

ALASKA LEGISLATURE COMMITTEE FILES 1981-1982 86/2

1451 SHESS EXECUTIVE ORDER # 50 198

DRAFT

1st Comm. Budget Amendment

Prepared By	Initials
Approved By	

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Title	Range	\$/mo	\$/year	Benefits @ 15.79%	SBP @ 6.13% or \$2004	Other Benefits	Total Personal Services	Conts	Equipmt			
1 Deputy Comm	28 A	4819	57828	9131	2004	1800	70763	2700	1800			
2 Secretary II	11 B	1708	20496	3236	1256	1800	26788	2700	10800			
3 Director	26 A	4483	53796	8494	2004	1800	66094	2700	1800			
4 Secretary I	10 B	1613	19356	3056	1187	1800	25399	2700	10800			
5 Deputy Director	23 A	3746	44952	7098	2004	1800	55854	2700	1800			
6 Sup. Proj. Ass't	20 A	3039	36468	5758	2004	1800	46030	2700	1800			
7 Comm. Eng.	20 A	3039	36468	5758	2004	1800	46030	2700	1800			
8 TV Switcher	10 B	1613	19356	3056	1187	1800	25399	2700	1800			
9 Clerk Typist III	8 B	1433	17196	2715	1054	1800	22765	2700	10800			
10 Systems Design Plnr.	22 A	3494	41928	6620	2004	1800	52352	2700	1800			
11 Needs Assmt Plnr.	22 A	3494	41928	6620	2004	1800	52352	2700	1800			
12 State Agency Plnr.	22 A	3494	41928	6620	2004	1800	52352	2700	1800			
13 Regulatory Economist	21 A	3260	39120	6177	2004	1800	49101	2700	1800			
14 Com. Sec. II	10 B	1613	19356	3056	1187	1800	25399	2700	10800			
15 Clerk Typist III	8 B	1433	17196	2715	1054	1800	22765	2700	10800			
			507372	80110	24961	27000	639443	46500	72000			

ADD TUL. 2004
ADD 25K UPS
TDS.

758,943
@ 752,000

Does not include travel phones, office supp's, etc

STATE OF ALASKA

JAY S. HAMMOND, GOVERNOR

DEPARTMENT OF LAW

OFFICE OF THE ATTORNEY GENERAL

POUCH K - STATE CAPITOL
JUNEAU, ALASKA 99811
PHONE: (907) 465-3600

February 23, 1981

Honorable Charles H. Parr, Chairman
Senate HESS Committee
Alaska State Legislature
Pouch V
Juneau, Alaska 99811

Re: Executive Order No. 50
Telecommunications

Dear Senator Parr:

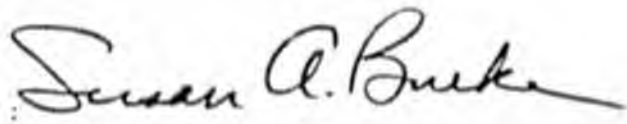
This is in response to your request for a written statement of intent concerning the scope of Executive Order No. 50. Apparently a question has arisen concerning whether the Executive Order would give the Department of Administration any authority over telecommunications activities and functions in the Legislature.

Those of us in the Executive Branch who worked on the Executive Order understood and contemplated from the very beginning that the Legislature would continue to have control and authority over its own telecommunications activities. Further, any interpretation of the Order to the contrary would raise constitutional problems. First, a separation of powers question would arise if the Order were interpreted as giving the Department of Administration authority over a matter concerning the administration of the Legislature. Second, the scope of an Executive Order is limited under the Alaska Constitution to the reorganization of executive departments. An Executive Order cannot grant to an executive department new powers that did not exist before.

I hope this answers your questions. Please let me know if you need anything further.

Sincerely,

WILSON L. CONDON
ATTORNEY GENERAL

B: 
Susan A. Burke
Assistant Attorney General

SAB:wjp

January 12, 1981

R E S O L U T I O N

WHEREAS adequate telecommunications facilities and services available at reasonable and affordable rates are essential to the conduct of government, commerce and private life and that these facilities and services should be available, to the extent possible, to all agencies and citizens of the state regardless of location; and

WHEREAS it is in the interest of all people of the state for the state to facilitate the development of both basic and advanced telecommunications service and facilities to be available to all its citizens for their individual and mutual benefit; and

WHEREAS consolidating telecommunications activities through one department should assure increased efficiency, increased accountability, increased effectiveness in coordinating and assisting public service telecommunications users, will establish consistent public policy for the state related to telecommunications systems and services, and will assure better public understanding of the state's policies and programs; and

WHEREAS the Alaska Public Broadcasting Commission will be able to pursue with greater effectiveness its role in the encouragement, development and support of non-commercial public broadcasting; and

WHEREAS the Commission would retain responsibility for long-range planning for the development of non-commercial public broadcasting in the state and would fulfill its role of supporting public broadcasting primarily through planning and through making grants and providing assistance for non-commercial public broadcasting purposes; and

WHEREAS the Order stresses the importance of the state's maintaining a strict policy against influence or control over actual program content and over the use and scheduling of broadcast time,

BE IT RESOLVED, that the Board of Directors of Alaska Public Television, Inc. endorses and supports the findings and purposes of Executive Order No. 50 issued by Governor Jay S. Hammond, January 12, 1981, in regard to the reorganization of state telecommunications services and facilities.

SIGNED:



Marilynn S. Scott
Chairman, Board of Directors
Alaska Public Television, Inc.





KAKM ALASKA PUBLIC TELEVISION, INC
2651 PROVIDENCE DRIVE/ANCHORAGE, ALASKA 99504
(907) 276-7070

February 20, 1981

Senator Charles Parr
Alaska State Senate
District "V"
Juneau, Alaska 99811

Dear Senator Parr:

Enclosed in an endorsement from the Board of Directors of Alaska Public Television, Inc. regarding Governor Jay Hammond's Executive Order, No. 50. This resolution of support was adopted by the Board in a unanimous vote January 15, 1981.

We hope this document and the support it represents will be of value to both you and the Alaska Public Broadcasting Commission in their reorganization as regards Executive Order No. 50.

Sincerely,

Elmo Sackett

Elmo Sackett
Executive Director
and General Manager

ES/so

Enclosure

Education
A.P.R. Network → Det
Statewide Radio Stations
Alascom? 264-7000
UA → Jane Nemmet
anch.

green = Stanley

Referred: Health, Education &
Social Services and State
Affairs
1/13/81

IN THE SENATE

EXECUTIVE ORDER NO. 50

1
2 Under the authority of art. III, sec. 23, of the Alaska Constitution,
3 and in accordance with AS 24.30.130(b), I order the following:

4 * Section 1. FINDINGS AND PURPOSE. (a) As governor, I find that ade-
5 quate telecommunications facilities and services available at reasonable and
6 affordable rates are essential to the conduct of government, commerce, and
7 private life and that these facilities and services should be available, to
8 the extent possible, to all agencies and citizens of the state regardless of
9 location. In addition, the future development of the state's public and
10 private sectors will depend greatly on the innovative use of new telecommuni-
11 cations services and techniques now becoming available. It is in the inter-
12 est of all people of the state for the state to facilitate the development
13 of both basic and advanced telecommunications services and facilities to be
14 available to all its citizens for their individual and mutual benefit.
15 Furthermore, I find that in the interest of minimizing the size and influence
16 of government, private ownership and control of telecommunication facilities
17 should be facilitated and enhanced, and that state government actions affect-
18 ing telecommunications should include an efficient and thorough assessment
19 of long-range costs and benefits to users as well as the direct and indirect
20 effect on the communications industry and the public.

21 (b) These goals can be best accomplished by coordinating all of
22 the state's telecommunications activities through one department. Consoli-
23 dating these activities will assure increased efficiency in providing the
24 public benefits of comprehensive telecommunications planning for the state;
25 increased accountability for adequate, reliable, and cost-effective tele-
26 communications system development; increased effectiveness in coordinating
27 and assisting public service telecommunications users; the establishment of
28 consistent public policy for the state related to telecommunications systems
29 and services; and better public understanding of the state's policies and

1 programs.

2 * Sec. 2. AS 14.58.010 is amended to read:

3 Sec. 14.58.010. CREATION OF ALASKA PUBLIC BROADCASTING COMMISSION.

4 There is created within the Department of Administration [EDUCATION]
5 the Alaska Public Broadcasting Commission. *Similar intent*

6 * Sec. 3. AS 14.58.050 is amended to read: *pg. 8 of FCC*

7 Sec. 14.58.050. PURPOSE OF THE COMMISSION. The commission is
8 created to encourage and supervise the development of an integrated
9 public broadcasting system for the state and for the coordination of
10 all public broadcasting stations. The primary purpose of the commission
11 is the encouragement and support of noncommercial public broadcasting in
12 the state through the provision of operating and capital grants in sup-
13 port of the delivery of noncommercial programs intended for a general
14 audience by locally controlled nonprofit broadcast stations or tele-
15 communications entities. The commission may support stations and en-
16 tities which also engage in the delivery of instructional, for-credit
17 programs, and the commission may provide funds for those purposes, but
18 the primary purpose of commission funds is the support of activities
19 that result in the delivery of general audience, noncommercial material.

20 * Sec. 4. AS 14.58.060 is amended to read:

21 Sec. 14.58.060. DUTIES OF THE COMMISSION. The commission shall

22 [(1) CONTROL AND SUPERVISE THE USE OF BROADCASTING CHANNELS
23 RESERVED BY THE FEDERAL COMMUNICATIONS COMMISSION FOR EDUCATIONAL
24 BROADCASTING PURPOSES;

25 (2) INITIATE OR RECEIVE FOR REVIEW AND APPROVAL ALL APPLI-
26 CATIONS FOR EDUCATIONAL BROADCASTING LICENSES SUBMITTED TO THE FEDERAL
27 COMMUNICATIONS COMMISSION FOR OR ON BEHALF OF AN ELEMENTARY SCHOOL
28 SYSTEM, COMMUNITY COLLEGE, INSTITUTION OF HIGHER LEARNING, PRIVATE
29 EDUCATIONAL INSTITUTION, NONPROFIT COMMUNITY OR MUNICIPAL ORGANIZATION

1 IN THE STATE;

2 (3) INITIATE OR RECEIVE FOR REVIEW AND APPROVAL ALL APPLI-
3 CATIONS FOR FEDERAL, STATE OR PRIVATE FUNDS IF THE APPLICATIONS INVOLVE
4 ANY FORM OF EDUCATIONAL BROADCASTING;]

5 (4) apply for federal and private funds for public broad-
6 casting purposes and receive all federal, state or private funds,
7 property or assistance that may be appropriated, granted or otherwise
8 made available to the commission for public [EDUCATIONAL] broadcasting
9 purposes [AT ALL LEVELS OF EDUCATION], and use and disburse funds and
10 property for purposes consistent with the terms of this chapter, sub-
11 ject to reasonable limitations imposed by the grantor;

12 (5) provide consultative services in all aspects of public
13 [EDUCATIONAL] broadcasting to all public or private agencies in the
14 state which request them;

15 (6) serve as a library and clearinghouse for public broad-
16 casting information [ON BROADCASTING FOR EDUCATIONAL AND PUBLIC PUR-
17 POSE];

18 [(7) HAVE THE FINAL AUTHORITY OVER THE BROADCASTING POLICY
19 PROGRAMMING;]

20 (8) Repealed by sec. 7, ch 87, SLA 1976.

21 (9) through grants to qualified entities, develop an inte-
22 grated public broadcasting network for the state;

23 [(10) DEVELOP AND DISTRIBUTE PUBLIC BROADCAST PROGRAMMING FOR
24 EDUCATIONAL INSTITUTIONS AND PUBLIC AGENCIES IN THE STATE;]

25 (11) through grants to qualified entities, develop and dis-
26 tribute public broadcasting programming [FOR PUBLIC AFFAIRS] in the
27 state;

28 (12) prepare and submit to the governor and the legislature,
29 in consultation with the telecommunications divisions in the Department

1 of Administration, a long term plan for the development of public broad-
2 casting stations and systems in the state, and annually update the
3 plan;

4 (13) perform all other functions necessary to ensure the
5 orderly and coordinated development of public broadcasting in the
6 state.

7 * Sec. 5. AS 14.58.070 is amended to read:

8 Sec. 14.58.070. POWERS OF THE COMMISSION. (a) The commission may

9 (1) employ all consultative, technical and clerical personnel
10 necessary for the implementation of this chapter, within the limits of
11 available funds;

12 (2) employ a director, who shall be directly responsible to
13 the commission in financial and administrative matters;

14 (3) provide grants to locally controlled non-profit tele-
15 communications entities which [WHERE NO OTHER COMPETENT CONTRACTING
16 AGENCY EXISTS] lease, purchase, construct, own, operate and manage and
17 are the licensees [LICENSEE] of public [EDUCATIONAL] broadcasting
18 stations, production centers, and [ALL] other related equipment and
19 facilities for the production and transmission of open circuit, closed
20 circuit, 2,500 Megahertz, and other transmission means necessary to
21 provide fully effective public [EDUCATIONAL] broadcasting in the state;

22 (4) appoint unpaid advisory committees to assist in develop-
23 ment of programs for [INSTRUCTIONAL AND] public television broadcasts;

24 (5) provide assistance to licensed commercial broadcasting
25 stations for the broadcast of public affairs programming [AND UTILIZA-
26 TION OF SATELLITE COMMUNICATIONS FOR THE BROADCASTING OF SPECIAL PUBLIC
27 AFFAIRS PROGRAMMING].

28 (b) In performing its duties and exercising its authority under
29 this chapter, the commission may not exercise control over the specific

1 content or airing of any program material.

2 * Sec. 6. AS 14.58.090(2) is amended to read:

3 (2) "public broadcasting" includes, but is not limited to,
4 television and radio transmission by 2,500 megahertz, closed circuit or
5 microwave video and audio programming, slow-scan television program-
6 ming, programming via satellite, teletype or facsimile transmission,
7 and distribution methods, when the transmission, programming and dis-
8 tribution are intended to serve a noncommercial [EDUCATIONAL,] public
9 [OR INSTRUCTIONAL] purpose.

10 * Sec. 7. AS 44.21.020 is amended by adding a new paragraph to read:

11 on pg. 16 FCC study, design, implement, and manage the telecommunica-
12 tions systems and services of the state under AS 44.21.200 -- 44.21.250.

13 * Sec. 8. AS 44.21.160 is amended by adding a new subsection to read:

14 (f) The division of data processing shall coordinate with the
15 divisions of telecommunications in providing for the effective transfer
16 of information by telecommunications through the establishment of com-
17 patible systems and common standards.

18 * Sec. 9. AS 44.21 is amended by adding new sections to read:

19 ARTICLE 4. TELECOMMUNICATIONS.

20 Sec. 44.21.200. TELECOMMUNICATIONS DIVISIONS. There is estab-
21 lished in the department

22 (1) a division of telecommunications services; and

23 (2) a division of telecommunications systems.

24 Sec. 44.21.210. DEPUTY COMMISSIONER. (a) The telecommunications
25 divisions shall be administered by a deputy commissioner of the depart-
26 ment appointed by the commissioner.

27 (b) The deputy commissioner shall

28 (1) provide executive direction for the activities of the
29 telecommunications divisions; and

restrictive

1 (2) assure that division activities in no way constitute an
2 influence on the content or airing of programming, and report to the
3 governor, the commissioner, and the Alaska Public Broadcasting Commis-
4 sion any request or attempt, by an employee of the state to influence
5 the content or airing of program material.

6 Sec. 44.21.220. POWERS AND DUTIES OF THE TELECOMMUNICATIONS
7 DIVISIONS. (a) The telecommunications divisions, as directed by the
8 deputy commissioner, shall

9 (1) advise the governor on matters of policy and comprehen-
10 sive state planning for telecommunications services;

11 (2) make an annual report to the governor and to the legis-
12 lature on the activities of the telecommunications divisions;

13 (3) coordinate, manage, and supervise ^{existing} state programs in
14 telecommunications, including the management of those telecommunication
15 services for the state obtained from common carriers and from the
16 communications industry;

17 (4) when requested, provide technical and consulting assis-
18 tance to the executive, judicial, and legislative branches of state
19 government, to the University of Alaska, and to private ^{Randy - no doc} noncommercial
20 entities ^{agencies} which request that assistance in facility procurement and
21 leasing and in identifying long-range goals and objectives for the
22 state and its political subdivisions in all aspects of telecommunica-
23 tions, including public, educational, and instructional telecommunica-
24 tions;

25 (5) prepare and maintain a state comprehensive telecommuni-
26 cations development plan to further state telecommunications develop-
27 ment and to meet state telecommunications needs and prepare and maintain
28 a comprehensive inventory of all state communications facilities;

29 (6) whenever feasible, procure services from private enter-

1 prise or certified and franchised utilities and contract for the cor-
2 struction, management, operation and maintenance of telecommunications
3 systems, and develop a procurement policy under AS 37.05; the pro-
4 urement policy must seek to achieve the maximum benefit to the public,
5 and methods of procurement, including lease, purchase, rental, or com-
6 binations of lease, purchase, and rental, must be selected on the basis
7 of factors such as the ratio of long-range costs versus benefits, life
8 cycle costing, and the costs to the communications industry to the
9 extent that these costs may affect local and long distance basic tele-
10 phone rates;

11 (7) provide information and assistance to state agencies to
12 promote governmental coordination and unity in the preparation of
13 agency plans and programs involving the use of telecommunications;

14 (8) apply for and accept federal and private money, property,
15 or assistance, that may be appropriated, granted, or otherwise made
16 available to the telecommunications divisions and use and disburse
17 money and property for purposes consistent with AS 44.21.200 -- 44.21.-
18 250 and AS 14.58, subject to reasonable limitations imposed by the
19 grantor;

20 (9) participate with other governmental units in planning,
21 and assist ^{Alaska's} local governments and governmental conferences and councils
22 in the state in planning and coordinating their activities relating to
23 telecommunications;

24 (10) provide for the orderly transition to new telecommuni-
25 cations services and systems by state agencies;

26 (11) serve as a clearinghouse for information, data, and
27 other materials which may be necessary or helpful to federal, state, or
28 local governmental agencies in the development of telecommunication
29 systems;

start here

1 (12) coordinate their services and activities with those of
2 other state departments and agencies to the fullest extent possible to
3 avoid unnecessary duplication; and

4 (13) provide that all activities of the telecommunications
5 divisions are responsive to state statutes and regulations, and to the
6 regulations and rulings of the Federal Communications Commission.

7 (b) The telecommunications divisions, as directed by the deputy
8 commissioner, may

9 (1) coordinate their functions with local, regional, state,
10 and federal officials, private groups and individuals, and with offi-
11 cial of other countries, provinces, and states;

12 (2) enter into contracts and subcontracts on behalf of the
13 state to carry out the provisions of AS 44.21.200 -- 44.21.250;

14 (3) act for the state in the initiation, investigation, and
15 evaluation of, or participation in, programs related to the purposes of
16 the telecommunications divisions which involve more than one government
17 or governmental unit;

18 (4) on behalf of the state, apply for, accept, and expend
19 gifts or grants made to the state if the gifts or grants are for the
20 purposes of furthering the objectives of the telecommunications divi-
21 sions; and

22 (5) hold public hearings to obtain information for the
23 purpose of carrying out the provisions of AS 44.21.200 -- 44.21.250.

24 (c) The telecommunications divisions may not attempt to influence
25 or affect the content or airing of program material.

26 See. 44.21.230. DIVISION OF TELECOMMUNICATIONS SERVICES. (a) The
27 division of ^{public} telecommunications services shall be administered by a
28 director appointed by the commissioner.

29 (b) The division of telecommunications services shall provide

public

*other than by those
(see pg. 6 of FCC version)*

and grants

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(1) technical consultation to educational and public telecommunications users;

(2) coordination and support to telecommunications services for instruction, including technical assistance and assistance in preparation of applications for grants related to program development as may be requested by

(A) public school districts and the Department of Education;

(B) the University of Alaska; and

(C) other state agencies as approved by the deputy commissioner;

see pg. 7 of FCC

(3) coordination and support for health and safety-related functions, including the administrative and client services provided by state, federal, and private agencies;

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(4) coordination and support to telecommunications services for public participation in state-financed services, including the public hearing process, as may be statutorily required or otherwise appropriate;

? Rural Alaska T.V. Network?

(5) assistance, through design, development, and promotion, to local school districts or other local and regional education agencies for the regionalization of instructional telecommunications services;

(6) establishment of operational policies for public telecommunications services other than public broadcasting; and

see pg. 8 of FCC

(7) assistance to the Alaska Public Broadcasting Commission and any commission-designated subcommittees, as necessary to perform assigned division functions; the division shall cooperate with the commission and subcommittees in order to develop policies which are responsive to the user groups which are represented on the commission.

(c) Subject to available funding, the division of telecommunica-

1 tions services may make grants to educational and public telecommunica-
2 tions users, except grants for public broadcasting purposes.

3 (d) The division of ^{public} telecommunications services shall study,
4 plan, and develop integrated instructional telecommunications services
5 for all residents of the state, and shall annually report on current
6 fiscal year instructional telecommunications activities and, after
7 public hearings, ^{see page 8} submit to the governor and the legislature an annually
8 updated long-term development plan prepared in consultation with the
9 Department of ^{2 year in FCC version} Education, the University of Alaska, local school dis-
10 tricts, and other local and regional education areas.

11 (e) The division of ^{public} telecommunications services shall, after
12 public hearings, submit to the governor an annually updated ^{2-year} long-term
13 development plan for teleconferencing facilities and services, including
14 facilities and services used both by state agencies and groups other
15 than state agencies.

16 (f) The division of ^{public} telecommunications services may not own,
17 operate, or be the licensee of a public noncommercial broadcast station
18 or production center.

19 (g) Nothing in this section implies division responsibility for
20 programming content. ^{see page 8 of FCC} Program design, production, and use are the
21 responsibility of the program-sponsoring agency or other entity, not
22 the division.

23 Sec. 44.21.240. DIVISION OF TELECOMMUNICATIONS SYSTEMS. (a) The
24 division of telecommunications systems shall be administered by a
25 director appointed by the commissioner. ^{on pg. 14 of FCC}

26 (b) Except as provided in (c) of this section, the division of
27 telecommunications systems may, consistent with the provisions of AS
28 44.21.220(a)(6)

29 (1) plan, design, construct, manage, and operate all tele-

1 communications systems owned or leased by state agencies;

2 (2) manage centrex and other telephone-related services of
3 state agencies;

4 (3) be responsible generally for telecommunications systems
5 and design for state agencies; and *not in FCC version*
6 *see pg. 15*

7 (4) coordinate with state agencies in performing their data
8 and word processing tasks.

9 (c) Within the limits of available financing, the division of
10 telecommunication systems shall administer and operate the satellite
11 television project, by

12 (1) coordinating with the satellite television user groups
13 and entities; and *see pg. 15 for deletions*

14 (2) providing liaison, management support, and technical
15 assistance for the satellite television project.

16 (d) Decisions and policies relating to programming under the
17 satellite television project, including scheduling and allocation
18 policies, may not be made by the divisions of telecommunications or the
19 department, but may only be made by a network that is representative of
20 participating rural television users, by commercial broadcast users or
21 by other affected participating user groups and entities under pro-
22 cedures provided by statute or, if no statute applies, then by agree-
23 ment of the affected user networks or groups. The department shall
24 assist users in preparing agreements that may be required under this
25 subsection.

26 (e) The divisions of telecommunications and the department may
27 not engage in any activity which interferes with a contract or program
28 right relating to commercial television programming, including but not
29 limited to any right protected by copyright.

(f) Nothing in AS 44.21.200 -- 44.21.250 prohibits a state agency

1 from developing telecommunications systems within its own agency if the
2 commissioner gives written authorization for the agency to engage in
3 its own design, development, management, or operation. The commissioner
4 may authorize independent development only upon a showing of necessity.
5 A description of all authorization under this subsection must be in-
6 cluded in the annual report required under AS 44.21.220(a) (2).

7 (g) A state agency authorized to develop an internal telecom-
8 munications system shall, whenever feasible, coordinate its design
9 development, management, and operation with the division of telecom-
10 munications systems.

11 Sec. 44.21.250. DEFINITIONS. In AS 44.21.200 -- 44.21.250

12 (1) "commissioner" means the commissioner of administration;

13 (2) "department" means the Department of Administration;

14 (3) "deputy commissioner" means the deputy commissioner
15 the department who administers the telecommunications divisions;

16 (4) "public broadcasting" means the delivery of radio or
17 television noncommercial programming intended for the general public by
18 any method of telecommunications;

19 (5) "public ^{service} telecommunications" means telecommunications
20 which serve public broadcasting, general educational, instructional,
21 medical, safety, emergency, or public participation functions;

22 (6) "state agencies" means all departments, divisions, and
23 offices in the executive branch of state government; it does not mean
24 an agency of the legislative or judicial branch of government or the
25 University of Alaska;

26 (7) "telecommunications" means the transmission and reception
27 of messages, impressions, pictures, and signals by means of electromag-
28 netic transmission with or without benefit of a closed transmission
29 medium including all instrumentalities, facilities, apparatus, and

of
telecom-
munications

1 services, whether conveyed by cable or wire, radiated through space, or
2 transmitted through other media within a specified area or between
3 designated points;

4 (8) "telecommunications systems" means those systems in
5 which the principal service and functions are telecommunications.

6 * Sec. 10. AS 44.42.020 is amended to read:

7 Sec. 44.42.020. POWERS AND DUTIES. (a) The department shall

8 (1) plan, design, construct and maintain all state modes of
9 transportation and transportation facilities [, COMMUNICATION FACILI-
10 TIES,] and all docks, floats, breakwaters, buildings and similar
11 facilities;

12 (2) study existing transportation modes and facilities [AND
13 *COMMUNICATION FACILITIES] in the state to determine how they might be
14 improved or whether they should continue to be maintained;

15 (3) study alternative means of improving transportation [AND
16 *COMMUNICATION] in the state with regard to the economic costs of each
17 alternative and its environmental and social effects;

18 (4) develop a comprehensive, long-range intermodal trans-
19 portation plan for the state;

20 (5) study alternatives to existing modes of transportation
21 in urban areas and develop plans to improve urban transportation;

22 (6) cooperate and coordinate with and enter into agreements
23 with federal, state and local government agencies and private organi-
24 zations and persons in exercising its powers and duties;

25 (7) manage, operate, and maintain state transportation
26 facilities [, *COMMUNICATION FACILITIES,] and all docks, floats, break-
27 waters and buildings, including all state highways, vessels, railroads,
28 pipelines, airports, and aviation facilities;

29 (8) study alternative means of transportation in the state,

1 considering the economic, social, and environmental impacts of each
2 alternative;

3 (9) coordinate and develop state and regional transportation
4 systems, considering deletions, additions, and the absence of altera-
5 tions;

6 (10) develop facility program plans for transportation [AND
7 COMMUNICATION FACILITIES] and state buildings, docks and breakwaters
8 required to implement the duties set out in this section, including but
9 not limited to (A) functional performance criteria; and (B) schedules
10 for completion;

11 (11) supervise and maintain all state automotive and mechan-
12 ical equipment, aircraft, and vessels, ~~except vessels and aircraft used~~
13 by the Department of Fish and Game or the Department of Public Safety;
14 [AND]

15 (12) supervise aeronautics [AND COMMUNICATIONS] inside the
16 state, under AS 02.10; [.]

17 (13) complete and maintain a current inventory of public
18 facilities, including a projection of the serviceability of the facili-
19 ties and projections of replacements and additions to facilities needed
20 to provide the level of services programmed by the various user agen-
21 cies, for municipalities with populations of less than 12,000 and for
22 unincorporated communities, and perform those duties on a cooperative
23 basis with larger municipalities; [.]

24 (14) adopt energy performance standards for public facilities
25 of the state, the construction of which begins after July 1, 1980; the
26 standards shall be based on thermal and lighting energy standards
27 established by the American Society of Heating, Refrigeration and Air
28 Conditioning Engineers as adapted for application in high latitude,
29 cold climate environs;

1 (15) provide planning assistance, including but not limited
2 to energy audits and related technical services, to school districts
3 and regional educational attendance areas to develop and implement

4 (A) standards for the design, construction and opera-
5 tion of rural educational facilities; and

6 ? (B) energy conservation measures for rural educational
7 facilities.

8 (b) The department may

9 (1) engage in experimental projects relating to available or
10 future modes of transportation and any means of improving existing
11 transportation facilities and service [AND COMMUNICATION];

12 (2) exercise the power of eminent domain, including the
13 declaration of taking as provided in AS 09.55.

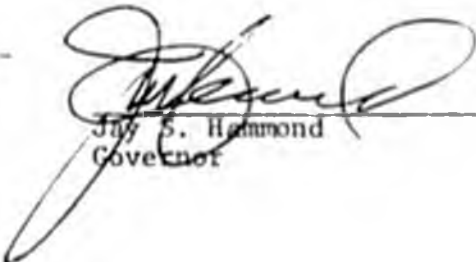
14 * Sec. 11. AS 44.42.055(b)(3)(F) is amended to read:

15 (F) [COMMUNICATIONS FACILITIES AND] transportation
16 facilities;

17 * Sec. 12. This order takes effect July 1, 1981.

18 DATED

19 July 12, 1981

20 
21 Jay S. Hammond
22 Governor

Jack - leg. Research -
★ 3991

Alascom - Chuck Robinson
264-7000

ATA telephone

Stowell Johnstone
Chair - Pub. Brd. Comm

↓
Gordon Palmer

Gene Beck - RAY WELDX
X Dennis Eggar - KJVO 277-1626

ok.

KTVF ~~X~~ Hank Howe 452-5121 - Tradio!
2468

midnight Sun
Branstead Charlie Gray

X Jennifer Wilke - 2884
Incl. - Jane Demmett - 277-1636
Holtman T.V.

KJVO → ZUCH
AUCH TRIPINT

Stuart Riquenoux
Lud Brown

Commerce Version

House Journal - 2 letters Intent ^{SB509}

Kelley Brown - Juncos
6-6228

Dick Downing - Law
Brown

Bob [unclear] - Juncos
479-7052
479-7137
6035

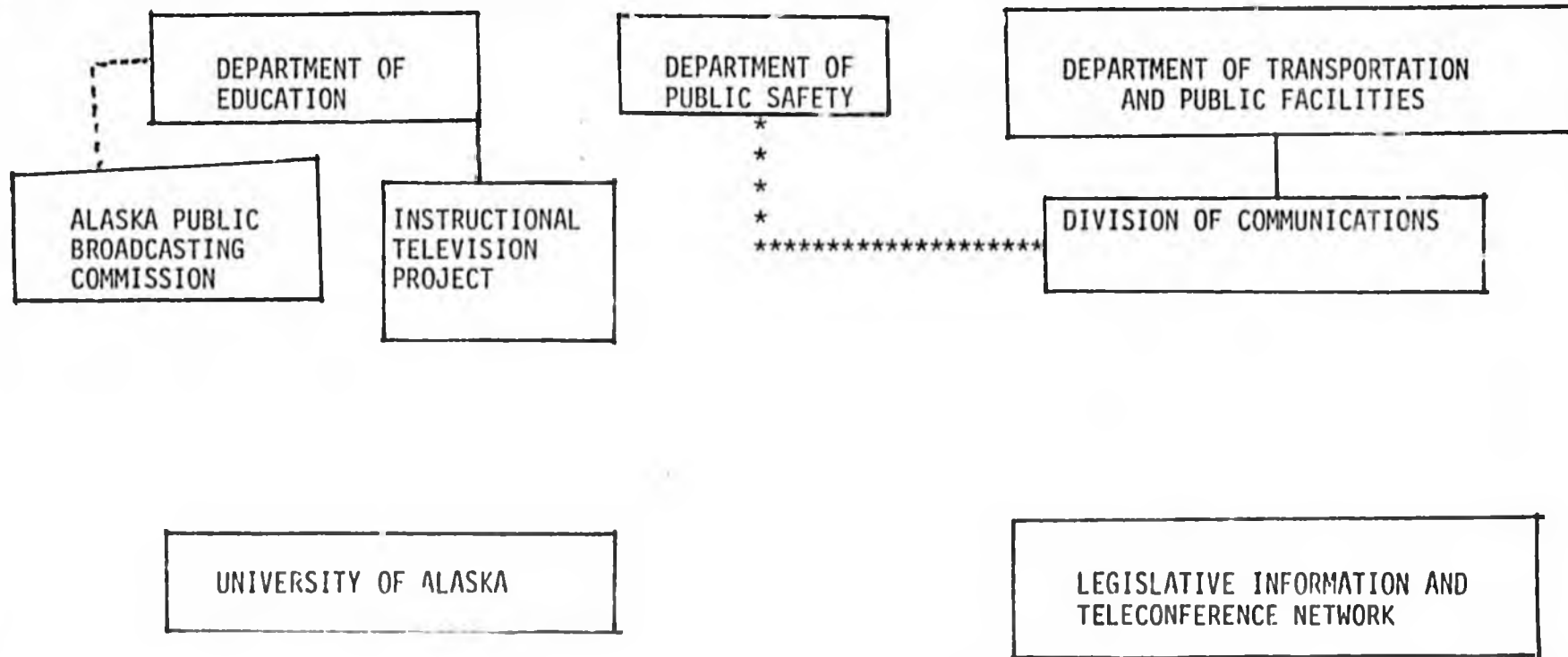
Further details concerning ownership and management may be obtained from the Alaska Public Utilities Commission Utility Listing included as Appendix I.

Telephone companies certified and regulated by the Alaska Public Utilities Commission are listed below:

<u>Certificate Number</u>	<u>Name</u>	<u>Abbreviated Name</u>
3	General Telephone Company of Alaska	(Gen-Tel)
11	Copper Vailey Telephone Cooperative, Inc.	(CVTC)
15	Juneau and Douglas Telephone Co.	(JDTC)
19	Matanuska Telephone Association, Inc.	(MTA)
25	Sitka Telephone Co.	(STC)
31	National Utilities, Inc.	(NVI)
49	Glacier State Telephone Company	(GSTC)
54	Whittier Telephone Company	(WTC)
66	Radio Communications, Inc.	(RCI)
83	OTZ Telephone Cooperative, Inc.	(OTZ)
94	Communications Equipment and Services, Inc.	(CESI)
98	Alascom, Inc.	(Alascom)
99	Bush-Tell, Inc.	(Bush-Tell)
104	Ketchikan Public Utilities, City of	(KPU)
117	Fairbanks Municipal Utilities System	(FMUS)
120	Anchorage Telephone Utility	(ATU)
162	Cordova Telephone Cooperative, Inc.	(CTCI)
165	Interior Telephone Company	(ITC)
182	Bristol Bay Telephone Communications	(BBIC)
185	Capitol Communications, Inc.	(CCI)
208	Nushagak Telephone Coop, Inc.	(NTCI)
213	Yukon Telephone Company James Clifton Eller	(YTC)

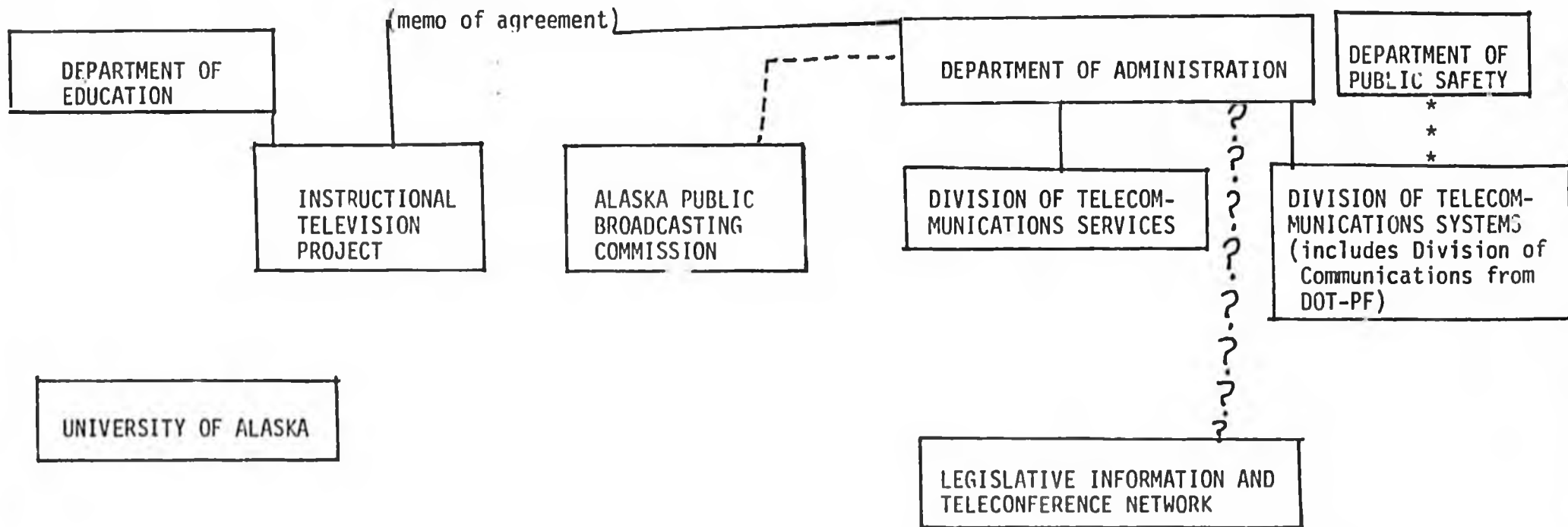
D/B/A

ORGANIZATIONAL CHART FOR THE EXISTING TELECOMMUNICATIONS STRUCTURE



***** installation & maintenance

ORGANIZATIONAL CHART FOR THE TELECOMMUNICATIONS STRUCTURE ESTABLISHED BY EXECUTIVE ORDER # 50



***** installation & maintenance

****PLEASE NOTE****

THE ORIGINAL FILE CONTAINS AN OVERSIZED DOCUMENT THAT IS UNSUITABLE FOR FILMING. PLEASE REFER TO THE ALASKA STATE ARCHIVES TO VIEW THE ORIGINAL.

BROCHURE

"ALASCOM"

... ON TELECOMMUNICATIONS

TO: Alaska State Legislature
House of Representatives
Research Agency
Pouch Y, State Capitol
Juneau, Alaska 99811

ATTN: Duncan L. Read, Director

FROM: Glenn M. Stanley

SUBJECT: TELECOMMUNICATIONS REPORT

This report is presented as one of the requirements of a contract between the State of Alaska, House of Representative House Research Agency and the University of Alaska. In brief, the contract provides for the consultant services in matters of telecommunications of Professor Robert P. Merritt, Department of Electrical Engineering of the University of Alaska and Mr. Glenn M. Stanley, a retired professor of Applied Sciences at the University of Alaska. The subject matter of this report will cover a rather wide range of material under the general heading of telecommunications. Such diverse subjects as telephone, radio, television distribution, and regulatory affairs will be addressed. It is hoped that the report will be useful to legislators and staff and that it will provide a beginning for those unfamiliar with the terminology and the complexity of the telecommunications world.

TELECOMMUNICATIONS REPORT

GLENN M. STANLEY

TELECOMMUNICATIONS CONSULTANT

NOVEMBER, 1980

This report was produced under a contract between the State of Alaska, House of Representatives Research Agency and the University of Alaska.

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ABSTRACT

This report contains a discussion of the regulation of the telecommunications industry and how pending legislation and the trend towards de-regulation will affect it. The report also contains a discussion of the various methods that television is distributed to the eventual user.

INTRODUCTION

This paper is an effort to provide an introduction to some phases of telecommunication. Of necessity, it will be neither exhaustive nor complete since the amount of subject matter concerning telecommunications is enormous and is increasing at an accelerating rate. It is hoped that the content of this report will be of use to legislators and their staff who will, I believe, have a considerable number of telecommunications matters before them in this and subsequent sessions. During the past decade the legislature of the State of Alaska has taken a very active role in the development of telecommunications in the state. They have caused to be implemented programs which were far in advance of those in existence in other parts of the U.S. and the world. It is my belief that this trend will continue. The cost of transportation is increasing at a rapid rate and telecommunications can in many instances be substituted for transportation in a cost effective manner.

DEFINITIONS

Since the field of communications is very broad, it seems to me that a definition of some terms used in the field would be appropriate.

"Telecommunications" means the transfer of information by means of electrical or optical transmission, with or without the benefit of any closed medium, including all instrumentalities, facilities, apparatus, and services (including the collection, forwarding, switching, transmission, and delivery of such information) essential to offering of telecommunications.

"Telecommunications Facilities" means transmission facilities and associated switching equipment under common ownership or control with such facilities.

"Telecommunications Service" means the offering of telecommunications by means of such facilities.

"Basic Telephone Service" means a basic telecommunications service which allows natural persons to communicate with each other by voice over intraexchange, interexchange, and international telecommunications facilities.

"Telecommunications Carrier or Carrier" means any person, including any government or quasi-government entity, which owns or controls telecommunications facilities used by any person to provide telecommunications services. A person engaged in any non-telecommunication activities, in providing any information service, or information software, in producing or marketing telecommunications equipment, which person is fully separated from any affiliated regulated carrier, or a person engaged in broadcasting, or in providing any cable television service, shall not, insofar as a person is so engaged, be deemed a carrier.

"Cable Television Service" means the re-transmission of a signal of any broadcast station or the origination of one-way video entertainment programming on a per channel, per program, or other subscription basis over any closed transmission medium.

"Subscription Television" (STV) is a broadcast television encoded at the transmitter and decoded at the home receiver.

"Direct Broadcast Satellite" (DBS) is a satellite whose transponder and antenna system is powerful enough to be received at the home with a very inexpensive home antenna.

"Community Antenna Television" (CATV) is a television distribution system in which a high gain antenna is used to receive signals from a distant transmitter which are distributed to the local community. It has come to mean cable television for the most part.

"Multipoint Distribution System" (MDS) is a television distribution system utilizing the services of a common carrier to distribute television to individual customers. It utilizes a much higher frequency for the transmission of TV signals than the usual systems.

COMMENTS ON REGULATED TELECOMMUNICATIONS

In almost every country in the world other than the United States, telecommunications establishments are owned by the government. The reason for this is clear. It is well established that whoever controls telecommunications has the potential for a very strong hold on the people. Many countries do not, of course, exercise this control but the potential is there. Since the United States did not choose to own the telecommunications system, the system grew under private enterprise in a somewhat helter-skelter fashion, starting as a telegraph service, following the railroads, evolving into telephone service and on into radio. The telephone

companies were often small, with dissimilar standards leading to a system that could hardly be classified as nationwide.

In 1934 the U.S. Congress passed the Communications Act. This act has been amended many times as the technology and circumstances warranted. The main concept of the Communication Act of 1934, as amended, still exists. That is, that all of the citizens of the United States are entitled to have access to nationwide telephone system at affordable rates. In modern terms this is sometimes referred to as POTS (plain old telephone service). In order to implement this concept, a monopoly was granted to American Telephone and Telegraph Co. (A.T. & T.) to interconnect all local telephone companies to provide message toll service (MTS) commonly referred to as long distance. It should be noted that the long distance service referred to above is between exchange areas. These areas are designated by State Commissions. If the exchange areas are in the same state, the Commissions (such as the Alaska Public Utilities Commission (APUC)) control the tariff while interstate tariffs are controlled by the F.C.C.

In addition to the MTS under the Communications Act, the Federal Government maintains control of all radio, telegraph, cable, broadcasting, and other sources of telecommunications. It permits the commercial use of these services by license. The government body charged with the responsibility of controlling this vast complex is the Federal Communications Commission (F.C.C.). The Commission consists of seven members appointed by the President to seven year terms of office. The Commission Staff (a very small organization) serves both as advisors to the Commission and as advocates before them. The Commission does indeed have a great deal to say about our day to day existence through their regulation of almost all forms of telecommunications.

A few words should be said about regulation versus non-regulation. As the government gave a monopoly to A.T. & T. as a longlines carrier, they retained the right to regulate the telecommunications industry. Regulation takes many forms. It gives the F.C.C. the right to decide who shall have the right to build and operate a radio station; it gives them the right to determine what a long distance interstate telephone call will cost; it gives them the right to determine what electronic hardware may be used in a particular radio service; it gives them the right to determine what rate of return on investment a telephone company may reasonably make; and indeed it gives them substantial control over the telecommunications industry. Under this strong control business monopolies which were determined to be detrimental to the public have been broken up - A. T. & T. was forced to divest itself of Western Electric since it was buying hardware from its own company at non-competitive prices. In a recent action affecting Alaska, the

F.C.C. forced RCA Globcom to divest itself of RCA Alascom (at the request of the State of Alaska). Indeed under this strong regulatory control the United States Telephone System has become (in approximately 45 years) the best system in the world. With minor exceptions the goal of universal telephone service at affordable rates has been reached. Unfortunately one of those exceptions is the State of Alaska and even there it is only a small portion of our populace who do not have POTS at an affordable rate. I do not, of course, deny the importance of good service to that portion of our populace but looking at the nationwide picture it is understandable that the Congress is beginning to say that the goal of universal service has nearly been reached.

During the past few years there has been an increasingly strong current in government to de-regulate industry whenever possible. The telecommunications industry is no exception. De-regulation of the industry is espoused both by the executive branch and the Congress. In the executive branch the National Telecommunication and Information Agency (NTIA) in the Department of Commerce has recommended that all phases of telecommunications be allowed to be competitive. The philosophy is that competition should not only be allowed but that it should be actively encouraged. In the same vein the F.C.C. has by a series of regulations and orders opened competition in private line communications, television broadcasting, satellite systems, and a host of other areas began to let the telecommunications industry compete in providing services and hardware.

The Congress is also in the throes of trying to rewrite or amend the Communications Act to relax or entirely do away with regulation of large areas of telecommunications. A number of bills have been introduced in both the Senate and the House of Representatives in an attempt to carry out de-regulation. Late in the 2nd Session of the 96th Congress, Mr. Hollings (for himself, Mr. Cannon, Mr. Packwood, Mr. Stevens, Mr. Goldwater, and Mr. Schmitt) introduced S2827 titled "Communications Act Amendments of 1980". The findings of this bill, I believe, state clearly the feelings of the Congress. ----"(1) rapid advances in telecommunications technologies are making possible competition among providers of telecommunications services which were previously thought to have natural monopoly characteristics; and (2) under conditions of full and fair competition, the market place is a more efficient regulator than government of the provision of diverse telecommunications services and, as full and fair competition continues to develop, de-regulation of telecommunications carriers and services should occur."

This bill and the several others that were introduced in the 96th Congress have had extensive hearings in several committees during the past two years. None have passed and it is unlikely that any will in the immediate future although both houses are

trying for legislation to be passed by mid 1981. In the meantime the F.C.C. who is charged with the regulation of telecommunications, sensing the general feelings of government and industry that some degree of de-regulation would be beneficial, is continuing to wrestle with the problem. Probably the most important facet of this struggle is one of accounting. Part 31 of the F.C.C. rules describes in detail how regulated telecommunications carriers keep their accounts. This system is also known as the "Uniform System of Accounts". For years there has been pressure to restructure the rules of Part 31. In 1978, the F.C.C. opened a docket (Docket 78-196) on this restructuring. Clearly this is a controversial and complicated problem and one that will have wide reaching consequences if implemented. Basically the present system requires a combined accounting of all activities of a carrier with no complete separation in the system between inter and intra state portions of the business. Since inter and intra state revenues must be separated for an accurate determination of the rate of return, it is now necessary for special accounting studies to be made in order to relate "price for service" to "cost of service". These special studies may be made to come out in as many different ways as there are accountants. This leads to drawn out proceedings before the F.C.C. and in the courts. Neither the F.C.C. nor the State Public Utilities Commissions (PUC's) have the facilities to do an adequate determination of which portion of the costs and revenues should be attributed to interstate (governed by the F.C.C.) or to intrastate (governed by the local PUC's) without a uniform system of accounts which separates the costs of each.

Most people feel that there will be a continuing need for some regulation even in the presence of competition so that the dominant firms (i.e., A.T.& T., G.T.E., Alascom) do not by predatory pricing and cross-subsidization make it impossible for small companies to survive.

The debate between regulation and non-regulation will no doubt continue for years. Almost certainly Congress will pass legislation concerning it and the F.C.C. will continue its efforts to implement the wishes of Congress. It should be noted that with the change of administration the new President will appoint at least two new members to the F.C.C. The Chairman, Mr. Ferris who serves at the pleasure of the President will be replaced and Commissioner Quello whose term is up will be replaced. In addition Commissioner Lee whose term expires in mid 1981 has stated that he intends to retire very soon giving a third appointment to the President. This, no doubt will change the entire complexion of the Commission probably in the direction of more de-regulation. Needless to say at the time this is being written there is great speculation as to who will be the successors of the departing Commissioners. One of the scenarios is that Commissioner Lee will act as temporary Chairman until early 1982 (his mandatory retirement age absent presidential exception) to be succeeded by Commissioner Ann Jones. Further as Chairman Ferris appointed many of the senior F.C.C. staff, many of them may be replaced.

In any event it will be some months before much activity may be expected from the F.C.C.

In the case of the Congress, the extent of the disruption caused by this election is extreme. Senior Committee Chairman and members were not re-elected and the entire complexion of Congress is changed. From the viewpoint of those interested in the passage of legislation concerning telecommunications, there seems little doubt that the new Congress will be far more likely to re-write the Communications Act than the old one.

TELEVISION DISTRIBUTION SYSTEMS

Most Alaskan's active interest in obtaining access to adequate entertainment television is quite understandable. The extremes of climate and distance causes them to perceive a level of isolation which is to some extent relieved by television. Although most television viewers display remarkably little interest in the method by which the television signal arrives at their set, this complicated process is the basis for one of the largest industries in the United States. Since Alaska's population is small and, with the exception of a few cities, widely separated; conventional means of providing television to rural and remote Alaska is to a large degree uneconomical. In recent years, the Alaska Legislature has provided funds and direction for a unique television distribution project. This project has brought television for a few hours a day to more than sixty remote communities which would otherwise not have had access to real time (or near real time) T.V. As that project seems likely to continue for the next few years it seems to me that a discussion of the various ways that entertainment television is produced and distributed would be in order.

At the present time there are several methods to bring a picture to the home T.V. set. The most familiar are the television broadcasting stations and cable television. In addition to these there are subscription T.V., multipoint distribution systems, and, in the near future, direct broadcasting satellite T.V. In addition, there are video cassettes, video discs and video tapes which may be purchased or rented to play on your T.V. set as you would a phonograph record. There are of course, variations and combinations of the above.

Broadcast television is familiar to most viewers. A signal is transmitted from a tower and is received on an antenna at your home. Broadcast television is generally received on the "very high frequency" (VHF) portion of your T.V. set (i.e., channels 2 through 13). In many areas there will be one or more stations operating in the "ultra high frequency" (UHF) band (channels 14 to 83). The great majority of the programming will be provided by the "networks". At the present time, there are three commercial networks, The American Broadcasting Corporation, (ABC), the Columbia Broadcasting System, (CBS), and the National Broadcasting Corporation (NBC). Each of these organizations own one or more T.V. Broadcast stations and are affiliated with many other stations. The networks originate and distribute most of the programs broadcast by their stations

and their affiliates. Much of the programming distributed by the networks is owned by its producers and is protected by copyright or other legal means. The cost of operations of the stations is paid for by the sale of advertising with no direct cost to the viewing public. It should be noted that the programming distributed by the networks (over A.T. & T. microwave systems, for the most part) is not suitable for broadcasting without considerable work at the broadcasting station. Since stations pay their expenses by the sale of advertising, the programs distributed by the networks leave very precise gaps in the programs for insertion by local stations of local advertising.

The fourth network in operation today, the Public Broadcasting System (PBS), is not a commercial network. It is funded to some large degree by the Federal Government and by grants from industrial firms. In neither case do the funders have control of the programming material. Many PBS programs are now transmitted by satellite and received by local public broadcasting stations on a satellite receiving antenna near the local broadcasting station. These stations are funded by public contributions and government grants. Again the program content is not controlled by the funders.

There is an increasing number of privately owned television stations. Those stations are not affiliated with any network and broadcast programming to their local area. They are funded entirely by the sale of advertising and broadcast both in the VHF and UHF portion of the spectrum. Very recently the growth of satellite technology and the trend towards de-regulation by the F.C.C. have triggered important developments which involve private television station broadcasting.

With the advances in satellite technology in the last few years, it has become economically feasible to transmit a television signal to a satellite which in turn re-broadcasts it at a different frequency. Modern satellites have the capability to carry twenty-four simultaneous television programs on a single satellite. In addition, production has reduced the cost of excellent receiving equipment to a few tens of thousands of dollars. Thus, if the owner of a private station can obtain customers willing to buy his programs, he may sell them in some fashion to supplement the station income. There are several superstations around the country serving customers such as cable systems and multipoint distribution systems.

A very recent development in the broadcast television arena is the relaxation by the F.C.C. of requirements for "low power" television. Recent rulings by the Commission have made it possible to construct and operate a low power T.V. station. The significance of these rulings will become apparent when we discuss subscription television.

As a subset of broadcast T.V. some areas which have poor or nonexistent reception from the T.V. transmitters (either network or private) install "translators". The technique is to install a highly

directional hi-gain antenna (usually on a mountaintop) which can receive the signal from the transmitter and re-transmit the signal on a different frequency at much higher power thus making reception possible at great distances from the originating transmitter. Many variations of this system are in use. In some cases the signal passes through several antennae and goes several hundred miles before it is received by the ultimate viewer. The cost of this translating system is paid for in many ways. In some cases it is paid for by local government, by state government, by private subscription, the sale of advertising by the originating station who has extended his coverage and by cable operators who distribute the signal on their systems.

In all of the above distribution methods, with some exceptions (cable and private station satellite distribution) the viewing public receives the programs at his television set with no direct charge to the viewer. In addition, there are several distribution systems where the viewer must pay a fee for the programming he receives. The most common of these is cable T.V. Cable T.V. requires that each set be connected to a central location by co-axial cable. Conceptually 83 channels of television may be transmitted over one co-axial cable simultaneously. Although there have been grandiose predictions as to the amount of use of very wide band systems using all channels the paucity of programming material has thus far prevented any such use of channels. Generally speaking cable systems obtain a franchise from a local government to install a cable system. The operator pays the government for the use of power poles or utilidors and guarantees a certain standard of performance and a certain number of operating channels. He then bills the customers for his services. He may have, in addition to regular programming, (i.e., network stations, private stations, religious programming, via satellite and the like) one or more tiers of premium programming for which he charges extra fees. Programs such as Home Box Office, Showtime, Madison Square Garden Sports, and others may be scrambled at the cable head and de-scrambled at the set.

This then leads to three other methods of T.V. distribution; Subscription (STV), Multipoint Distribution System (MDS), and Low Power T.V. (LPTV). Both STV and LPTV are broadcast in the VHF and low UHF band and may be received on the home set directly. MDS is a special case utilizing special antennae and frequency converters and the signal is distributed on a frequency in the high UHF band. All of these systems can and do distribute premium programming for a fee. The techniques for collection of the fee differ but the principle is the same. If advertising is not used to pay for the programming, then the individual user must in some way be charged directly.

Still another distribution system for television is looming on the horizon. As has long been predicted, the Direct Broadcast Satellite (DBS), is receiving considerable attention. The concept is that a satellite will be placed in geostationary orbit with

transponders and antennae of sufficient power to permit reception at the home with inexpensive earth terminals. Clearly such a system will not have as many transponders as present satellites but there will be several. The staff of the F.C.C. recently recommended to the Commission that the Commission "keep as low a profile as possible" in this matter and to let the market place decide what standards, costs, and specifications should be used. It characterized the DBS as a high risk venture, pointing out that DBS would be in direct competition with existing services. In general, the feeling is that DBS will not fly before 1985 and some feel as I do that it will be several years longer.

Although all of the other distribution systems do or will impinge on the Alaska scene in the near future, DBS is unlikely to be of significance for some time. Since hi-gain antennae are an integral part of the system, they will of necessity cover only the contiguous 48 states. Alaska's small population does not hold the potential to encourage an effort for special antenna coverage and the regulatory process is not likely to insist as they did on the DOMSAT issue.

It should be noted that all of the T.V. distribution systems described above are regulated in some form by the F.C.C. In some cases local Public Utility Commissions have some jurisdiction over the non-broadcast portion of the system (i.e., cable T.V.). In the light of the trends toward de-regulation it is clear that there will be a proliferation of low power T.V. stations and a relaxation of requirements on public service programming now required of stations.

COMMENTS CONCERNING TELEPHONE COSTS FOR THE STATE OF ALASKA

With the continuing emphasis on de-regulation, it should be possible for the Alaska State Government to markedly reduce the cost of their telephone service. Several companies are now in existence which offer intercity business two-way telephone service between metropolitan areas. Such companies as Microwave Communications Inc., (MCI), Southern Pacific Communications, (SPC), and International Telephone and Telegraph, (ITT), offer service at substantially less cost than direct dial calls being carried by American Telephone and Telegraph Co., (A.T. & T.). Even newer companies are being formed who claim that their costs will be 30 to 60% less than those of MCI, SPC, and ITT for comparable service. Clearly, the State of Alaska, one of the largest, if not the largest, single user of telephone communications should examine the possibilities of major reductions in cost of telephone service. Preliminary discussions of attempts to reduce the message toll cost to the State of Alaska have brought immediate and vociferous replies from Alascom. They argue that reduction of revenue to them will cause the cost of message toll service to go up for the private users of telephone service. It seems to me that cost of service derived in the marketplace and attributable to the user is more desirable than a subsidy.

In any event, the State of Alaska should, in my view, examine the possibility of some such purchase of telephone services.

MISCELLANEOUS COMMENTS

As of 23 October, 1980 there were twenty cable systems (CATV) in Alaska that are certified and regulated by the Alaska Public Utilities Commission.

<u>Certificate Number</u>	<u>Name</u>	<u>Abbreviated Name</u>
143	Sitka Sitka Alaska Television, Inc.	(SATV)
144	Ketchikan Ketchikan Alaska Television, Inc.	(KATV)
156	Juneau B-C Cable Company	(B-C Cable)
157	Cordova Alaska Cablevision, Inc.	(ACVI)
158	Wrangell Alaska Cablevision, Inc.	(ACVI)
159	Haines Capital Cablevision	(CCV)
164	Nome Alaska Cablevision, Inc.	(ACVI)
168	Kodiak Alaska Cablevision, Inc.	(ACVI)
181	Skagway Skagway Network Television, Jack W. Brown	D/B/A (SNTV)
186	Haines Lynn Canal Cable Vision Jack W. Brown	D/B/A (LCCV)
187	Barrow ASRC Communications LTD	(ASRC)
191	Valdez Alaska Cablevision, Inc.	(ACVI)
207	Port Lions Port Lyons General Store, Inc.	(Port Lyons)
245	Kotzebue Alaska Cablevision, Inc.	(ACVI)
246	Bethel Bethel Cablevision	(BCV)
250	Thorne Bay Thorne Bay Community TV, Inc.	(Thorne Bay)
252	Fairbanks Frontier Color Cable, Inc.	(Frontier)
261	Anchorage Multivisions, LTD	(MVL)
265	Pelican Pelican utility Company	(PELCO)
269	Eielson AFB M2PDC, Inc.	(M2PDC)

<u>Certificate Number</u>	<u>Name</u>	<u>Abbreviated Name</u>
234	Girl Friday Communications Girl Friday, Inc.	D/B/A (GFC)
249	United Utilities, Inc.	(United)
251	Greatland Telephone Co.	(GTC)
253	Mukluk Telephone Co, Inc.	(MUKLUK)
257	Arctic Slope Telephone Assoc. Coop., Inc.	(ASTAC)
260	Bettle Telephone, Inc.	(BTI)
264	Manley Utility Co., Inc.	(Manley)

Again further details concerning the above telcos may be found in Appendix I.

- REVISUS 1/1/10/80

THE ALASKA TELECOMMUNICATION SYSTEM

presented by

Robert P. Merritt, P.E.
Legislative Consultant
and
Professor of Electrical Engineering
University of Alaska - Fairbanks

30 September 1980

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APPENDIX

Figure 1: Satellite Location Along Geostationary Arc 24

Figure 2: Location of Earth Stations and Microwave Paths

THE ALASKA TELECOMMUNICATION SYSTEM

INTRODUCTION

The State of Alaska with a population just over 400,000 has a land area greater than 500,000 square miles. Alaska extends north-south over 1,500 miles and west to east over 2,500 miles; most of Alaska is north of the 60th latitude. The small population is made up of people of several origins that developed similar life style to contend with the harsh climate. Almost half of the population lives in the vicinity of the largest city, Anchorage. Most of the remaining people live in the ten larger communities of over 3,000; the remaining people are scattered in 150 villages with populations between 20 and 3,000. The average distance between one settlement and another is approximately sixty miles; some villages, however, are more than 150 miles from their nearest neighbor.

Historically, Alaska has on several occasions been in the forefront of innovative communications systems and yet has been lacking in the basic needs of its citizens for adequate communication. As an example, in the early 1850's after several attempts to lay a transatlantic telegraph cable had failed, some Americans initiated an effort to establish a telegraph line to Europe by going west through Canada and Alaska, across the Bering Straits, connecting with the Russian telegraph line in the Amur River Basin. Surveys had already begun when the transatlantic cable was finally successfully completed and the project was abandoned. One of the early supporters of the transalaska telegraph system was William H. Seward, who later became Secretary of State and arranged the purchase of Alaska in 1867.

Further progress in Alaska telecommunications had to wait until the early 1900's when the United States Army Signal Corps began construction of a telegraph line through the territory. Shifting ice destroyed submarine cables in one section along the coastline. As a result, the

Army developed a 100-mile radio-telegraph link in 1903. This was the first application in the world of this type of communications link put into operational use. Other than the development of high frequency (HF) radio circuits, very little occurred in Alaska communications until the Second World War. An open wire telephone system was constructed along the Alaska Highway between Fairbanks and Dawson Creek, Canada.*

Following the war, major improvements in communications in Alaska were accomplished with the installation of a microwave transmission system back through Canada to the contiguous 48 and the development of tropospheric forward scatter system over long distances in Alaska. Most small village communities, however, were still isolated from the integrated communication network. They relied on HF radio which due to the highly disturbed ionosphere over Alaska, has a reliability between 12 and 15%. (Report to HEW by the Geophysical Institute).

The Geophysical Institute at the University of Alaska was located at College, Alaska, in order to study the ionosphere and the auroral phenomenon.

Medical care in the villages of Alaska is provided by the U.S. Public Health Service (PHS). In this program, a local person, usually a native woman, receives a few weeks of training in emergency medical procedures and patient care, and consults daily with a regional doctor by HF radio. This doctor-call program with the health-aide and the regional physician has been very successful but limited by the HF radio communications.

In 1969 the University started a research program developing a communication system utilizing the NASA ATS-1 satellite VHF transponder and provided a simplex (push-to-talk) voice circuit. The program began

* A submarine telephone cable installed by American Telephone & Telegraph Company linked Seattle, Washington, with several southeastern Alaskan cities.

with three locations, two villages and the University Electrical Engineering Department. A doctor from the local PHS Clinic would come over every evening and discuss medical problems with the village health-aide over the ATS-1 transmitter-receiver facility. The system worked so well that the Public Health Service wanted the system extended to a much greater number of villages. We were able to convince the National Library of Medicine, Communications Section to allow us to extend the program to 23 villages. Most of these villages were in the Tanana district which includes about 200,000 square miles of interior Alaska.

In 1974 the Geophysical Institute staff secured a contract to analyze the communications problem in the Bethel district in which about 50 villages communicate with Bethel Native Service Hospital (PHS) for their medical advice and consultation. It was decided after a careful study of the possibilities of VHF mountain-top repeaters and other communication options that the most cost effective and reliable method of providing this communication was by satellite. The conclusions, in a report to HEW, specify that 10-foot diameter antennas operating into an appropriately configured satellite would provide communications to all 50 villages in the Bethel district. The original design of the basic earth station was expanded to include a public access message telephone service in addition to the PHS doctor-call emergency medical capability. The earth station design was modified to include a 4.5 meter antenna, a low-noise gallium-arsenide field-effect transistor preamplifier; and a single carrier per channel system providing two channels and expandable to eight channels without adding additional cabinet space. The transmitter selected was a 40 watt traveling-wave tube. The University and the State of Alaska have been involved with other experimental programs including ATS-6 and the CTS satellite planning project.

OPERATIONAL PROGRAM

In Alaska the primary interest now is in establishing operational telecommunications facilities. In 1975 the Legislature provided funds for the purchase of 120 small earth stations to ensure that all communities with a permanent population of 25 or more receive adequate telephone service. The basic criterion was to provide a voice circuit for emergency medical communication plus a message telephone circuit (MTS) for public use.

The design of the system was largely determined by the characteristics of the communication satellites which were available. The satellite-earth station system was optimally designed for more general use in the contiguous United States. The satellite transponder design was originally intended for use with high-sensitivity earth stations employing 10-meter and larger diameter (30-meter) antennas. The Alaska system uses smaller antennas in all but the largest communities in order to make it economically feasible to locate earth stations at each village. At the special request of the State of Alaska, RCA modified their satellites, F-1 and F-2, to provide several transponders with more amplifier gain through the satellite and adjust their antenna feed-horn to increase the radiated power directed toward Alaska for six of the twenty-four transponders on board each satellite. Using larger earth stations would have limited the number that could be constructed, making it necessary to link many villages via VHF or thin-route microwave circuits to the nearest earth station. The initial cost of utilizing this "cluster concept" to provide basic service to all communities would have been greater; adding more circuits later would have been difficult or impossible to accomplish. The cost of supplying television to small villages is much less with the small earth-station approach whereas it would have been prohibitively expensive if only large earth stations and the cluster concept were constructed because of the high cost of terrestrial video distribution.

The earth station design which evolved utilizes 4.5 meter antennas, receivers employing gallium-arsenide field-effect transistor preamplifiers with equivalent noise temperature of less than 190 Kelvins (typical 150K) and transmitters using traveling-wave tubes of 50 watt power output. Voice transmission is accomplished by frequency modulating (FM), a specific carrier (SCPC) for each channel. Earth stations in the smaller villages are usually equipped with two circuits; (1) a conventional message telephone circuit, and (2) a special circuit for emergency medical service. Expansion up to eight circuits can easily be accomplished through the insertion of additional circuit modules; this would supply enough trunks to serve a community of several hundred with a local telephone exchange. In villages with no existing telephone service, a single instrument is located in a central building which is accessible to the public. The use is generally monitored by an attendant. At this time over 120 small earth stations have been installed.

The carrier frequency for each circuit in every earth station is unique and preassigned. All circuits are routed through the satellite to a major earth station and then to a switching center in Anchorage. Thus, calls between villages must be transmitted through the satellite twice. This "double-hop" transmission is annoying due to the increased propagation delay (approximately 0.6 second); it also utilizes twice the satellite bandwidth, reducing the number of simultaneously available channels by a factor of two. If a channel is not being used by the station it is assigned to, it cannot be used by any other station. Traffic characteristics require that, in a preassigned system, a large fraction of channels will generally be unused. Demand Assigned Multiple Access (DAMA) techniques will be utilized in the future to eliminate these problems. In the DAMA system no frequencies are assigned to any earth station on a permanent basis. Instead, frequencies are automatically assigned to channel units only when necessary to establish a

circuit to meet a specific need. Digitally-controlled frequency synthesizers are programmed by channel selection logic to allow single-hop transmission directly between any two stations. Traffic statistics are such that use of DAMA gives five to fifteen times the effective circuit capacity as can be obtained through fixed assignment (G.D. Dill, 1972).

The emergency/medical service does not utilize conventional full-duplex circuits. Instead, a single frequency is employed for transmitting and receiving by all stations in a medical district network. This requires simplex (push-to-talk) operation, a mode preferred for this service as a result of experience gained through use of HF radio and the ATS-1 satellite. It was learned that when the medical aides in a number of locations were listening to consultations between a doctor and other medical aides, that they acquired much valuable knowledge by monitoring the channel. Further, group participation helps reduce the sense of isolation in these remote communities. The telephone desk sets used in this service can select one of five channels; different channel frequencies can be assigned in various geographical regions to allow specialized networks to be established and to limit the participants on any one channel to a manageable number.

Establishing the basic communications services described so far represents the most urgent aspect of the program. Because of the extreme isolation and lack of adequate transportation in most locations, tele communications is used to a greater-than-usual extent to support many activities in rural Alaska.

METEOR BURST SYSTEM

Meteor burst systems use the short-lived ionization trails of meteors as the refractive medium for returning radio frequency signals to earth. Microcomputer technology allows a message of useful length to be transmitted from a remote station back to a central base station even though the operationally useful time interval associated with the meteor trail is typically only a few tenths of a second.

Meteor trails occur quite frequently and are more or less randomly distributed in space during any given short time period*. Under typical ionospheric conditions, reliable point-to-point communications may be realized if the messages are not too long.

The Federal government has installed a "meteor burst data acquisition system" in Alaska, which is capable of recording environmental data from hundreds of remote stations. Physical variables such as temperature, wind speed, snow depth, etc., are measured and stored using a microcomputer at the remote measuring site. When the remote station receives an interrogation signal from the central master station, an on-board transmitter sends the data "packet" to the central station. The data file is then updated. Short messages can be sent and received between any remote station and the master station, using suitable hardware.

Meteor burst systems are characterized by relatively low total cost, high reliability, and low average "bit rates". The low average bit rate problem is probably the single largest disadvantage of meteor burst communication systems. Meteor burst systems are capable of broad geographic coverage.

- * There are diurnal and seasonal variations in meteor trail densities, but these effects are not important so far as this introduction is concerned.

State of Alaska applications of a meteor burst network include monitoring of operating parameters (such as boiler temperatures, ambient air temperature, voltage levels, etc.) for power generating facilities, satellite earth stations, village schools, and other facilities in relatively remote locations. If low average "bit rates" are acceptable, the system seems almost ideally suited for telemetering data from remote state facilities. Other applications, such as emergency communications and aviation weather monitoring are also possible with a meteor burst system.

OVERALL SYSTEM DESCRIPTION

A meteor burst transmission system consists of a master station, and a network of remote and portable stations located within a radius of approximately 1200 miles from the master station. The master station collects data from each remote station by "polling" stations according to a predetermined sequence. When a propagation path exists (due to a meteor trail) the remote station responds and the data is stored in the master station processor. The remote station data tables are then updated. When all stations in a group have responded, or when the polling time for a given cluster of stations has expired, the master station polls another group.

Clusters of remote stations which can be addressed from the same meteor trail are placed in separate polling groups, to prevent two or more stations from responding simultaneously. A typical signal "footprint" from the master station is about 4 x 25 miles and roughly oval in shape. The master station may poll according to some preset routine, or a user command may be introduced to obtain data from a specific remote station. Stations within a given cluster are distinguishable by a station identification code. In the Federal system, communications with field personnel may be carried out with a Portable Communications/Field Test Unit (PC/FTU). Sixteen numbers or letters may be sent in a single

group in response to a probe from the master station. These groups may be queued to allow composition of a message of 128 characters.

The master station is assembled from "off the shelf" parts and modules, many of which are quite familiar to even novice radio communicators. A variety of commercial manufacturer's gear is thus available for the various system components. Software has been developed by Western Union, and is relatively routine.

While some elements of a meteor burst system are relatively routine, other components are not. Overall, a new technology is represented, with associated development problems. Master station maintenance must be of the highest quality for satisfactory results. The Federal experience with the Alaska system was characterized by frustrating outages and other problems until a private contractor was brought in to maintain the system at peak performance levels. Any decision concerning lease or purchase of a meteor burst system must be based on an understanding of the unique maintenance problems of a new technology. On the plus side, when good maintenance is available, meteor burst systems perform very well.

MICROWAVE SYSTEM

Point to point microwave systems provide communication along the Alaska oil pipeline and between many of the larger communities in Alaska. The system is characterized by the following requirements; Signals follow a straight line (line-of-sight) radio path, propagation is affected by a free-space attenuation and precipitation; high frequency radio waves, typically 2 to 13 GHz are employed permitting more information per radio frequency carrier, and frequency or phase modulation is normally used. However, time division multiplexing is becoming more common each year. The Alaska microwave system was started in the early 50's to provide the "rearward" communication system for the Dewline radar network. A microwave system was built from Fairbanks through Alaska to Canadian cities including Dawson Creek, Edmonton, Calgary, Vancouver and connected to the AT&T system at Sweetgrass, Montana. A circuit also went from Tok through Glennallen to Anchorage and on to Homer and Seward. Several hundred telephone circuits can be accommodated on the radio frequency channel using the technique of frequency-division-multiplexing and frequency modulation. In the last several years a microwave link has been completed along the new highway from Anchorage through Mt. McKinley Park to Fairbanks.

A microwave system connects many of the cities of Southeastern Alaska such as Wrangle, Petersburg, Ketchikan, Juneau and Sitka. An undersea telephone cable was used to provide service between Ketchikan with Seattle. The cable was abandoned several years ago and the area is linked to the rest of Alaska and the south 48 by the satellite earth station at Juneau (Lena Point). Most of the intrastate telephone traffic is handled by the microwave circuits. Seventy percent of the interstate traffic is provided over satellite circuits, the remaining thirty percent still use the system through Canada to the AT&T network connection.

SATELLITE TRAFFIC LOAD

The number of interstate voice satellite circuits in use at each earth station during 1979 include Bartlett (Talkeetna) 643, Eagle River (Anchorage) 525, Lena Point (Juneau) 156. Intrastate voice satellite circuits in use in 1979 include Bartlett - 512, Eagle River - 621. Additional intrastate voice circuits using the single-carrier-per-channel (SCPC) transmission techniques include Bartlett - 220 and Eagle River - 322. A 20% growth is expected in circuit loading in the next three years.

TELEVISION DEMONSTRATION PROGRAM

A program to demonstrate the capability of the small earth stations to supply quality color television programming via satellite for entertainment and educational purposes has been in operation for several years. The alternative to supplying television programming by satellite is to mail pre-recorded videotapes to the television transmitter sites. Satellite distribution is favored for increasing numbers of sites and greater numbers of programming hours as the cost per site-hour decreases; this cost is essentially constant in a tape distribution system. Fifty rural villages have earth stations equipped to receive frequency-modulated video signals from a satellite transponder dedicated to television transmission. Twenty more villages may be added this year. Audio may be transmitted with the video signal or received through the SCPC equipment via the same transponder used for telephone service. Special channel modules are utilized to provide program channel frequency response from 50 Hz to 8 kHz.

In order to obtain the best compromise between signal quality and margin above FM threshold at the small earth station, a deviation (FM transmission index) less than optimum for more sensitive earth stations is used. The quality of the received signals exceeds that required for excellent viewing. Ten-watt "mini-TV" transmitters are employed to broadcast programming in the villages. These low-power transmitters have a range of three miles or greater, more than adequate for the typical village.

The selection of entertainment programming for transmission to the small earth stations in rural Alaska is done by representatives from the villages receiving television. They meet periodically to develop and refine their views in order to choose programming best suited for their villages. This programming is transmitted for six hours each evening after the period of transmission to the urban areas has ended.

The same satellite transponder used for transmission of television to the small earth stations is used earlier in the day to bring signals into the State from the lower 48 states. In this mode of operation the programming is intended only for the urban areas which are served by large earth stations. The increased sensitivity of these stations allows two channels of programming to be transmitted through the transponder at the same time. Transmission parameters employed for this service are specially selected for Alaska reception.

The Alaska Time Zone, where most of the state's citizens live, is two hours behind the Pacific Time Zone and five hours behind the Eastern Zone. Earth stations are located in each of these time zones allowing a specific program to be accessed at two different times. Because two programs can be transmitted simultaneously, it is possible to import as many as four national programs which are scheduled for the same local time. The commercial programming that is brought into the State is selected by the managers of the four television network stations in Alaska; if scheduling conflicts develop they are resolved through negotiation.

The morning hours are utilized by the Department of Education and the University of Alaska to transmit instructional programming for pre-school through college level students; in addition there are courses in basic educational skills for adults.

Experience gained during the first several years of the television demonstration program shows extremely high interest for both entertainment and instructional programming in rural and urban parts of Alaska. Additional funding for extending the demonstration period has been granted to enable staff to better determine means for including all communities and developing acceptable financing methods for continuing operation. An additional satellite transponder has been made available

for occasional use of television transmission.

In addition to the small earth stations, the 30-meter station at Talkeetna, a 13-meter station at Eagle River, and twelve installations with 10-meter antennas are now in service. Approximately 15 more 10-meter stations will be constructed to handle high-density commercial and military traffic. Over 120 small earth stations are currently planned; this number could grow to nearly 200 before all needs are met.

Satellite communications is meeting needs in Alaska that would be prohibitively expensive by any other means at this time. In many respects a number of the larger developing nations have similar communications problems which can be most effectively solved through satellite telecommunications systems of this type. Advances in technology since the Alaska system was designed (especially in digital techniques) make it likely that other systems would differ in detailed parameters while still utilizing the concept of employing many small earth stations.

TELECONFERENCING

As the television demonstration program developed and other telecommunications facilities became available, several individuals and groups began looking at the possibility of using various forms of teleconferencing to cut down on the long distances one must travel to attend meetings and the isolation felt by the general public from the legislative process.

A teleconference is a situation in which several people in different locations use a form of electronic communications to converse for the purpose of sharing information and making decisions. The mainstay of the legislative teleconference network is a dedicated private line

circuit with the following characteristics:

- (1) It links the capitol in Juneau with network stations in Nome, Bethel, Fairbanks, Anchorage and Ketchikan. The network circuit simultaneously links all sites with one another like a high quality telephone party line.
- (2) It is a private line identified for easy maintenance by its own circuit number, and dedicated to the exclusive use of the conference centers.
- (3) It is leased at a flat monthly rate for permanent, 24-hour availability so that charges are not a measurement of use.
- (4) It uses both satellite and terrestrial carriers. Microwave relays connect Juneau and Ketchikan, Anchorage and Fairbanks. Single hop satellite transmission links Juneau with the Talkeetna earth station serving Anchorage and Fairbanks, and likewise, links Nome and Bethel with the same ground station. Double hop transmission, two complete transmissions from the earth to the satellite and back, is necessary to carry audio from Nome and Bethel in northwestern and central Alaska, to Juneau and Ketchikan in southeastern.
- (5) It is a four-wire, rather than a standard two-wire telephone circuit. The additional two wires enable the circuit to provide exclusive paths for transmission and reception, i.e., one pair for each direction. This is the standard circuit used on a conference network because it is least prone to line degradation and lends itself to easy expansion.
- (6) Finally, it is a voice plus data circuit, which means that it may be used to telecopy documents with no additional toll charges.

The network implemented by the Legislative Affairs Agency connected the coordinator's office and various committee rooms in the capitol with about twenty locations in Alaska and the legislative offices of the congressional delegation in Washington, D.C.

Video teleconferencing is very expensive and does not generally increase the efficiency of conducting a committee meeting or conference. In fact, several demonstration video teleconferences have indicated that the presence of the video probably has disrupted the more orderly process of the audio-only conference.

Three video conferences conducted in 1978-79 concerning a resolution relating to the voluntary withdrawal of life-support devices; a bill relating to the creation of closed primaries; and a series of bills relating to the regulation of subsistence hunting and fishing were implemented. The dispute underlying each issue is philosophic, fundamental, and emotionally charged. For first hearings on bills of this type, legislation that holds an exceptionally high level of popular interest, the ability to place names with faces and voices creates a level of intimacy which makes video conferencing attractive to many legislators.

A LOOK AT THE FUTURE

The decade of the eighties will be an exciting time in satellite communication. The companies that are presently engaged in providing service expect to greatly expand their capabilities and additional companies, like Hughes and Southern Pacific Railroad, are planning to develop extensive satellite communication systems. Some estimates place the number of transponders required by 1990 at nearly 1,000 units. The capability of the geostationary satellite arc to sustain this number of transponders is unlikely. It is estimated that perhaps 300 or 400 transponders represents the capability in space by 1990. The most critical consideration at this time is the allocation of geostationary arc space to the various companies competing for satellite locations.

Directly related to the problem of satellite arc location is the efficient use of the radio spectrum at those locations. There are presently satellites in orbit with 12 and 24 transponder capability; by the use of polarization diversity, frequency reuse is accomplished on several of these satellites. Using this technique effectively doubles the capacity of the satellite. Satellites using K-band, 12 and 14 GHz, can be interspersed or co-located with satellites using presently available 4 and 6 GHz systems. Additional experiments are being conducted using 20 and 30 GHz frequency band which has greatly expanded capacity for communication channels. Some of the new satellite proposals such as the Southern Pacific filing indicate 12 transponders, but they plan 72 MHz bandwidth for each transponder as compared to the 36 MHz bandwidth on existing transponders.

Figure 1 indicates the complex problem of locating transponders along the geostationary arc. The names located inside the circle are satellite systems presently in orbit; the names outside the circle represent satellites that are presently scheduled for launch and applications that are presently filed for satellite locations. Included are the INTELSAT satellite locations to give an indication of the international

satellite distribution. For example, at 132° west longitude the arc filing for Hughes and SATCOM III; at 128° there is a filing for COMSTAR IV and for the AT&T TELSTAR which is planned for launch in 1986. Another conflict would be at 119° where the SATCOM II replacement satellite is planned for 1983 while the SBS business systems satellite is planned for 1982 at that same orbital location. In this case, the SBS satellite is planning to use the K-band frequency channels while the SATCOM II replacement satellite will use the 4 and 6 GHz frequencies. At 104° SBS and General Telephone and Electronics (GTE) plan K-band satellites on each side of the Annex III location. At 100° there is a serious conflict. SBS and GTE both plan K-band satellites very close to the location of the WESTAR I. WESTAR IV, using 4 and 6 GHz, will replace the WESTAR I satellite. At 83° another conflict appears. SATCOM IV satellite, which is planned for launch in 1981, and the advanced WESTAR, planned for launch in 1983, will both have 4 and 6 GHz capability; the advanced WESTAR being a hybrid satellite containing both 4/6 and 12/14 transponders. At 75° west longitude, the Hughes and WESTAR V will be conflicting for both frequency and orbit location.

These conditions, of course, cannot be allowed to culminate in conflicting satellites using the same frequencies at the same location in orbit. A system must be devised by the Federal Communications Commission (FCC) to allocate the space and frequencies available and the system must be implemented very quickly. Several suggestions have been made and are being considered by the FCC. Congress has mandated an open skies policy which has been in effect for twenty years. The FCC has been given the responsibility for implementing this in an equitable and effective manner. The Commission is considering alternatives as options of space and frequency. A lottery method of selecting the bidders has been suggested to determine which orbit slots and spectrum right will be granted. Almost any allocation plan will end up in court. One of the satellite common carriers has prepared an allocation chart which they

believe will make room for everyone presently requesting space and frequency allocation in the geostationary orbit. This plan would place hybrid satellites at strategic locations and 4/6 and 12/14 satellites between these locations in such a way as to avoid conflicts. The FCC is actively investigating this proposal but has not made it public nor has the proposal been forwarded to the other competing companies.

The decisions to be reached at the 1983 World Administrative Radio Conference (WARC) will have the effect of treaty status in the international community. This conference will have a profound effect on the FCC deliberations regarding the orbital arc. Besides the United States and Canada and their obvious stake in the allocations, there are South American countries requesting that satellite space be available for them in the next few years for their developing communications plans. This will further crowd the orbital arc and produce additional concern for space and frequency.

TRANSMISSION METHODS

At the present time, most of the satellite communications systems are using analog transmission methods. This has been brought about by the historical influence of the land based microwave technology using frequency division multiplexing. The decade of the eighties will see a tremendous conversion and upsurge in digital communication techniques. RCA Americom and others are marketing satellite services presently providing a large number of customers with digital communication service. Agencies such as NASA, Department of Defense and other government services, as well as industrial and private corporations are receiving digital transmission service through the satellites. This will expand greatly when SBS becomes operational in 1981 providing totally digital service through their satellite.

Digital communication has certain advantages and disadvantages compared with the analog systems. When converting an analog signal to the digital bit stream, there is inherently introduction of noise from the digitizing techniques. This is called quantizing noise and can be a problem if proper design and implementation are not followed. As soon as the signal has been converted to a digital bit stream, further amplification and transmission through multiple repeaters does not produce any additional degradation in the signal as long as the bit error rate is controlled to an acceptable value. The signal may be amplified, transmitted and if the signal waveform is degraded at the receiving end, the digital bit stream can be regenerated to the original form. This means that transmission through many hops of microwave, or through satellite and then microwave and then perhaps cable transmission will not produce any degradation greater than the original quantizing noise.

Delta modulation techniques and other band compression methods are greatly increasing the number of channels that can be transmitted through a given transponder. Error correcting codes can be introduced in the bit stream to additionally reduce the error rate and improve the quality of transmission. Secure communications can be obtained using cryptographic techniques at the point of origin of the communications.

Several years ago I saw a demonstration of digital transmission of television. Two pictures, one using the present analog satellite transmission and one using a digital technique were presented side by side. Both pictures were excellent. The analog system used 36 MHz satellite bandwidth; the digital system would have required 100 MHz of bandwidth. The digital system was then processed to neglect the least significant bits, to introduce error correcting codes and to use other bandwidth compression techniques to the point that 45 MHz of bandwidth produced a picture which was indistinguishable from the 36 MHz analog transmission. Since that time, further techniques in digital bandwidth compression have been developed which now make it almost competitive with the analog

bandwidth requirements. At this time, the cost of the digital techniques is considerably higher than the present system of analog transmission. It is anticipated that in the next several years improvements in memory devices will bring the cost down for transmission of video pictures. For many years experts have been predicting that digital techniques would take over the entire communication industry in the next few years. It now appears that the digital systems are ready to begin to supplant the analog techniques in communication.

A simple method of digital transmission reverses the phase (180°) of the carrier for each one or zero of the digital bit stream. This system can further increase the efficient use of bandwidth by putting two bit streams together and using a 90° phase shift for each one or zero transmission of each separate bit stream. This is called quadrature phase. Efficient transmission systems have now been developed up to "eight-phase" modulation techniques. This type of highly sophisticated communication technology is going to be the coming method of efficient digital transmission through satellites and terrestrial facilities as well. The satellite business systems (SBS) satellite has a number of customers already lined up to use their facilities. Westinghouse Corporation plans to carry about one-fourth of their voice traffic and some data over the SBS system. A total of eight companies are now signed up with SBS for service beginning in 1981; IBM, AETNA, Traveler's Insurance, Boeing, Crocker National Bank and a number of other companies that are not yet identified, have signed up for digital voice and data service. Two major areas of service are communications network service (CNS), high volume integrated network, interstate voice and dedicated line services.

Companies that were planning to launch satellites into geostationary orbit using the space shuttle are now making arrangements on other launch vehicles to get their systems into orbit. The Air Force and NASA have indicated that additional Atlas Centaur and Atlas Agena

systems will be made available over the next several years to alleviate this delay. Additionally, some companies are contracting with the French rocket system called Arion, for launch vehicle delivery as far off as 1984. Several companies are in great difficulty, having designed a satellite which is not capable of being launched by existing liquid fuel, non-recoverable rocket systems. Design engineers are very concerned about the Arion engines because at this time they do not know why a May launch crashed. Americans have lost a number of satellites during the launching stage, however, they were always able to determine the reason for the failure and that particular failure hasn't recurred. In this case, the engines of the Arion rocket are still being analyzed and the cause of the failure has not been determined. The next launch, originally set for November 1980, has been delayed until February 1981.

A large number of companies have gotten into the business of leasing transponder space and then providing audio and video service to corporations, the government and the general public. Holiday Inn has developed their HyNet Inc. television service which is prepared to arrange a teleconference for a large company or, for example, a sales meeting, in which they will provide meeting rooms, television sets, interconnection to the telephone company for additional services, and food and lodging. This is being offered as a package deal and they have a growing number of customers making use of the services. As an example, they had a video teleconference seminar with one-way video and two-way audio for the National Credit Association. The program was transmitted to twenty-five locations. The program was originated in the HBO studios in New York and was attended by about 700 people. The cost per person was considerably less than bringing those people to a central location and trying to provide them with all of the facilities for a convention. It was estimated that the cost per person was about 20% of the cost of bringing them all to a central location. The Robert Wold Company has been delivering about 12,000 hours of television programming in the last year. They are presently operating

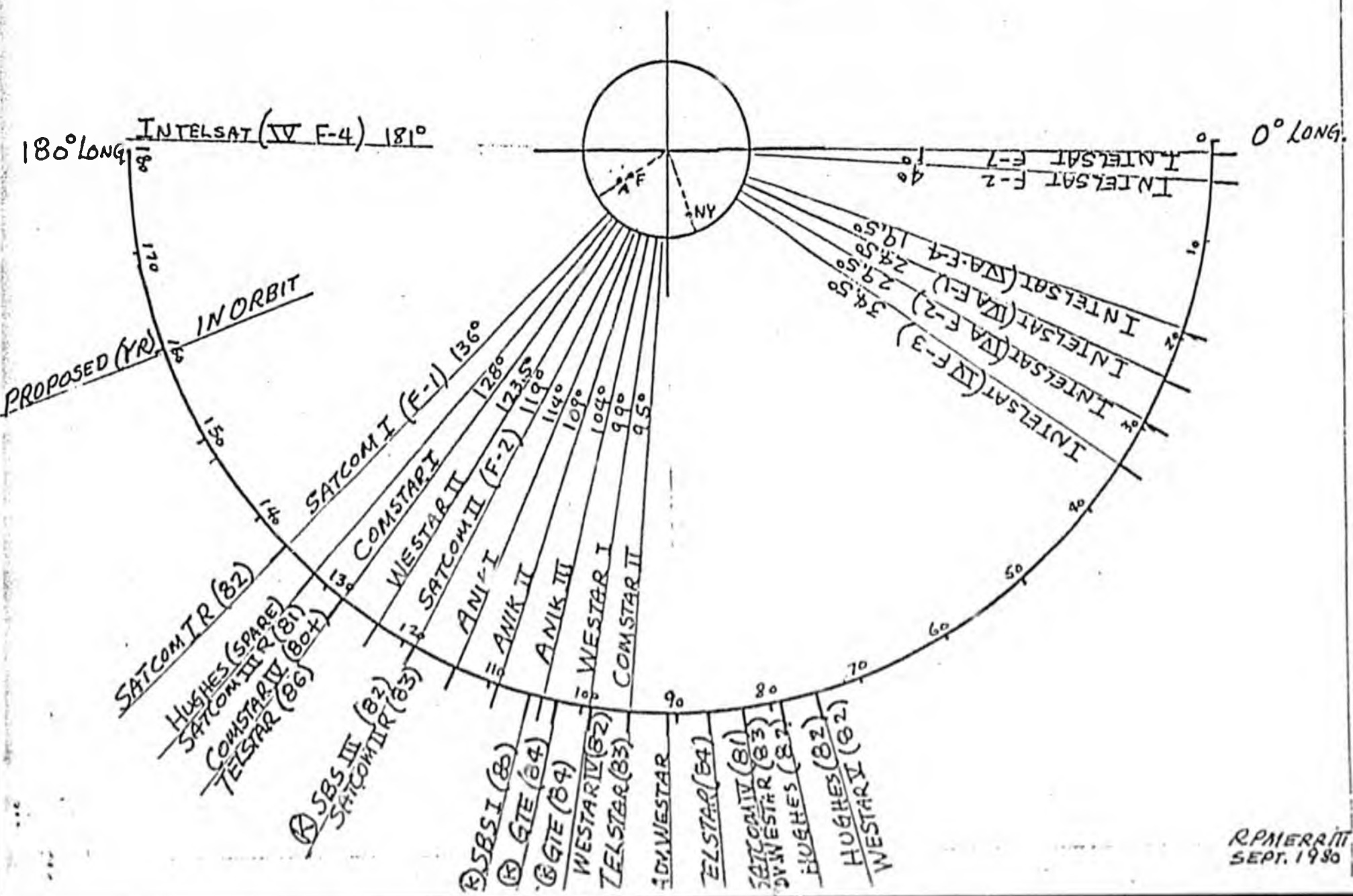
two portable earth stations which they took to the national Republican and Democratic conventions to provide transmission from Detroit and downtown New York for WTCI, the ABC and CBS networks and for a number of local stations who wanted their reporter live from the convention center at the time of the convention. Robert Wold Company has leased one transponder on WESTAR for their full time use and are subleasing from other owners two other transponders during high traffic times.

A number of companies are putting up dedicated earth stations on their property and leasing transponder space for communication with their worldwide corporation headquarters. An example of this type of program is the John Mansfield Company of Denver which started out using microwave interconnect for some of their local plants, then started planning with Western Union to develop a satellite communication system with many of their business centers around the United States. In 1977 they decided to do it themselves and to lease transponder space and put up their own earth stations and build their own satellite communication network. They are using digital techniques for their data and voice transmission and for slow-scan video and for full motion video teleconferencing they are still using the analog transmission technique. It is estimated that they have had an 11% reduction in their communication costs by the development of the in-house capability. Their Vice-President for Communications feels that it is very important that the company develop a feeling of maximizing the opportunities and capabilities instead of dwelling on minimizing the risk in developing a system of this type.

APENDIX

1

FIGURE 1: SATELLITE LOCATIONS ALONG GEOSTATIONARY ARC



R. PMERRITT
SEPT. 1980



INVENTORY OF COMMUNICATIONS FACILITIES

SERVING ALASKA COMMUNITIES

DEPARTMENT OF THE AIR FORCE
5049th BROADCASTING SQUADRON (AAC)
ELMENDORF AFB, ALASKA 99506



30 APR 1990

House Research Agency
Pouch Y
Juneau, AK 99811

Dear Sir

We have reviewed the booklet "Inventory of Communications Facilities" and request the following changes be made for Alaskan Forces Satellite Network facilities:

Delete: Page 14 - Elmendorf AFB - AFSN no longer serves with radio or television.
Page 15 - Ft Greely - AFSN no longer provides television, radio is still valid.
Page 16 - Ft Richardson - AFSN no longer serves with radio or television.
Page 16 - Ft Wainwright - AFSN no longer serves with radio or television.

Add: Page 22 - King Salmon - Add AFSN Radio
Page 23 - Kodiak - Add AFSN Radio
Page 42 - Tok - Add AFSN Radio

Thank you.

Sincerely,

A handwritten signature in cursive script, appearing to read "William S. Whipple", is written over the typed name.

WILLIAM S. WHIPPLE, Major, USAF
Commander

INVENTORY OF COMMUNICATIONS FACILITIES SERVING ALASKA COMMUNITIES

This inventory was compiled by the House Research Agency at the request of Representative Fred Brown, Chairman of the House Commerce Committee in the Eleventh Alaska Legislature.

While many lists of communications were available at the time of the request, in most cases they detailed only one system or function. A current compilation was unavailable. The first step to any evaluation of the State of Alaska's Telecommunications problems was to combine these various lists so that the legislature would in fact know what was available in each community.

The inventory research request was made in mid-February with a completion date set for mid-March. During that period, Elaine Mitchell, hired for the project, solicited information from a variety of sources and compiled the inventory.

Without the active cooperation of individuals in the private sector and various government agencies, completion of the project would have been impossible within the time frames given. The following deserve special recognition: John E. McGill and George Shaginaw of Alascom, Inc.; Jennifer Wilke of the Department of Education; Richard Dowling of the Governor's Office; Bruce Carlson of the Department of Administration, Division of Data Processing; Ted McIntire and Mel Hooversten of the Department of Transportation and Public Works; Mark Johnson of the Department of Health and Social Services; Kay Rosier of the Alaska State Library; Dick Frost of the U.S. Public Health Service; and Stuart Browne, Communications Consultant.

The inventory presented here is not comprehensive (though very nearly complete), nor has time allowed for verification of individual entries. Readers are invited to note omissions and corrections and to provide supplementary data and updated information.

Until permanent responsibility for maintaining and updating the inventory is assigned, comments may be directed to the House Research Agency, Pouch Y, Juneau, Alaska 99811 (telephone: 465-3991).

NOTES

Geographic locations listed related to accompanying map provided by the Alaska State Library; the original prepared by the Department of Community and Regional Affairs, 1979.

Emergency Medical communications information was provided by the Department of Health and Social Services; Mark Johnson, and by the Alaska Native Health Service, Dick Frost; listing current to 8/1/79

High frequency radio (HF) call signs and locations were provided by the Department of Transportation and Public Facilities, Mel Hoversten, Director of Communications; listing current to 1/30/80

Local telephone company information and long line trunks listing was provided by Alascom; listing current to 1/11/80

Small earth station (SES) and long line telephone numbers were taken from the Alascom Bush Telephone Directory, 1980. Location of small earth stations was provided by Division of Planning, Department of Transportation and Public Facilities, Ted McIntire; February, 1980

Percentage of availability (of small earth stations) is compiled monthly by Alascom, provided here by George Shaginaw for January, 1980

Mini-TV listing indicates stations operational as of February 1, 1980

Data service information was provided by the Alaska State Library, Kay Rosier, compiled in March, 1980

Power generation information was provided by Stuart Browne, Consultant, in a report dated February 27, 1980. The listing indicates generator output, ownership, fuel used and reliability--shown as + or - 80% reliability.

All other information used was provided by the Department of Education, Instructional Television Coordinator, Jennifer Wilke, compiled in February, 1980

March 17, 1980

COMMUNITY	POPULATION	GEOGRAPHIC LOCATION	EMERGENCY MEDICAL	HP RADIO	LOCAL TELCO.	LONG LINE	% AVAIL. JAN 1980	TV SERVICE	RADIO BROADCAST	DATA SERVICE	TELECONF.	CABLE TV	POWER GENERATION INFORMATION
ADAK	5,000	Aleutians			Adak Naval Sta.	MES		AFSN	AFSN Am/Fm	ETA			Navy oil +
AKHIOK	121	Kodiak Is.	SES #1 to Kodiak	WIM-92 School		SES 299-8001	11.02%						3 KW Private oil -
AXIACHAK	354	Lower Kuskokwim				IMTS 543-2001		KYUK via trans.	KYUK-AM via trans.				7.2 KW School oil +
AKIAK	216	Lower Kuskokwim				IMTS 543-2002		KYUK via trans.	KYUK-AM via trans.				250 KW School oil +
AKUTAN	100	Aleutians	SES #1 to Anchorage	KW-69 KXI-5		SES 698-8001	100%						20 KW Private hydro +
ALAKANUK	527	Lower Yukon R. Coastal	SES #2 to Bethel	KOV-35 School	VUI 25 phones	SES 685-8001 3 trunks	100%	KYUK via trans.	KYUK-AM via trans.				245 KW School oil +
ALEXAGIK	227	SW. Alaska near Dillingham				IMTS 246-3364		AFSN via trans.					oil +

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COMMUNITY	POPULATION	GEOGRAPHIC LOCATION	EMERGENCY MEDICAL	HF RADIO	LOCAL TELCO.	LONG LINE	% AVAIL. JAN 1980	TV SERVICE	RADIO BROADCAST	DATA SERVICE	TELECONF.	CABLE TV	POWER GENERATION INFORMATION
ALLAKAKET	216	Interior Yukon River	SES #4 to Tanana			SES 968-8001	83.40%						170 KW School oil +
AMBLER	217	N.W. Arctic	SES #3 to Kotzebue	KXQ-53 KTV-2 KLT-41	OTZ 33 phones	SES 3 trunks	100%	Mini TV	KOTZ-AM				450 KW oil +
ANAKTUVUK PASS	173	North Slope Borough	SES #4 to Tanana	KXP-38 WFF-7		SES 668-8001	90.27%	Mini TV					oil +
ANCHOR POINT	800	Kenai Peninsula			CS	MW		KIMO KENI KAKM KTVA via trans.	KBBI-AM				
ANCHORAGE	185,280	South Central Alaska			ATU 127,744 phones	MW Bartlett 1416 trunks		3 comm. 1 public	4 FM Com. 1 FM pub. 6 AM Com.	ETA Libraries, court legis. (etc.)			
ANDERSON (6 Clear)	470	S.W. of Fairbanks	832-5280		CS	MW		All Fairbanks stations	AFSN + all Fairbanks stations	ETA			Oil +

March 17, 1980

COMMUNITY	POPULATION	GEO-GRAPHIC LOCATION	EMERGENCY MEDICAL	HF RADIO	LOCAL TELCO.	LONG LINE	% AVAIL. JAN 1980	TV SERVICE	RADIO BROADCAST	DATA SERVICE	TELE-CONF.	CABLE TV	POWER GENERATION INFORMATION
ANGOON	541	S.E. Alaska Admiralty Island		KWE-79 WZR-6 KAA-81	STC 122 phones	MW 9 trunks		Mini TV		ETA			Oil +
ANIAX	355	Lower Kuskokwim			BT 100 phones	MES 8 trunks		KYUK via trans	KYUK-AM	ETA			400 KW oil +
ANNETTE	200	S.E. Alaska near Ketchikan			GT 50 phones	MW*			KRBD-FM	ETA			
ANVIK	102	Lower Yukon River	SES #2 to Bethel	WKE-23 KZX-6		SES 462- 8001	100%	KYUK via trans.	KYUK-AM				112 KW oil +
ARCTIC VILLAGE	111	N.E. Arctic	SES #4 to Tanana			SES 587- 8001	98.11%						60 KW school oil +
ATKA	88	Aleutians	SES #1 to Anchorage			SES 767- 8001	100%						40 KW school oil +
ATKASOOK (Atkasuk)	84	North Slope Borough				SES 433- 8001	0.00%		KBRW-AM				Oil +

*Served from Metlakatla

March 17, 1980

COMMUNITY	POPULATION	GEO-GRAPHIC LOCATION	EMERGENCY MEDICAL	HF RADIO	LOCAL TELCO.	LONG LINE	% AVAIL. JAN 1980	TV SERVICE	RADIO BROADCAST	DATA SERVICE	TELE-CONF.	CABLE TV	POWER GENERATION INFORMATION
ATMAUTLUAK	200	Lower Kuskokwim				IMTS 543-2103		KYUK	KYUK-AM				
ATTU	40	Aleutians											
BARANOF		S.E Alaska Baranof Is		KWB-36									
BARROW	2,715	North Slope Borough			GT 1168 phones	MES 35 trunks		Mini TV	KBRW-AM	ETA	*	BEI	4000 KW oil +
BEAVER	80	Upper Yukon River No. of Fairbanks	SES #4 to Tanana			SES 628-8001	99.74%						95 KW school oil +
BETHEL	3,853	Lower Kuskokwim			GT 1745 phones	MES 44 trunks		KYUK	KYUK-AM	Legis. info. ETA State library	*	B.C.	8,450 KW oil +
BETTLES	60	N. Central Koyukuk River	692-5791		BTC 35 phones	MW 4 trunks							600 KW oil +

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COMMUNITY	POPULATION	GEOGRAPHIC LOCATION	EMERGENCY MEDICAL	HF RADIO	LOCAL TELCO.	LONG LINE	% AVAIL. JAN 1980	TV SERVICE	RADIO BROADCAST	DATA SERVICE	TELE-CONF.	CABLE TV	POWER GENERATION INFORMATION
BETTLES FIELD (Evansville)	80	N. Central Koyukuk River				HF							660 KW oil +
BIG DELTA	30	S.E. of Fairbanks			GS	MW		KFAR KTVF KUAC via trans.	KUAC-FM				
BIG LAKE	1,557	Mat-Su. Borough			MTA 595 phones	MW 25 trunks							
BIRCH CREEK	29	Yukon Flats N.E. of Fairbanks	662-2430 VHF			VHF to Pt. Yukon 662-2430							20 KW school oil +
BREVIC MISSION	147	Seward Peninsula											148 KW school oil +
BUCKLAND	170	Kotzebue Sound			OTZ 34 phones	SES 4 trunks	100%		KOTZ-AM				140 KW oil +

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COMMUNITY	POPULATION	GEO-GRAPHIC LOCATION	EMERGENCY MEDICAL	HF RADIO	LOCAL TELCO.	LONG LINE	% AVAIL. JAN 1980	TV SERVICE	RADIO BROADCAST	DATA SERVICE	TELE-CONF.	CABLE TV	POWER GENERATION INFORMATION
BUTTE	448	Mat-Su. Borough near Palmer				MW			All Anchorage stations				
CANTWELL	62	No. of Mat-Su. Borough	768-2222		MTA 50 phones	MW 5 trunks							Private gas +
CAPE POLE	125	S.E. Alaska Kocziusko Island				SES 879-8001	93.67%	Mini TV					Private oil +
CENTRAL	45	Yukon Flats N.E. of Fairbanks		WIN-21 KQM-6		SES 520-8001	100%						Private
CHALKYTSIK	99	Yukon Flats N.E. of Fairbanks	SFS #4 to Tanana			SES 848-8001	99.81%						70 KW school oil +
CHEFORNAK	206	Lower Kuskokwim near coast		KPR-3 WDM-55 KOY-83		SES 787-8001	100%	KYUK via trans.	KYUK-AM				65 KW oil +

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COMMUNITY	POPULATION	GEOGRAPHIC LOCATION	EMERGENCY MEDICAL	HF RADIO	LOCAL TELCO.	LONG LINE	% AVAIL. JAN 1980	TV SERVICE	RADIO BROADCAST	DATA SERVICE	TELECONF.	CABLE TV	POWER GENERATION INFORMATION
CHEVAK	468	Lower Yukon East of Hooper Bay				VHF to Cape Romazoff 543-2003		KYUK via trans.	KYUK-AM				560 KW oil +
CHIGNIK BAY	78	Alaska Peninsula	SES #4 to Kanakanak	KNC-39 school		SES 749-8001							
CHIGNIK LAGOON	70	Alaska Peninsula	SES #4 to Kanakanak	KND-32 school KTD-28 KPG-8		SES 947-8001	100%						Private oil
CHIGNIK LAKE	115	Alaska Peninsula	SES #4 to Kanakanak	KNF-27 school KNZ-24 KPI-78 school		SES 566-8001	49.59%						Private oil
CHINIYAK	111	Kodiak Island		KEP-78 school									
CHISTOCHINA	33	Copper River Area			CV	MW			KCAM-AM				500 KW Private oil
CHITINA	46	Copper River Area				SES 496-8001	100%	Mini TV	KCAM-AM				60 KW private oil +

March 17, 1980

COMMUNITY	POPULATION	GEOGRAPHIC LOCATION	EMERGENCY MEDICAL	HF RADIO	LOCAL TELCO.	LONG LINE	% AVAIL. JAN 1980	TV SERVICE	RADIO BROADCAST	DATA SERVICE	TELECONF.	CABLE TV	POWER GENERATION INFORMATION
CHUATHBALUK	127	Kuskokwim River N.E. of Bethel				VHF to Aniak 543-2102		KYUK via trans.	KYUK-AM				
CHUGIAK	489	Anchorage area			MTA	MW		All Anchorage	All Anchorage				
CIRCLE	76	Yukon Flats	SES 04 to Tanana		CU	SES 779-8001 3 trunks	100%						110 KW private oil +
CIRCLE HOT SPRINGS	36	Yukon Flats											
CLARK'S POINT	98	Bristol Bay				VHF to Dillingham 246-3347			KLDG-AM				20 KW school oil
CLEAR (Anderson)	470	No. of Mat-Su. Borough			GS	MW		All Fairbanks stations	AFSN & all Fairbanks stations	ETA			Oil +
CLOVER PASS	261	Ketchikan Borough			KPU			CK-TV (Canada) via trans.	KBRD-FM				

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COMMUNITY	POPULATION	GEO-GRAPHIC LOCATION	EMERGENCY MEDICAL	HF RADIO	LOCAL TELCO.	LONG LINE	% AVAIL. JAN 1980	TV SERVICE	RADIO BROADCAST	DATA SERVICE	TELE-CONF.	CABLE TV	POWER GENERATION INFORMATION
COFFMAN COVE	100	S.E. Alaska Prince of Wales Is.											
COHOE	120	Kenai Peninsula Lower Cook Inlet											
COLD BAY	340	Alaska Peninsula			ITC 145 phones	MES 9 trunks			AFSN via trans				1520 KW private oil +
COOPER LANDING	184	Kenai Peninsula			ITC 76 phones	MW 10 trunks		KENI TV via trans.					
COPPER CENTER	443	E. of Mat-Su. Borough			CV	MW		KPAR-TV via trans.	KCAM-AM				
CORDOVA	2,780	Prince William Sound			CPU 1121 phones	MES 31 trunks			KLAM-AM	ETA		Cordova Cable System	8150 KW oil +
COUNCIL	23	Seward Peninsula	SES #3 to home			SES 665-8001	85.44%		All Nome stations				1.5 KW school oil

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COMMUNITY	POPULATION	GEO-GRAPHIC LOCATION	EMERGENCY MEDICAL	HF RADIO	LOCAL TELCO.	LONG LINE	% AVAIL. JAN 1980	TV SERVICE	RADIO BROAD-CAST	DATA SERVICE	TELE-CONF.	CABLE TV	POWER GENERATION INFORMATION
CRAB BAY	50	Prince William Sound			STC	MW							
CRAIG	587	S.E. Alaska Prince of Wales Is.			NU 185 phones	MW 9 trunks				ETA			1015 KW oil +
CROOKED CREEK	107	Interior-on Kuskokwim River	SES #2 to Bethel		KWI-89 school	SES 432-8001	82.93%	KYUK-TV via trans.	KYUK-AM				Private oil
DANGER BAY	140	Kodiak Island			WFM-20 school								
DEERING	133	Seward Peninsula N. Coast	SES #3 to Kotzebue		OTZ 32 phones	SES 4 trunks	100%		KOTZ-AM				140 KW oil +
DELTA JUNCTION	892	S. of North Star Borough			CT 594 phones	MW 20 trunks		All Fairbanks stations direct		ETA			
DILLINGHAM	1,656	Bristol Bay			NTC 395 phones	MES 20 trunks		Via trans	KL 2-AM	ETA Legis. info.			2900 KW oil +
DIOMEDE	125	Off shore Seward Peninsula	VHF #3 to Nome			IMTS to Tin City		Mini TV					255 KW school wind/oil +

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COMMUNITY	POPULATION	GEO-GRAPHIC LOCATION	EMERGENCY MEDICAL	HF RADIO	LOCAL TELCO.	LONG LINE	% AVAIL. JAN 1980	TV SERVICE	RADIO BROADCAST	DATA SERVICE	TELECONF.	CABLE TV	POWER GENERATION INFORMATION
DOT LARF	81	S.E. of North Star Borough	883-2695		NU	MW		KUAC KTVF					
DORA BAY	35	S.E.Coast Prince of Wales Is. S.E.Alaska											
EAGLE	142	East of Fairbanks on border		KWO-93		SES 459- 8001							
EAGLE RIVER	2,437	Anchorage area			MTA 5260 phones	MW 68 trunks		All Anchorage stations					
EAGLE VILLAGE	100	Upper Yukon River	SES #4 to Tanana			SES 729- 8001	83.14%						
EEK	307	Kusko-kwim Bay				IMTS to Bethel 543- 2004		KYUK-TV via trans.	YUK-AM				
ECEGIK	148	Alaska Peninsula				VHF to King Salmon 246- 3430			KDLG-AM				

March 17, 1980

COMMUNITY	POPULATION	GEOGRAPHIC LOCATION	EMERGENCY MEDICAL	HF RADIO	LOCAL TELCO.	LONG LINE	% AVAIL. JAN 1980	TV SERVICE	RADIO BROADCAST	DATA SERVICE	TELECONF.	CABLE TV	POWER GENERATION INFORMATION
EIELSON AFB (Fairbanks)	6,150				FMU				AFSN All Fairbanks stations				
EIGHT FATHOM BITE		Prince William Sound											
EKUK	51	Bristol Bay Coast			VHF to Dillingham 842-5937				KDLG-AM				Private
EKWOK	111	Bristol Bay area-Nushagak River	SES #2 to Kanakanak	KXA-96 school		SES 464-8001	71.44%		KDLG-AM				75 KW school oil +
ELFIN COVE	30	S.E. Alaska No. tip of Chichagof Is.		KWC-95 KWK-6 KWD-48		VHF to Cape Spencer 697-3131							Private oil +
ELIM	218	No. side Norton Sound	SES #3 to Nome			SES 885-8001			All Nome stations direct				275 KW oil +
ELMENDORF AFB (Anchorage)	6,020				ATU	MW		AFSN All Anchorage stations direct	AFSN				