its “killer app”, CDMA cellular, did. Qualcomm was fortunate in that in a 1987 decision FCC decided to deregulate the choice of 2G technology for a variety of reasons, thus assuring market access for Qualcomm’s main product and early key money maker. Whether this 2 year turnaround in the 1980s was good luck or good lobbying doesn’t matter, because such turn around for new technologies is virtually inconceivable with FCC actions of the past 2 decades.

Most of our foreign competitors in information communications technology (ICT) use a “state capitalism” model for fostering their communications technology industries. That is not our system and should not become our system, but we have to recognize what our competitors are doing and make sure our regulatory system does not operate in a way that puts us at a competitive disadvantage. Our competitors subsidize with government funds research projects in communications technology to develop new products for their industries. Once public funds have been invested in radio technologies, the natural tendency of bureaucrats to make their projects successful leads to few doubts about regulatory approval for the new radio technology. For example, German laboratories are now developing with national funding new very high speed point to point microwave system at 237 GHz that achieved a record 100 Gb/s throughput<sup>8</sup>. Meanwhile FCC’s rules for the upper end of the spectrum remain limited to frequencies below 95 GHz, a limit reached in October 2003 in Docket 02-146.<sup>9</sup> Can US firms compete on new radio

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<sup>8</sup> <http://spectrum.ieee.org/telecom/wireless/a-new-record-for-terahertz-transmission>

<sup>9</sup> Actually it is even worse: In the Report & Order in Docket 10-236 ([http://hraunfoss.fcc.gov/edocs\\_public/attachmatch/FCC-13-15A1.pdf](http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-13-15A1.pdf)) FCC forbids (revised 47

technologies with foreign firms that have both national research subsidies and negligible regulatory risk? Shouldn't the US level the playing field by at least giving US developers timely go/no go answers on innovative wireless technology?

FCC technical spectrum policy is not just slow with adapting for the use of innovative technology, it is also slow in addressing interference to incumbent users – even incumbent users who have major influential trade associations like CTIA - that arises from unexpected sources that are legal under present FCC rules because the intersystem interaction was not anticipated. Such “emerging interference” issues are probably inevitable to some degree in a rapidly evolving industry, but they need to be recognized and address in a timely basis. Let us consider 2 topics that dragged on for years with ongoing interference to incumbents while the issues were pending.

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C.F.R. 5.85(a) without any explanation any experiment in a band with only passive allocations for the first time. This applies even if there are no passive users that might be impacted by the experiment in an area. Since there are many such passive bands above 95 GHz and few components at such frequencies are readily available this prohibition greatly complicates US experimentation. Indeed, the German experiment discussed might have been impossible under this new FCC rule. A timely reconsideration petition on this issue from MSS (<http://apps.fcc.gov/ecfs/document/view?id=7022416291>) that has been supported by Boeing and Battelle Memorial Institute has been pending at FCC for over 10 months. It seems likely that the sentence restricting all experiments was simply placed in the wrong paragraph of the rules.

First, the interference between “cellular booster amplifiers” and cellular operators that became the main subject of Docket 10-4. On May 1, 2006, CTIA submitted to the FCC staff “WHITE PAPER ON THE HARMFUL IMPACTS OF UNAUTHORIZED WIRELESS REPEATERS” that contained the following clear and unambiguous statement :

**V. FCC ACTION IS URGENTLY NEEDED**

**Figure 2: Section heading of CTIA White Paper Submitted to FCC 5/5/06<sup>10</sup>**

While this white paper is dated May 2006, it is likely that CTIA discussed this issue informally with FCC staff at an earlier date as it is clear from the white paper that some time had passed since the problem was first recognized.

Here are the key milestones in the resolution of this issue:

May 1, 2006	CTIA white paper given to FCC
November 2, 2007	CTIA petition for rulemaking
January 6, 2010	FCC public notice initiating Docket 10-4
April 6, 2011	FCC NPRM
February 20, 2013	FCC Report & Order
April 30, 2014	Effective date of new rules

**Table 1: Timeline of Docket 10-4**

This is just one example of FCC delays in dealing with new interference sources to incumbent users. Consider the case of Docket 01-278 that dealt with interference from police radar detectors (illegal in 20+ states including Virginia) to VSAT receiver systems. The NPRM for this proceeding introduces it with this sentence, “More recently, however, we have received a number of reports of interference caused to very small aperture

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<sup>10</sup> [http://files.ctia.org/pdf/filings/FINAL--CTIA--\\_Jammers\\_Petition\\_for\\_Declaratory\\_Ruling.pdf](http://files.ctia.org/pdf/filings/FINAL--CTIA--_Jammers_Petition_for_Declaratory_Ruling.pdf)  
At .pdf p. 45 (Whitepaper p. 14)

satellite terminals (VSATs) by mobile receivers designed to detect the presence of police radar (‘radar detectors’).”<sup>11</sup> (Emphasis added)

While the radar detector issues in Docket 01-278 were resolved in less than a year after the NPRM, the introduction in the NPRM “fuzzifies” the real history of this problem. The author knows that a VSAT system operated by FEMA used at the site of the April 19, 1995 Oklahoma City bombing disaster received interference and was unusable. FCC enforcement personnel at that time quickly realized that due to numerous previous incidents the most likely source was police radar detectors’ excessive, but then unregulated, emissions from vehicles driving on an undamaged highway near the disaster scene. (Previously FEMA had used the VSAT system successfully for disasters such as earthquakes, hurricanes, and tornadoes where there was little high speed traffic in the disaster area.) While the author has no clear documentation, he is certain this problem was well known to the FCC staff at least a decade before the Docket 01-278 NPRM.

In the case of Docket 10-4, perhaps the cellular industry was implicitly or explicitly given the choice by FCC of prioritizing either the cellular booster interference problem or their quest for 500-700 MHz of additional spectrum. Perhaps they chose the additional spectrum as their highest priority. But is this the proper way to deal with spectrum policy? Do incumbent spectrum users have to choose between *either* stopping ongoing interference to their licensed spectrum or FCC addressing needs for new spectrum? If true, isn’t this a sign that FCC as presently structured does have the decision making throughput to handle the technical aspects of its spectrum policy job under the 1934 Act? There are some issues that need the insights of presidential

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<sup>11</sup> NPRM Docket 02-478 (October 15, 2011) at para. 11  
 ([http://hraunfoss.fcc.gov/edocs\\_public/attachmatch/FCC-01-290A1.pdf](http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-01-290A1.pdf))



appointees confirmed by the Senate. These include the public interest issues on the merits of spectrum use A versus spectrum use B. For example, consider these questions:

- Was the potential interference from M2Z's proposed use of AWS-3 spectrum to adjacent channel licensee under some circumstances acceptable in light of the new service they might offer?
- Is the potential interference from LightSquared to some GPS applications in some circumstances acceptable given the benefits of the proposed new service?
- Is the proposed new use of current broadcast spectrum by CMRS licensees in the incentive auction rulemaking acceptable given the decrease in over-the-air broadcasting and the resulting new interference from CMRS to TV broadcasting?

But this weighing of the merits of alternative spectrum uses in the public interest is very different from the increasingly technical issues in spectrum management. For example, as part of the above 3 questions, someone has to determine

- How much interference might M2Z cause to the adjacent channel licensee and what are the options to reduce this to a lesser level?
- How much interference might LightSquare cause to various classes of GPS users and what options are available to minimize that?
- How to quantify CMRS/TV interference given a spectrum plan and transmitter locations?

Note that the second group of questions are very different from the first group although they deal with the same basic subject matter. These are questions that are not natural ones for the FCC commissioners of the past 30 years with their backgrounds. Thus the Commission as presently formulated does a good job with the first set of questions but a poor and slow job with the second set. Perhaps in 1934 when there were fewer and simpler technical questions and no APA the present FCC structure could

handle these issues efficiently, today it is just falling behind with a throughput unable to keep up.

Here are some suggested options based on the IEEE-USA recommendations and experience at other agencies with technical jurisdiction:

1. While the FCC's Technological Advisory Committee (TAC) does a good and useful job representing the views of FCC regulatees and addressing long term issues not now on the FCC's agenda, it is unable because of its structure to help the FCC on substantive issues that need timely resolution because its members mostly represent specific interests. FCC structured it this way in great part to avoid paying the members. But EPA, NRC, and FDA have paid advisory committees of members without conflicts (e.g. academics and industry retirees) that take an active role in help those agencies resolve complex technical issues analogous to the first 3 questions above. While FCC *could* create such a committee without legislative action, the present funding situation making that unrealistic. The EPA, NRC and FDA committees have a statutory mandate that facilitates funding in the appropriation process. Legislation should be explored to create analogous provisions for FCC. In particular a new technical spectrum policy committee with paid members lacking conflicts of interest and with security clearances could be in a position to provide neutral technical advice on the implications of possible decisions and possible options to FCC, NTIA, and the White House Spectrum Management Team. Such a committee should and will not duplicate the roles of the present FCC TAC and NTIA CSMAC, but

rather perform roles on ongoing spectrum deliberations that TAC and CSMAC have been unable to do because of their structure.

2. Decades of low funding at FCC have made it almost impossible to use outside consultants to assist deliberations on novel technical matters. However in the past a few studies but outside contractors have had major impacts. A 1980 study<sup>12</sup> by MITRE Corp. was the first place that the idea of unlicensed use in the ISM bands was broached. This idea was subsequently fleshed out in an FCC rulemaking and became the foundation of Wi-Fi, Bluetooth, ZigBee and several other technologies that have changed our world. The \$55,652 paid for the study in 1980 dollars, even if adjusted for inflation has perhaps been the best investment the federal government has ever made in terms of GDP impact. Another study<sup>13</sup>, also by MITRE, was ordered by legislation<sup>14</sup> and resulted in a timely resolution of the complex MVDDS/Northpoint controversy that vexed the FCC for several years.<sup>15</sup> Yet FCC lacks the funding for such studies to complement its internal resources even though other agencies use outside to studies to perform their goal. NRC routine contracts with DOE national

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<sup>12</sup> MITRE Corp., "POTENTIAL USE OF SPREAD SPECTRUM TECHNIQUES IN NON-GOVERNMENT APPLICATIONS" (MTR80W00335), December 1980, <http://www.mitre.org/sites/default/files/pdf/MTR80W335.pdf>

<sup>13</sup> MITRE Corp., "Analysis of Potential MVDDS Interference to DBS in the 12.2–12.7 GHz Band" (MTR 01W0000024). April 2001

<sup>14</sup> Section 1012, Prevention of Interference to Direct Broadcast Satellite Services, of the Commerce, Justice, State and Judiciary Appropriations Act, H.R. 5548, Pub. L. No. 106-553, 114 Stat. 2762A-141 (2000).

<sup>15</sup> MSS has no connection to MITRE Corp. and is not recommending them explicitly as a support contractor for FCC. The 2 good examples of support work that expedited policy issues happen to be from MITRE. There are several other Federally Funded Research and Development Centers (FFRDCs) as well as some private entities that could compete to serve such functions on an as needed basis if Congress encouraged FCC to seek outside help on novel technical issues and provided the resources to do so.

laboratories for technical support even though its inhouse technical staff dwarfs FCC's and its commissioners have more background in the technical issues of its jurisdiction than recent FCC commissioners have had.

3. Many years ago FCC had a Review Board that acted under delegated authority pursuant to §5(c) to act on matters generally dealing with broadcast ownership issues. This was a board of career FCC staffers that reviewed ALJ findings and made decisions that could be appealed to the Commission. We believe that in a parallel way FCC could create a board of senior career employees, perhaps with an academic on sabbatical as a member to add some outside insight, to handle noncontroversial spectrum policy issues and technical subproblems of controversial spectrum issues - such as the second set of 3 questions given above. This board might be called the Spectrum Technical Policy Board and could speed deliberations on many technical spectrum issues as well as decrease the workload of the commissioners by removing *de novo* consideration of many technical spectrum issue from them thus allowing them more time to focus on other key issues in the FCC's jurisdiction. Under the longstanding provisions of §5(c)(4) and the whole Commission could review any decision of this board.

Pursuant to §5(c)(5)

“In passing upon applications for review, the Commission may grant, in whole or in part, or deny such applications without specifying any reasons therefor. No such application for review shall rely on questions of fact or law upon which the panel of commissioners, individual commissioner, employee board, or individual employee has been afforded no opportunity to pass.”

## Question 2: Unlicensed Spectrum

The CMRS community has a love/hate relationship with unlicensed spectrum.<sup>16</sup> On one hand they use it heavily for offload of traffic that would otherwise clog their system in congested areas. On the other hand they oppose virtually any new unlicensed spectrum and appear to be the forces behind the ill fated proposed to require an “auction” for any new unlicensed spectrum.

Rather than addressing the general issue, let us help clear up some facts.

1. Most present unlicensed spectrum is spectrum that is just not available to any other use due to the nature of primary allocation in the same band or in adjacent bands. Ultimately, dynamic spectrum assignment, such as is being considered now for the 3650 MHz band, may allow alternative uses for such secondary sharing *in some cases* and when that becomes realistic it should be considered where appropriate. When the 900, 2400, and 5700 MHz ISM bands were made available for unlicensed use in 1985 there was no other interest in such bands by any other users due to the need to share them with ISM systems (*e.g.* microwave ovens) and some primary federal users.
2. There is a real synergy between unlicensed spectrum and technical flexibility in regulations. We believe that the reason why the ISM bands made available for unlicensed use became the “killer app” of today’s Wi-Fi and Bluetooth was the basic flexibility of the rules and the lack of a specific vision by FCC and industry of what applications the rules would

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<sup>16</sup> <https://www.google.com/search?q=love%2Fhate+site%3Amarcus-spectrum.com>

be used for. Indeed, few in industry supported the rules and many opposed them in the early 1980s. There is nothing in the record of Docket 81-413 that even hints for the need of radio local area networks (RLANs) before the ISM band rules were adopted in 1985. But there was a real synergy between these flexible unlicensed rules and the recognition in the next few years that RLANs would be needed. Even the initial RLAN product efforts in industry focuses on niche markets such as wireless cash registers for department stores – an area unlikely to have attracted timely FCC interest.<sup>17</sup>

By comparison the industry supported petitions for both U-PCS and U-NII had very slow “take up rates”. The supporters of these unlicensed bands had specific markets in mind and wrote complex rules for those markets. The resulting rules were much longer and detailed than the ISM band rules and probably outdated by the time of their final publication in the *Federal Register* and were then protected by the “full faith and credit of the APA” from the needed updating. As we have shown above, such updating requires the type of Commission action that has real throughput problems as FCC is presently structured and probably does not require the participation of 5 presidential appointees with Senate confirmation. **A key lesson is that in order to enable unanticipated applications, unlicensed rules need to be minimalist.** The mere creation of new

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<sup>17</sup> Details of the history of Wi-Fi are in this book by several of the early participants of the 802.11 standards group: W. Lemstra, V. Hayes, J. Groenewegen, *The Innovation Journey of Wi-Fi*, Cambridge University Press, 2011

unlicensed bands will do little to spur creativity if those bands are burdened by detailed rules that limit their ability to evolve quickly as new technology appears and needs for new types of services evolve.

### **Question 3: What should be done to encourage efficient use of spectrum by government users?**

The administration of the President's §305 authority has to be done with national goals as a primary objective. A historical account of IRAC from the early 1960s is contained in a RAND Corporation report by Nobel laureate Ronald Coase that was not released until 1995<sup>18</sup>. While the Coase account is 60 years old at this point, the agency parochialism described in it is very reminiscent of the authors contact with IRAC as an FCC senior staffer and on external observables in recent years. The IRAC members need "adult supervision – in the Silicon Valley context – from either an NTIA that really acts like an independent regulator with "tough love" or from a better split of the §305 authority between the White House and NTIA.

### **Question 4: What other steps can be taken to increase the amount of commercially available spectrum?**

While there are many steps that can be taken, one of them should be to expand the upper limit of radio service rules that presently end at 95 GHz, a limit reached 9 years ago.

While FCC has allocations up to 275 GHz and may have jurisdiction as high as 1000 or 3000 GHz, the lack of service rules for either licensed or unlicensed use above 95 GHz

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<sup>18</sup> R. Coase, W. Meckling, J. Minasian, "Problems of Radio Frequency Allocation", DRU-1219-RC, RAND Corp., 1995 (<http://www.rand.org/pubs/drafts/DRU1219.html>)

discourages capital formation for R&D while the state capitalism spectrum management system of our foreign competitors speeds on. This is particularly ironic since component technology in this upper spectrum is being driven by US military R&D! The longstanding provisions of §303(g) provide that the Commission shall:

“(s)tudy new uses for radio, provide for experimental uses of frequencies, and generally encourage the larger and more effective use of radio in the public interest;” (emphasis added)

This language does not seem to be for an FCC intended to wait, like the Patent Office, for “mother may I?”-like applications to come in from the public for new bands that are presently lying fallow. The 1934 Act appears to have anticipated a pro-active FCC with respect to new technologies. Realities of recent funding levels have limited this, but Congress should address what really are its goals for FCC here.

**Question 9: Can engineering and forward-looking spectrum strategies account for the possibility of unanticipated technologies and uses in adjacent spectrum bands?**

Better engineering studies can decrease the risk of emerging interference issues that have arisen in the past. However, the only way to bring them to near zero is a return to detailed technical regulation of 4 decades ago that stifled both technical innovation and competition in wireless services. For example, we would never have the CDMA technology that many carriers used for 2G cellular and which was the core of all 3G cellular service worldwide had it not been for the Commission’s 1987 decision to allow multiple 2G technologies subject only to adjacent band emission limits.

However, better technical support for the commission through an active advisory committee that can deal with ongoing rulemakings- unlike the present TAC, but like such



committees at other regulatory agencies - as well as the delegation of technical spectrum issues to an internal board created, as proposed above, under §5(c) of the Act will give more review to these challenges and decrease the number of surprise interactions.

However, it can not realistically prevent all unexpected interference interactions and thus it is important that the Commission must treat “emerging interference” correction through rulemaking as a high priority “product” not as a stepchild as it did in the case of cellular boosters and police radar detector/VSAT interference described above. Today FCC is unwilling to publicly acknowledge a string of interference events from FM broadcast stations to 700 MHz cellular base stations<sup>19</sup> and a smaller, but persistent, number of events from set top TV antennas with builtin amplifiers<sup>20</sup> to many other services including cellular and GPS.

FCC must be willing to address such issues on a timely basis unlike its historic approach of focusing mainly on providing new service. The organizational changes suggested above might help achieve this goal, but it could also be accomplished within the present structure if leadership balanced its priorities.

### **Question 10: NTIA**

NTIA was created in 1978 with the transfer of the President’s §305 authority from the White House staff to the Commerce Department and their delegation to the Assistant

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<sup>19</sup> <http://www.marcus-spectrum.com/Blog/files/FM2LTEint214.html>

<sup>20</sup> It is ironic that the amplifiers in such antennas probably have no positive impact on TV reception in urban areas and may actually have a negative impact through decreasing sensitivity of some stations due to having a higher noise figure than the TV receiver and a greater susceptibility to receiver-generated intermodulation products. Nevertheless such antennas with amplifiers are very common in mass retailers today. While the antennas do not cause interference to other services if designed properly and if they are not damaged, when there is coupling from the amplifier output back to the antenna element there can be resulting oscillations that can impact cellular bands and even GPS, see <http://www.uscg.mil/auxiliary/publications/alcoast/alcoast-298-03.asp>.

Secretary of Commerce for Communications and Information. From 1969 to the creation of NTIA, the Department of Commerce's Office of Telecommunications (OT) had supported the White House staff that acted on behalf of the President's §305 authority – the Office of Telecommunications Policy (OTP) after 1970. But until 1978 a White House official with some staff had final responsibility.

While the 1978 change *may* have been justified and reasonable at that time, it is the root cause of many spectrum problems today. While the Herbert Hoover Building is within sight of the White House, it is a world away in the context of power.

Discussions with OTP alumni consistent reveal how directors like Clay “Tom” Whitehead were able to use their White House positions to directly contact cabinet secretaries whose IRAC members were taking positions that were inconsistent with national goals and priorities. This is something the Assistant Secretary of Commerce for Communications and Information is unable to do no matter how well motivated and skilled the incumbent is.

While the IRAC member agencies are no doubt pleased with the present arrangement, it is simply not conducive to an effective national spectrum policy. (The IRAC membership even successfully fought a Bush (43) Administration proposal to just put NTIA under the Undersecretary of Commerce for Technology who probably was in a better position to lean on cabinet agencies since he was also effectively the CTO at the time.)

The creating of the White House Spectrum Policy Team created by a June 14, 2013 Presidential Memorandum<sup>21</sup> is a good step forward. But this team seems to have only one full time staffer dedicated to the issue: the Deputy Chief Technology Officer for Telecommunications in OSTP who at present is actually on detail from NTIA. Furthermore, like the head of NTIA, the White House Spectrum Policy Team has no independent place it can go for technical advice or technical options on complex spectrum policy issues and must depend on NTIA's Office of Spectrum Management (OSM) for any technical support. Unfortunately, OSM is in an awkward and confusing role between the NTIA front office and the IRAC and has to choose between the somewhat conflicting roles as:

- IRAC secretariat,
- “recorder of deeds” for federal spectrum assignments,
- the law firm that represents IRAC members to FCC and argues their position, and
- their theoretical role as the independent regulator of federal spectrum use.

While there are other agencies that regulate the activities of federal entities, e.g. GSA, EPA, NRC (with respect to nonmilitary nuclear issues), and OSHA, OSM as presently structured in today's NTIA is just not doing that.

We understand the cost and complexity of government reorganizations and do not want to propose such. But a move back towards the “two body” federal spectrum management structure of the Nixon Era OTP<sup>22</sup> in the White House and the Commerce

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<sup>21</sup> <http://www.whitehouse.gov/the-press-office/2013/06/14/presidential-memorandum-expanding-americas-leadership-wireless-innovatio>

<sup>22</sup> The Nixon era OTP had other function besides federal spectrum management. (See [http://en.wikipedia.org/wiki/Office\\_of\\_Telecommunications\\_Policy](http://en.wikipedia.org/wiki/Office_of_Telecommunications_Policy) ) This suggestion is not urging a complete return to the OTP functionality, rather just bringing the federal spectrum management leadership responsibility back to the White House while keeping the personnel-

Department's OT would address many of the problems. The current NTIA would need little or not change and the present White House Spectrum Policy Team could be established by law with an OTP-like function supervising NTIA similar to the former OTP/OT. The new advisory committee suggested earlier could then provide technical support to both the strengthened White House Spectrum Policy Team as well as NTIA and FCC. (Since the committee is intended to focus on technical issues such as quantifying interference potential and suggesting alternatives, its technical analyses should be neutral with respect to FCC, NTIA, and the White House.

### **The Problem of Section 7 and Its False Promise**

On December 8, 1983 Pub. L. 98-214 was signed by President Reagan and its §12 became §7 of the Communications Act. It begins with the bold words

It shall be the policy of the United States to encourage the provision of new technologies and services to the public. Any person or party (other than the Commission) who opposes a new technology or service proposed to be permitted under this chapter shall have the burden to demonstrate that such proposal is inconsistent with the public interest.<sup>23</sup>

30 years of experience under many commissioners and chairmen of both major parties have shown this to have been a false promise and its only impacts may have actually been negative in giving false hope to technical entrepreneurs. Clearly this legislation as adopted has not worked, a fact publicly acknowledged by Commissioner Pai in his first public speech after joining FCC<sup>24</sup>. A prominent communications attorney

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intensive functions in NTIA as they were in the Nixon era OT. We have no view on whether other functions might be brought back to the White House.

<sup>23</sup> 47 U.S.C. §157(a)

<sup>24</sup> Remarks of FCC Commissioner Ajit Pai, "Unlocking Investment and Innovation in the Digital Age: The Path to a 21st-Century FCC", Carnegie Mellon University, Pittsburgh, PA, July 18, 2012 [http://hraunfoss.fcc.gov/edocs\\_public/attachmatch/DOC-315268A1.pdf](http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-315268A1.pdf)

even tells clients that they should avoid any mention of §7 in seeking FCC action to enable a new technology because the very mention of it may delay consideration!

§7 should be either repealed or amended to make its provisions more than a false promise. While FCC has promised to resolve complex corporate mergers within “180 days”<sup>25</sup> (actually about 1 year of “clock time” when one considers the details of how time is counted) and has done an outstanding job in meeting that goal, it has dismally failed in resolving the issues associated with new technologies that need nonroutine approvals within anything even vaguely resembling the time scale mandated by §7. To be clear, the §7 one year period is an explicit statutory requirement at present while the merger “goal” has no statutory basis.

We suggest that the Congress consider amending §7 to make it parallel the forbearance provisions of §10(c) which the Commission routinely complies with. An alternative might be to delete the explicit deadline altogether but require the Commission to adapt clear rules for handling innovative technology and have a clear and transparent tracking system for such requests modeled after its present tracking system for merger requests.<sup>26</sup>

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<sup>25</sup> <http://www.fcc.gov/encyclopedia/informal-timeline-consideration-applications-transfers-or-assignments-licenses-or-autho>

<sup>26</sup> For an example of current merger tracking see <http://www.fcc.gov/transaction/sinclair-allbritton>

## **CONCLUSION**

We thank the Committee for this opportunity to comment on these key issues and congratulate it on the wise selection of topics raised. We would be pleased to help the Committee and staff in any way dealing with the issues raised above.

Sincerely,

A handwritten signature in black ink, appearing to read "Michael J. Marcus", with a long horizontal flourish extending to the right.

Michael J. Marcus, Sc.D., F-IEEE  
Director