

1 Information to be reported by Alascom

2 4. Alascom agrees to submit the following information:

3 (a) Minutes Data: the originating and terminating
4 minutes for each DAMA location, separately indicating state and
5 interstate jurisdictional minutes. If actual terminating minutes
6 are unavailable, Alascom will so indicate and provide an estimate
7 of the terminating minutes.

8 (b) Customer Data: the number of customers and
9 originating revenues associated with each DAMA location using the
10 following four categories: i) MTS and MTS-like services, ii)
11 private line services, iii) other, and iv) total. For this item,
12 customers may fit in more than one of the above 4 categories.
13 For all revenue data, Alascom will separately identify state and
14 interstate revenues. Alascom will also identify the services
15 included in the "other" category.

16 (c) Market Conditions Data: a brief description of all
17 significant characteristics of the market and changes in the
18 market for each location, including:

- 19 i) significant changes in demand, revenues or costs
20 of service;
- 21 ii) promotional offerings;
- 22 iii) implemented and planned upgrades in technology and
23 quality of service;
- 24 iv) list of locations where Alascom is currently
25 providing wireless services.
- 26

DEPARTMENT OF LAW
OFFICE OF THE ATTORNEY GENERAL
ANCHORAGE BRANCH
1031 W. FOURTH AVENUE, SUITE 200
ANCHORAGE, ALASKA 99501
PHONE: (907) 269-5100

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5. For purposes of the information required to be filed by Alascom, DAMA locations include all 50 GCI DAMA sites and associated regional centers.

DATED: December 8, 1995 BRUCE M. BOTELHO
ATTORNEY GENERAL

By: Virginia A. Rusch
Virginia A. Rusch
Assistant Attorney General

DATED: December 12, 1995 GENERAL COMMUNICATION, INC.

By: James R. Jackson
James R. Jackson
Its: Regulatory Attorney

DATED: December 11, 1995 ASHBURN & MASON

By: William Saupe
William Saupe
Counsel for Alascom, Inc.

Attachment 2

Background memorandum identifying key regulatory proceedings underway or shortly to be underway at the APUC.

To Commissioners: Date: September 9, 1997
Sam Cotten, Chairman
Alyce A. Hanley File: Pending assignment
Dwight D. Ornquist
Tim Cook Re: Telecommunications
James M. Posey Act of 1996:
Market Structure
NOI

cc: Robert A. Lohr, Executive Director
Lori Kenyon
Philip Treuer

From: Lew Craig, Communications Common Carrier Specialist

BACKGROUND

By Order R-96-3(1), dated July 24, 1996, the Commission requested comment on issues it had preliminarily identified as needing attention under the Telecommunications Act of 1996 (the Act). At the Commission's public meeting on February 6, 1997, the Commission Staff (Staff) presented a summary of comments filed in R-96-3 and a recommendation of how to proceed.

The Commission adopted Staff's recommendation to open five new rulemaking dockets to address private pay telephones, directory assistance, access charge reform, universal service, and various market structure issues. To date the Commission has opened rulemaking dockets to address:

private pay telephones	Order R-97-3
directory assistance	Order R-97-7
access charge reform	Order R-97-5
universal service	Order R-97-6

Market structure is the last of the rulemaking dockets discussed at the February 6, 1997 public meeting.

DISCUSSION

The market structure topics discussed at the February 6, 1997, public meeting included the following issues.

- I. Arbitration -- Pricing Standards
- II. Removal of Barriers to Entry
 - A. Barrier to Entry sub-issues

1. IXC Facility Restrictions
 2. IXC Facility Modernization
 3. IXC wholesale rates
 4. Access to IXC networks
- II. Provision of Intrastate Interexchange Service
- III. LEC Pricing Flexibility

Staff has worked with the Commission's consultant, Ben Johnson & Associates (BJA),¹ to more fully develop these issues identified for inclusion in the market structure NOI.²

I. Arbitration -- Pricing Standards:

Subsection 252(d) of The Act sets separate pricing standards for three different types of interconnection charges:

<u>Interconnection Charge</u>	<u>Pricing Standard</u>
Interconnection and network element charges	Based upon the cost (determined without reference to a rate-of-return or other rate-based proceeding) of providing the interconnection or network element. Nondiscriminatory. May include a reasonable profit.
Charges for transport and termination of traffic	Mutual and reciprocal recovery of costs associated with transport and termination on each carrier's network of calls that originate from the other carrier. Costs based upon reasonable approximation of additional costs of terminating calls.
Wholesale prices for telecommunications services	Based upon retail rates, excluding the portion attributable to marketing, billing, collection, and other avoided costs.

The Eight Circuit Court of Appeals has vacated the pricing rules established by the FCC for interconnection. As a result, States have authority to establish their own pricing rules (the FCC has

¹The BJA comments and suggestions, filed September 8, 1997, will be provided separately.

²The draft market structure NOI is attached as CLC-1.

noted its intent to appeal).

In the arbitration between General Communications Corp. (GCI) and Anchorage Telephone Utility (ATU) [Docket U-96-89] both parties recognized that the arbitration process did not afford sufficient time to develop prices based upon a new cost study. Therefore, the Commission specifically stated that all prices adopted pursuant to the arbitrator's decision were temporary in nature and would require a full study based upon a cost methodology to be determined by the Commission.

Staff has included this issue in the attached draft NOI.

II. Removal of Barriers to Entry -- State Authority:

No State or local statute or regulation, or other State or local legal requirement, may prohibit or have the effect of prohibiting the ability of any entity to provide any interstate or intrastate telecommunications service. [Section 253(a)]

Nothing in Section 253 of The Act affects the ability of a state to impose, on a competitively neutral basis and consistent with Section 254 of The Act, requirements necessary to preserve and advance universal service, protect the public safety and welfare, ensure the continued quality of telecommunications services, and safeguard the rights of consumers. [Section 253(b)]

Issues originally identified for market structure NOI:

1. IXC Facility Restrictions
2. IXC Facility Modernization
3. IXC wholesale rates
4. Access to IXC networks

The issue of wholesale rates has recently been a topic in various proceedings before the Commission. Also General Communications Corp. (GCI) recently petitioned the Commission regarding the legality of 3 AAC 52.355, "facilities restriction." GCI contends that the Act preempts the Commission's regulation as a barrier to entry. Staff believes that the interexchange issues are of sufficient magnitude to warrant a separate market structure proceeding. Staff recommends the Commission initiate a separate NOI to address interexchange market structure issues.

III. LEC Provision of Intrastate Interexchange Service:

At an Emergency Public Meeting held May 31, 1996, the Commission denied a petition filed by General Communications, Inc. (GCI) requesting that the Commission adopt regulations governing provision of interexchange service by an LEC. The Commission stated that while it has previously noted its intention to develop rules governing LEC entry into the intrastate interexchange market (Docket R-90-1; See 10 APUC 416), it was not currently prepared to find that GCI's proposed regulations comprehensively addressed all of the Commission's concerns regarding this matter. However, the Commission did determine that the issue of LEC entry into interexchange markets should be incorporated as an additional item in the Commission's pending omnibus rulemaking docket to implement The Act.

In individual interexchange certification proceedings the Commission has established conditions on the approval of LEC affiliate IXC applications to ensure the reasonable protection of LEC rate-payers, ensure that unreasonable cross-subsidization does not occur, and maintain a level competitive IXC playing field yet not create an unreasonable barrier to a LEC's entry into the IXC market. For example the Commission has generally not allowed incumbent LEC/IXC affiliates to market local exchange and long distance service as a "bundled" package. In the case of ATU/ATU-LD the Commission concurred with Staff that the ability to "bundle" LEC/IXC services would provide ATU/ATU-LD with an inappropriate ability to influence the market.

Staff believes the Commission should develop rules governing LEC entry into the intrastate interexchange market in conjunction with market structure rules regarding LEC pricing flexibility and market dominance. Therefore Staff has included this issue in the draft NOI as a part of the discussion of market power and pricing flexibility.

IV. LEC Pricing Flexibility:

To date the Commission has authorized three telecommunications companies to operate as local exchange carriers in the Anchorage market, Anchorage Telephone Utility (ATU), General Communications Corp. (GCI-LEC), and Alascom, Inc. (Alascom-LEC). In the past months the new entrants, GCI-LEC and Alascom-LEC, have proposed several tariff revisions to reduce prices or offer promotional packages. ATU, the incumbent, has responded by proposing its own

promotions and price reductions.

Under current pricing rules, LECs in Alaska are subject to cost-based (rate base, rate of return) pricing rules. Any proposed rate for a new service is subject to requirements that generally require a utility to file cost justification with its proposal. The Commission's current regulations do not address competitive LEC markets, e.g., competitive pricing, and do not distinguish between incumbent LECs and competitive LECs. The Act does not address pricing flexibility for LECs.

To date the Commission has exercised flexibility to encourage developing competition and maintain a level playing field. Rules are necessary that balance the need for pricing flexibility with adequate protection for the public. Staff has included this issue in the draft NOI as part of the discussions regarding market power and dominance.

CONCLUSION

Staff recommends that the Commission issue the attached NOI to address LEC market structure issues of pricing flexibility, market dominance and LEC provision of interexchange service as well as arbitration pricing standards (draft NOI attached as CLC-1). Staff also recommends the Commission consider the IXC market structure issues of facility restrictions, facility modernization, wholesale rates, and access to interexchange networks as a separate NOI.

Attachment 3

The attached report provides a general description of the early history regarding the explosions at GCI earth stations. Since the April 1997 report, numerous other actions have occurred. A full account of this matter is available through APUC Docket U-95-38.

RECEIVED
A.P.U.C.

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STATE OF ALASKA

THE ALASKA PUBLIC UTILITIES COMMISSION

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Before Commissioners:

Sam Cotten, Chairman
Alyce A. Hanley
Dwight D. Ornquist
Tim Cook
James M. Posey

In the Matter of the Request by)
GENERAL COMMUNICATION, INC.,)
for Waiver of 3 AAC 52.355(a) and)
Approval of a 50-Site Demonstra-)
tion Project)
_____)

Docket U-95-38

REPORT ON BATTERY
SAFETY ISSUES

In an effort to provide the Commission and all affected parties with information regarding the safety of GCI's DAMA installations, GCI provides this report.

I. The Current Situation:

First, the current situation. All of the batteries that were contained in small shelters have been disconnected, removed from the shelters, and removed from service. They are inactive and are outside. They present no safety concerns.

GCI has obtained the services of Frank J. Vaccaro, of Frank J. Vaccaro & Associates in Parsippany, NJ. Mr. Vaccaro is a very highly qualified expert with both impressive academic credentials and extensive experience. His resume is attached.

Mr. Vaccaro is both guiding and reviewing GCI's plans for placing the batteries back in service. The safety of the installations will be assured before GCI proceeds.

GCI Communication Corp.
2550 Denali Street, Suite 1000
Anchorage, AK 99503
(907)265-5600

1 II. Explanation of Prior Events¹

2 In 42 of GCI's DAMA locations, the batteries that constitute the back-up
3 power supply for the installations were contained in an unvented metal shelter
4 about the size of a large refrigerator.² The batteries are lead-acid batteries similar to
5 "maintenance free" automobile batteries. There were four such batteries in each
6 power shelter. The shelters had been constructed to be nearly airtight because of
7 the harsh environment in which they were deployed.

8 On the afternoon of January 21, 1997, GCI was notified that the shelter in
9 Shungnak had exploded. That location was not in service at the time of the
10 explosion. Two days later GCI visited the site, and additional personnel visited
11 the site a day later. GCI determined that an explosion had occurred that blew the
12 shelter apart. GCI also determined that the battery charger at the Shungnak site
13 had been set on the "equalize" mode. That was inappropriate but had not been
14 noticed because Shungnak was not in service.

15 The Shungnak explosion was caused by a slow release and build-up of
16 hydrogen into the airtight container. The slow release of hydrogen was caused by
17 the charger being set in the equalize mode.

18 The explosion in Shungnak was very serious, and GCI took the explosion
19 very seriously. GCI's personnel first arrived in Shungnak on Thursday January 23
20 and returned on to Anchorage on Friday January 24. On Saturday January 25 GCI
21 considered the situation and decided what action should be taken based on
22 information from the site visit and consultations with independent Environment
23 Health Sciences (EHS) and the battery manufacturer. The next day, Sunday
24

25 ¹ A more technical explanation of the batteries and the associated problems is attached as Appendix
26 A.

27 ² There are 56 DAMA locations, including the regional centers. The 6 regional centers and 8 other
intermediate sites have different installations and the batteries are not included in airtight
shelters.

1 January 26, GCI dispatched three crews to visit all sites. Each crew included an
2 Industrial Hygienist from Environmental Health Services. The purpose of the
3 visit was to test all shelters for the presence of hydrogen; to open all containers to
4 allow any hydrogen to escape; to disable the equalize mode in the battery charger;
5 and to add vents to all the shelters. One crew began on the North Slope, one
6 began in the Kotzebue region, and one began in the Bristol Bay region. By January
7 28, all of the remote installations had been visited and the four foregoing tasks
8 accomplished. Thus, within 7 days after GCI was notified of the explosion and
9 only 5 days after GCI first visited the site, GCI personnel had flown all over Alaska
10 to 38 different³ remote locations to assess the situation and implement changes to
11 prevent a recurrence. This included opening a vent on every power shelter.

12 As noted, the shelters were tested for the presence of hydrogen by
13 independent personnel from EHS. The highest concentration of hydrogen found
14 at any site was only 16% of the concentration necessary for the hydrogen to ignite.

15 Based on the incorrect setting of the charger in Shungnak and the low
16 concentrations of hydrogen at all other sites, at that time GCI believed that the
17 problem of the hydrogen release was related solely to the battery charger. GCI also
18 believed that, even if hydrogen were released, the installation of vents would
19 prevent any buildup of hydrogen and subsequent explosion.

20 On March 5, 1997, the DAMA installation in Nondalton, which was in
21 service, went "off the air".⁴ GCI visited the site on the same day and discovered
22 that the door on the shelter in Nondalton had been forced open and the shelter
23 bulged outward, and the batteries were bulged or cracked. There had been another
24

25 _____
26 ³ Two locations that were not connected to electrical power were not visited; in one location the
shelter is not installed.

27 ⁴ TelAlaska reported to the Commission that the Nondalton station exploded twice. (TelAlaska
Petition, p. 11.) That is incorrect. There was a single incident in Nondalton, as described.

1 release of hydrogen that ignited. It appears that the vents had successfully reduced
2 both the size and impact of the explosion. However, GCI also realized that the
3 cause of the release of hydrogen was different from Shungnak, because the battery
4 charger was not in the equalize mode. Therefore, GCI realized that it had an
5 unsolved issue regarding the cause of the release of hydrogen.

6 GCI again took prompt action. GCI decided to completely disconnect all
7 batteries and remove them from the shelters. This project began on March 10,
8 1997 and was completed on March 13, 1997.

9 Once the batteries were disconnected and removed from the shelters, there
10 were no safety concerns. The batteries in that state are no more dangerous than a
11 battery on the shelf of an auto parts store. All of the installations are surrounded
12 by a chain link fence. That is the current situation.

13 III. Plans

14 In March, 1997, GCI obtained the services of a consultant to advise GCI on the
15 situation. This consultant came to Anchorage on March 12, 1997. Although that
16 consultant was useful, GCI determined that he did not have as much experience
17 and expertise as GCI desired. GCI then obtained the services of Mr. Vaccaro. Mr.
18 Vaccaro was hired on March 20 or 21, 1997, and he came to Anchorage on March
19 24.

20 GCI has designed a temporary shelter to house the batteries that provide back-
21 up power. This shelter is totally separate from the airtight shelter previously
22 used; it is well ventilated; and it contains nothing but the batteries and
23 thermostats. Mr. Vaccaro has reviewed GCI's plans for the temporary shelter. GCI
24 is now incorporating Mr. Vaccaro's modifications into the design. GCI plans to
25 proceed with installation of the temporary shelters as soon as it is assured of the
26 safety, based on Mr. Vaccaro's guidance. With installation of the temporary
27

GCI Communication Corp.
2550 Denali Street, Suite 1000
Anchorage, AK 99503
(907)265-5600

1 shelters, the batteries will be reconnected and the DAMA facilities will again have
2 back-up power.

3 GCI is also investigating a longer-term solution. Development of a longer
4 term solution has nothing to do with improving the safety of the interim
5 solution. Although entirely safe, the interim solution does not provide an
6 adequate environment for long-term operation of the batteries; most particularly,
7 the temporary shelters do not provide adequate protection from severe cold
8 temperatures.

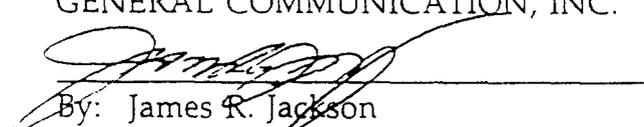
9 The long term solution may include larger shelters than the original power
10 shelters. The larger shelter may offer advantages for housing the batteries.
11 Furthermore, notwithstanding the problems with batteries, GCI's DAMA facilities
12 are bringing the improvement in rural telecommunications that GCI promised.
13 In view of the current efforts to improve telemedicine and to provide Internet
14 and high speed communications to schools, GCI now believes that larger shelters
15 may be desirable to allow for the provision of these services and accommodate
16 future increases in the capacity of each system.

17 Conclusion

18 GCI hopes that this report provides adequate assurance to the Commission
19 and all parties that, first, GCI has dealt with this problem correctly and, second,
20 that the present and future safety of the installations is assured.

21
22 Respectfully submitted, this 15th day of April, 1997.

23
24 GENERAL COMMUNICATION, INC.

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27 By: James R. Jackson
Its: Regulatory Attorney

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VERIFICATION

I, James R. Jackson, Regulatory Attorney for General Communication, Inc., say on oath and affirm that I have read the Report On Battery Safety Issues and believe all statements made in those documents are true and correct to the best of my knowledge.


James R. Jackson

SUBSCRIBED AND SWORN to before me this 15th day of April 1997.


NOTARY PUBLIC FOR ALASKA
My Commission expires MY COMMISSION EXPIRES JANUARY 17, 2001

GCI Communication Corp.
2550 Denali Street, Suite 1000
Anchorage, AK 99503
(907)265-5600

GCI Communication Corp.
2550 Denall Street, Suite 1000
Anchorage, AK 99503
(907)265-5600

TECHNICAL EXPLANATION

Lead-Acid Batteries

All lead-acid batteries produce an electric current with chemical reactions involving sulfuric acid, water, and solid plates containing lead. The liquid in a battery is called the "electrolyte". Each set of plates in a battery is called a "cell". (A standard 12-volt car battery contains 6 cells.) When a battery is in a discharged state, the majority of the electrolyte is water. Charging the battery causes the water to react with the plates, producing sulfuric acid. Maintaining a cell at the fully charged level is accomplished by applying a "float voltage" at just the right magnitude to overcome the cell's natural self-discharge. Any voltage above this ideal float voltage will cause the cell to decompose the water, producing hydrogen and oxygen gas. The ideal float voltage is very dependent upon the temperature. The ideal float voltage for a warm cell is less than that for a cold cell.

"Flooded" vs. "Sealed"

In an older-style battery, this decomposition of water would eventually cause the battery to dry out, and more water would have to be added. These types of batteries are known as "flooded cells". Within the last decade, a new type of lead-acid battery has become popular in the telecommunications industry. These batteries have the liquid immobilized in a gel, or absorbed in a fiberglass mat. They are sometimes called "Sealed" or "Maintenance Free", and do not provide access to the electrolyte. Rather than letting the gasses escape into the atmosphere, most of the gasses are recombined into the electrolyte and plates, returning the wasted charging energy as heat.

VRLA Batteries

The correct term for this type of "Sealed" battery is "Valve-Regulated Lead-Acid", or VRLA. Although most gas is recombined in the battery, the reactions are not perfect, and some gas can build up. Rather than just allowing the gas to escape, VRLA batteries allow the pressure to build until it reaches several pounds per square inch, after which gas is allowed to vent. For a healthy battery under ideal temperature and float voltage conditions, the quantity of gas generated is very small. A VRLA battery under normal operating conditions generates between 1% and 10% as much gas as a flooded battery. However, the term "Sealed" in reference to a VRLA battery is a misnomer.

Shungnak

The DAMA Power Shelter originally contained "sealed" VRLA batteries. The shelter was constructed of a nearly airtight design because of the harsh environment in which they were deployed. The battery charger at the Shungnak site was in the "equalize" mode, which raised the voltage across the batteries to a level well beyond the ideal-float conditions. The batteries generated excess gas for a

GCI Communication Corp.
2550 Denall Street, Suite 1000
Anchorage, AK 99503
(907)265-5600

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long period of time, eventually resulting in an explosion which destroyed the shelter. Shelters at all other sites were then provided with a vent, and the equalize mode on the chargers was disabled.

Nondalton

The Nondalton site experienced a small explosion which blew open the doors of the Power Shelter. The batteries were disconnected, and the shelter was restored to service and replaced shortly thereafter. Inspection of the batteries revealed they were severely bulged or cracked - an indication suggesting they had undergone "Thermal Runaway". Thermal Runaway occurs when a VRLA battery produces more heat internally due to gas recombination than it can dispose of to the surrounding environment. This heating causes a decrease in the ideal float voltage, which produces more heat and generates excess gas. The cycle usually continues until the battery dries out. While the vent was adequate for gas production under normal conditions, the volume of gas generated during thermal runaway was in excess of what it could handle; the vent reduced the severity of the explosion significantly but did not eliminate it. An explosive environment is possible at a 4% concentration of hydrogen. After this incident, all batteries were disconnected and removed from the shelters at all sites.

FRANK J. VACCARO

32 Maplewood Drive, Parsippany, NJ 07054 Telephone: (201) 335-2049

EDUCATION

M.S. ELECTROANALYTICAL CHEMISTRY, 1967; B.S. CHEMISTRY, 1957
Brooklyn College, Brooklyn, NY

EMPLOYMENT

CHEMIST, AT&T Bell Laboratories, Murray Hill, NJ (1968 - 1991)

- Lead scientist for the research and development of battery products from concept to introduction.
- Supervise other scientists and technical support groups.
- Project leader of a team to develop, market, manufacture and introduce new products.
- Developed post and cover jar seals for both flooded and electrolyte starved lead-acid batteries.
- Quantified the effect of water loss from the cell electrolyte, on the cell's impedance and capacity.
- Demonstrated to the scientific community that impedance measurements can be used to track the capacity of starved electrolyte cells.
- Studied the kinetics of water vapor transport through plastic materials used for battery containers, a self discharge mechanism for the positive plate of a lead-acid battery and rotating disk procedures for the evaluation of materials.

CHEMIST, Singer Central Research Center, Denville, NJ (1966 - 1968)

CHEMIST, Western Electric Co., New York, NY (1957 - 1966)

PATENTS

1. A Post Seal for Lead-Acid Batteries.
2. A Hybrid Alloy Lead-Acid Battery.
3. A New Geometry for Positive Plate Grids.

PUBLICATIONS AND PRESENTATIONS

1. "The Water Vapor Permeability of Plastics Used for Battery Containers,"
Intelec 1989, Florence Italy.
2. "Starved Electrolyte Battery Life Monitored by Impedance Measurements,"
Northeast Utilities Conference, 1988, Albany, NY.
3. "Factors Affecting the Float Performance of the Negative Plate of the Lead-Acid Battery,"
Intelec 1988, San Diego, CA.
4. "Internal Resistance: Harbinger of Capacity Loss in Starved Electrolyte Lead-Acid Batteries,"
Intelec 1987, Stockholm, Sweden.
5. "Some Experiments on the Thermal Characteristics, and Thermal Management of
Valve Regulated Cells," Intelec 1991, Kyoto, Japan.

PROFESSIONAL AFFILIATIONS

- Committee Chairman, Battery Standards Committee for Telecommunications-Editing.
- Member, Intelec

COMPUTER EXPERIENCE

- Experienced with computer architecture, Unix and Basic programming.
- Familiar with Lotus 1,2,3, Energraphics, Harvard Graphics, Word Perfect, etc.

ACTIVITIES

- marathon runner
- sailing

REFERENCES

Available upon request.

**FRANK VACCARO
& ASSOCIATES**

32 Maplewood Drive, Parsippany, NJ 07054 - Phone (201)335-2049

Consultants - Batteries, Materials, Telecommunications

As a chemist with 25 years of *hands on experience* gained at Bell Telephone Laboratories, I can help you toward more efficient expenditure of your battery dollars and enhance your product reputation in the battery industry. My experience in lead-acid battery development, manufacture, field application, materials evaluation, *plus my contacts in the technical community*, will expand the expertise I can bring to you.

FOLLOWING ARE SOME AREAS IN WHICH I CAN ASSIST YOU:

- o **LEAD-ACID BATTERY DEVELOPMENT**
 - Cover to jar and terminal post sealing
 - Leak testing
 - Accelerated testing
 - Plastic container selection
 - Thermal management
 - Performance testing

- o **BATTERY MANUFACTURING**
 - Electrolyte filling of valve regulated cells
 - Low rate leak testing
 - Formation and processing
 - Product testing, inspection and quality control

- o **BATTERY FIELD PERFORMANCE**
 - Float problems
 - Maintenance
 - Battery plant design
 - Safety

- o **BATTERY SALES AND TECHNICAL REPRESENTATIVE**
 - Interface with customers
 - Provide Standards Committee representation

Please call for additional information.

Frank J. Vaccaro
Chief Consultant

SERVICE LIST
CC98-6

February 12, 1998
Page 1 of 11

Richard Hutchinson d/b/a
Circle Telephone
P. O. Box 1
Circle, AK 99733

The Honorable Ted Stevens
United States Senate
222 West Seventh Avenue, No. 2
Anchorage, AK 99513-7569

Robert E. Stoller, Esq.
Suite 3-640
800 East Dimond Boulevard
Anchorage, AK 99515

Honchen & Uhlenkott, Inc.
Consultants
Suite 3-640
800 East Dimond Boulevard
Anchorage, AK 99515

Melissa Fouts
Secretary/Treasurer
ATU Long Distance, Inc.
Suite 602
301 West Northern Lights Boulevard
Anchorage, AK 99503

John R Snedegar
President
Advanced Management Services, Inc.
3030 North Central Ave.
Phoenix, AZ 85012

Mark J. Vasconi
Regulatory Affairs Director
Alascom, Inc., d/b/a AT&T Alascom
210 East Bluff Drive
Anchorage, AK 99501-1100

Sean K. Stogner
President of Operations
Alaska Call Connection, Inc.
2130 Colony Loop
Anchorage, AK 99596

Judith Colbert
Executive Director
Alaska Exchange Carriers
Association, Inc.
3380 C Street, Suite 201
Anchorage, AK 99503

Charles Hensley
President
Alaska Network Systems, Inc.
4300 "B" Street, Suite 502
Anchorage, AK 99503

Ron Zobel, Esq.
Assistant Attorney General
Alaska Public Utilities Commission
1031 West Fourth Avenue, Suite 200
Anchorage, AK 99501

James Rowe
Director
Alaska Telephone Association
201 E. 56th Avenue, Suite 114
Anchorage, AK 99518

Michael Garrett
President
Alaska Telephone Company, et al.
P. O. Box 222
Port Townsend, WA 98368

John R. Summers
Senior Vice President
AmeriTel Pay Phones, Inc.
611 S.W. Third Street
Lee's Summit, MO 64063

Lance J. M. Steinhart, Esq.
Attorney
American Express Telecom, Inc.
Suite 285
6455 East Johns Crossing
Duluth, GA 30155

Carl E. Worboys
Vice President - Administration
American Telecommunications
Enterprise, Inc.
7323 Oswego road
Liverpool, NY 13090

Jeffrey R. Lowe
Director - Regulatory Affairs
Ameritech Communications
International, Inc.
Loc. 4G58
2000 West Ameritech Center Drive
Hoffman Estates, IL 60196

Glenn S. Richards, Esq.
Fisher Wayland Cooper Leader
& Zaragoza L.L.P.
Counsel for Ameritech
Communications International,
Inc.
Suite 400
2001 Pennsylvania Avenue, N. W.
Washington, DC 20006-1851

Robert L. Vasquez, Esq.
General Counsel
Anchorage Telephone Utility
a/k/a ATU Telecommunications
Municipality of Anchorage d/b/a
600 Telephone Avenue
Anchorage, AK 99503-6091

David S. Fauske
General Manager
Arctic Slope Telephone Association
Cooperative, Inc., and ASTAC Long
Distance, Inc.
4300 B Street, Suite 501
Anchorage, AK 99503-5900

A. William Saupe, Esq.
Ashburn & Mason
1130 West Sixth Avenue, Suite 100
Anchorage, AK 99501

Robert Sternberg
President
BLT Technologies, Inc.
610 Esther Street, Suite 1000
Vancouver, WA 98660

Ben Johnson
Ben Johnson and Associates
1234 Timberlane Road
Tallahassee, FL 32312

Heather H. Grahame, Esq.
Michelle A. Stone, Esq.
Bogle & Gates P.L.L.C.
1031 West Fourth Avenue, Suite 600
Anchorage, AK 99501

Robin O. Brena, Esq.
Brena, Bell, and Clarkson
310 K Street, Suite 601
Anchorage, AK 99501

Duane C. Durand
General Manager
Bristol Bay Telephone
Cooperative, Inc., and King
Salmon Communications, Inc.
P. O. Box 259
King Salmon, AK 99613

Harry F. Colliver, Jr.
President/General Manager
Bush-Tell, Incorporated
P. O. Box 109
Aniak, AK 99557

Dorota A. Smith
Tariff and Regulatory Supervisor
Cable & Wireless, Inc.
8219 Leesburg Pike
Vienna, VA 22182

Charles S. Isdell
Vice President
Comdata Telecommunications
Services, Inc.
5301 Maryland Way
Brentwood, TN 37027

Tim Rennie
General Manager
Copper Valley Telephone
Cooperative, Inc.
P. O. Box 337
Valdez, AK 99686

Ruth A. Steele
General Manager
Cordova Telephone Cooperative, Inc.
P. O. Box 459
Cordova, AK 99574-0459

Joseph M. Moran, Esq.
DeLisio, Moran, Geraghty & Zobel
943 West Sixth Avenue
Anchorage, AK 99501-2033

Jim Butler
Director, Regulatory Affairs
EXCEL Telecommunications, Inc.
8750 North Central Expressway
Lockbox 106
Dallas, TX 75231

Jason O'Brieon
Manager Regulatory Affairs
Federal Transtel, Inc.
2868 Acton Road, Suite 100
Birmingham, AL 35243

Michael Nighan
Director of Regulatory Affairs
Frontier Communications Intl., Inc.
180 South Clinton Ave.
Rochester, NY 14646

Alan C. Eaker
General Manager
GTE Alaska Incorporated
Suite 201
16404 Smokey Point Boulevard
P. O. Box 1025
Arlington, WA 98223-6025

Richard E. Potter, Esq.
Associate General Counsel
GTE Alaska Incorporated
P. O. Box 1003
Everett, WA 98206

H. Gordon Allen
General Manager
GTE Communications Corporation
1200 Walnut Hill Lane, Suite 2000
Irving, TX 75038

James A. Durant
Senior Consultant
GVNW Inc./Management
P. O. Box 230399
Portland, OR 97281-0399

Dana L. Tindall
Vice President of Regulatory
Affairs
General Communication Corp.
d/b/a General Communication,
Inc., and d/b/a GCI
2550 Denali Street, Suite 1000
Anchorage, AK 99503