BEFORE THE TENNESSEE REGULATORY AUTHORITY
NASHVILLE, TENNESSEE

IN RE:	:	
COMPLAINT OF	:	
CONCORD TELEPHONE EXCHANGE, INC.,	:	
HUMPHREYS COUNTY TELEPHONE	:	
COMPANY, TELLICO TELEPHONE	:	
COMPANY, TENNESSEE TELEPHONE	:	
COMPANY, CROCKETT TELEPHONE	:	DOCKET NO.: 1100108
COMPANY, INC. PEOPLES TELEPHONE	:	
COMPANY, WEST TENNESSEE	:	
TELEPHONE COMPANY, INC., NORTH	:	
CENTRAL TELEPHONE COOP., INC. AND	:	
HIGHLAND TELEPHONE COOPERATIVE,	:	
INC. AGAINST HALO WIRELESS, INC.,	:	
TRANSCOM ENHANCED SERVICES, INC.	:	
AND OTHER AFFILIATES FOR FAILURE	:	
TO PAY TERMINATING INTRASTATE	:	
ACCESS CHARGES FOR TRAFFIC AND	:	
OTHER RELIEF AND AUTHORITY TO	:	
CEASE TERMINATION OF TRAFFIC	:	
	:	

PRE-FILED DIRECT TESTIMONY OF ROBERT JOHNSON

TABLE OF CONTENTS

BEFORE THE TENNESSEE REGULATORY AUTHORITY
NASHVILLE, TENNESSEE

IN RE:	:	
COMPLAINT OF	:	
CONCORD TELEPHONE EXCHANGE, INC.,	:	
HUMPHREYS COUNTY TELEPHONE	:	
COMPANY, TELLICO TELEPHONE	:	
COMPANY, TENNESSEE TELEPHONE	:	
COMPANY, CROCKETT TELEPHONE	:	DOCKET NO.: 1100108
COMPANY, INC. PEOPLES TELEPHONE	:	
COMPANY, WEST TENNESSEE	:	
TELEPHONE COMPANY, INC., NORTH	:	
CENTRAL TELEPHONE COOP., INC. AND	:	
HIGHLAND TELEPHONE COOPERATIVE,	:	
INC. AGAINST HALO WIRELESS, INC.,	:	
TRANSCOM ENHANCED SERVICES, INC.	:	
AND OTHER AFFILIATES FOR FAILURE	:	
TO PAY TERMINATING INTRASTATE	:	
ACCESS CHARGES FOR TRAFFIC AND	:	
OTHER RELIEF AND AUTHORITY TO	:	
CEASE TERMINATION OF TRAFFIC	:	
	:	

PRE-FILED DIRECT TESTIMONY OF ROBERT JOHNSON

Q: Please state your name, title and business address.

A: My name is Robert Johnson. I am the President of Ameliowave, Inc. My business address is 307 W. 7th St., Suite 1600, Ft. Worth, TX 76107. Ameliowave is a consulting and software development practice that is under contract with Transcom to provide support for managing existing products, developing new products, and architecting the platform and systems that support all products.

Q: Please state your educational background and experience.

A: I received a BSEE with an emphasis on Computer and Network Engineering from the University of Texas in Austin, TX in 1998 and an MSE with an emphasis on Telecommunications and Information Systems Engineering from the University of Texas in

Austin, TX in 2000. My Master's Report (filed and copyrighted in 2000 at the University of Texas in Austin) was entitled "Implementing Telephony Services on Data Networks."

My prior work experience, from most recent (prior to co-founding MarketEcho, which was acquired by Ameliowave in 2007):

From 2003 to 2005 I was the Director of Regional Product Management for T-Systems North America, the North American subsidiary of T-Systems International, the International arm of Deutsche Telekom. I was responsible for managing the existing telecommunications products and developing the new telecommunications products throughout my region, which included most of the Americas. Between 2002 and 2003 I worked for T-Mobile US, the US subsidiary of T-Mobile International, the mobile telephone division of Deutsche Telekom as an Engineer. As part of those responsibilities, I helped develop their VoATM and VoIP platforms for their 2G and 3G networks. From 2001 to 2002 I was President of Athoia Solutions where I did consulting on product management, new product development, and platform/system architecture. Between 2000 to 2001 I was the Director of Technology for Advent Networks, a start-up developing innovative cable modem technology, for which my team and I were awarded 2 US and International patents. Prior to that in 2000 I was a Senior Project Manager for Newbridge Networks (prior to and during their acquisition by Alcatel) supporting SBC in the evaluation and ultimate selection of our latest ATM switch for use in the core of SBC's Project Pronto. From 1998 to 2000 I was the Senior Product Manager at Broadwing Communications (formerly IXC Communications and now part of Level 3 Communications) where I was responsible for all Voice Over Anything (VoX) product management and development.

Q: Are you an attorney?

A: No.

Q: On whose behalf are you appearing?

A: I am supplying testimony on behalf of Transcom Enhanced Services, Inc. ("Transcom").

Q: Do you have personal knowledge of the facts you will relate as they pertain to Transcom?

A: Yes.

TRANSCOM'S ESP STATUS

Q: Is Transcom a telecommunications carrier?

A: That is largely a legal question. But I am informed by counsel that the law requires consideration of certain facts, which I will supply. Counsel advises that the Communications Act has a definition of "telecommunications carrier."[1] Counsel states that the statutory definition requires two things. The provider must (1) be a "common carrier"[2] and (2) offer telecommunications"[3] to the public for a fee. Counsel explains that it is the attribute of an entity being a common carrier that turns "telecommunications" into a "telecommunications service."[4] I am also informed that some ILECs have asserted that Transcom is a specific species of carrier, *i.e.*, an "interexchange carrier" ("IXC")[5] that provides "telephone toll service."[6] I further

[1] *See* 47 U.S.C. § 153 (44) TELECOMMUNICATIONS CARRIER.--The term "telecommunications carrier" means any provider of telecommunications services, except that such term does not include aggregators of telecommunications services (as defined in section 226). A telecommunications carrier shall be treated as a common carrier under this Act only to the extent that it is engaged in providing telecommunications services, except that the Commission shall determine whether the provision of fixed and mobile satellite service shall be treated as common carriage.

[2] *See* 47 U.S.C. § 153 (10) COMMON CARRIER.--The term "common carrier" or "carrier" means any person engaged as a common carrier for hire, in interstate or foreign communication by wire or radio or in interstate or foreign radio transmission of energy, except where reference is made to common carriers not subject to this Act; but a person engaged in radio broadcasting shall not, insofar as such person is so engaged, be deemed a common carrier.

[3] *See* 47 U.S.C. § 153(43) TELECOMMUNICATIONS.--The term "telecommunications" means the transmission, between or among points specified by the user, of information of the user's choosing, without change in the form or content of the information as sent and received. Transcom will address this definition and its meaning below.

[4] *See* 47 U.S.C. § 153(46) TELECOMMUNICATIONS SERVICE.--The term "telecommunications service" means the offering of telecommunications for a fee directly to the public, or to such classes of users as to be effectively available directly to the public, regardless of the facilities used.

[5] "Interexchange carrier" is not defined in the statute. Section 254(g) speaks to "providers of interexchange telecommunications services" and § 153 has a definition of "telephone toll service." The FCC has equated "IXC" with "provider of interexchange telecommunications service." *See* Report and Order, *Policy and Rules Concerning*

understand that one issue in this case is whether "exchange access"[7] charges are due for Transcom's traffic. I am told that this must be the claim because only IXCs are subject to "exchange access service" charges, and access applies only with regard to their "telephone toll service," under 47 C.F.R. § 69.5(b), whereas end user traffic associated with a telephone exchange service is not subject to switched exchange access charges.

Counsel advises that the courts have fashioned the following two-part test for common carriage:

> The primary *sine qua non* of common carrier status is a quasi-public character, which arises out of the undertaking to carry for all people indifferently. This does not mean that the particular services offered must practically be available to the entire public; a specialized carrier whose service is of possible use to only a fraction of the population may nonetheless be a common carrier if he *holds himself out to serve indifferently all potential users.*
> * * *
> A second prerequisite to common carrier status [is] ... that the system be such that customers transmit intelligence of their own design and choosing.[8]

Counsel states that these are *conjunctive* requirements; both must be met before common carrier status is established. I am not a lawyer, but I am aware of the facts that will be used to perform the legal analysis stated above.

Q: What are the facts that plug into the above-stated legal analysis?

1. Transcom provides wholesale services to other entities that provide service to others such that Transcom has no sales "at retail."
2. Transcom purchases services from third parties for the transport of information, and then networks its enhanced service platform components on top of the transport that it obtains from others to provide its services.

---

the Interstate, Interexchange Marketplace Implementation of Section 254(g) of the Communications Act of 1934, as amended, CC Docket No. 96-61, FCC 96-331, 11 FCC Rcd 9564 (rel. Aug. 1996).

[6] *See* 47 U.S.C. § 153 (48) TELEPHONE TOLL SERVICE.--The term "telephone toll service" means telephone service between stations in different exchange areas for which there is made a separate charge not included in contracts with subscribers for exchange service.

[7] (16) EXCHANGE ACCESS.--The term "exchange access" means the offering of access to telephone exchange services or facilities for the purpose of the origination or termination of telephone toll services.

[8] *National Ass'n of Regulatory Util. Comm'rs v. FCC*, 174 U.S. App. D.C. 374, 533 F.2d 601, 608-09 (D.C. Cir. 1976) ("*NARUC II*") (internal quotes and footnotes omitted) (emphasis added).

3. Transcom is not registered as a carrier or interexchange carrier with the FCC and does not access the PSTN via exchange access services as I understand is required for carriers or interexchange carriers. Instead, Transcom purchases end user services (telephone exchange services) from its common carrier vendors.

4. Transcom does not have any "carrier codes" such as a CIC or OCN.

5. Transcom does not hold itself out as a carrier or interexchange carrier, and has not represented that is it a carrier. To the contrary, Transcom has consistently denied carrier status and aggressively asserts end user status.

6. Transcom does not undertake to provide service to all potential customers indifferently. On the contrary, Transcom negotiates private contracts on a case-by-case basis, with rates and other terms varying considerably among its customers.

7. Transcom's rates are not nationwide averaged and differ between localities and within and between states.

8. Transcom's system *intentionally* and *pervasively* changes the content of the information transmitted by the persons engaged in any call session. Transcom often also performs a net change of form. Transcom therefore does not offer or provide services for the 'transmission, between or among points specified by the user, of information of the user's choosing, without change in the form or content of the information as sent and received.' I will further address this below.

9. Transcom has obtained multiple rulings from a court of competent jurisdiction finding that (a) Transcom is an enhanced service provider ("ESP"), (b) Transcom is not obligated to pay exchange access charges to anyone, but rather is an end user that pays end user charges, and (c) the service provided by Transcom is different from the service addressed by the FCC in the AT&T Order,[9] and therefore the AT&T Order is not applicable to Transcom.

Q: You say that Transcom does not provide telecommunications or telecommunications service. Given that Transcom is a communications intensive business, how does it obtain the telecommunications service that it needs to perform its enhanced/information service functions?

[9] Order, *In The Matter Of Petition For Declaratory Ruling That AT&T's Phone-to-Phone IP Telephony Services Are Exempt From Access Charges*, FCC 04-97, 19 FCC Rcd 7457 (rel. April 21, 2004) (the "*AT&T Order*").

A: Transcom buys telecommunications service from carriers, usually from exchange carriers like a CLEC or – as in this case – from a CMRS provider. Specifically, Transcom purchases telephone exchange service as an end user.

Q: Does Transcom buy telecommunications service from Halo?

A: Yes. Transcom purchases end user telephone exchange service from Halo in numerous locations throughout the country.

Q: Does Transcom hold itself out as an Enhanced Service Provider or ESP?

A: Yes, Transcom holds itself out as an ESP.

Q: What is Transcom's basis for this?

A: Transcom has purposefully arranged its operations to meet the test for ESP status and to not meet the test of being a common carrier or provider of telecommunications service. Transcom has defended that status at all times, including in litigation. In no case where Transcom was a party has any authority held Transcom is not an ESP. Indeed, there are four court rulings saying that Transcom is an ESP and is not a carrier. I understand that Mr. Wiseman attached those decisions to his Direct Testimony. Transcom has relied on those rulings in its dealings with all potential vendors.

INTRODUCTION TO TRANSCOM'S ENHANCED SERVICE PLATFORM

Q: How does Transcom provide its enhanced voice service offering?

A: Transcom operates an enhanced service platform from which it offers its enhanced voice service. Transcom's customers connect to this platform using either Internet Protocol (IP) or Time Division Multiplexed (TDM) transport, which can be directly connected to the platform with dedicated transport circuits or, in the case of IP transport, can be indirectly connected over an intermediate IP network such as the Internet. Transcom's platform does not support indirect

TDM connections over intermediate networks such as those that make up the Public Switched Telephone Network (PSTN). These connections are built once, when the customer is first established with Transcom and they remain in place until the customer is no longer a customer of Transcom's.

Q: How do Transcom's customers access their enhanced voice service?

A: Once connected to Transcom's enhanced service platform using one of the methods described previously, a customer must signal either an IP session or a TDM call over its connection to initiate the process that will institute an enhanced service session through which it can use Transcom's enhanced voice service offering.

Q: Does Transcom know *a priori* what kind of signaling the customer will use over its connection?

A: Yes, the kind of signaling used by the customer is determined by the kind of transport used by the customer. If the customer connects to the platform using IP transport (either directly or indirectly), the signaling will be for an IP session, and if it connects using TDM transport, the signaling will be for a TDM call.

Q: Are there any other customer-specific parameters that are set up when the individually negotiated contract is formed with a customer?

A: Yes. Transcom develops a traffic-handling policy that is specific to each customer, which it programs into the enhanced service platform when the customer is first connected. The platform applies the policy each time the customer seeks to initiate an enhanced service session.

Q: What are some of the various alternatives that are available for programming into each of Transcom's customer-specific policy determinations?

A: Transcom's customer-specific traffic-handling policies include a number of options for how Transcom will handle traffic provided by the customer. They include:

- Identification methods for traffic such as Originating Point Code (OPC), source IP address, prefixes on signaling parameters, etc.
- Services options such how many additional legs to add to the session and where to send the traffic.
- Signaling options for each leg such as what SIP options to apply (e.g. enable/disable PING or PRACK) and how to format the values of each signaling parameter

Q: Does the kind of transport and signaling used by the customer indicate the nature of the traffic?

A: No, the customer can use IP transport (either directly or indirectly) and signal IP sessions for traffic that started in TDM or in IP format. The customer can use TDM transport and signal TDM calls for traffic that started in IP or TDM format. Transcom cannot tell in what format the traffic started, nor can we identify where or on what network the traffic began.

Q: How does Transcom know what traffic started as an IP session in IP format?

A: In some cases, Transcom's customers will separate their IP-originated traffic from their TDM-originated traffic and certify that the separate IP-originated traffic is indeed IP-originated. Otherwise, Transcom has no idea what traffic might have started as an IP session in IP format.

Q: What percent of Transcom's traffic is certified as being IP-originated?

A: More than 50% of the traffic Transcom carried during the 2011 calendar year was certified by Transcom's customers as IP-originated. This figure significantly underestimates the

actual percentage of traffic that was IP-originated because some customers deliver IP-originated traffic over arrangements that are not IP-certified.

Q: What does Transcom do once it receives signaling from its customer?

A: Transcom's enhanced service platform extracts the signaling parameters that are explicitly in the session or call signaling it received and combines those with the customer-specific parameters that are implicit in the connection over which it received the signaling. The platform then uses its internal policy engine to determine how to handle the traffic.

If the traffic-handling policy states that the traffic is authorized, then the enhanced service platform establishes an enhanced service session to handle the traffic and proceeds to implement the policy. In addition, the platform sends signaling back to the customer to let them know that the enhanced service session was initiated and the enhanced service will be available soon so the customer doesn't try to end the enhanced service session.

If the traffic-handling policy states that the traffic is not authorized, then the enhanced service platform discards the parameters and it may or may not signal back to the customer that the effort to initiate an enhanced service session has failed. If the platform does signal back to the customer it will likely indicate why the effort failed.

Q: What does Transcom do once it has initiated the enhanced service session?

A: Once Transcom's enhanced service platform has initiated the enhanced service session the platform adds the customer's IP session or TDM call as the first external "leg" of the enhanced service session. The platform then utilizes the traffic-handling policy to determine how many more external legs are required. If traffic-handling policy dictates that one or more additional external legs are required for the enhanced service session to function, the platform will use its routing engine to determine which vendors are best suited for these additional

external legs and will signal to those vendors to create the additional leg using either IP or TDM. If the signaling fails for any reason, the enhanced service platform may attempt another vendor for each leg that failed, within the parameters determined in the initial step of the process.

Q: You mentioned that there may be more than one additional egress leg. Is that common?

A: It is not rare. And it is increasing. A customer might be engaged in unified messaging and use SIP capabilities to simultaneously reach out to multiple edge devices like, for example, a legacy phone on the PSTN, a cell phone, a Skype or GoogleVoice number or a dedicated device for voice messaging. Whichever of the edge devices first answers will get the call and all other legs will be dropped. This is but one example of why multiple egress legs would be created.

Q: So there is a period of time between when the session is initiated by a customer and when any additional legs are completed and joined to the enhanced service session?

A: Yes, although it is usually measured in milliseconds.

Q: What happens after all the necessary egress leg routes are set up?

A: The enhanced service platform utilizes the traffic-handling policy to join the additional legs into the existing enhanced service session created when the customer initially signaled its intent to the platform. Then the platform signals back to the customer and vendors that the enhanced service session is complete and available to use. Information can then begin to flow in the session.

Q: What do you mean by "information"?

A: In the TDM world it is often called "bearer." For the most part we are dealing with audio information. The customer will supply the information. Transcom will then process it. Content is the information that is "sent" by the user. Similarly, the "content of the information" that is

"received" by other participants is also "content." My non-legal reading of the definition of "telecommunications" in § 153(43) is that it requires that the information sent by the user be the same as the information received by the other participants. If the information is different due to interaction or modification by a provider then it is no longer "telecommunications."

Telephone handsets have a speaker and a mouthpiece. The sounds that impact the diaphragm on a handset cause the mouthpiece to vibrate, thus generating the electrical impulses that are transmitted across a legacy network.[10] Those sounds are not just "words" or "voice." All other sounds – like a door squeaking or a vacuum cleaner running in the background – vibrate the diaphragm too and form part of "the content of the information" that is "sent." Indeed, even "silence" supplied by the customer when he or she has chosen to not make any noise can be content and have meaning in many contexts – as any married individual will attest.

I take the information "content" "as sent" for purposes of §153(43) as <u>not</u> merely the "words"; it is the <u>electrical representation</u> of all <u>the sounds impacting (or not impacting) the diaphragm</u>, including background noise and other aural information as well as spoken words. The entire "substance, purport or meaning" – including all the background noise and even the silence – is what I believe should be considered when applying the "change in content" test.

In a legacy PSTN-PSTN call there is no change in content. The "information" sent from one handset is the same "information" received by the other handset. Silence and background noise are faithfully transmitted across the network and delivered intact at the other end, so long as they fit within the voice band.[11]

---

[10] *See* http://www.sciencetech.technomuses.ca/english/schoolzone/Info_Sound.cfm#handset "How does the telephone handset work?"

[11] "In order to eliminate unwanted signals (noise) that can disturb conversations or cause errors in control signals, the circuits that carry the telephone signals are designed to pass only certain frequencies. The ranges of frequencies that are passed are said to be in the pass band. Zero to 4000 hertz is the pass band of a telephone system voice channel-a VF channel. (Sometimes this band is called a message channel.) Bandwidth is the difference

Q: What does Transcom do with the information flowing in the enhanced service session?

A: The enhanced service platform collects the information that comes from any and all of the external legs and employs computer processing applications that act on the format, content, code, protocol or similar aspects of the received information. The platform will provide the customer additional, different, or restructured information. This is done by generating, acquiring, storing, transforming, processing, retrieving, utilizing, or making available information via telecommunications.

The precise handling is determined by the customer-specific traffic-handling policy, but generally speaking the purpose is to identify, isolate, enhance and then regenerate the "voice information" contained within the customer's supplied information. The equipment at the edge of the enhanced service platform (connected to the leg from which the information is arriving) uses proprietary algorithms to identify the customer supplied information that is "voice" and extract that information from the rest. The "voice" information is then processed and ultimately a "new" set of information is created on the egress side that represents the "voice" information, net of all the improvements, enhancements and changes that are applied by the platform based on the customer-specific policy. Non-voice information such as background noise and silence that was supplied by the customer is discarded on the ingress side. The platform does detect periods of

---

between the upper limit and lower limit of the pass band. Therefore, the bandwidth of the VF channel is 4000 hertz. However, the transmission of speech does not require the entire VF channel. The voice pass band is restricted to 300 through 3300 hertz. Hence, any signal carried on the telephone circuit that is within the range of 300 to 3300 hertz is called an in-band signal. Any signal that is not within the 300 to 3300 hertz bands, but is within the VF channel, is called an out-of-band signal. All speech signals are in-band signals. Some signaling transmissions are in-band and some are out-of-band." *Gateway Protocols, Defining Analog Voice*, Document ID: 8628, © 1992-2008 Cisco Systems, Inc. (Feb. 12, 2007), available at http://www.cisco.com/en/US/tech/tk1077/technologies_tech_note09186a00800a70bf.shtml.

But something like a dog whistle, which typically operates within the range of 16,000 Hz to 22,000 Hz (*See* http://wiki.answers.com/Q/How_many_hertz_high_is_a_dog_whistle, © 2008 Answers Corporation) would therefore not be transmitted across the traditional analog network even though it would wobble the heck out of that diaphragm in the handset.

silence and acts to positively generate new content on the egress side in the form of "comfort noise."

The "voice" information is enhanced in several ways. The audio level is increased in relation to other sounds and made clearer and more understandable than was the case with the original. Thus, Transcom's platform actively removes information that was supplied by the customer, adds information that was not supplied by the customer and changes some of the information that was supplied. All of this new content contains a kind of recreation of the voice information using proprietary algorithms and some new noise to play between the gaps in the voice information.

Q: What does Transcom do with non-voice information contained in the content it receives on a leg of the enhanced service session?

A: During the content processing, in addition to looking voice information, the enhanced service platform is also looking for certain non-voice information that might be contained in the content. The primary forms of non-voice information the enhanced service platform is set to identify for special treatment are: FAX signals, modem signals, and Dual-Tone Multi-Frequency (DTMF) tones.

When the enhanced service platform identifies FAX and modem signals, the platform applies another policy and uses modified algorithms for the extraction of the non-voice information and the generation of new content containing the extracted non-voice information. Transcom's platform, unlike some of its competitors' systems, does support FAX.

When the enhanced service platform identifies DTMF tones in the content, it applies algorithms similar to those it applies to fax and modem signals with the additional benefit that the platform can use DTMF tones as triggers to other actions.

Q: How do enhanced service sessions end?

A: The enhanced service platform uses the explicit and implicit parameters mentioned previously to determine when to end the enhanced service session. Typically the platform will receive new explicit signaling parameters on one or more of the legs of the enhanced service session indicating that that leg is being torn down, which will trigger the traffic-handling policy to determine if the enhanced service session should also be torn down. If so, it will tear down each of the legs, write an enhanced service session detail record, and end the enhanced service session.

Q: Does Transcom's platform change the content supplied by the customer in every session?

A: In all cases the enhanced service platform utilizes the customer-specific traffic-handling policy to activate the required changes in the content throughout the duration of the session once information is allowed to flow.

Transcom's IP-Based offerings use a specific set of unique, proprietary methods that work with other more standardized VoIP technologies to implement this result. For example, the platform uses a proprietary and specialized version of Voice Activity Detection (VAD),[12] and Comfort Noise Generation (CNG).[13] These have multiple uses. VAD was initially developed to conserve bandwidth among other things but Transcom's use of VAD in the enhanced service platform leads to less bandwidth conservation and actually serves to improve quality by bringing out the "voice" by distinguishing or enhancing it in relation to other background noise. VAD also

[12] For an explanation and analysis of VAD see M.Y. Appiah, M. Sasikath, R. Makrickaite, M. Gusaite, "Robust Voice Activity Detection and Noise Reduction Mechanism" (PDF), Institute of Electronics Systems, Aalborg University (2005), available at http://kom.aau.dk/~myap04/pjts/final_report_8th.pdf.

[13] http://en.wikipedia.org/wiki/Comfort_noise. Wikipedia® Text available under GNU Free Documentation License.

reduces the jarring effect of "sound" that suddenly starts after a silent period. CNG prevents the conversing parties from wrongly thinking the call has been disconnected.

These functionalities and attributes are therefore "intended to be a service rendered to a customer."[14] Any contention that the call session participants that are on the PSTN cannot observe the difference would be incorrect. I would analogize the effect to what happens when an HD capable video receiver upconverts NTSC (analog) TV signals to ATSC for display by a new HDTV. The result is an improvement from the original and the participants would clearly notice the difference *if they could compare it to the original*. If the difference was not "evident" or "perceptible" then options for turning these functions on and off or for tuning them would not be necessary and Transcom would have no reason to make those options available within its policy set.

Q: So the information content that comes out of the platform is always different than the information content that was sent by the customer?

A: Yes. In all cases the enhanced service platform utilizes the customer-specific traffic-handling policy to activate the required changes in the content throughout the duration of the session once information is allowed to flow.

Q: Does Transcom's platform add enhancements with every session?

A: The specific enhancements will vary depending on the customer-specific traffic-handling policy, but there is almost always some kind of enhancement with every session.

Q: Does Transcom change the form of the information received from customers?

[14] *See* Supplemental Notice of Proposed Rulemaking, *In the Matter of Amendment of Sections 64.702 of the Commission's Rules and Regulations (Third Computer Inquiry); and Policy and Rules Concerning Rates for Competitive Common Carrier Services and Facilities Authorizations Thereof Communications Protocols under Section 64.702 of the Commission's Rules and Regulations*, FCC 86-253, ¶¶ 21-23, n. 30-31, CC Docket No. 85-229, Phase II, 1986 FCC LEXIS 3236 *21-*24 (rel. Jun. 1986).

A: Yes, but not necessarily with every session. For example if the customer initiated the enhanced service session by signaling an IP session in IP format and there is only one egress leg that is also in IP format then there is no change of form. But if any of the legs in the enhanced service session are in different formats, then the enhanced service platform has affected a net change of form.

Q: Your answers rely on a very technical understanding of Transcom's service. Is there another way of describing this, by way of analogy, that would be more accessible to folks less technical than yourself?

A: Yes. Let's use shipping produce as an analogy for the "end-to-end" model favored by the ILECs. When produce is shipped from the farm to the store, it is boxed up at the farm and shipped to an intermediate facility, where it is likely loaded with other produce from other farms and shipped to another intermediate facility, and so on. The only action taken at the intermediate facility is to open and inspect and repackage the produce. This process is an inherently lossy one, where produce gets bumped and bruised, ripens and sometimes rots, and is occasionally destroyed by bugs or other pestilence (including hungry produce handlers). The goal is to get the produce from farm to store with as little loss as possible.

Now we add Transcom into the process as a new kind of intermediate facility, one that does more than just open the box of produce and inspect it. As an example, Transcom would analyze the produce, looking through the damage done to the produce already, to determine what produce the farm *intended* to ship. Since the produce was already damaged and the analysis damages them further, Transcom throws the original box of produce away and uses the information from the analysis to create an entirely new box of produce that better represents the intention of the farmer than the damaged original box. It would have the same number of items

of produce in it, each the same size as before, but it would be entirely new produce without the defects introduced by the shipping process thus far.

Of course it's tough to imagine Transcom creating entirely new items of produce because that's not a tool that science has given us, but science has given us the tools to analyze old digital content and create new digital content based on that analysis, which is exactly what Transcom does to the content it receives on the legs of an enhanced session. Transcom opens and inspects each "box of produce" it receives on the ingress leg of an enhanced session. Transcom then creates an entirely new box with entirely new produce. Indeed, the new items of "produce" are improved--they do not have any of the defects that the original produce had when Transcom received it. All content received by Transcom is discarded. Not one bit of the original content received by Transcom is ever delivered to the receiving party. Instead, only the newly created content is delivered.

TRANSCOM BUYS TELEPHONE EXCHANGE SERVICE FROM HALO AND CONNECTS WIRELESSLY IN THE MTA.

Q: How does Transcom connect to Halo?

A: Transcom leases wireless equipment that can authenticate on and communicate with Halo's base station in an MTA when proximate thereto.

Q: Do call sessions that Transcom processes for its customers get set up through the wireless equipment in an MTA?

A: When Transcom needs to originate a call from our system in order to communicate with an edge device that is on the PSTN and Halo has been selected as the exchange carrier vendor for the call, Transcom will originate the call using our wireless equipment in the MTA that contains the rate center with which the desired terminating number is associated.

Q: So every call that AT&T receives from Halo will have originated from Transcom wireless CPE in the same MTA?

A: Yes.

Q: Does Transcom receive Halo-assigned numbers?

A: Yes. Halo has assigned Transcom at least one number per LATA. It serves as the billing telephone number.

Q: Do calls addressed to a Transcom number in a LATA go to Transcom?

A: Yes, these are active numbers. If a user on the PSTN in the LATA makes a call to that number it comes to Transcom and is answered.

Q: What happens today with such calls?

A: Transcom has an outgoing message indicating that the number is presently an administrative number and is not monitored.

Q: Does Transcom plan to more actively use this incoming capability in the future?

A: Yes. Transcom is actively developing new products that will rely on local dial-in capability. The uncertainty and distraction caused by all of the litigation has delayed its roll-out. When Transcom does deploy these services it will require more than one number per LATA.

Q: You have said several times that Transcom "originates" the call using Halo's service. How does Transcom's service originate calls as opposed to "re-originating" calls.

A: Transcom is an end user. End users use customer premises equipment ("CPE"). End users originate calls using CPE. Calls terminate to end user premises using CPE. End user CPE can also perform routing functions associated with origination or termination. *See* § 153(14)[15] End user CPE is an end-point. The equipment that Transcom leases to connect to Halo are registered

[15] (14) CUSTOMER PREMISES EQUIPMENT.--The term "customer premises equipment" means equipment employed on the premises of a person (other than a carrier) to originate, route, or terminate telecommunications.

Part 90 stations designed for end user operation while connected to a Halo-operated base station. This is CPE, in contrast to "telecommunications equipment"[16] which is what carriers use.

When the ILECs says that there can be only one "origination" and it is determined on using the "end to end" concept, they seem to be implying that if an entity is "in the middle" it must be a carrier and cannot be an end user. I will allow counsel to debate this from a legal perspective, but in my experience that is simply not the case from an operational and functional viewpoint. ESPs have always been in "the middle" if a communication is viewed "end to end" and there are multiple legs. Yet ESPs have always been treated as end users, and have always been allowed to purchase telephone exchange service instead of exchange access service. ESPs have always been considered an end-point, for both origination and termination.

ESPs HAVE ALWAYS USED TELEPHONE EXCHANGE SERVICE TO ORIGINATE CALLS

Q: Do you know how some of the first ESPs secured local connections?

A: They purchased local business lines that they used to originate calls or receive calls.

Q: Did the first ESPs use local business lines to originate an additional leg of a communication that started somewhere else?

A: Of course. That is why the FCC consistently compared ESP use to that of a "leaky PBX."

Q: Do you have a concrete example?

A: Long before there was a "public Internet" there were companies the FCC referred to as "Value Added Networks" ("VANs) that were the precursors to what we now call "Enhanced Service Providers." They operated packet networks, although they did not use IP. As part of the

[16] (45) TELECOMMUNICATIONS EQUIPMENT.--The term "telecommunications equipment" means equipment, other than customer premises equipment, used by a carrier to provide telecommunications services, and includes software integral to such equipment (including upgrades).

Computer Inquiry series of decisions[17] the FCC determined that they were not to be treated as common carriers. They were allowed to obtain basic business service – usually in the form of a PBX trunk arrangement – as the means by which they would collect calls from the PSTN and originate calls to the PSTN. It was well known at the time that quite often a call would originate on the PSTN and go to a local PBX trunk and the information would be converted to packets. The VAN would then transmit the packetized information across its network to a large mainframe computer. Sometimes the user would want to be able to reach another device in a distant location that was reachable only through the PSTN, and the VAN's platform would support that capability by seizing an outdial in the distant location and dialing another local number. Thus, the VAN would be originating (or re-originating) a second call, just like Transcom does today. The second call on the distant outdial was always considered an "origination" even though the two legs were then joined to make an "end to end" communication and the VAN was "in the middle."

Q: What was one of the uses for this "in the middle" "re-origination" capability?

A: A company called Telenet had an offering called "PC Pursuit." Again, this was before the public Internet. Users with home computers of the time would have a modem with a local line and dial in to Telenet's ingress portion of the platform using a local number. Telenet would then allow the user to go to any of the "bulletin board" systems that were "local" to where Telenet had an egress location. The distant bulletin board would be a computer that also had a modem. The user would connect through Telenet's platform and communicate with the distant bulletin board

[17] Counsel advises that the case that started it all was Notice of Inquiry, *In re Regulatory & Policy Problems Presented by the Interdependence of Computer and Communication Services & Facilities*, 7 FCC 2d 11 (1966). There have been too many decisions since them to list here. Some seminal ones, however, are *In re Amendment of Section 64.702 of the Commission's Rules and Regulations (Second Computer Inquiry)*, Docket No. 20828 77 F.C.C.2d 384 (rel. May 1980); *Computer and Communications Industry Association v. Federal Communications Commission*, 693 F.2d 198 (D.C. Cir. 1982); Report and Order, *Amendment of Sections 64.702 of the Comm'n's Rules and Regs*., 104 F.C.C.2d 958 (1986) ("*Computer III Report and Order*").

by having Telenet signal the telephone number associated with the local service arrangement that supported the bulletin board.

Q: So Telenet's "PC Pursuit" offering would allow a user with CPE (the modem) communicate with another user in a distant city that also had CPE (the modem)?

A: Yes.

Q: The PC Pursuit offering used local business lines at the ingress and egress locations to receive local calls and originate local calls?

A: Yes.

Q: The PC Pursuit ingress location was considered to be the terminating location for the call from the modem user?

A: Yes.

Q: The PC Pursuit egress location was considered to be originating a call to the bulletin board?

A: Yes.

Q: But this was "one call" wasn't it?

A: There was ultimately an "end to end" communication, with Telenet sitting in the middle between two users. But it did so while acting as a communications intensive business end user customer that was receiving calls, originating calls and joining various legs – just like Transcom does today. These were treated as two separate calls even though the legs were connected and information went from "end to end."

Despite all of the noise made by the ILECs this is the classic ESP leaky PBX method that has been used for years, and is still being used – by Transcom and others. The ILECs did not like it then and they do not like it now. They have been complaining about "access avoidance" for

this very arrangement ever since access charges were first developed in the 1980s and the FCC decided to preserve ESPs' status as end users by formalizing the arrangement into what is now known as the "ESP Exemption."[18, 19, 20]

[18] Counsel points to the *MTS/WATS Market Structure* decisions insofar as they decided to maintain ESPs as end users and thus not subject to switched access, ultimately promulgating what is now 47 C.F.R. § 69.2(m) and 69.5(a) and (b). For a demonstration that the FCC compared ESP use of local connections to a "leaky PBX" that originates calls even though the communication may have actually started somewhere else on the PSTN see the following passage from one of the *Access Charge Reform* Orders:

> 341. In the 1983 *Access Charge Reconsideration Order*, the Commission decided that, although information service providers[n498] ***(ISPs) may use incumbent LEC facilities to originate and terminate*** *interstate calls*, ISPs should not be required to pay interstate access charges.[n499] In recent years, usage of interstate information services, and in particular the Internet and other interactive computer networks, has increased significantly. …
>
> n498 The term "enhanced services," which includes access to the Internet and other interactive computer networks, as well as telemessaging, alarm monitoring, and other services, appears to be quite similar to the term "information services" in the 1996 Act.… For purposes of this order, providers of enhanced services and providers of information services are referred to as ISPs.
>
> n499 *MTS and WATS Market Structure*, Memorandum Opinion and Order, Docket No. 78-72, 97 FCC 2d 682, 711-22 (Access Charge Reconsideration Order). See also *Amendments of Part 69 of the Commission's Rules Relating to Enhanced Service Providers*, CC Docket No. 87-215, Order, 3 FCC Rcd 2631 (1988) (*ESP Exemption Order*).

First Report and Order, *In the Matter of Access Charge Reform; Price Cap Performance Review for Local Exchange Carriers; Transport Rate Structure and Pricing End User Common Line Charges*, CC Docket No. 96-262; CC Docket No. 94-1; CC Docket No. 91-213; CC Docket No. 95-72, FCC 97-158, ¶ 341 and notes 498 and 499, 12 FCC Rcd 15982 (rel. May 1997) (emphasis added).

[19] Counsel also suggests that the TRA review the *Computer Inquiry* decisions insofar as they ultimately come up with the term "enhanced service" that was excluded from common carrier treatment and led to the promulgation of what is now 47 C.F.R. § 64.702(a). *See* in particular *In re Amendment of Section 64.702 of the Commission's Rules and Regulations (Second Computer Inquiry)*, Docket No. 20828, 77 F.C.C.2d 384, ¶¶ 121 - 123 (rel. May 1980) (emphasis added):

> 121. Because enhanced service was not explicitly contemplated in the Communications Act of 1934, there is no more a requirement to confront it with a specific traditional regulatory mechanism than there was, for example, in the case of cable television, which has formal elements of common carriage and broadcast television, or of specialized mobile radio services, which bears many formal similarities to radio common carriage. Precedent teaches that the Act is not so intractable as to require us to routinely bring new services within the provision of our Title II and III jurisdiction even though they may involve a component that is within our subject matter jurisdiction. In fact, in *GTE Service Corp. v. FCC*, 474 F.2d 724 (2nd Cir. 1973), the court substantially affirmed a Commission decision the underlying premise of which was that **not all services involving the electronic transmission of information are communications services subject to regulation under Title II of the act.**
>
> 122. Precedent teaches us, also, that **all those who provide some form of transmission services are not necessarily common carriers.** See, e.g., *AT&T v. FCC*, 572 F.2d 1725 (2d Cir. 1978) (sharing of communications services and facilities not common carriage and not subject to Title II); *National Association of Regulatory Utility Commissioners v. FCC*, 525 F.2d 630 (D.C. Cir. 1976) ("NARUC I") (SMRS); *American Civil Liberties Union v. FCC*, 523 F.2d 1344 (9th Cir. 1976) (CATV); *Philadelphia Television Broadcasting Co. v. FCC*, 359 F.2d 282 (D.C. Cir. 1966). (FCC not required to treat

Q: Please provide the source of your assertions relating to Telenet

A: http://en.wikipedia.org/wiki/Telenet

http://massis.lcs.mit.edu/archives/public.access/pc.pursuit

http://hackarchives.org/archives/website-hacking/telnet/299-telnet-access-numbers

---

> cable television systems as common carriers nor to employ Title II regulatory tools.) Although the term itself is difficult to define with any precision, a distinguishing characteristic is the quasi public undertaking to "carry for all people indifferently." *NARUC I*, 525 F.2d at 641; *National Association of Regulatory Utility Commissioners v. FCC*, 533 F.2d 601, 608 (1976) ("NARUC II") citing *Seamon v. Royal Indemity Co.*, 279 F.2d 737, 739 (5th Cir. 1960) and cases cited therein. While one may be a common carrier even though the nature of the service offered is of use to only a segment of the population, *NARUC I*, 525 F.2d at 641, ". . . a carrier will not be a common carrier where its practice is to make individualized decisions, in particular cases, whether and on what terms to deal." *Id.* At the same time, we recognize certain inadequacies of any definition of common carriage which is dependent entirely on the intentions of a service provider. Instead, as the Court's opinion in *NARUC I* acknowledges, **an element which must also be considered is any agency determination to impose a legal compulsion to serve indifferently.** *NARUC I*, 525 F.2d at 642. **We have specifically imposed no such obligation with respect to enhanced service providers.**
>
> 123. **Even this definition of common carriage cannot be readily applied to vendors of enhanced services.** Inherent in the offering of enhanced services is the ability of service providers to custom tailor their offerings to the particularized needs of their individual customers. Thus, such services can vary from customer to customer as "individualized decisions" are made as to how best to accommodate the processing needs of their various subscribers. **Admittedly, vendors of enhanced services also have the ability, if they so desire, to provide these services on an indiscriminate basis. Presumably, some do. But "this is not a sufficient basis for imposing the burdens that go with common carrier status."** *NARUC I* at 644. We cannot conclude that under the common law providers of these services are common carriers or that Congress intended that these services be regulated under our Title II of the Act. **Indeed, to subject enhanced services to a common carrier scheme of regulation because of the presence of an indiscriminate offering to the public would negate the dynamics of computer technology in this area.** It would substantially affect not only the manner in which enhanced services are offered but also the ability of a vendor to more fully tailor the service to a given consumer's information processing needs.

[20] The FCC observed in the first decision that created what is now known as the "ESP Exemption" that ESP use of the PSTN resembles that of the "leaky PBXs" that existed then and continue to exist today, albeit using much different technology. Leaky PBXs originate calls that terminate on the PSTN. *See*, Memorandum Opinion and Order, *MTS and WATS Market Structure*, Docket No. 78-72, FCC 83-356, ¶¶ 78, 83, 97 FCC 2d 682, 711-22 (rel. Aug. 22, 1983) [discussing "leaky PBX" and ESP resemblance]; Second Supplemental NOI and PRM, *In the Matter of MTS and WATS Market Structure*, FCC 80-198, CC Docket No. 78-72, ¶ 63, 77 F.C.C.2d 224; 1980 FCC LEXIS 181 (rel. Apr. 1980) [discussing "leaky PBX"]. *See, also generally*, Notice of Proposed Rulemaking, Third Report and Order, and Notice of Inquiry, *In the Matter of Access Charge Reform; Price Cap Performance Review for Local Exchange Carriers; Transport Rate Structure and Pricing Usage of the Public Switched Network by Information Service and Internet Access Providers*, CC Docket Nos. 96-262, 96-263, 94-1, 91-213, FCC 96-488, 11 FCC Rcd 21354, 21478, ¶ 284, n. 378 (rel. Dec. 24, 1996); Order, Amendments *of Part 69 of the Commission's Rules Relating to Enhanced Service Providers*, CC Docket No. 87-215, FCC 88-151, 3 FCC Rcd 2631, 2632-2633. ¶13 (rel. April 27 1988); Memorandum Opinion and Order, *MTS and WATS Market Structure*, Docket No. 78-72, FCC 83-356, ¶¶ 78, 83, 97 FCC 2d 682, 711-22 (rel. Aug. 22, 1983).

http://hackarchives.org/archives/website-hacking/telnet/317-telnet-pc-pursuit-outdials

Q: So in your opinion have Transcom and Halo concocted some new "access avoidance scheme"?

A: Of course not. What is really going on is that the ILECs are trying to pump up their access revenues by forcing access-exempt entities to pay access that is not due.

Enhanced services were defined long before there was a public Internet. ESPs do far more than just hook up "modems" and receive calls. They provide a wide set of services and many of them involve calls to the PSTN, from the PSTN and calls that have PSTN legs on each side. The FCC expressly recognized the bidirectional nature of ESP traffic, when it observed that ESPs "may use incumbent LEC facilities to originate and terminate interstate calls." ESPs have used the leaky PBX model for their local connections for a very long time – without payment of access charges – but the ILEC's persist in spreading myths and mischaracterizations. They have always tried to limit the ESP Exemption and, frankly, have never liked ESPs at all. They most certainly did not consider them valuable customers.

When local competition began in the 1990s the ESPs quickly found a more friendly set of vendors. The CLECs welcomed ESPs as customers. The ILECs proceeded to turn on the CLECs and began to label them as "arbitrageurs" and "cream-skimmers." The TRA will likely recall the painful and extended wars over dial-up ISP-bound traffic, which the ILECs particularly attacked because of the reciprocal compensation effects. It might be useful to compare and contrast this matter to the ISP wars, when the traffic was going the other way. Back then the ILECs did not want to pay *any* compensation to CLECs for ISP-bound traffic. They argued for bill and keep. Now, however, the ILECs are not even content to be paid reciprocal compensation and want to receive access for what is essentially the same call using the same leaky PBX, just in the

opposite direction. They will never voluntarily pay anything, but insist on always receiving access. That does not seem too fair.

I am not a lawyer, but I do know that from an operational and technical perspective ESPs have always secured local connections just like all other end users, they used these local connections to both originate (indeed, re-originate) and receive calls and neither they nor their exchange carrier vendor had to pay other exchange carriers any form of access.

Transcom is no different from all the ESPs that went before: it can buy telephone exchange service and its traffic is access-exempt.

Q: Does this conclude your testimony?

A: Yes. I reserve the right to make corrections of any errors we may discover by submitting an *errata*.

Federal Communications Commission

Wireless Telecommunications Bureau

RADIO STATION AUTHORIZATION

LICENSEE: HALO WIRELESS

ATTN: NATHAN NELSON
HALO WIRELESS
307 WEST 7TH STREET SUITE 1600
FORT WORTH, TX 76102-5114

Call Sign	File Number
WQJW781	0003681223
Radio Service NN - 3650-3700 MHz	
Regulatory Status Common Carrier	

FCC Registration Number (FRN): 0018359711

Grant Date	Effective Date	Expiration Date	Print Date
01-27-2009	01-27-2009	11-30-2018	01-27-2009

Market Name: Nationwide

Channel Block: 003650.00000000 - 003700.00000000 MHz

Waivers/Conditions:

This nationwide, non–exclusive license qualifies the licensee to register individual fixed and base stations for wireless operations in the 3650–3700 MHz band. This license does not authorize any operation of a fixed or base station that is not posted by the FCC as a registered fixed or base station on ULS and mobile and portable stations are authorized to operate only if they can positively receive and decode an enabling signal transmitted by a registered base station. To register individual fixed and base stations the licensee must file FCC Form 601 and Schedule M with the FCC. See Public Notice DA 07–4605 (rel November 15, 2007)

Conditions:
Pursuant to §309(h) of the Communications Act of 1934, as amended, 47 U.S.C. §309(h), this license is subject to the following conditions: This license shall not vest in the licensee any right to operate the station nor any right in the use of the frequencies designated in the license beyond the term thereof nor in any other manner than authorized herein. Neither the license nor the right granted thereunder shall be assigned or otherwise transferred in violation of the Communications Act of 1934, as amended. See 47 U.S.C. § 310(d). This license is subject in terms to the right of use or control conferred by §706 of the Communications Act of 1934, as amended. See 47 U.S.C. §606.