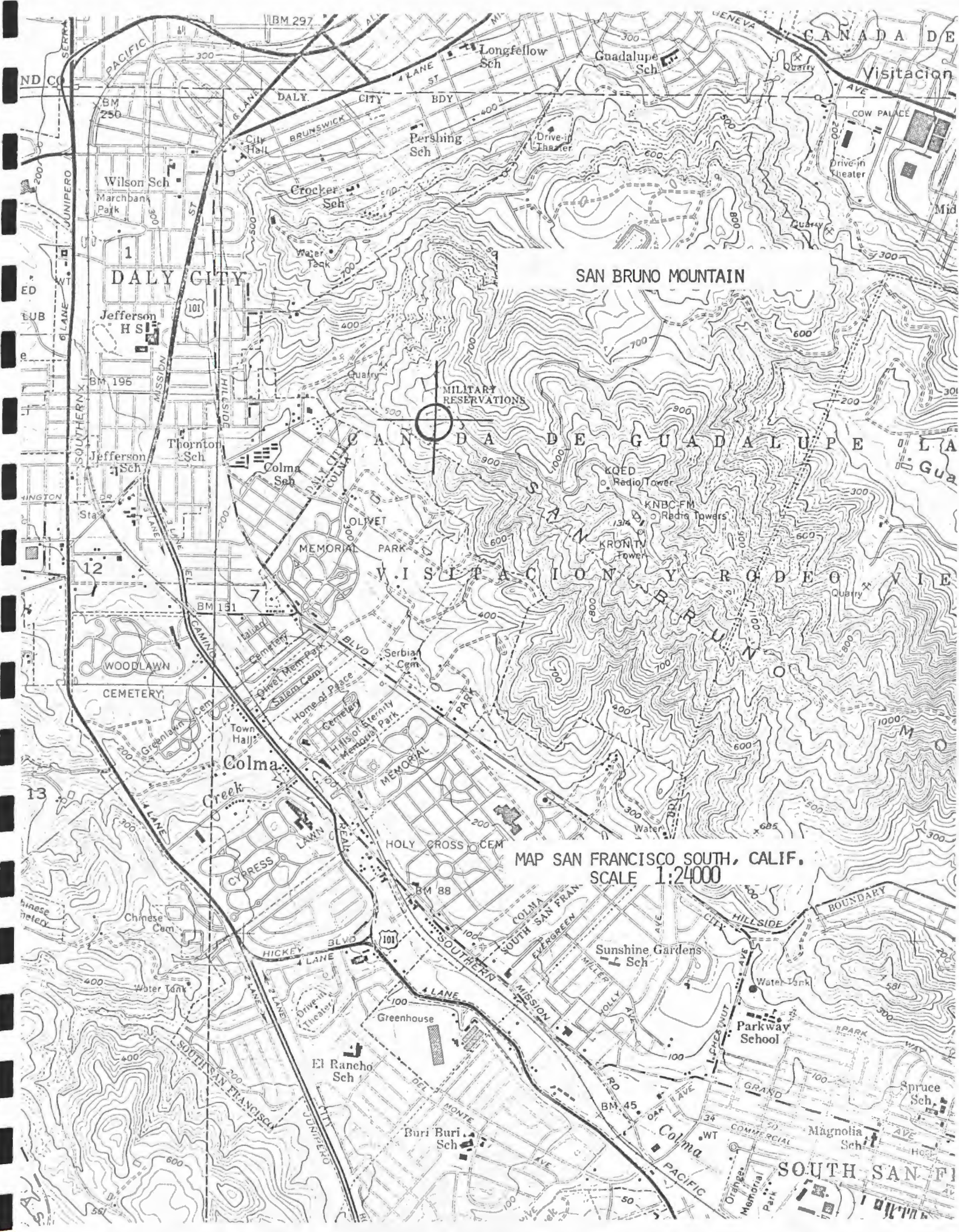


4. TOPOGRAPHIC
DATA

TOPOGRAPHIC DATA

Attached hereto is a topographic map indicating the exact location of the station proposed by this Application.



MAP SAN FRANCISCO SOUTH, CALIF.
SCALE 1:24000

RECEIVING STATIONS

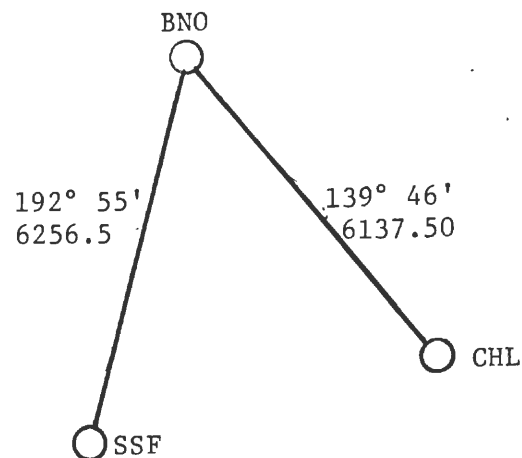
The station list and diagram below lists proposed frequencies, locations of stations, and direction of transmit path to adjacent receive station.

Call SignFrequenciesLocation

To be assigned
To be assigned

6256.5 MHz
6137.50 MHz

South San Francisco (SSF)
Mt. Chual (CHL)



N

SAN BRUNO (BNO)

OWNERSHIP

GENERAL

The applicant is a wholly owned subsidiary of University Computing Company, Dallas, Texas.

Certified copies of the Articles of Incorporation and By-Laws of the applicant are attached hereto as Attachments A and B, respectively.

Certified copies of the Articles of Incorporation and By-Laws of University Computing Company are on file with the Commission in File Numbers 2108-C1-AP/AL-(8)-69, granted March 13, 1969, and 600/601-C1-P-70, accepted for filing on August 18, 1969. No changes have occurred.

The management of University Computing Company is as follows:

Sam Wylly 1300 Frito-Lay Tower Dallas, Texas 75235	Chairman of the Board of Directors
Charles J. Wylly, Jr. 1300 Frito-Lay Tower Dallas, Texas 75235	President and Director
Ben Voth 823 South Detroit Street Tulsa, Oklahoma 74120	Chairman of the Executive Committee of the Board of Directors
D. R. McCord 1949 N. Stemmons Freeway Dallas, Texas 75207	Vice President and Director
John E. Larcade 1300 Frito-Lay Tower Dallas, Texas 75235	Vice President
Seymour Joffe 1300 Frito-Lay Tower Dallas, Texas 75235	Vice President
E. W. McCain, Jr. 1300 Frito-Lay Tower Dallas, Texas 75235	Vice President
Eldon R. Vaughan 1300 Frito-Lay Tower Dallas, Texas 75235	Secretary, General Counsel and Director
August R. Buchel 3015 Cedar Springs Dallas, Texas	Director

Charles V. Campell First National Bank Bldg. Dallas, Texas 75201	Director
Raymond E. Hannon 1300 Frito-Lay Tower Dallas, Texas 75235	Vice President
Richard C. Bower 1300 Frito-Lay Tower Dallas, Texas 75235	Vice President
Charles N. Brewer 1300 Frito-Lay Tower Dallas, Texas 75235	Treasurer
Washington Giles Thompson 1300 Frito-Lay Tower Dallas, Texas 75235	Controller

Under present plans, the applicant will be a wholly owned but completely separate subsidiary of University Computing Company. The parent company will provide the applicant with the necessary technical, financial and managerial resources until the applicant is in a position to furnish the same on its own behalf.

A primary objective of the organization, management and operating plans of the applicant is not only to promote and insure a clear separation between University Computing Company and the applicant, but to provide visibility in matters of accounting, rate and tariff formulation, and relationships between the applicant and its subscribers.

OWNERSHIP

SEPARATION OF MANAGEMENT

The applicant's autonomy will be insured as follows:

Board of Directors

Following final approval of these applications, the Board of Directors of the applicant will consist of not less than 11 members, of whom at least 6 but always a majority, will be persons who are not officers or directors of University Computing Company or any other corporation (other than the applicant) directly or indirectly controlled by University Computing Company.

As of the date of these applications, there are two persons who are common to the Boards of Directors of the applicant and University Computing Company. Charles J. Wyly, Jr., Chairman of the Board of Directors of the applicant, is also a member of the Board of Directors of University Computing Company. Sam Wyly, a member of the Board of Directors of the applicant, is also the Chairman of the Board of Directors of University Computing Company.

Additionally, as of the date of these applications, there are two officers of University Computing Company who are members of the Board of Directors of the applicant. Seymour Joffe is a Corporate Vice President of University Computing Company, and Washington Giles Thompson is Controller.

Upon approval of the applications and initiation of construction of the proposed facilities, if not before, the Board of Directors of the applicant will be expanded by a number of members unassociated and unaffiliated with either the applicant or University Computing Company.

Company Officers

Upon final approval of these applications, no officers of the applicant will be coincidentally officers of University Computing Company.

At the time of the filing of these applications there is one officer of the applicant who is also an officer of University Computing Company. Seymour Joffe,

President of the applicant, is a Corporate Vice President of University Computing Company. Upon final approval of these applications, if not before, Mr. Joffe will cease to be an officer of University Computing Company.

Additionally, Martin R. Hoffmann, Assistant General Counsel of University Computing Company, is Acting General Counsel for the applicant. Upon final approval of these applications, if not before, a General Counsel, who is not otherwise affiliated with University Computing Company, will be designated for the applicant.

OWNERSHIP

SEPARATION OF CORPORATE BOOKS, RECORDS AND ACCOUNTING

At the time of the filing of these applications, all accounting activities for the applicant are being performed by the staff of the applicant, with assistance from the University Computing Company's corporate accounting group under the direction of the parent Company's corporate Staff Activities Controller.

Within a reasonable period following final approval of the applications, if not before, the applicant will secure the services of a fully qualified Vice President for Financial Affairs, together with appropriate staff capability, to effectively discharge its required financial activities independently of the University Computing Company.

In addition, immediately following approval of these applications, all accounting functions of the applicant will be transferred to the applicant's Corporate headquarters or some other office not then occupied by University Computing Company. All accounting functions will be recorded under the Uniform System of Accounts and other applicable accounting rules and regulations prescribed by the Commission. Accounting functions will be supervised by the applicant's personnel and all accounting personnel will be employees of the applicant. The applicant will maintain complete administrative and financial records separately from University Computing Company.

In addition to the separation outlined above in its accounting functions, the applicant will maintain separate from University Computing Company other administrative functions, such as personnel and legal.

The applicant's business activities and operation will be strictly separated from those of University Computing Company.

OWNERSHIP

SEPARATION OF FACILITIES

The applicant will maintain separate physical facilities from University Computing Company.

At the time of the filing of these applications, the applicant's operations office is located at 6201 Leesburg Pike, Falls Church, Virginia. The principal location of officers of the applicant other than at that address is as follows:

Seymour Joffe, President -- at Datran Center, 1137 Frito-Lay Tower, Dallas, Texas.

David Foster, Vice President, Administration -- at Datran Center, 1137 Frito-Lay Tower, Dallas, Texas.

Facilities separate from University Computing Company will be maintained for the above officers, and for additional officers and staff of the applicant as they are retained.

OWNERSHIP

SEPARATION OF OPERATIONS

The applicant's communications plant will be managed and maintained separately from the computer hardware and other equipment owned and used by University Computing Company in conducting its business activities. The applicant's communications plant, including switching equipment utilized in its systems, will not be operated for any purpose except for the furnishing of communications service.

OWNERSHIP

SEPARATION OF CORPORATE INTERESTS

The applicant's objectives and operations as a public service common carrier will be pursued and conducted independently and autonomously of the objectives and operations of University Computing Company. The applicant will be fully responsive to the needs of its subscribers and the public, and will operate in the public interest.

The system to be implemented through the facilities being applied for has not been designed to confer any competitive or other advantage upon University Computing Company's data processing service operations that will not be conferred equally upon other participants in the data processing industry as reflected in the responses to the Commission's "Inquiry into the Independence of Computer and Communication Services and Facilities", Docket No. 16979, many respondents expressed the view that they would derive substantial benefits from using a common carrier dedicated to data transmission. The facilities being applied for are designed to confer these benefits and serve the public interest.

While University Computing Company may, in fact, become a subscriber of the applicant, at no time will University Computing Company in any sense or aspect receive preferential treatment as a subscriber.

As outlined in Exhibits Nos. 9 and 13, and in the foregoing paragraphs of this Exhibit, the relationship between the applicant and University Computing Company as its parent and as a subscriber will be highly visible, and easily susceptible to the closest scrutiny by the Commission, other subscribers, and the public.

The applicant proposes through the facilities being applied for to provide new, unique and needed communications services in the public interest, and the applicant believes that effectuation of the applicant's proposed network will constitute a significant contribution to the future growth and development of the nation's economy, and will to the highest degree serve the public interest, convenience and necessity.

CERTIFICATE OF AMENDMENT
OF
CERTIFICATE OF INCORPORATION

DATA TRANSMISSION COMPANY, a Corporation organized
and existing under and by virtue of the General Corporation Law of the State
of Delaware,

DOES HEREBY CERTIFY:

FIRST: That at a meeting of the Board of Directors of DATA TRANSMISSION
COMPANY resolutions were duly adopted setting forth a proposed amendment
to the Certificate of Incorporation of said Corporation, declaring said amendment
to be advisable and calling a meeting of the stockholders of said Corporation for
consideration thereof. The resolution setting forth the proposed amendment
is as follows:

RESOLVED, That the Certificate of Incorporation of this Corporation
be amended by changing the article thereof numbered "THIRD" so
that, as amended said article shall be and read as follows:

"The nature of the business or purposes to be conducted or
promoted is:

To engage in any lawful act or activity for which corporations
may be organized under the General Corporation Law of Delaware.

Further, to engage generally in the business of developing,
planning, constructing, owning and operating a communications
common carrier system utilizing all forms and means of trans-
mission and, in connection therewith, to make application for
and hold all permits, licenses and other authorizations required
by federal and state regulatory bodies, and applicable law, to
publish and maintain tariffs for services furnished, to enter into
such agreements with other common carriers as may be necessary
to conduct the business of and to act as a communications common
carrier, both under the Communications Act of 1934, as amended,
and other applicable statutes and laws."

SECOND: That thereafter, pursuant to resolution of its Board of
Directors, a special meeting of the stockholders of said Corporation was
duly called and held, upon notice in accordance with Section 222 of the
General Corporation Law of the State of Delaware at which meeting the
necessary number of shares as required by statute were voted in favor of
the amendment.

THIRD: That said amendment was duly adopted in accordance with the provisions of Section 242 of the General Corporation Law of the State of Delaware.

FOURTH: That the capital of said Corporation shall not be reduced under or by reason of said amendment.

IN WITNESS WHEREOF, said DATA TRANSMISSION COMPANY has caused its corporate seal to be hereunto affixed and this certificate to be signed by Seymour Joffe, its President, and attested by its Secretary, this 31st day of October, 1969.

DATA TRANSMISSION COMPANY

By Seymour Joffe
Seymour Joffe, President

(CORPORATE SEAL)

ATTEST:

David H. Foster
David H. Foster, Secretary

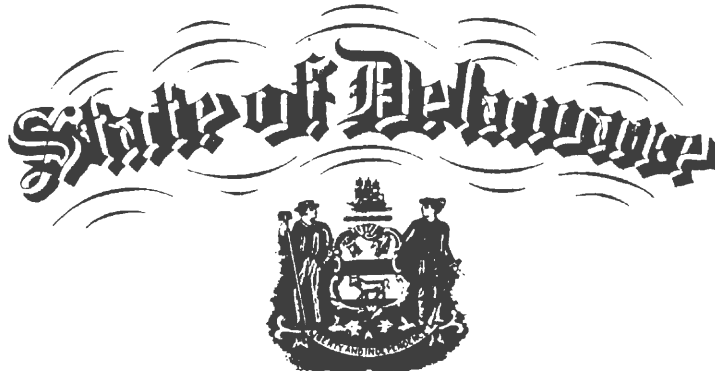
STATE OF TEXAS

COUNTY OF DALLAS

BE IT REMEMBERED that on this 31st day of October, 1969, personally came before me DENNIS R. CASSELL, a Notary Public in and for the County and State aforesaid, SEYMOUR JOFFE, President of a corporation of the State of Delaware, the corporation described in and which executed the foregoing certificate, known to me personally to be such, and he the said SEYMOUR JOFFE as such President, duly executed the said certificate before me and acknowledged the said certificate to be his act and deed and the act and deed of said corporation and the facts stated therein are true; that the signature of the President of said corporation to the foregoing certificate is in the handwriting of the said President of said corporation, and that the seal affixed to said certificate, and attested by the Secretary of said corporation, is the common or corporate seal of said corporation.

IN WITNESS WHEREOF, I have hereunto set my hand and seal of office the day and year aforesaid.

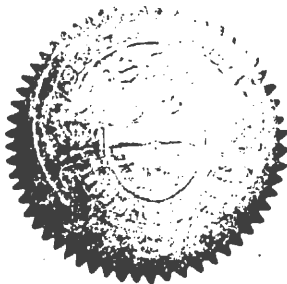
Dennis R. Cassell
Notary Public, Dallas County, Texas



Office of Secretary of State.

J. Eugene Bunting, Secretary of State of the State of Delaware,
do hereby certify that the above and foregoing is a true and correct copy of
Certificate of Amendment of the "DATA TRANSMISSION COMPANY", as
received and filed in this office the tenth day of November, A.D. 1969,
at 9 o'clock A.M.

In Testimony Whereof, I have hereunto set my hand
and official seal at Dover this tenth day
of November in the year of our Lord
one thousand nine hundred and sixty-nine.



Eugene Bunting

Secretary of State

R. H. [Signature]

Asst Secretary of State

CERTIFICATE OF INCORPORATION
OF
DATA TRANSMISSION COMPANY

* * * * *

FIRST. The name of the corporation is
DATA TRANSMISSION COMPANY.

SECOND. The address of its registered office in
the State of Delaware is No. 100 West Tenth Street, in the
City of Wilmington, County of New Castle. The name of its
registered agent at such address is The Corporation Trust
Company.

THIRD. The nature of the business or purposes to
be conducted or promoted is:

To engage in any lawful act or activity for which
corporations may be organized under the General Corporation
Law of Delaware.

FOURTH. The total number of shares of stock which
the corporation shall have authority to issue is ten (10)
and the par value of each of such shares is One Hundred
Dollars (\$100.00) amounting in the aggregate to One Thousand
Dollars (\$1,000.00).

FIFTH. The name and mailing address of each
incorporator is as follows:

<u>NAME</u>	<u>MAILING ADDRESS</u>
B. J. Consono	100 West Tenth Street Wilmington, Delaware
F. J. Obara, Jr.	100 West Tenth Street Wilmington, Delaware
A. D. Grier	100 West Tenth Street Wilmington, Delaware

SIXTH. The corporation is to have perpetual existence.

SEVENTH. In furtherance and not in limitation of the powers conferred by statute, the board of directors is expressly authorized:

To make, alter or repeal the by-laws of the corporation.

To authorize and cause to be executed mortgages and liens upon the real and personal property of the corporation.

To set apart out of any of the funds of the corporation available for dividends a reserve or reserves for any proper purpose and to abolish any such reserve in the manner in which it was created.

By a majority of the whole board, to designate one or more committees, each committee to consist of two or more of the directors of the corporation. The board may designate one or more directors as alternate members of any committee, who may replace any absent or disqualified member at any meeting of the committee. Any such committee, to the extent provided in the resolution or in the by-laws of the corporation, shall have and may exercise the powers of the board of directors in the management of the business and affairs of the corporation, and may authorize the seal of the corporation to be affixed to all papers which may require

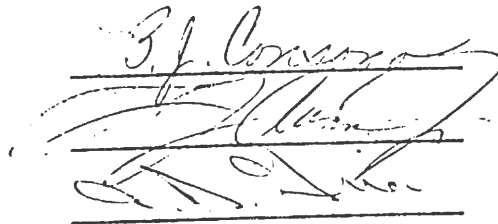
it; provided, however, the by-laws may provide that in the absence or disqualification of any member of such committee or committees, the member or members thereof present at any meeting and not disqualified from voting, whether or not he or they constitute a quorum, may unanimously appoint another member of the board of directors to act at the meeting in the place of any such absent or disqualified member.

When and as authorized by the affirmative vote of the holders of a majority of the stock issued and outstanding having voting power given at a stockholders' meeting duly called upon such notice as is required by statute, or when authorized by the written consent of the holders of a majority of the voting stock issued and outstanding, to sell, lease or exchange all or substantially all of the property and assets of the corporation, including its good will and its corporate franchises, upon such terms and conditions and for such consideration, which may consist in whole or in part of money or property including shares of stock in, and/or other securities of, any other corporation or corporations, as its board of directors shall deem expedient and for the best interests of the corporation.

EIGHTH. Meetings of stockholders may be held within or without the State of Delaware, as the by-laws may provide. The books of the corporation may be kept (subject to any provision contained in the statutes) outside the State of Delaware at such place or places as may be designated from time to time by the board of directors or in the by-laws of the corporation. Elections of directors need not be by written ballot unless the by-laws of the corporation shall so provide.

NINTH. The corporation reserves the right to amend, alter, change or repeal any provision contained in this certificate of incorporation, in the manner now or hereafter prescribed by statute, and all rights conferred upon stockholders herein are granted subject to this reservation.

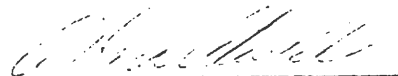
WE, THE UNDERSIGNED, being each of the incorporators hereinbefore named, for the purpose of forming a corporation pursuant to the General Corporation Law of the State of Delaware, do make this certificate, hereby declaring and certifying that this is our act and deed and the facts herein stated are true, and accordingly have hereunto set our hands this 1st day of July, 1968.


Three handwritten signatures are written over three horizontal lines. The top signature appears to be 'J. J. Conner', the middle one is 'J. H. [unclear]', and the bottom one is 'J. A. [unclear]'. The signatures are in cursive and somewhat stylized.

STATE OF DELAWARE }
COUNTY OF NEW CASTLE } ss:

BE IT REMEMBERED that on this 1st day of
July, 1968, personally came before me, a Notary
Public for the State of Delaware, B. J. Consono,
F. J. Obara, Jr. and A. D. Grier, all of the parties to the
foregoing certificate of incorporation, known to me per-
sonally to be such, and severally acknowledged the said cer-
tificate to be the act and deed of the signers respectively
and that the facts stated therein are true.

GIVEN under my hand and seal of office the day and
year aforesaid.



Notary Public



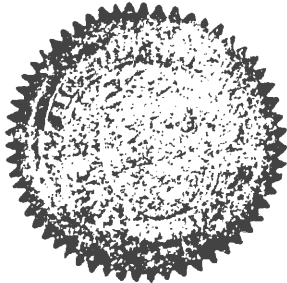
State of Delaware



Office of Secretary of State.

I, Eugene Bunting, Secretary of State of the State of Delaware,
do hereby certify that the above and foregoing is a true and correct copy of
Certificate of Incorporation of the "DATA TRANSMISSION COMPANY", as
received and filed in this office the first day of July, A.D. 1968,
at 8:30 o'clock A.M.

In Testimony Whereof, I have hereunto set my hand
and official seal at Dover this eighteenth day
of November in the year of our Lord
one thousand nine hundred and sixty-nine.



Eugene Bunting

Secretary of State

R. H. Felder

Asst. Secretary of State

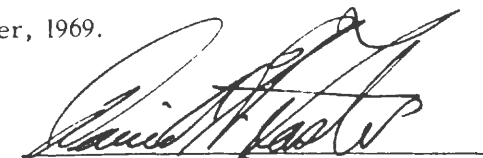
ATTACHMENT B
to EXHIBIT NO. 6

SECRETARY'S CERTIFICATE

THE STATE OF TEXAS §
 § KNOW ALL MEN BY THESE PRESENTS
COUNTY OF DALLAS §

That I, DAVID H. FOSTER, Secretary of Data Transmission Company, do hereby certify that the attached is a true and correct copy of the bylaws of the said Data Transmission Company as adopted at a meeting of the Directors held on the 15th day of September, 1969; that said bylaws have not been modified, repealed, amended or rescinded and are still in full force and effect.

IN WITNESS WHEREOF, I hereunto set my hand and seal
of office on this 18th day of November, 1969.


David H. Foster, Secretary

SUBSCRIBED AND SWORN to before me by the said
DAVID H. FOSTER, this 18th day of November, 1969.


Notary Public, Dallas County, Texas

BY-LAWS
OF
DATA TRANSMISSION CORPORATION

(A corporation incorporated in the State of Delaware in the year 1968)

ARTICLE I
OFFICES

Section 1. Registered Office. The registered office shall be in the city of Wilmington, County of New Castle, State of Delaware.

Section 2. Other Offices. The Corporation may also have offices at such other places both within and without the State of Delaware as the board of directors may from time to time determine or the business of the corporation may require.

ARTICLE II

MEETINGS OF STOCKHOLDERS

Section 1. Meetings. Meetings of stockholders for any purpose may be held at such time and place, within or without the State of Delaware, as shall be stated in the notice of the meeting or in a duly executed waiver of notice thereof.

Section 2. Annual Meeting. Annual meetings of stockholders shall be held between March 1 and July 31, at such time and place as the Board of Directors by resolution shall determine, at which meeting the shareholders shall elect by a plurality vote a board of directors, and transact such other business as may properly be brought before the meeting.

Section 3. Notice of Annual Meeting. Written notice of the annual meeting shall be given to each stockholder entitled to vote

thereat at least ten days before the date of the meeting.

Section 4. List of Stockholders. A complete list of the stockholders entitled to vote at any election of directors, arranged in alphabetical order and showing the address of each stockholder and the number of voting shares held by each, shall be prepared by the officer in charge of the stock ledger and shall be filed at the place where the election is to be held or at another place within the city, town or village where the election is to be held (which place, if other than the meeting place, shall be specified in the notice of the meeting) at least ten (10) days before such election, and shall at all times prior to the election during the usual hours for business, and during the whole time of said election, be open to examination and inspection of any stockholder.

Section 5. Special Meeting. Special meetings of the stockholders, for any purpose or purposes, unless otherwise prescribed by statute or by the certificate of incorporation, may be called by the President and shall be called by the President or Secretary at the request in writing of a majority of the board of directors, or at the request in writing of stockholders owning a majority in amount of the entire capital stock of the corporation issued and outstanding and entitled to vote. Such request shall state the purpose or purposes of the proposed meeting.

Section 6. Notice of Special Meeting. Written notice of a special meeting of the stockholders, stating the time, place and object thereof, shall be given to each stockholder entitled to vote thereat, at least ten days before the date fixed for the meeting.

Section 7. Business At Special Meeting. Business transacted at any special meeting of stockholders shall be limited to the purposes stated in the notice.

Section 8. Quorum. The holders of a majority of the stock issued and outstanding and entitled to vote thereat, present in person or represented by proxy, shall constitute a quorum at all meetings of the stockholders for the transaction of business except as otherwise provided by statute or by the certificate of incorporation. If however, such quorum shall not be present or represented at any meeting of the stockholders, the stockholders entitled to vote thereat, present in person or represented by proxy, shall have power to adjourn the meeting from time to time, without notice other than announcement at the meeting, until a

quorum shall be present or represented. At such adjourned meeting at which a quorum shall be present or represented, any business may be transacted which might have been transacted at the meeting as originally notified.

Section 9. Voting. When a quorum is present at any meeting, the vote of the holders of a majority of the stock having voting power present in person or represented by proxy shall decide any question brought before such meeting, unless the question is one upon which by express provision of the statutes or of the certificate of incorporation, a different vote is required, in which case such express provision shall govern and control the decision of such question.

Section 10. Proxy. Except as provided in the certificate of incorporation, each stockholder shall at every meeting of the stockholders be entitled to one vote in person or by proxy for each share of the capital stock having voting power held by such stockholder. No proxy shall be voted on after three years from its date, unless the proxy provides for a longer period, and, except where the transfer books of the corporation have been closed or a date has been fixed as a record date for the determination of its stockholders entitled to vote, no share of stock shall be voted on at any election for directors which has been transferred on the books of the corporation within twenty days next preceding such election of directors.

Section 11. Consent of Stockholders in Lieu of Meeting. Whenever the vote of stockholders at a meeting thereof is required or permitted to be taken for or in connection with any corporate action, the meeting and vote of stockholders may be dispensed with: (1) if all of the stockholders who would have been entitled to vote upon the action if such meeting were held shall consent in writing to such corporate action being taken; or (2) on the written consent of the stockholders having not less than the percentage of the total number of votes as may be authorized in the Certificate of Incorporation of the corporation; provided that in no case shall the written consent be by the holders of stock having less than the minimum percentage of the total vote required by statute for the proposed corporate action, and provided that prompt notice is given to all stockholders of the taking of corporate action without a meeting and by less than unanimous written consent.

ARTICLE III

DIRECTORS

Section 1. Number of Directors. The number of directors shall be the number fixed from time to time by resolution of the board of directors; provided that the number shall not be less than three (3) nor more than fifteen (15). Unless otherwise provided in the certificate of incorporation, the directors shall be elected annually and each director shall continue in office until his successor shall have been elected and qualified, or until his death, or until he shall resign, or shall have been removed for adequate cause. Directors need not be stockholders.

Section 2. Vacancies. Vacancies and newly created directorships resulting from any increase in the authorized number of directors may be filled by a majority of the directors then in office, though less than a quorum, and the directors so chosen shall hold office until the next annual election and until their successors are duly elected and shall qualify, unless sooner displaced.

Section 3. Management of Business. The business of the corporation shall be managed by its board of directors which may exercise all such powers of the corporation and do all such lawful acts and things as are not by statute or by the certificate of incorporation or by these by-laws directed or required to be exercised or done by the stockholders.

Section 4. Meetings. The board of directors of the corporation may hold meetings, both regular and special, either within or without the State of Delaware.

Section 5. Annual Meeting. The first meeting of each newly elected board of directors shall be held immediately following the meeting of stockholders at which such directors were elected, or be fixed by the vote of the stockholders at the annual meeting and no notice of such meeting shall be necessary to the newly elected directors in order legally to constitute the meeting, provided a quorum shall be present. In the event such meeting is not held immediately following the annual meeting, or at the time and place so fixed by the stockholders, the meeting may be held at such time and place as shall be specified in a notice given as hereinafter provided for special meetings of the board of directors, or as shall be specified in a written waiver signed by all of the directors.

Section 6. Regular Meeting. Regular meetings of the board of directors shall be held without special notice at such time and at such place as shall from time to time be determined by the board.

Section 7. Special Meeting. Special meetings of the board of directors may be called by the Chairman of the Board or by the President, or, on the written request of two directors, by the Secretary on twenty four hours' notice to each director either personally or by mail or telegram.

Section 8. Quorum. At any stated or special meeting of the board of directors a majority of the directors at the time in office (but not less than one-third of the whole board) shall constitute a quorum for the transaction of business and the act of a majority of the directors present at any meeting at which a quorum is present shall be the act of the board of directors except as may be otherwise specifically provided by statute or by the certificate of incorporation. In the absence of a quorum a majority of the directors present may adjourn any meeting from time to time until a quorum is present. No notice of any adjourned meeting need be given.

Section 9. Committees of Directors. The board of directors may, by resolution adopted by affirmative vote of a majority of the whole board, appoint one or more committees, including, but not limited to, an executive committee, each committee to consist of two or more of the directors of the corporation. At any meeting of the committees a majority of the members of the committee shall constitute a quorum for the transaction of business, and the act of a majority of the members present at any meeting at which a quorum is present shall be the act of the committee. Any such committee or committees, other than the executive committee, appointed by the board of directors shall have and may exercise only the power of recommending action to the board of directors and of carrying out and implementing any instructions or any policies, plans and programs theretofore approved and adopted by the board of directors. The executive committee shall, during the intervals between meetings of the board of directors, have and may exercise all of the powers of the board of directors in the management of the business and affairs of the corporation, including the election or appointment of officers of the corporation (other than the President, Secretary and Treasurer), and may authorize the seal of the corporation to be affixed to all papers which may require it. Meetings of the

executive committee may be called and notices given in the same manner as calling and giving notice of special meetings of the board of directors. The committees shall keep regular minutes of their proceedings and report the same to the board of directors, when required.

Section 10. Compensation of Directors. The directors may be paid their expenses, if any, of attendance at each meeting of the board of directors and may be paid a fixed sum for attendance at each meeting of the board of directors or a stated salary as a director. No such payment shall preclude any director from serving the corporation in any other capacity and receiving compensation therefor. Members of special or standing committees may be allowed like compensation for attending committee meetings.

ARTICLE IV

NOTICES

Section 1. Form of Notice. Notices to directors and stockholders shall be in writing and delivered personally or mailed to the directors or stockholders at their addresses appearing on the books of the corporation. Notice by mail shall be deemed to be given at the time when the same shall be mailed. Notice to directors may also be given personally and by telegram.

Section 2. Waiver. Whenever any notice is required to be given under the provisions of the statutes or of the certificate of incorporation or of these by-laws, a waiver thereof in writing, signed by the person or persons entitled to said notice, whether before or after the time stated therein, shall be deemed equivalent thereto.

ARTICLE V

OFFICERS

Section 1. In General. The elected officers of the corporation shall be a President, one or more Vice Presidents, with or without such descriptive titles as the board of directors shall deem appropriate, a Secretary, a Treasurer, and a Controller, and, if the board of directors so elects, a Chairman of the Board. The board of directors by resolution may also appoint one or more

Assistant Secretaries, Assistant Treasurers, Assistant Controllers and such other officers and agents as from time to time may appear to be necessary or advisable in the conduct of the affairs of the corporation. Any two or more offices may be held by the same person except the offices of President and Secretary.

Section 2. Election. The board of directors at its first meeting after each annual meeting of stockholders shall elect and appoint the officers to fill the positions designated in Section 1 of this Article V.

Section 3. Salaries. The salaries of all elected officers of the corporation shall be fixed by the board of directors.

Section 4. Term of Office and Removal. The officers of the corporation shall hold office until their successors are chosen and qualify. Any officer elected or appointed by the board of directors may be removed at any time by the affirmative vote of a majority of the whole board of directors. Any vacancy occurring in any office of the corporation by death, resignation, removal or otherwise shall be filled by the board of directors.

Section 5. Chairman of the Board. The Chairman of the Board shall preside when present at all meetings of the board of directors. He shall advise and counsel the President and other officers of the corporation, and shall exercise such powers and perform such duties as shall be assigned to or required of him from time to time by the board of directors.

Section 6. President. The President shall be the chief executive officer of the corporation, and, subject to the provisions of these by-laws, shall have general supervision of the affairs of the corporation and shall have general and active control of all its business. He shall preside, when present, at all stockholders meetings, except as may otherwise be provided by statute, and, in the absence of any other person designated thereto by these by-laws, at all meetings of the board of directors and the executive committee, respectively. He shall have general authority to execute bonds, deeds and contracts in the name of the corporation and to affix the corporate seal thereto; to sign stock certificates; to cause the employment or appointment of such employees and agents of the corporation as the proper conduct of operations may require, and to fix their compensation, subject to the provisions of these by-laws; to remove or suspend any employee or agent who shall have been employed or appointed

under his authority or under authority of an officer subordinate to him; to suspend for cause, pending final action by the authority which shall have elected or appointed him, any officer subordinate to the President, and, in general, to exercise all the powers usually appertaining to the office of president of a corporation, except as otherwise provided in these by-laws. In the absence of the President, his duties shall be performed and his powers may be exercised by such other officer as he shall designate in writing or (failing such designation) by the executive committee, subject, in either case to review and superseding action by the board of directors.

Section 7. Vice Presidents. The several Vice Presidents shall perform all such duties and services as shall be assigned to or required of them from time to time by the board of directors, the executive committee or the President.

Section 8. Secretary. The Secretary shall attend all meetings of the board of directors and all meetings of the stockholders and record all proceedings of the meetings of the stockholders of the corporation and of the board of directors in a book to be kept for that purpose, and shall perform like duties for the standing committees when required. He shall give, or cause to be given, notice of all meetings of the stockholders and meetings of the board of directors. He shall be under the supervision of the President and shall perform such other duties as may be prescribed by the President. He shall have charge of the seal of the corporation and have authority to affix the same to any instrument requiring it, and when so affixed, it shall be attested by his signature or by the signature of the Treasurer or an Assistant Secretary, which may be in facsimile. He shall keep and account for all books, documents, papers and records of the corporation except those for which some other officer or agent is properly accountable. He shall have authority to sign stock certificates, and shall generally perform all the duties usually appertaining to the office of the secretary of a corporation.

Section 9. Assistant Secretaries. Assistant Secretaries in the order of their seniority, unless otherwise determined by the board of directors, shall assist the Secretary, and in the absence or disability of the Secretary, perform the duties and exercise the powers of the Secretary. They shall perform such other duties and have such other powers as the board of directors may from time to time prescribe.

Section 10. Treasurer. The Treasurer shall be the chief financial officer of the corporation and shall have active control of and shall be responsible for all matters pertaining to the finances of the corporation and its subsidiaries. He shall have charge of all matters pertaining to taxation and insurance. He shall have the care and custody of all monies, funds and securities of the corporation and shall deposit all monies and other valuable effects in the name of and to the credit of the corporation in such depositories as may be designated by or pursuant to resolution of the board of directors. He shall cause to be recorded a statement of all receipts and disbursements of the corporation in order that proper entries may be made in the books of account. He shall have the power to sign stock certificates, to endorse for deposit or collection, or otherwise, all checks, drafts, notes, bills of exchange, or other commercial paper payable to the corporation, and to give proper receipts or discharges for all payments to the corporation. He shall be responsible for all terms of credit granted by the corporation and for the collection of all its accounts. The Treasurer shall be under the supervision of the President and he shall perform such other duties as may be prescribed by the President. If required by the board of directors, the Treasurer shall give the corporation a bond in such sum and with such surety or sureties as shall be satisfactory to the board of directors for the faithful performance of the duties of his office and for the restoration to the corporation, in case of his death, resignation, retirement or removal from office, of all books, papers, vouchers, money and other property of whatever kind in his possession or under his control belonging to the corporation. He shall report to the board of directors and to the executive committee when requested by the President on any and all financial matters not normally the responsibility of the Controller.

Section 11. Assistant Treasurers. The Assistant Treasurers, in the order of their seniority unless otherwise determined by the board of directors, shall assist the Treasurer, and in the absence of disability of the Treasurer, perform the duties and exercise the powers of the Treasurer. They shall perform such other duties and have such other powers as the board of directors may from time to time prescribe.

Section 12. Controller. The Controller shall be the chief accounting officer of the corporation and its subsidiaries and shall be responsible for all matters pertaining to the accounts of the corporation, its subsidiaries and divisions, with

the supervision of the books of account, their installation, arrangement, and classification. He shall maintain adequate records of all assets, liabilities, and transactions; shall audit all payrolls and vouchers for payment by the corporation and all documents pertaining to such vouchers; see that an adequate system of internal audit thereof is currently and regularly maintained; coordinate the efforts of the company's independent public accountants in its external audit program; receive, review, and consolidate all operating and financial statements of the corporation and its various departments and subsidiaries; and, prepare financial statements, reports and analyses. He shall have supervision of the accounting practices of the corporation and of each subsidiary and division of the corporation, and shall prescribe the duties and powers of the chief accounting personnel of the subsidiaries and divisions. He shall cause to be maintained an adequate system of financial control through a program of budgets, financial planning and interpretive reports. He shall initiate and enforce measures and procedures whereby the business of the corporation and its subsidiaries and divisions shall be conducted with the maximum safety, efficiency, and economy. He shall prepare a monthly report covering the operating results and financial position of the corporation, its subsidiaries and divisions. The Controller shall be under the supervision of the President and he shall perform such other duties as may be prescribed by the President.

Section 13. Assistant Controllers. The Assistant Controller, in the order of their seniority unless otherwise determined by the board of directors, shall assist the Controller, and in the absence or disability of the Controller, perform the duties and exercise the powers of the Controller. They shall perform such other duties and have such other powers as the board of directors may from time to time prescribe.

Section 14. Indemnification. (a) The corporation shall indemnify any person who was or is a party or is threatened to be made a party to any threatened, pending or completed action, suit or proceeding, whether civil, criminal, administrative or investigative (other than an action by or in the right of the corporation) by reason of the fact that he is or was a director, officer, employee or agent of the corporation, or is or was serving at the request of the corporation as a director, officer, employee or agent of another corporation, partnership, joint venture, trust or other enterprise, against expenses (including attorneys' fees), judgments, fines and amounts paid in settlement

actually and reasonably incurred by him in connection with such action, suit or proceeding if he acted in good faith and in a manner he reasonably believed to be in or not opposed to the best interests of the corporation, and, with respect to any criminal action or proceeding, had no reasonable cause to believe his conduct was unlawful. The termination of any action, suit or proceeding by judgment, order, settlement, conviction, or upon a plea of nolo contendere or its equivalent, shall not, of itself, create a presumption that the person did not act in good faith and in a manner which he reasonably believed to be in or not opposed to the best interests of the corporation, and, with respect to any criminal action or proceeding, had reasonable cause to believe that his conduct was unlawful.

(b) The corporation shall indemnify any person who was or is a party or is threatened to be made a party to any threatened, pending or completed action or suit by or in the right of the corporation to procure a judgment in its favor by reason of the fact that he is or was a director, officer, employee or agent of the corporation, or is or was serving at the request of the corporation as a director, officer, employee or agent of another corporation, partnership, joint venture, trust or other enterprise against expenses (including attorneys' fees) actually and reasonably incurred by him in connection with the defense or settlement of such action or suit if he acted in good faith and in a manner he reasonably believed to be in or not opposed to the best interests of the corporation and except that no indemnification shall be made in respect of any claim, issue or matter as to which such person shall have been adjudged to be liable for negligence or misconduct in the performance of his duty to the corporation unless and only to the extent that the Court of Chancery or the court in which such action or suit was brought shall determine upon application that, despite the adjudication of liability but in view of all the circumstances of the case, such person is fairly and reasonably entitled to indemnity for such expenses which the Court of Chancery or other court shall deem proper.

(c) To the extent that a director, officer, employee or agent of the corporation has been successful on the merits or otherwise in defense of any action, suit or proceeding referred to in subsections (a) and (b), or in defense of any claim, issue or matter therein, he shall be indemnified against expenses (including attorneys' fees) actually and reasonably incurred by him in connection therewith.

(d) Any indemnification under subsections (a) and (b) (unless ordered by a court) shall be made by the corporation only as authorized in the specific case upon a determination that indemnification of the director, officer, employee or agent is proper in the circumstances because he has met the applicable standard of conduct set forth in subsections (a) and (b). Such determination shall be made (1) by the board of directors by a majority vote of a quorum consisting of directors who were not parties to such action, suit or proceeding, or (2) if such a quorum is not obtainable, or, even if obtainable a quorum of disinterested directors so directs, by independent legal counsel in a written opinion, or (3) by the stockholders.

(e) Expenses incurred in defending a civil or criminal action, suit or proceeding may be paid by the corporation in advance of the final disposition of such action, suit or proceeding as authorized by the board of directors in the manner provided in subsection (d) upon receipt of an undertaking by or on behalf of the director, officer, employee or agent to repay such amount unless it shall ultimately be determined that he is entitled to be indemnified by the corporation as authorized in this section.

(f) The indemnification provided by this section shall not be deemed exclusive of any other rights to which those indemnified may be entitled under any by-law, agreement, vote of stockholders or disinterested directors or otherwise, both as to action in his official capacity and as to action in another capacity while holding such office, and shall continue as to a person who has ceased to be a director, officer, employee or agent and shall inure to the benefit of the heirs, executors and administrators of such a person.

(g) The corporation may purchase and maintain insurance on behalf of any person who is or was a director, officer, employee or agent of the corporation, or is or was serving at the request of the corporation as a director, officer, employee or agent of another corporation, partnership, joint venture, trust or other enterprise against any liability asserted against him and incurred by him in any such capacity, or arising out of his status as such, whether or not the corporation would have the power to indemnify him against such liability under the provisions of this section.

ARTICLE VI

CERTIFICATES REPRESENTING STOCK

Section 1. Form of Certificates. Every holder of stock in the corporation shall be entitled to have a certificate, signed by, or in the name of the corporation by, the President or Vice President and the Treasurer or an Assistant Treasurer or the Secretary or an Assistant Secretary of the corporation, certifying the number of shares owned by him in the corporation. If the corporation shall be authorized to issue more than one class of stock, the designations, preferences and relative, participating, optional or other special rights of each class and the qualifications, limitations or restrictions of such preferences and/or rights shall be set forth in full or summarized on the face or back of the certificate which the corporation shall issue to represent such class of stock; provided, however, except as otherwise provided by statute in lieu of the foregoing requirements, there may be set forth on the face or the back of the certificate which the corporation shall issue to represent such class or series of stock, a statement that the corporation will furnish without charge to each stockholder who so requests, the designations, preferences and relative, participating, optional or other special rights of each class of stock or shares thereof and the qualifications, limitations or restrictions of such preferences and/or rights.

Section 2. Facsimile Signatures. Where a certificate is signed (1) by a transfer agent or an assistant transfer agent or (2) by a transfer clerk acting on behalf of the corporation and a registrar, the signature of any such President, Vice President, Treasurer, Assistant Treasurer, Secretary or Assistant Secretary may be a facsimile. In case any officer or officers who have signed, or whose facsimile signature or signatures have been used on, any such certificate or certificates shall cease to be such officer or officers of the corporation whether because of death, resignation or otherwise, before such certificate or certificates have been delivered by the corporation such certificate or certificates may nevertheless be adopted by the corporation and be issued and delivered as though the person or persons who signed such certificate or certificates or whose facsimile signature or signatures have been used thereon had not ceased to be such officer or officers of the corporation.

Section 3. Lost Certificates. The board of directors may direct a new certificate or certificates to be issued in place

of any certificate or certificates theretofore issued by the corporation alleged to have been lost or destroyed, upon the making of an affidavit of that fact by the person claiming the certificate of stock to be lost or destroyed. When authorizing such issue of a new certificate or certificates, the board of directors may, in its discretion and as a condition precedent to the issuance thereof, require the owner of such lost or destroyed certificate or certificates, or his legal representative, to advertise the same in such manner as it shall require and/or to give the corporation a bond in such sum as it may direct as indemnity against any claim that may be made against the corporation with respect to the certificate alleged to have been lost or destroyed.

Section 4. Transfer of Stock. Upon surrender to the corporation or the transfer agent of the corporation of a certificate for shares duly endorsed or accompanied by proper evidence of succession, assignment or authority to transfer, it shall be the duty of the corporation to cause a new certificate to be issued to the person entitled thereto, the old certificate to be cancelled and the transaction to be recorded upon its books.

Section 5. Record Date. The board of directors may fix in advance a date, not exceeding fifty, preceding the date of any meeting of stockholders, or the date for the payment of any dividend, or the date for the allotment of rights, or the date when any change or conversion or exchange of capital stock shall go into effect, or a date in connection with obtaining the consent of stockholders for any purpose, as a record date for the determination of the stockholders entitled to notice of, and to vote at, any such meeting, and any adjournment thereof, or entitled to receive payment of any such dividend, or to any such allotment of rights, or to exercise the rights in respect of any such change, conversion or exchange of capital stock, or to give such consent, and in such case such stockholders and only such stockholders as shall be stockholders of record on the date so fixed shall be entitled to such notice of, and to vote at, such meeting and any adjournment thereof, or to receive payment of such dividend, or to receive such allotment of rights, or to exercise such rights, or to give such consent, as the case may be notwithstanding any transfer of any stock on the books of the corporation after any such record date fixed as aforesaid. The stock transfer books of the corporation shall not be closed in connection with the taking of such record.

Section 6. Registered Stockholders. The corporation shall be entitled to recognize the exclusive right of a person registered on its books as the owner of shares to receive dividends, and to vote as such owner, and to hold liable for calls and assessments, a person registered on its books as the owner of shares, and shall not be bound to recognize an equitable or other claim to or interest in such share or shares on the part of any other person, whether or not it shall have express or other notice thereof, except as otherwise provided by the laws of Delaware.

Section 7. Stock Options and Agreements. Any stockholder of this corporation may enter into agreements giving to any other stockholder or stockholders or any third party an option to purchase any of his stock in the corporation; and such shares of stock shall thereupon be subject to such agreement and transferable only upon proof of compliance therewith, provided, however, that a copy of such agreement be filed with the corporation and reference thereto placed upon the certificates representing said shares of stock.

ARTICLE VII

GENERAL PROVISIONS

Section 1. Dividends. Dividends upon the capital stock of the corporation subject to the provisions of the certificate of incorporation, if any, may be declared by the board of directors at any regular or special meeting, pursuant to law. Dividends may be paid in cash, in property, or in shares of the capital stock, subject to the provisions of the certificate of incorporation.

Section 2. Reserves. Before payment of any dividend, there may be set aside out of any funds of the corporation available for dividends such sum or sums as the directors from time to time, in their absolute discretion, think proper as a reserve or reserves to meet contingencies, or for equalizing dividends, or for repairing or maintaining any property of the corporation, or for such other purpose as the directors shall think conducive to the interest of the corporation and the directors may modify or abolish any such reserve in the manner in which it was created.

Section 3. Annual Statement. The board of directors shall present at each annual meeting and when called for by a vote of the stockholders at any special meeting of the stockholders, a full and clear statement of the business and condition of the corporation.

Section 4. Checks. All checks or demands for money and notes of the corporation shall be signed by such officer or officers or such other person or persons as may from time to time be designated by or pursuant to resolution of the board of directors.

Section 5. Fiscal Year. The fiscal year of the corporation shall be fixed by resolution of the board of directors.

Section 6. Seal. The corporate seal shall have inscribed thereon the name of the corporation, the year of its organization and the words "Corporate Seal, Delaware". The seal may be used by causing it or a facsimile thereof to be impressed or affixed or reproduced or otherwise.

ARTICLE VIII

AMENDMENTS

Section 1. Amendments. These by-laws may be altered or repealed at any regular meeting of the stockholders or of the board of directors or at any special meeting of the stockholders or of the board of directors if notice of such alteration or repeal be contained in the notice of such special meeting. No change of the time or place of the meeting for the election of directors shall be made within sixty days next before the day on which such meeting is to be held, and in case of any change of such time or place, notice thereof shall be given to each stockholder in person or by letter mailed to his last known post office address at least twenty days before the meeting is held.

OWNERSHIP OF OTHER RADIO STATIONS

The applicant does not own or control either directly or indirectly, through stock ownership, contract, or otherwise, any radio stations licensed by the Commission.

The applicant's parent corporation, University Computing Company, owns through its wholly owned subsidiary, Microwave Transmission Corporation, the following radio stations in the Domestic Public Point-to-Point Microwave Radio Service:

Call Sign	Location	License No.
KVU78	Broadcast Peak, Calif.	4675-C1-ML-68
KVH57	San Bruno Mountain, Calif.	893-C1- L-69
KTR45	Bakersfield, Calif.	4340-C1- P-69
		6860-C1- L-67
KTR46	Frazier Mt., Calif.	4341-C1- P-69
		6861-C1- L-67
KNL77	Calandra Pk., Calif.	5949-C1-ML-68
KNL46	Mt. Chual, Calif.	5950-C1-ML-68
KNL31	Fremont Pk., Calif.	3704-C1- R-66
KNK60	Mt. Lowell, Calif.	188-C1- R-66
		7880-C1-ML-66
KPZ25	Jump-Off Joe Butte, Wash.	1524-C1-M -68
KPR32	Ravens Roost, Wash.	757-C1-ML-70
KPR33	Mission Ridge, Wash.	758-C1-ML-70
KOY40	Ephrata, Wash.	4717-C1-ML-68

The applicant's parent corporation, University Computing Company, owns through its wholly owned subsidiary, Microwave Transmission Corporation, the following radio stations in the Safety and Special Radio Services Bureau, Business Radio Services:

Call Sign	Business Radio	Location
KDE47	Control	Ephrata, Wash.
KDE48	Fixed Relay	Mission Ridge, Wash.
KBR472	Base	Mission Ridge, Wash.

EXHIBIT NO. 7

KF4665	Mobile	Grant, Yakima, Wash.
KDO326	Base-Mobile	San Luis Obispo, Calif.
KDO327	Mobile Relay	Fremont Peak, Calif.
KK3719	Mobile	Salinas, Calif.
KXU65	Control	Salinas, Calif.

SCHEDULE OF PROPOSED CHARGES¹

SWITCHED SERVICE MONTHLY CHARGES²

1. 150 BPS SERVICE

Service Availability Charge (includes 4,000 data units)	\$20./Mo.
Usage Charge	0.5¢/data unit
Local	9/data units/min.
Regional	16/data units/min.
Digital Communications Console	\$15/Mo.
Installation Charge ³	\$25

2. 4800 BPS SERVICE

Service Availability Charge (includes 5,000 data units)	\$25/Mo.
Usage Charge	0.5¢/data unit
Local	23/data units/min.
Regional	39/data units/min.
Digital Communications Console	\$15/Mo.
Installation Charge	\$25

3. 9600 BPS SERVICE

Service Availability Charge (includes 6,000 data units)	\$30/Mo.
Usage Charge	0.5¢/data unit
Local	42/data units/min.
Regional	70/data units/min.
Digital Communications Console	\$15/Mo.
Installation Charge	\$25

4. 14.4 KBPS SERVICE

Service Availability Charge (includes 8,000 data units)	\$40/Mo.
Usage Charge	0.5¢/data unit
Local	56/data units/min.
Regional	94/data units/min.
Digital Communications Console	\$15/Mo.
Installation Charge	\$25

1. Local and regional usage charges listed for information purposes. The application in its present form, seeks authorization to provide interstate services only.
2. The following dedicated line services will be offered as market demand requires: 150 bps; 4,800 bps; 9,600 bps; 14.4 kbps; 40.8 kbps.
3. The installation charge is a one-time charge for installation of service, and provides for the installation of the Digital Communication Console if connected at the time of installation of service.

DESCRIPTION OF SERVICEGeneral Service Concept

The applicant's proposed system is designed to efficiently and economically meet the present and future data transmission needs of the public. The proposed system will provide nationwide electronically-controlled circuit switched communications service on an interstate basis. These services will be offered on a common carrier basis and designed specifically for subscribers having a requirement to transmit digital information quickly and reliably. The applicant will also offer dedicated line services as required by market demand.

A subscriber will be afforded a choice of several classes of switched service (i.e. speed of transmission) and ancillary features which will accommodate his data transmission requirements. The proposed system is capable of a wide variety of speeds of transmission and is designed to meet not only present but future demands of the public.

Every subscriber will utilize a communication console, a communication channel, and, in the case of switched service, share the electronically-controlled circuit switch. The following characteristics are design goals of the proposed system:

High Reliability: The system is designed to provide an error rate probability of less than 10^{-7} , a goal that will result in an average of no more than one error during transmission of 10 million bits of data.

Rapid Connection: Regardless of origin and destination, the subscriber will receive, upon a valid request, a completed transmission path within 3 seconds after receipt of the last character identifying the destination.

Grade of Service: The subscriber will encounter no more than an average of three busy indications in one hundred call attempts during busy periods. Outside of busy periods, a network busy condition will occur far less frequently.

In addition to these service characteristics, the following service features will be offered to enhance the services.

Abbreviated Calling: This feature allows for the dialing of an abbreviated number of digits to obtain a connection to the destination.

Broadcasting: This feature allows for a mode of broadcasting to a maximum of seven compatible terminals simultaneously.

Manual or Automatic Addressing: This feature allows a subscriber either to dial the

the required address manually or to utilize an automatic dialing device.

In addition, it will be the applicant's policy to publish service standards as part of its filed tariff. To assure compliance with these standards, system tests will be conducted periodically, and the results will be supplied to the applicable regulatory bodies.

Service Offerings

The following service offerings are proposed for use by subscribers on the applicant's network.

Switched Service

150 bps

4800 bps

9600 bps

14.4 kbps

It is also contemplated that the following dedicated line services will be offered as market demand requires: 150 bps; 4800 bps; 9600 bps; 14.4 kbps; and 40.8 kbps.

Interconnection and Subscriber-Provided Equipment

While the applicant's proposed data transmission system will provide end-to-end service, it is recognized that some subscribers may wish the flexibility which would result from the interconnection of the applicant's system with a private network or with an existing common carrier. In these circumstances, subscribers will exercise their independent judgements regarding both the selection of ancillary terminal equipment and the interfacing with other systems.

The applicant's policy will be to encourage the interconnection of its system with other communications carriers and with other authorized communications entities, in order to make available continuous service to all locations and to augment the capability of the system to meet particular demands. Interconnection will be subject only to the requirement that the arrangement is not in violation of any law and that it meets relevant technical standards. Appropriate specifications will be published to insure that interconnection is not technically harmful to the applicant's system.

Sharing Provisions

In the filed tariff, the applicant will provide for sharing of lines and terminals to meet

the public demand. The sharing provisions will enable subscribers to share a terminal for access to the applicant's switched network as well as to share the use of a dedicated channel between two points. It is anticipated that these sharing provisions will extend the availability of the applicant's services to potential markets which might not, because of economic reasons, be able to justify utilization of the proposed services on an individual user basis.

PHILOSOPHY OF CHARGES FOR SWITCHED SERVICE

General

The charges for the proposed services are intended to illustrate the applicant's basic rate structure and philosophy. Subsequently, a specific tariff will be presented to the Commission with information required to support the rate structure.

The monthly recurring charges for each of the four speed classes of switched service consist of a fixed service charge, a usage charge, and a digital communications console charge. The fixed charge is a "service availability" charge for providing and maintaining the subscriber with a local access line and an included amount of data units. A data unit is defined as the basic unit of usage measurement to which charges are applicable. A variable number of data units per increment of chargeable time applies depending on whether a call is local or regional and depending on the class of service.

For billing purposes, usage is determined by measuring the holding time of the originating terminal and is recorded automatically in increments of one-tenth of a minute (6 seconds) at the serving District Office. Aggregate monthly usage measured in time is then converted to equivalent data units and the appropriate rate per data unit is applied to determine the subscriber's bill.

150 bps Switched Service - Two-way Simultaneous Transmission (Full Duplex)

A fixed charge of \$20 is applicable to each 150 bps switched terminal. This is a service availability charge which includes up to 4,000 data units. For all usage in excess of the included data units during any monthly billing period at a 150 bps switched terminal, the usage charge is determined according to the following schedule:

RATE
0.5¢ per data unit (DU)

Rate Application

Local	9 DU per minute or fraction
Regional	16 DU per minute or fraction

The monthly charge for the digital communications console is \$15.

The installation charge is \$25.

4800 bps Switched Service - Two-way Simultaneous Transmission (Full Duplex)

A fixed charge of \$25 is applicable to each 4800 bps switched terminal. This is a service availability charge which includes up to 5,000 data units. For all usage in excess of the included data units during any monthly billing period at a 4800 bps switched terminal, the usage charge is determined according to the following schedule:

RATE
0.5¢ per data unit (DU)

Rate Application

Local	23 DU per minute or fraction
Regional	39 DU per minute or fraction

The monthly charge for the digital communications console is \$15.

The installation charge is \$25.

9600 bps Switched Service - Two-way Simultaneous Transmission (Full Duplex)

A fixed charge of \$30 is applicable to each 9600 bps switched terminal. This is a service availability charge which includes up to 6,000 data units. For all usage in excess of the included data units during any monthly billing period at a 9600 bps switched terminal, the usage charge is determined according to the following schedule:

RATE
0.5¢ per data unit (DU)

Rate Application

Local	42 DU per minute or fraction
Regional	70 DU per minute or fraction

The monthly charge for the digital communications console is \$15.

The installation charge is \$25.

14.4 kbps Switched Service - Two-way Simultaneous Transmission (Full Duplex)

A fixed charge of \$40 is applicable to each 14.4 kb switched terminal. This is a service availability charge which includes up to 8,000 data units. For all usage in excess of the included data units during any monthly billing period at a 14.4 kbps switch terminal, the usage charge is determined according to the following schedule:

RATE

0.5¢ per data unit (DU)

Rate Application

Local 56 DU per minute or fraction

Regional 94 DU per minute or fraction

The monthly charge for the digital communications console is \$15.

The installation charge is \$25.

RATE DEVELOPMENT

General Considerations

The applicant's basic objective in terms of rate development is to optimize the effective capability of the proposed digital transmission network. This objective includes incorporating advanced technology as it develops, sustaining a high rate of innovation, and effectively using capital and manpower to distribute services at as low a cost and price as practical. To meet this broad objective, the applicant will utilize sound innovative rate philosophies in setting the rates on the individual service which will be offered.

The applicant will seek an objective rate of return on the aggregate of its services, and will design a total rate structure which should produce revenues fully covering all costs, as well as the objective rate of return. It is imperative to identify the cost responsibility of each service in order to design this kind of total rate structure. Costs will include both directly assignable and common cost elements. Directly assignable costs are those which are directly associated with the provision of a service or a segment thereof. Common costs are those which are related to functions shared by more than one service such as sales, administrative and similar expenses. These latter costs are allocated on an equitable basis to insure that revenues will cover total costs, and also that components of costs are fairly distributed over the various services.

The applicant recognizes that principles of good rate development dictate that factors in addition to fully allocated costs must be incorporated into the rate philosophy. One of the most important variables in structuring specific rates for services is market demand (See Exhibit No. 14). The applicant's system will be offering a range of services which provide subscribers with several alternatives. The growth of services and competition in this area will increase due to growth in (a) general information exchange, (b) more and more specialized communications offerings, and (c) rapidly advancing technology.

The applicant recognizes that sound rate philosophy includes an understanding of the value of promotional pricing techniques to the general rate payer, as well as to the applicant. An example might be the formulation of an off-peak rate which would generate revenue not attainable without the provision of this rate. The proper application of promotional pricing techniques results in a lower level of rates for the other rate payers served by the applicant.

In summary, the present appraisal of the market indicates that all of the major services which the applicant will offer, when priced on a fully allocated cost basis, including the objective after - tax rate of return on capital, will bring the benefits of new technology to the general public.

Switched Service

The switched service rate concept was developed by carefully combining the important technical, marketing and financial considerations so that the service would be profitable to the applicant and yet still be price attractive in the market place. The switched service the applicant will offer has been structured into four classes to satisfactorily serve major data communications requirements. The resulting rate structure, with its fixed or minimum charge, the inclusion of some amount of usage, and a variable charge based on additional usage, achieves a simplified pricing form which should encourage full use of the system and gain early subscriber acceptance.

Usage Charge Philosophy

Within each service class, usage charges vary with the duration and distance involved for each message or connection. Traditional usage charges have thus embodied two variable elements - duration (lapsed time or word units) and distance (rate squares or rate areas-rate zones). Because of the manner in which the proposed system has been engineered, the costs associated with distance are reduced to two basic categories - intra DO calls and inter DO calls. Thus while recognizing the time and distance variables in sample rates, the applicant's system is designed in such a way as to minimize those cost elements that vary as a function of distance.

The minimum unit for measuring usage has been defined as 6 seconds. Switched philosophy utilized in the proposed system can easily accommodate lesser or greater measuring units in order that the pricing philosophy can be totally responsive to market demands.

Revenue Requirements

As previously stated in this Exhibit, the applicant's objective is to optimize the effectiveness of its digital transmission plant. This objective can only be realized by incorporation of the latest technology, by innovation, and by efficiently using available capital resources. From a financial standpoint, the applicant must generate sufficient income to satisfy these objectives, not only to sustain a healthy rate of growth and to maintain financial stability, but to encourage potential sources of capital investment. In short, the applicant must meet its revenue requirements.

The technology requisite to successful operation by the applicant, of its proposed system, has already evolved. Trained managerial and technical personnel are available, and a receptive market awaits the service. The applicant can, through its proposed charges, meet its revenue requirements.

OTHER BUSINESS INTERESTS

The applicant is engaged in no business activities other than those of a communications common carrier.

The applicant's parent, University Computing Company, is primarily engaged in the business of operating a computer utility network and providing data processing services, computer software services and other professional services related to the use of computer equipment in commercial, industrial, governmental and educational institutions. It also develops, manufactures and sells peripheral input and output devices and visual display devices for computer systems, and leases computer equipment. In addition, the applicant's parent is engaged, through wholly-owned unconsolidated subsidiaries, in the business of writing property, casualty, and life insurance.

University Computing Company employs the term "computer utility" as a corporate expression in order to emphasize the universal usefulness of its computer systems and services to all classes of users. The term is not used nor can it be construed to connote that its computer systems and services should be offered as a regulated service.

The computer service industry is a highly competitive industry. It includes a substantial number of large companies - including computer manufacturers - rendering services the same as or similar to the services rendered by the University Computing Company. Such companies include major industrial companies which have divisions rendering these services, seeking contracts for their own technical staffs to augment internal operations, or attempting to derive revenue from the sale of excess time on computers. In addition, there are a number of companies organized and operating for the sole purpose of rendering some or all of the services rendered by University Computing Company. Moreover, included among the companies offering services the same as or similar to the services rendered by University Computing Company are both wholly owned and affiliated subsidiaries of communications common carriers offering both interstate and intrastate communications services and facilities to the public.

The applicant's parent will keep separate and distinct its business activities from those of the applicant (See Exhibit No. 6). In this respect, the applicant will employ its own

personnel well acquainted with common carrier operations, rules and procedures and adopt separate accounting rules and regulations approved by the Commission (See Exhibit No. 13). In summary, the applicant and University Computing Company propose to separate their respective business and other activities.

Attached hereto as Attachment A is a list of all companies affiliated with the University Computing Company. None of these companies except Microwave Transmission Corporation (See Exhibit No. 12) will be combined or integrated with the applicant's common carrier operations.

AFFILIATED COMPANIES

The following table lists all subsidiaries of the applicant's parent, and, by indentation, the immediate parent of each subsidiary. Except where otherwise indicated, the applicant's parent owns, directly or indirectly, all of the voting stock of each subsidiary.

<u>Name</u>	<u>Nature of Business</u>
Carter Systems Consultants, Inc., Dallas, Texas	Computer Business Applications for Municipalities
Computer Bureau (Shannon), Ltd., Republic of Ireland	Large Scale Key Punch
Computer Industries, Inc.,* Sherman Oaks, Calif.	Manufacture of Peripheral Computer Equipment
Computer Instrumentation, Ltd., Hampshire, England	Manufacture of Peripheral Computer Equipment
C.I. Data Centre, Ltd., Hampshire, England	Computer Business Applications
Datel of California, Inc., McLean, Va.	Manufacture of Peripheral Computer Equipment
Datel of Wyoming, Inc., McLean, Va.	Manufacture of Peripheral Computer Equipment
Computer Leasing Company** Washington, D.C.	Leasing of Computers and Peripheral Computer Equipment
Alcorn Combustion Company New York City, N.Y.	Manufactures and Sales of Heat Transfer Equipment
Alcorn Combustion Company of Canada, Ltd., Toronto, Ont., Canada	Manufacture and Sales of Heat Transfer Equipment
Alcorn Combustion Company, Ltd., London, England	Manufacture and Sales of Heat Transfer Equipment
Alcorn Corporation Chanute, Kans.	Manufacture and Sales of Heat Transfer Equipment
Alcorn Italiana S.P.A. Milan, Italy	Manufacture and Sales of Heat Transfer Equipment
Alcorn S.A.R.L. Paris, France	Manufacture and Sales of Heat Transfer Equipment

*Approximately 85% owned as of September 5, 1969.

**Approximately 53% owned as of September 5, 1969.

<u>Name</u>	<u>Nature of Business</u>
Becco, Inc., Houston, Texas	Manufacture and Sales of Heat Transfer Equipment
Bell Equipment Corp., New York City, N.Y.	Sales and Rentals of Material Handling Equipment
Bell Caribbean, N.V. Netherlands, Antilles	Sales and Rentals of Material Handling Equipment
Bell Eastern Corporation Yonkers, N.Y.	Sales and Rentals of Material Handling Equipment
Bell International, S.A.R.L. Paris, France	Sales and Rentals of Material Handling Equipment
Bell Overseas, Inc., Wilmington, Del.	Rentals of Material Handling Equipment
Bell Equipment Corp. de Puerto Rico Ponce, Puerto Rico	Rentals of Material Handling Equipment
Canadian Bellequip, Ltd., Montreal, Quebec, Can.	Sales and Rentals of Material Handling Equipment
Hayes Statistical Service, Inc., Chicago, Ill.	Computer Business Applications
Hunter Associates, Inc., Dallas, Texas	Professional Computer- Related Engineering Services
Hunter Industrial Management Dallas, Texas	Professional Computer- Related Engineering Services
Keystone Computer Associates, Inc., Ft. Washington, Penn.	Computer Programming and Systems Design
James A. Lewis Engineering Co., Ltd., Calgary, Alberta Canada	Professional Computer- related Engineering Services
James A. Lewis Engineering, Inc., Dallas, Texas	Professional Computer- related Engineering Services
Lewis Operating Corporation Dallas Texas	Management and Operation of Producing Oil and Gas Properties
Management Communications Consultants, Inc., Los Angeles, California	Advertising

<u>Name</u>	<u>Nature of Business</u>
D. R. McCord and Associates, Inc., Dallas, Texas	Computer Applications for the Petroleum Industry
Compania Computadora Universitaria de Venezuela, C. A. Caracas Venezuela	Computer Applications for the Petroleum Industry
Microwave Transmission Corporation Falls Church, Va.	Microwave Common Carrier
Mortgage Systems Co. Dallas, Texas	Mortgage Loan Applications
UCC Financial Corporation Dallas, Texas	Holding Company
Gulf Atlantic Life Insurance Company Dallas, Texas	Life Insurance
Gulf Computer Services, Inc., Dallas, Texas	Computer Business Applications for Insurance Industry
Gulf Insurance Company Dallas, Texas	Property and Casualty Insurance
Atlantic Insurance Company Dallas, Texas	Property and Casualty Insurance
Select Insurance Company Dallas, Texas	Property and Casualty Insurance
Rives, Massey & Hedges, Inc. Atlanta, Georgia	General Insurance Agency
Western Credit Corporation (Nevada) Las Vegas, Nevada	Finance
Western Credit Corporation (Oklahoma) Dallas, Texas	Insurance Premium Financing
Western Security Life Insurance Company Dallas, Texas	Life Insurance
UCC International, Inc., Dallas, Texas	Data Processing Service Computer Software Services Professional Services related to use of computers outside of the United States.
ACI Automation Center International AG Zurich, Switzerland	Business Applications
AC-Service Gesellschaft fur Automatische Datenverarbeitung mbH (Austria)	Computer Business Applications

<u>Name</u>	<u>Nature of Business</u>
AC Service Gesellschaft fuer Automatische Datenverarbeitung mbH (Germany) Dusseldors Germany	Computer Business Applications
Automation Center AG Elektronische Datenverarbeitung Wettingen, Switzerland	Computer Business Applications
Automation Center S.A. (Belgium) Brussels, Belgium	Computer Business Applications
Automation Center S.A. (France) Paris, France	Computer Business Applications
Automation Center S.p.A. Milano, Italy	Computer Business Applications
University Computing Company (Nederland) N.V. The Hague, The Netherlands	Computer Business Applications
UCC International Trade S.A. Dallas, Texas	Purchase and sale of new and used computer equipment in Europe
UCC Realty Company Dallas, Texas	Leasing and Management of Real Estate
University Computing Company (Great Britain) Limited Birmingham, England	Computer Utility and Computer Business Applications

In addition, University Computing Company owns, directly or indirectly, approximately 49% of the outstanding common stock of Academy of Computer Technology, Inc., in Dallas, Texas, which is in the business of operating schools offering vocational training in the use of computing systems, technical applications and computer programming. University Computing Company is one of two 50% stockholders of Computer Marketing Corporation, which sells data processing tapes and other supplies.

Note: Plans were announced on September 5, 1969, whereby University Computing Company would acquire 100% ownership of Computer Leasing Company and Computer Industries, Inc. The agreement and plans of merger were executed on October 15, 1969.

FINANCIAL QUALIFICATIONSSummary

System plant investment will cost approximately \$349 million when completed. Financing will total \$306 million providing funds for the complete trunk and spur component, switch component and 70% of the local distribution component of the system. The remaining \$43 million, all of which is local distribution component investment, will be financed from revenues received from initial operation of the system.

Equity financing of approximately \$136 million will be provided by the applicant's parent, University Computing Company. Debt financing of approximately \$170 million will be provided with the underwriting and other assistance of applicant's investment bankers with interim construction financing provided from applicant's commercial bankers.

Construction of the system will proceed immediately upon granting of the required construction permits. First revenues will be realized approximately 18 months after construction begins. Through that portion of the construction period prior to the receipt of any revenues, total cash outlays for the project will total \$170 million, including \$140 million in plant assets. Funding for this phase will consist of equity investment by University Computing Company and interim debt financing.

During the first year of operation, an additional \$120 million cash outlay will be required, including \$74 million for additional plant assets. This requirement will be met from an additional \$90 million of equity and debt financing, and from first year operational revenues of approximately \$30 million.

At the end of the first year of operation, an additional \$46 million of equity and debt financing will be made available for completing local distribution investment. Revenues will provide funds for the remaining plant investment.

Construction of the initial system will be completed approximately 5 years after granting of the construction permits, and approximately 3 years after revenues on the system are first realized.

Although a rapid build-up of revenues is desirable because of extremely large initial investment in operating plant, the applicant will be capable of operating without the benefit of revenues during the first 12 months after the initial portion of the system is placed in operation.

Operating revenues will exceed cash operating expenses by the end of the first year of operation.

Plant Investment

Investment in the operating system will be \$340 million (trunk and spurs, switching offices, and local distribution). An additional \$9 million will be invested in vehicles, leasehold improvements, and other assets. Attachment A to this Exhibit shows the investment of these assets.

Economic Feasibility

Pro-forma financial statements have been compiled by the applicant which reflect the investment in operating plant and which show the revenues and expenses which will occur from the operation of the system. These pro-forma statements were examined by the applicant's independent economist, investment banker, commercial banker, and outside consultants to determine the reasonableness of the financial and operating assumptions used in their composition. The applicant has been assured that the statements reflect a reasonable forecast of the financial requirements, equity and debt financing, and subsequent operation of the system. The independent economist's opinion appears as Attachment B to this Exhibit.

Financing Opportunities

The applicant will finance the system with equity investment from University Computing Company and from long-term debt to be arranged through the applicant's investment banker. Commercial banking sources will provide interim financing for construction in progress. The applicant has considered other sources of financing from equipment suppliers and short-term bank borrowing. However, these sources are not relied upon in the financial plan presently envisioned.

Capital Structure

Pro-forma financial statements for the project have been compiled using a debt/equity ration of 50/50 at a maximum. While a more liberal approach could be taken by using more debt, the applicant believes that in the initial phases of the project higher equity percentages are warranted. As the system continues to develop and expand with additional investment in later years, a greater percentage of debt could be used.

Equity Financing

University Computing Company by resolution of its Board of Directors has made a firm commitment to furnish the funds necessary for the equity portion of the system financing. This resolution appears as Attachment C to this Exhibit.

With present system configuration, the equity investment will total \$136 million. The equity investment is shown in Attachment D to this Exhibit.

University Computing Company, with the assistance of its investment banker, will provide the necessary equity funds through a plan which will be finalized at the time the funds are needed. University Computing Company's source of these funds may be any one or a combination of public or private issuance of common stock, other equity-type securities or long term-debt. The consolidated balance sheet of University Computing Company and Subsidiaries as of September 30, 1969, is included as Attachment E to this Exhibit.

Debt Financing

Debt financing for the project will total \$170 million. In considering the proposed financing, the applicant's investment banker and commercial banker have had the benefit of the commitment of University Computing Company to provide equity financing, the debt/equity ratio of 50/50 in the initial stages of operation, and pro-forma financial statements.

The unprecedented size of the debt financing has made it impractical to obtain firm financial commitments at this time. However, letters from the applicant's investment banker and commercial banker, included as Attachments F and G respectively, to this Exhibit, indicate the feasibility of this financing as well as their expressed interest in financing the project upon granting of the construction permits.

Financial Implementation

By the end of 1969, the applicant will have spent approximately \$2 million in development of the proposed system. This includes staff costs and expenditures for system design, market research, engineering, and management consulting.

By the time construction permits are awarded, a minimum of \$5 million will have been expended on development. An additional \$3 million is expected to be expended on pre-construction engineering and advanced switch development. In total, the applicant will have at risk a minimum of \$8 million prior to receiving the construction permits.

At the time permits are granted construction will begin. Construction of the nationwide trunk system is scheduled to be complete in 18 months. At this time a total of \$170 million will have been spent on development and start-up expenses, plant, and working capital.

Initial revenues from the system will be realized upon completion of the following system elements: the cross country trunking system, spur system to fourteen cities, one district switching office, and local distribution facilities to provide service to subscribers in those cities.

During the first year of operation, twenty-one additional cities will be reached by the trunk and served by the system. Additional investment of \$120 million will be required for plant, working capital, and operating expenses during this first year of operation.

At the end of the first year of operation the final increment of financing will be available for the continued construction of the system.

Revenues of approximately \$30 million are forecast for the first year of operation of the system. However, the applicant is fully prepared to operate the system without recourse to revenues during the first 12 months.

After the first year of operation, \$140 million will be used for the remaining plant construction and working capital. Of this amount \$46 million will be provided from the remaining equity and debt financing with the balance of \$94 million provided from system operation.

Financial Forecasting

Applicant has developed a computerized econometric financial planning model to forecast and plan operating revenues and expenses, and to create pro-forma financial statements. Market, operating and financial alternatives and assumptions may be inserted into the model to determine rapidly the financial impact of the various factors involved in constructing, implementing, and operating the system. The applicant will use this tool to optimize the utilization of investment in the system to provide the greatest service at the lowest feasible cost.

CUMULATIVE PLANT INVESTMENT
(\$000's)

	YEAR* 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
Trunk & Spurs	1,500	87,558	114,313	114,313	114,313	114,313
District Switches	1,500	11,047	28,176	49,228	59,999	59,999
Regional Switches				1,353	5,072	5,072
Local Distribution			21,532	84,349	140,549	160,970
Vehicles		428	915	1,404	1,836	2,272
Other Assets	<u> </u>	<u>4,200</u>	<u>6,340</u>	<u>6,340</u>	<u>6,340</u>	<u>6,340</u>
TOTAL	3,000	103,233	171,276	256,987	328,109	348,966

* Schedule assumes construction permits granted at end of year no. 1

ATTACHMENT A
to EXHIBIT NO. 10

RICHARD B. JOHNSON
6535 MEADOW CREEK DRIVE
DALLAS, TEXAS 75240
AC 214 239-6028

ATTACHMENT B
to EXHIBIT NO. 10

November 18, 1969

Data Transmission Company
1300 Frito Lay Tower
Dallas, Texas 75235

Gentlemen:

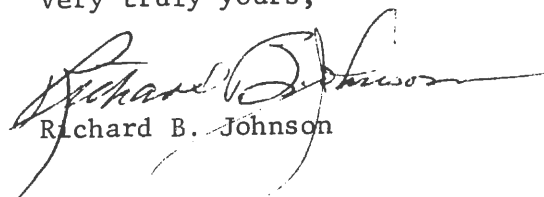
My qualifications and experience as an economist, financial and market analyst, and business consultant are stated in a vita attached to this letter as Exhibit "A".

At your request, I have investigated the economic practicability and financial feasibility of a proposed nation-wide data transmission system for the construction and operation of which you intend to apply for requisite authority to the Federal Communications Commission. In connection with my investigation, I have interviewed your principal officers, studied the description of the system and its proposed operation, reviewed your financial projections, and conferred with your several technical, business and financial consultants. I have sought in those ways to determine the adequacy of the market research, the validity of the operating assumptions, and the supportability of rate structures upon which your financial projections have been based. In these studies I have drawn upon my experiences in consultations with other communication common carriers concerning matters relevant to issues of public interest, rate structures, costs and market performance.

It is my opinion based on my investigation that the system as proposed is economically feasible; i.e., that it can be constructed and operated at costs which will permit services to be offered at attractive rates, that the market will be receptive and the market response large enough to permit the system as proposed to be operated at efficient levels, and that revenues will be produced which create an attractive and feasible undertaking from a financial point of view. This conclusion is based on the following conditions whose validity I have not had the opportunity to verify independently, or concerning which I am not equipped to make technical judgments, but which appear to have been given adequate consideration in your plan:

1. That the system described is technically feasible and that it can be developed without reliance on patents whose use may be restricted.
2. That the cost of equipment and its installation which is assumed in your system cost estimates is approximately accurate.

Very truly yours,


Richard B. Johnson

RBJ:ng
Encl.

BIOGRAPHICAL INFORMATION

RICHARD BUHMANN JOHNSON

Born: Galveston, Texas: August 18, 1913

Married: Four children

Education: University of Texas -- BA (1934), MA (1936), Ph.D. (1940)

Post-graduate work--University of Virginia and Leland
Stanford University; Ford Faculty Fellowship SMU (1954-55)

1936-38 Assistant to Comptroller, American National Insurance Co.
1938-42 Instructor and Assistant Professor, University of Arkansas
1942 Regional Business Consultant, U. S. Department of Commerce
1942-44 Research Economist, Federal Reserve Bank of Dallas
1944-46 Ensign and Lt. J. G., U. S. Navy
1946 Financial Advisor, AFPACM SCAP Japan Headquarters
1946-48 Senior Economist, Federal Reserve Bank of Dallas
1948-68 Chairman, Dept. of Economics, & Professor of Economics, SMU
1953-54 Ford Faculty Fellow

At present: Chairman, Financial Administration Institute and Professor
of Economics and Finance, Southern Methodist University
Director, The Southwestern Graduate School of Banking
Director, Metropolitan Data Bank for Dallas-Fort Worth
Metropolitan Area;
Director, Assemblies for Bank Directors

Memberships: Southwestern Social Science Association
American Economic Association
Phi Beta Kappa
Southern Economic Association
American Finance Association
Southern Finance Association

Directorships: Bank of Dallas
Exchange Savings and Loan Association, Dallas, Texas
Southwestern Investors, Inc., and Southwestern Investment
Growth Fund, Dallas, Texas
Trinity National Bank of Dallas (Advisory)

Consultant: American Telephone and Telegraph Company
South Central Bell Telephone Company
Air Transport Association
Oak Cliff Savings and Loan Association, Dallas
Richardson Savings and Loan Association
Dallas Federal Savings and Loan Association
Fort Worth Savings and Loan Association
Equitable Savings and Loan Association, Fort Worth

Research Interests: Capital Policy, Capital Markets and Capital Allocation
Regional Economic Structures and Development
Financial Market Structures and Trends

Publications: Thesis: The Effects of Severance Taxation Upon the Petroleum Industry in Texas, The University of Texas, June 1936

Dissertation: The Legal Reserve Life Insurance Industry in the United States: An Appraisal of its Operations and Proposals for Reform. The University of Texas, August 1943

Scholarly Journal and Professional Bulletin Articles:

"The Cost of Legal Reserve Life Insurance," University of Arkansas, Reprinted from the Southern Economic Journal, Vol. VIII, No. 3, January 1942

"The Housing Problem--Consideration of Some of its Aspects", Monthly Business Review of the Federal Reserve Bank of Dallas, Vol. 31, No. 8, August 1, 1946

"Some Observations on the Cotton Situation," Monthly Business Review of the Federal Reserve Bank of Dallas, Vol. 31, No. 10, October 1, 1946

"The Petroleum Industry and the Southwest," Monthly Business Review of the Federal Reserve Bank of Dallas, Vol. 32, No. 3, March 1, 1947

"The Ports of Texas--A Resource of the Southwest," Monthly Business Review of the Federal Reserve Bank of Dallas, Vol. 32, No. 9, September 1, 1947

"The European Recovery Program and its Effects upon the Southwest," Monthly Business Review of the Federal Reserve Bank of Dallas, Vol. 33, No. 2, February 1, 1948

"Disposal and Utilization of War Manufacturing Facilities in the Southwest," Monthly Business Review of the Federal Reserve Bank of Dallas, Vol. 33, No. 3, March 1, 1948

"Group Banking in Dallas County, Texas," Southwestern Social Science Quarterly, Vol. XXXI, No. 3, December, 1950
(With Dr. Warren Law)

"Conflicts in Monetary and Fiscal Policy," Southwestern Social Science Quarterly, Vol. XXXII, No. 1, June, 1951

"The University in an Expedient World," The McNeese Review, Spring, 1955, Vol. 7

"Capital Budgeting and the Allocation of Resources," The Southern Economic Journal, October 1955

"Corporate Retention of Earnings and Tax Policy," The Southern Journal of Business, April 1966

Monographs:

The Banking and Fiscal Systems of Japan, Military government monograph prepared for staff assistance in the occupation of Japan. CASA, 1945

"Banking and Economic Problems in _____,"
(A series of monographs on regional economic problems, senior economist in charge of industrial and economic sections--eight monographs.) Federal Reserve Bank of Dallas 1947-48

Market Studies:

The Braniff States of America: Analyses of economic developments in the area served by Braniff International Airlines, a series of five, 1949-53

Inter-American Trade-Aid; a brochure appraising inter-American trade potential, 1950. Published and distributed by Braniff

Brochures for the City of Odessa; a series of five illustrating living conditions, industrial potential, market areas, etc., 1950-51, published and distributed by Odessa Chamber of Commerce

The Dallas Retail Market and Factors Selecting Against Downtown Stores; a research monograph prepared for the confidential use of The Dallas Times Herald, and Dallas retailers, June 1952

The Admission Tax Problem and the Motion Picture Theater: An Analysis of the Effects of the Federal Admission Tax on the Motion Picture Theater Industry, 1947-53, a brochure published by the Allied Theater Owners for submission to the U. S. Congress, March 1953 (with Dr. Bill Zentz)

"The Wynnewood Market," published as a brochure, August, 1954

"The Lochwood Market," An analysis of the economic and sociological factor affecting the Dallas market--published as a brochure June 1955

"Market Projections for the Dallas-Fort Worth Area," published as a brochure July 15, 1956

"Wichita Falls as a Retail Market and the Suitability of Two Sites for Development as Shopping Centers," CALL FIELD ROAD CENTER, published as a brochure by Mr. Shom P. Cunningham, September 1956

"The Irving Retail Market and the Potential for a Shopping Center in the Central City," published as a brochure, September 28, 1957

"The Bachman Center," An analysis of the North Dallas Metropolitan Retail Market and the appropriate development of a regional shopping center on the Bachman site, published as a brochure, February 1959

"The Economic Potential of El Paso as a Convention City," published as a brochure, August 1962

"A Downtown Hotel for El Paso, Texas, Estimates of Demand and Projection of Operations," published as a brochure, June 14, 1963

Bank Charter Studies:

Application for a State Chartered Bank, the Inwood State Bank, an economic analysis of need and potential prepared for the Mercantile National Bank of Dallas Spring 1951

"A Bank for the Oak Lawn-Lemmon Section of the Dallas Metropolitan Area. The Trade Area and its Potential for the Proposed Bank," published as a brochure, July 5, 1961

"The Need for a Second Bank in Plano, Texas," published as a brochure, October 1961

"The Market Potential and Effects of a National Bank in Euless Texas. The Proposed City National Bank of Euless," published as a brochure, February 12, 1962

"The Potential of a Bank Located in the Hillside Village or Environs in Dallas, Texas," published as a brochure, May 20, 1962

"The Potential of a Bank Located to Serve the Wedgwood Area of Fort Worth, Texas," published as a brochure, July 2, 1962

"The Market for a Bank in the Northwest Oak Cliff Area in Dallas, Texas," published as a brochure, October 6, 1962

"Economic and Financial Developments and the Effect of a Third Bank Proposed for Grand Prairie," published as a brochure, March 1963

"The Potential of a Bank Located Near the Intersection of Forest and Marsh Lanes in Dallas, Texas," published as a brochure, March 15, 1963

"Athens, Texas, and Henderson County as a Market for a Savings and Loan Association," published as a brochure, June 24, 1963

Biographical Information
Richard B. Johnson
Page 5

"The Market of the Proposed Abilene National Bank, Abilene, Texas," published as a brochure, August 7, 1963

1964-68

Similar Bank and Savings and Loans Chamber-market studies for Irving, Lancaster, Garland, Hurst, Richardson, Corpus Christi, Longview, Beaumont, Fort Worth, Galveston and Houston. Market location valuations for Richardson, Dallas and Fort Worth.

Land Use and Other Studies:

"El Paso - Economic Plan for the Use of 115 Acres of Airport Property," 1958. Privately published brochure

"Galveston, A Program for Economic Development," prepared for the City of Galveston, 1963. Privately published brochure

"Economic Plan for the Use of 103 Acres in Central Albuquerque," 1965. Privately published brochure

"Valuation of Beach Properties and South Padre Island." Prepared in connection with condemnation procedures for the specified properties, 1968


"Pricing of Selected Communication Services." Prepared for and presented to the Federal Communications Commission, 1967 and 1968. Revised November 1968

SECRETARY'S CERTIFICATE

THE STATE OF TEXAS §
 § KNOW ALL MEN BY THESE PRESENTS
COUNTY OF DALLAS §

That I, ELDON R. VAUGHAN, Secretary of University Computing Company, do hereby certify that a meeting of the Board of Directors of University Computing Company was held on the 17th day of November, 1969, pursuant to the bylaws of the Company, at which meeting all members of the Board of Directors were present; that at said meeting the attached resolutions were duly passed; that said resolutions have not been modified, amended or rescinded.

IN WITNESS WHEREOF, I set my hand and seal of office this 18th day of November, 1969.



Eldon R. Vaughan, Secretary

SUBSCRIBED AND SWORN to before me by the said ELDON R. VAUGHAN on this 18th day of November, 1969.



Notary Public, Dallas County, Texas

WHEREAS, this Corporation is the owner of all the issued and outstanding capital stock of Data Transmission Company ("DATRAN"), and

WHEREAS, the officers of DATRAN have advised this Corporation of their intention to file application with the Federal Communications Commission for the requisite authority to construct and operate a nationwide data transmission system, at a cost of approximately Three Hundred Seventy-Five Million Dollars (\$375,000,000.00), and

WHEREAS, the officers of DATRAN have requested this Corporation to express its plans, intentions and commitments with regard to said application and the prosecution thereof, the financing of said system, and the organizational and operational structure of DATRAN and its relationship to this Corporation.

NOW, THEREFORE, be it resolved as follows:

1. That this Corporation will support the prosecution of the aforesaid application by providing to DATRAN all necessary technical, financial and managerial resources until DATRAN is in a position to furnish the same on its own behalf.
2. That this Corporation will provide to DATRAN through appropriate loans, advances, or capital investments, all the necessary funds for the construction and operation of the aforesaid system, other than those funds which are planned to be loaned, advanced or invested by other persons in accordance with the financing plan presented at this meeting.
3. That promptly upon receipt of the requisite authority to construct and operate the aforesaid system, this corporation will take such necessary steps to assure that:
 - (a) A majority of the Board of Directors of DATRAN will be persons who are neither officers nor directors of this Corporation or any other corporation, other than DATRAN, directly or indirectly controlled by this Corporation, and
 - (b) No officer or director of this Corporation shall be any officer of DATRAN other than Chairman of the Board of Directors, and
 - (c) That the business of DATRAN shall be carried on as autonomously and independently from the business of this Corporation as may be practicable, consistent with this Corporation's financial interest therein, and specifically, that the communications services proposed to be offered by DATRAN shall be offered and furnished to this Corporation,

or any corporation directly or indirectly controlled by this Corporation, if at all, on a basis and at tariffs or rates no more favorable than those enjoyed by any other user of such services.

4. That DATRAN is authorized to file this resolution as an exhibit to the aforesaid application to the Federal Communications Commission as evidence of the plans, intentions, and commitments of this Corporation.

CUMULATIVE SYSTEM FINANCING
(\$000's)

	PRIOR TO YEAR 1	YEAR* 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
EQUITY	4,000	5,000	61,000	111,000	136,000	136,000
DEBT	<u>---</u>	<u>5,000</u>	<u>60,000</u>	<u>100,000</u>	<u>148,000</u>	<u>170,000</u>
TOTAL	4,000	10,000	121,000	211,000	284,000	306,000

* Schedule assumes construction permits granted at end of year no. 1.

UNIVERSITY COMPUTING COMPANY and Subsidiaries

CONSOLIDATED BALANCE SHEET
(000's Omitted)

September 30, 1969

ASSETS

Current Assets:

Cash including certificates of deposit	\$ 15,382
Marketable securities (market value at Sept. 30, 1969, approximately \$11 million)	531
Accounts and contracts receivable less allowance for doubtful items	28,587
Inventories	7,784
Other	1,567
Total Current Assets	<u>53,851</u>

Contracts Receivable for Equipment

Rentals	<u>6,083</u>
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Computer and Other Equipment	177,419
Land, Buildings and Improvements	<u>10,942</u>
Total Fixed Assets at Cost	188,361

Less accumulated depreciation and amortization	(33,792)
	<u>154,569</u>

Investment in Unconsolidated Subsidiaries	<u>25,876</u>
---	---------------

Other Assets:

Compensating balances	7,608
Excess of cost over net assets of businesses acquired	18,247
Deferred software and installation costs	5,531
Unamortized debt expense	1,619
Sundry	16,405
	<u>49,410</u>

\$289,789

UNIVERSITY COMPUTING COMPANY and Subsidiaries

CONSOLIDATED BALANCE SHEET
(000's Omitted)

September 30, 1969

LIABILITIES AND SHAREHOLDER'S EQUITY

Current Liabilities:

Notes payable to banks	\$ 18,673
Accounts payable and accrued liabilities . . .	13,412
Income taxes	1,226
Long-term debt due within one year	<u>25,767</u>
Total Current Liabilities	<u>59,078</u>

Deferred Liabilities:

Deferred income taxes	2,811
Other deferred credits	<u>1,614</u>
	<u>4,425</u>

Long-Term Debt Due After One Year:

Equipment purchase and other obligations . . .	87,017
Subordinated debt	<u>25,130</u>
	<u>112,147</u>

Minority Interest in Subsidiaries 15,618

Shareholder's Equity:

Common Stock	70,339
Retained earnings	<u>28,182</u>
	<u>98,521</u>

\$ 289,789

Kidder, Peabody & Co.
Incorporated

Founded 1865

NEW YORK • BOSTON • PHILADELPHIA • CHICAGO
LOS ANGELES • SAN FRANCISCO • ATLANTA • DALLAS

20 EXCHANGE PLACE
NEW YORK, N.Y. 10005

November 19, 1969

Data Transmission Company
1300 Frito Lay Tower
Dallas, Texas

Gentlemen:

At the request of Data Transmission Company (DTC), a wholly-owned subsidiary of University Computing Company (UCC), we have conducted an evaluation of the financial feasibility of your proposed data transmission system.

Kidder, Peabody & Co. Incorporated, founded in 1865, has long been one of the leading investment banking firms in the nation. During the past five years we managed or co-managed public offerings of corporate securities with an aggregate market value exceeding \$4 billion. In the number of negotiated public offerings managed over the past five years we continued to be one of the top five investment banking firms. Our daily contacts with many large and small investing institutions, our extensive trading activities in maintaining markets for all types of corporate securities and our large retail organization keep us in close touch with demands of investors.

We are familiar with the affairs of University Computing Company. Our relationship with UCC goes back to the fall of 1967 when we raised privately approximately \$11 million of new funds through the sale of common stock. Since that time, we have managed in the summer of 1968 a public offering of UCC common stock totaling \$31 million. Furthermore, we have been chosen to manage a \$40 million issue of convertible debentures for UCC.

Our investigation has consisted of interviews with your principal officers, examination of the system description, review of

financial projections supplied by you, conferences with your business and financial consultants and other factors we deem to be relevant.

After consideration of these factors, it is our opinion that the long term financing of your proposed system is feasible provided that the appropriate legal authority for the project is obtained and provided further that the economic and operating assumptions you have utilized have been verified to our satisfaction at that time.

If appointed managing underwriter or agent to arrange such financing, our recommendation as to the precise financing pattern would be predicated on conditions prevailing in the marketplace at that time.

You have our permission to file copies of this letter with your application to the Federal Communications Commission.

Very truly yours,

KIDDER, PEABODY & CO. INCORPORATED

By


Louis D. Miltimore



ATTACHMENT G
to EXHIBIT NO. 10

FIRST NATIONAL CITY BANK

ANTHONY T. ELLIS
VICE PRESIDENT

399 PARK AVENUE, NEW YORK, N. Y. 10022

November 12, 1969

Data Transmission Company
1300 Frito-Lay Tower
Dallas, Texas

Gentlemen:

At your request, we have reviewed the information supplied to us in connection with your plans to construct and operate a nationwide public service data transmission system. In addition to discussing these plans with your principal officers, we have had access to financial projections compiled by you (including pro forma balance sheets and income statements) and the opinions prepared by Dr. Richard Johnson and the investment banking firm, Kidder, Peabody and Co., Inc. We understand that you intend to apply to the Federal Communications Commission for appropriate authority to construct and operate this system.

On the basis of this information and your position as a subsidiary of one of our valued clients, and provided that our Bank is satisfied with the credit considerations of the proposal as, and if, approved by the Commission and that at such time mutually satisfactory terms can be agreed upon, we would welcome an opportunity to act as a major participant in that portion of the related financing which is of a commercial banking nature. In addition to such direct participation and subject to the foregoing, we also would be willing to undertake the arranging of a consortium of commercial bank participants in this financing. We would expect to be advised of your interest in our acting in this capacity on or before January 1, 1972.

You have our permission to file copies of this letter with your application to the Commission.

Very truly yours,

A. T. Ellis

.. MAINTENANCE
AND REPAIR

MAINTENANCE AND REPAIR OF THE SYSTEM

GENERAL

The applicant will establish and implement a maintenance plan designed to enhance the dependability of the network. A complete system reliability analysis has been prepared to assure that operation of the proposed communication system complies with standards dictated by good engineering practices and by the Rules and Regulations of the Commission. The applicant's maintenance organization will require only a brief response time for immediate restoration of service in the event of failure. An adequate number of technically qualified personnel will be employed to maintain and repair the system.

The proposed communications system consists of three distinct, integral elements - trunking, switching and local distribution. Under the maintenance plan, the applicant will institute an overall program for the performance of preventive maintenance on, adjustments to, and periodic, routine inspection of the system. This Exhibit sets forth in general terms the proposed maintenance and repair plan for the system, including an analysis of the plan for each operational element of the system.

As the system is constructed and put into operation, conditions may develop that require modification to or augmentation of the plan to meet maintenance and reliability objectives. These improvements will be made on a continuing basis.

MAINTENANCE AND REPAIR OF THE SYSTEM

TRUNK MAINTENANCE

Organization

The trunking system including spur routes to District Offices is to be maintained by Maintenance Sections, each of which will be responsible for approximately ten microwave stations. The basic complement of personnel for each Maintenance Section is as follows:

Maintenance Supervisor	1
Licensed Field Engineers	3
Mechanic	1
Shop Engineer	1
Supply Clerk	1

Personnel numbers may be varied to meet conditions peculiar to the Section to which they are assigned. For instance, approximately one fourth of the Maintenance Sections have been designated as "remote" by reason of station access time and other related factors. An additional licensed Field Engineer will be assigned to each remote section.

The Maintenance Supervisor will also be a licensed field engineer. Licensed Field Engineers will be responsible for performing periodic routine inspections, preventive maintenance and adjustments to the equipment at the microwave stations. The mechanic's duties include general facilities maintenance as well as maintenance of all section mechanical equipment.

Each Field Engineer will be furnished a vehicle of a type compatible with topographical conditions existing in the portion of the transmission system to which his maintenance responsibilities extend. Although, in most cases the transmission system is readily accessible by all-weather roads, the applicant will nevertheless where appropriate, provide maintenance personnel with four-wheel drive, high axle vehicles to insure mobility and access to the transmission system under the most extreme or adverse weather conditions. All maintenance vehicles will contain appropriate parts and test equipment, and

will be stocked to provide the Field Engineer with the parts needed for proper maintenance and repair of stations except for complex components and assemblies, parts having a low predicted rate of failure, and parts which are extremely fragile.

At the District level, a Maintenance Manager will be provided for each four sections. Maintenance Managers will, in turn, be responsible to, and will be supervised by Regional Supervisors.

Maintenance Stations and Warehouses

Each section will maintain a Section Maintenance Station. Various repairs will be made at the Section Maintenance Station by the Section Shop Engineer. Station repairs will be generally limited to component card and module replacement except in emergency situations.

Parts required more frequently will be stocked at the Section Maintenance Station, and controlled by the Section Supply Clerk. Parts not available in a maintenance vehicle or at the Section Maintenance Station will be kept in inventory at the District Maintenance Warehouse. District Maintenance Warehouse inventories will be stocked directly from the manufacturer.

In emergencies, parts needed at the section level for repair or replacement which are not on hand or available from District Maintenance Warehouse inventory will be made available by the most rapid means possible, including charter aircraft or helicopter.

Maintenance Operations

Requirement for service or repairs may be detected in the course of site visits for routine inspection, preventive maintenance and adjustments to the equipment at the microwave stations. Service requirements may also be signalled by the Order Wire Alarm and Control System (See Exhibit No. 1, Order Wire Alarm and Control). A system outage will be indicated at the alarm point providing surveillance for the section in which the outage occurs.

Twenty-four hour surveillance of alarm displays will be maintained. Maintenance personnel will be notified of a condition requiring maintenance by means of order wire facilities if located at a station, by means of installed two-way mobile radio if located in maintenance vehicles, or by means of telephone if located at home. The Maintenance

Supervisor will maintain a status report of the availability of section maintenance personnel in order to facilitate deployment of personnel to meet system service requirements.

In making personnel assignments, the remoteness of the areas to be covered, and increased travel time required by unpaved highways will all be considered. Field Engineers will be assigned on a roving basis to act, in addition to their regular duties, as substitutes for regularly assigned Field Engineers absent due to illness, vacations, special training or other activities.

A qualified Field Engineer will be made available within minutes after recognition of an outage in the trunking system. Response time will be minimal from the time a fault is indicated on the display at the alarm center to the time a Field Engineer initiates travel to the affected station. Redundancy is provided in the basic design of the system to insure that, except for catastrophic failure, the transmission system will not be in an inoperative status during the time required for the Field Engineer to travel to the station where outage occurs to effect a repair.

Catastrophic Failure

To provide for immediate restoration of service in the event of catastrophic failure or destruction of a station in the transmission system, transportable repeater stations, each completely furnished with power and an erectable antenna, will be available at strategic locations along the route of the transmission system. In addition, module assemblies will also be available on a regional basis to permit rapid restoration of service in those situations where the outage is due to causes apart from destruction of a station.

Control

A system status board will be maintained at the principal operations offices of the applicant to insure that management is aware at all times of the operational status of the trunking and switching system. Details of the system status will be available by visual display and/or teleprinter terminals.

A continuous maintenance analysis program will be maintained to improve system maintenance capabilities and programs. This program will also contribute inputs to the ongoing improvement of transmission facilities by pinpointing the location of recurring deficiencies in the transmission system. Parts consumption, circuit outage, frequency of repair and other factors will be reviewed on a regular basis. Detailed analyses thereof

will provide inputs to programs for purposes of overall system maintenance control.

Personnel

The following number of personnel is proposed for maintenance of the trunking system:

Regional Supervisors	5
Clerical Assistants	5
Maintenance Manager	6
Maintenance Supervisors	26
Field Engineers	83
Mechanics	26
Shop Engineers	26
Supply Clerks	26

MAINTENANCE AND REPAIR OF THE SYSTEM

SWITCH MAINTENANCE

The importance of "demand service" to the data communications industry is ever present in the proposed network. For instance, the installation of redundant equipment at each switching office in order to provide a high degree of systems availability is described in Exhibit No. 1. Further, and to insure the availability of service, each switching office shall have a sufficient number of trained personnel to maintain the system twenty-four hours per day seven days per week.

The major tasks of switching maintenance personnel are to :

- Maintain a continuous monitor of the operating system
- Respond to abnormal occurrences reflected on the real-time systems console
- Effect immediate action to restore service due to equipment malfunction
- Repair and return to back-up service all components having malfunctioned
- Perform preventive maintenance on all equipment at prescribed intervals
- Initiate system diagnostics at scheduled intervals during slack periods.

Organization

For each of the ten switching centers, a complement of twelve trained persons are assigned to monitor and maintain the system. These are divided into four primary categories as follows:

District Office Supervisor (2), supervises and coordinates activities of persons who operate and maintain the communications processors, switching matrix and related peripheral equipments. Assigns personnel and schedules work flow to insure system performance. Develops operating methods in accord with established and/or modified company policies.

Switching Engineer (6), performs remedial and scheduled preventive maintenance on all District/Regional Office equipment. Installs field change orders received from the continuation engineering department and reports operating conditions on a daily basis.

Operator Trainee (3), monitors the daily operation of the switching systems as described by standard operating procedures. Abnormal conditions are reported to a switching engineer for correction. Operator Trainees are responsible for maintaining daily logs reflecting systems operation for use as a statistical guide.

Analyst/Service Order Technician (1), responsibilities include processing new order requirements and/or change in grade of service for present subscribers. This person requires operational and modifications knowledge of the applications software in sufficient detail to permit on-site program modification, including interrelated statistical gathering programs.

Total personnel requirements for District Office switching systems maintenance are as follows:

District Office Supervisors	20
District Office Switch Engineers	60
District Office Operator Trainees	30
District Office Analyst Service Order Technicians	10
Clerical Associates	10
District Office Managers	10

The personnel complement for a Regional Office is identical to that of a District Office. Should a Regional Office be co-located with a District Office (same room), both systems will be maintained by adding four Switching Engineers and two Operator Trainees to the normal District Office personnel complement.

MAINTENANCE AND REPAIR OF THE SYSTEM

LOCAL DISTRIBUTION

Applications for construction of local distribution facilities will be filed at a future date. The plan for maintenance and repair of these facilities will parallel the organization of the trunking and switching maintenance organizations. A detailed plan will accompany the local distribution applications.

PROPOSED OPERATIONGeneral

Under present plans, the applicant will be a wholly-owned but completely separate subsidiary of University Computing Company. University Computing Company will provide the applicant with the necessary technical, financial and managerial resources until the applicant is in a position to furnish the same on its own behalf. A primary objective of the organization, management and operating plans of the applicant is not only to promote and insure a clear separation between University Computing Company and the applicant, but to provide visibility in matters of accounting, rate and tariff formulation, and relationships between the applicant and its subscribers.

Organization

The applicant will have full responsibility for the day-to-day operation of its proposed system. Under present plans, the proposed management of the applicant will be organized into eleven major functions, under the direction and supervision of two Executive Vice Presidents. These officers will be responsible to the President. The proposed organizational structure of the applicant is depicted in Attachment A. The eleven major functions of management are set forth as follows:

- Finance and Control
- Government and Regulatory Affairs
- Employee Relations
- Community and Public Relations
- Corporate Development
- Marketing
- Operations
- Switch Engineering
- Transmission Engineering
- Quality Assurance
- Procurement

The responsibilities of the officers of the applicant, under whose guidance each of the major areas of management are carried out, may be briefly described as follows:

Vice-President, Finance and Control

This officer will be responsible for the three functions of financial planning, financial control, and fiscal receipt and disbursement, to be administered, respectively, by the Vice-President or Assistant Vice-President for Financial Planning, the Controller and the Treasurer. The function of financial planning will assure the orderly commitments to the construction of the system consistent with the applicant's financial resources and responsible planning for the growth of the system. The controller will establish and monitor the system of accounts to assure consistency with regulatory requirements and conservative accounting procedures. The treasurer will maintain suitable depositories for funds and monitor their receipt and disbursement.

Vice President, Government and Regulatory Affairs

This officer will be responsible for developing and maintaining all pricing structures and carrying out policies related to regulatory requirements and corporate goals. This officer will also have responsibility for the acceptance of proposed services and rates by the appropriate regulatory bodies, as well as developing, presenting, and supporting before appropriate regulatory agencies economic data for purposes of establishing new communications service.

Vice President, Employee Relations

This officer will be responsible for the administration, coordination, and supervision of policies relating to all phases of personnel activities. He will also be responsible for recruitment, selection and training procedures necessary to ensure that the applicant has the personnel needed to manage and operate the applicant's proposed system.

Vice President, Community and Public Relations

This officer will be responsible for assuring that the applicant carries on its business in a manner consistent with and contributory to the economic and social welfare of the national, state and local communities in which it operates.

Vice President, Corporate Development

This officer will be responsible for assuring that the future growth and development of the applicant is consistent with the proper construction, implementation and operation

of the system, and that other business interests of the applicant will enhance achievement of that goal.

Vice President, Marketing

This officer will have responsibility for directing the implementation of all marketing plans for services to be offered by the applicant. Included within these responsibilities are research, development and planning for marketing new and needed communication services.

Vice President, Operations

This officer will be responsible for the overall operation of the applicant's proposed system, and will direct and supervise all functions essential to the day to day operation and provision of communication services, including the establishment and implementation of policies and procedures for scheduled preventive and unscheduled emergency maintenance.

Vice President, Switching Systems Engineering

The officer will provide direction, administration, and management for all aspects of the design, assembly, integration, installation and acceptance of the applicant's switching systems. Major areas of responsibility include:

Preparation of systems performance.

Analysis of available equipments including modification.

Switching Systems design and/or performance specification preparation.

Preparation of applications and maintenance software packages.

The preparation of prototype test and acceptance test procedures.

Establishment of maintenance and outage reporting procedures .

Traffic engineering.

Statistical and data reduction as a network monitoring tool.

Continuation engineering to provide improvements to all systems as state-of-the-art advances.

Vice President, Transmission Engineering

The officer will provide direction, administration and management for all aspects of the design, assembly, integration, installation and acceptance of the applicant's trans-

mission system, including microwave, cable multiplexers, and channel equipment. Included among these responsibilities are the following:

Monitoring of contract engineering performance by outside firms for radio path engineering, and interference analysis.

Preparation and presentation of departmental activities to internal and external organizations.

Assessment of potential problems and the correction thereof or the referral of these problems to the proper department or higher management level.

Preparation of cost estimates for microwave transmission facilities and performing path loss calculation for these facilities.

Selection and evaluation of sites for microwave station, based on topographic maps, with on-site verification where needed.

Vice President, Quality Assurance

This officer will provide direction, administration and management for the following quality assurance functions:

Analysis of system's requirements.

Preparation of performance evaluation criteria.

Evaluation of pre-installation test analysis.

Post-installation performance testing.

Continued evaluation of statistical information related to quality assurance and systems performance.

The Quality Assurance function compliments Transmission Engineering and Switching Systems Engineering functions to insure network objectives.

Vice President, Procurement

This officer will have the responsibility for effecting overall procurement of facilities, sites, services and material required for the construction and operation of the proposed system.

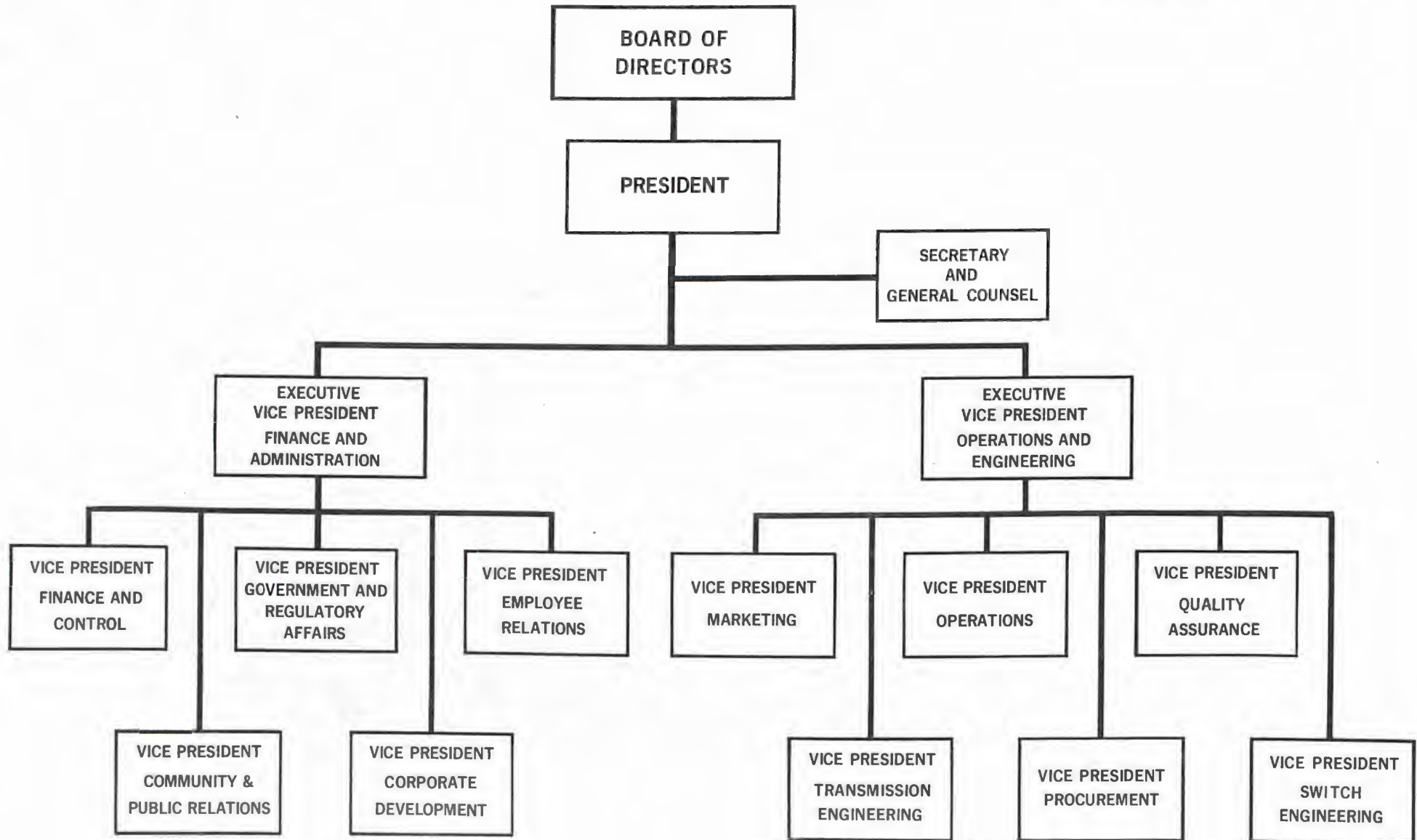
Day to Day Operation

The applicant proposes to institute appropriate new management techniques on a continuing basis in the day-to-day operation of the proposed system to insure that the highest quality of service in the public interest is offered.

The applicant anticipates combining the operations of Microwave Transmission Corporation at some point subsequent to the filing of these applications. Microwave Transmission Corporation is a wholly owned subsidiary of University Computing Company, and is licensed by the Commission to operate microwave common carrier radio stations in the Domestic Public Radio Services in the States of California and Washington. Because of pending private litigation affecting certain of the assets owned by Microwave Transmission Corporation, the applicant is not able at this time to integrate the common carrier operation of Microwave Transmission Corporation into the applicant's proposed operation. However the applicant proposes, when the pending litigation is culminated, to combine the common carrier operations of Microwave Transmission Corporation, with its own, and provide public subscribers of Microwave Transmission Corporation with more efficient management in day to day operation, and improvement in the quality of service.

DATA TRANSMISSION COMPANY PROPOSED ORGANIZATION

ATTACHMENT A



RESPONSIBILITY FOR THE SUPERVISION,
OPERATION, MAINTENANCE AND/OR
CONTROL OF THE PROPOSED FACILITIES

The applicant will have full responsibility for the supervision, operation, maintenance and/or control of the proposed facilities. The applicant will actively control their day to day management and operation.

The applicant's Board of Directors and Officers and key management include persons who have extensive experience and capabilities in the field of data communication. The Board of Directors and Officers are listed as follows:

Charles J. Wyly, Jr. 1300 Frito-Lay Tower Dallas, Texas 75235	Chairman of the Board of Directors
Sam Wyly 1300 Frito-Lay Tower Dallas, Texas 75235	Director
Seymour Joffe Datran Center 1137 Frito-Lay Tower Dallas, Texas 75235	President and Director
Edward A. Berg 6201 Leesburg Pike Falls Church, Virginia 22044	Vice President and Director
David Foster Datran Center 1137 Frito-Lay Tower Dallas, Texas 75235	Vice President, Secretary and Director
Washington Giles Thompson 1300 Frito-Lay Tower Dallas, Texas 75235	Director

In the supervision, operation, maintenance and/or control of the proposed facilities, the applicant will rely upon the experience and capabilities of its management as set forth more fully in Exhibit No. 12.

The applicant is a wholly owned subsidiary of University Computing Company. However, the applicant has been organized to be financially and operationally separate from the business activities of its parent. The applicant will comply with all applicable Rules and Regulations of the Commission, and will adopt the Uniform System of Accounts and other appropriate accounting rules and procedures prescribed by the Commission in conducting

its operations. The applicant's management is either experienced in or acquainted with the operations of common carriers.

The applicant's policy is one of offering, commensurate with its ability and Commission approval and authority, its communications services on an equal and non-discriminatory basis to any party who wishes to subscribe to its services. All services will be offered pursuant to the rules and regulations of prescribed tariffs filed with the Commission which shall guarantee to all subscribers equal and non-discriminatory access to the applicant's communications facilities.

The applicant will offer communications services only. The applicant's principal operates domestically the following large scale computing centers with the equipment shown at their respective locations:

Location	Equipment	Quantity
El Segundo, California	UNIVAC 1108	1
Palo Alto, California	UNIVAC 1108	1
Dallas, Texas	UNIVAC 1108	2
Houston, Texas	UNIVAC 1108	1
Tulsa, Oklahoma	UNIVAC 1108	1
East Brunswick, New Jersey	UNIVAC 1108	1

The applicant's parent's communications requirements are now provided by the present common carriers, and the applicant's parent expends approximately \$360,000.00 annually for communications facilities to serve its computing centers. The applicant estimates that as of December 31, 1968, approximately 47,000 general purpose digital computers were installed and were in operation in the United States. By contrast, the applicant's parent has installed and has in operation only seven large scale general purpose digital computers. Thus if the applicant's parent were desirous of obtaining the communications services which the applicant proposes to offer, such service provided by the applicant to its parent would reach insignificant dimensions. The majority of the applicant's subscribers will, therefore, be unrelated and unaffiliated.

PUBLIC INTEREST CONSIDERATIONS

Currently there is strong public interest in data transmission services. Major economic sectors, individual consumers, and providers of information systems and services in the aggregate constitute a public need which is largely unmet by present common carrier offerings. Furthermore, there is a need for competition in communications to motivate new technological innovations, cost reductions, and efficient allocation of facilities as well as to encourage efforts by the common carriers beyond the simple expansion of current networks to meet growing demand.

To facilitate an understanding of the public need and the way in which the applicant's proposed services will meet these needs, this Exhibit is organized in five sections:

- . Composition of the public interest in data communications
- . Scope and magnitude of specific public needs
- . Features of the proposed system in response to public needs
- . Competition in communications — the public interest
- . Conclusion

In addition, highlights of market research, sponsored by the applicant, relating to current and projected public demand, are outlined in Attachment A to this Exhibit.

1. COMPOSITION OF THE PUBLIC INTEREST IN DATA COMMUNICATIONS

The public interest in data communications is comprised of five major components:

- . Industry, Government, Finance, Not-for-Profit Organizations, and Educational and other Public Institutions
- . Individuals served directly, and indirectly, through the above organizations

- . Providers of information systems and services
- . Other users of the frequency spectrum
- . Benefits to the national economy as a whole

The individual and collective interests in data transmission of these five components of the public interest are described below.

(1) Dynamic Computer-Related Developments Are Spurring Uses for Data Communications Technology

Within the past decade, major advances in data processing technology have focused attention on the entire spectrum of data transmission services. The development of the first viable computer/communications interfaces in the late 1950's and early 1960's fostered a series of pioneering data communications applications such as message switching, airline reservations, and command and control systems.

In 1960 about 8,000 data terminals had been installed — most of these were standard keyboard/teleprinter devices. During the past ten years the number of data terminals has swelled to over 150,000, including such varied types of terminals as Cathode Ray Tubes (CRT's), remote entry devices, digital and graphic plotters, optical/mark scanners, magnetic tape units and a host of special purpose devices. Using these terminals, data communications applications now include order processing, inventory management, time-sharing, information retrieval and other mainstream business, government and institutional systems.

Major economic and social pressures are spurring users to seek faster, less costly and more accurate ways of transporting data. Most businesses are faced with rapidly rising costs, shrinking profit margins, deteriorating customer service and growing domestic and international competition. The federal government, state and local governments and private institutions are striving to

raise socio-economic standards, control the environment, advance scientific and defense efforts, and speed legislative and administrative processes.

In all of these endeavors, the need for access to large amounts of data has been accentuated by the computer's ability to put such data to effective use. The desire and need to increase the scope and magnitude of data communications systems to make this data processing capability more widely available is intensifying rapidly in most organizations. (See Attachment A.)

(2) Each Individual in this Country Ultimately will be Impacted by these Data Communications Uses

As a consumer of the products and services of industry, finance, government, not-for-profit organizations, and educational and other institutions, each individual in this country will enjoy the benefits of faster, lower-cost and more accurate flows of information which will be made possible through improved data transmission capabilities. Examples of specific benefits include:

- . Faster medical diagnoses and other services
- . Greater responsiveness to information inquiries
- . More efficient use of credit
- . Faster settlement of insurance claims
- . Advent of the "checkless" and "certificateless" society
- . Lower cost, more up-to-date publications
- . Improved product design
- . More comprehensive reservation systems for transportation, lodging and entertainment
- . More rapid processing and execution of orders for consumers, contractors and investors
- . Faster delivery and more efficient distribution of goods and services

In addition, many current developmental activities are focused on making computer-related services directly accessible to individuals. The ultimate impact of these developments will be to bring the benefits of the computer inside the home, through data transmission. Some of the more practical applications include:

- . Computer-assisted instruction
- . Remote order entry and catalog buying
- . Real-time opinion sampling, voting, and census taking
- . Computational assistance
- . Personal financial counseling
- . Direct banking services

(3) The Availability Of Efficient Data Transmission Capability Is Needed If The Information Systems And Services Industry Is To Reach Its Full Potential

Impressive advances in computer-related technology have been realized in recent years. These include:

- . Powerful computing and peripheral equipment — expanded memories, larger disks, optical scanners, multiprocessors
- . Low-cost data terminals and portable data recorders — CRT's, digital plotters, remote job entry devices, mini-computers, tape cassettes, facsimile units, and many others
- . Packaged software — compilers, time-sharing logic, applications, compatibility
- . New services — time-sharing, information utilities, data banks, specialized applications.

Despite these advances, the application of many of them to the public interest has been inhibited by the lack of availability of suitable, economical data transmission facilities.

In the public interest, data transmission services must keep pace with these developments to avoid stifling and discouraging the information systems and services industry from developing and applying new technology.

(4) Data Transmission Systems Must Conserve The Frequency Spectrum Through Efficient Utilization of this Vital Natural Resource

An essential element of the public interest is to assure proper utilization of the frequency spectrum, a limited resource which must be used with discrimination.

The proposed system exploits the concepts of digital data transmission and Time Division Multiplexing (TDM) to achieve less wasteful utilization of assigned frequencies. These digital data transmission concepts are best suited to meet the computer-related needs of the public while conserving the frequency spectrum.

(5) The Benefits Of Today's Data Processing/Communications Technology Should Accrue To The Economy And Society As A Whole

The four components of public interest discussed above, when taken collectively, constitute overwhelming interest in the future of data transmission services. The national economy as a whole has enormous financial, physical and natural resources invested in technological research and development activities. A sizeable portion of the return on this investment, in terms of benefits to organizations, individuals, and providers of information systems and services, can be unlocked only with the widespread availability of rapid, accurate and low-cost data transmission services. The applicant's system would signal a new era for the availability of such services.

2. SCOPE AND MAGNITUDE OF SPECIFIC PUBLIC NEEDS

The strong interest of the public in data transmission services manifests itself in major, specific public needs. The scope and magnitude of these needs are described below.

(1) The Basic Public Need Is The Rapid, Accurate, And Low-Cost Transmission Of Data

The application of computer-related technology to industry, finance, government, not-for-profit organizations, and educational and other public institutions, has resulted in data transfer needs which can be organized in five broad categories:

- . Block data transfer — point-of-origin to processing or output point(s)
- . Information retrieval and update — inquiries, man-machine interfaces, dynamic data base maintenance
- . Remote job processing — computer load leveling, remote job entry, substitutes for on-site computers
- . Computing — time-sharing, mathematics, modeling, process control, telemetering
- . Facsimile — graphics, photographs, printed/handwritten copy

These data transfer applications are being developed both in-house by users and by potential providers of information systems and services for ultimate consumption by others. In either case, the economic viability of many of these applications requires the availability of rapid, accurate, low-cost data transmission services.

(2) Current Developments In Major Economic Segments Point Up The Need For Expanded Data Services

The applicant recognizes that there are many ways to approach market demand projections in the dynamic, emerging field of data transmission. From the market research conducted to date, the applicant has focused on six economic segments which demonstrate the magnitude of the total market demand. Figure 1, following this page, shows the commonality of key data transmission applications to these six economic segments. The results of this market research indicate a demand for these six segments of nearly half a million data termination points. Furthermore, since a termination point may serve many individual data terminal/

recording devices, actual demand for terminals will be in excess of this market projection.

Figure 2, following Figure 1, presents a summary of selected industry characteristics and data communications requirements on these six economy segments, for which information was relatively complete and readily available. These segments currently represent about 56% of total installed computers and employ about 20 million Americans (roughly 1/4 of total U. S. employment). Market research performed by the applicant indicates that requirements currently exist for approximately 500,000 communications termination points at about one-fourth of the physical locations of organizations within these economy segments.

These segments provide a cross-section which alone can justify the need for the proposed network, and they are demonstrative of the wide range of existing data communications requirements. The applicant recognizes, however, that actual demand for its proposed services, as a minimum, will derive from these six segments and those additional segments identified in Attachment A to this Exhibit.

Moreover, it is quite possible that the total demand for data communications services will include added economy segments once low-cost, reliable data transmission capabilities become available.

(3) The Current And Projected Needs Of The Major Economic Segments Are Largely Unmet By Existing Common Carrier Offerings

The needs exist in the following areas:

- Low-cost — costs of communications services have not declined in proportion to data processing costs. In fact, frequently they have increased.
- End-to-end compatibility — existing analog transmission systems require costly modulator-demodulator equipment to convert digital signals to analog and back again

FIGURE 1 (1)

KEY DATA TRANSMISSION APPLICATIONS
IN SIX MAJOR ECONOMIC SEGMENTS

Key Data Transmission Applications	Retail Trade	Manufacturing	Processing Industries	Securities	Banking	Insurance
<u>Operating</u>						
. Order Processing	o	o	o	o		
. Production Scheduling and Control		o	o			
. Inventory Management	o	o	o			
. Manpower Planning	o	o	o			
. Process Control/Telemetry		o	o			
. Transportation Scheduling Control	o	o	o			
. Purchasing	o	o	o			
. Retail Transactions	o		o			
. Financial Transactions (Excluding Payments)				o	o	o
. Security Handling				o	o	
. Credit Cards	o		o		o	
<u>Marketing and Distribution</u>						
. Customer Purchasing	o	o	o	o	o	o
. Shipping	o	o	o			
. Billing	o	o	o	o	o	o
. Sales Analysis	o	o	o	o	o	o

FIGURE 1 (2)

Key Data Transmission Applications	Retail Trade	Manufacturing	Processing Industries	Securities	Banking	Insurance
<u>Financial</u>						
. Payroll/Personnel	o	o	o	o	o	o
. Accounts Receivable	o	o	o			o
. Payments	o	o	o	o	o	o
. General Ledger/Statements	o	o	o	o	o	o
. Cash Management	o	o	o	o	o	o
. Fixed Assets	o	o	o	o	o	o
<u>Engineering/Mathematical</u>						
. Design		o	o			
. Operations Research	o	o	o	o	o	o
. Statistical Analysis	o	o	o	o	o	o
<u>Management</u>						
. Forecasting	o	o	o	o	o	o
. Planning	o	o	o	o	o	o
. Simulation	o	o	o	o	o	o
. Economic Analysis	o	o	o	o	o	o
<u>General</u>						
. Information Retrieval	o	o	o	o	o	o
. Remote Job Entry	o	o	o	o	o	o
. Facsimile	o	o	o	o	o	o
. Computer Load Leveling	o	o	o			o

ESTIMATED MARKET DEMAND PARAMETERS

For Applicant's Proposed Services, 1968/69

<u>Economic Segment</u>	<u>Termination Points (b) (thousands)</u>	<u>Employees (b) (thousands)</u>	<u>Dollar Volume (b) (billions)</u>	<u>Number of Installed Computers (c)</u>
Retail Trade (SIC Nos. 52-59)	260 (a)	4,070	\$130	1,700
Manufacturing (SIC Nos. 19-27 and 31-39)	74 (d)	11,650	280 (f)	16,000
Process Industries (SIC Nos. 28-30)	21 (i)	1,610	72 (f)	2,400
Securities (SIC No. 62)	7 (j)	168	5 (g)	450
Banking (SIC No. 60)	33 (k)	842	540 (h)	4,250
Insurance (SIC Nos. 63, 64 and 66)	98 (l)	1,218	72 (h)	3,350
TOTALS	493	19,558	-	28,150
% of U. S. Universe	23%	25%	-	56%

(a) Multi-unit retail trade establishments

(b) 1968

(c) 1969

(d) Multi-unit manufacturing establishments plus branch (warehousing, sales and administrative) offices

(e) Sales

(f) Shipments

(g) Gross revenue

(h) Assets

(i) All processing and branch office establishments

(j) All securities and brokerage offices

(k) All bank offices

(l) All insurance company and independent agent offices

- . Rapid connection — current switched services often take significant time to establish connections — this detracts from the productivity of the terminal and operator
- . High reliability — transmission systems originally engineered for voice and record transmission often do not meet the more demanding reliability standards of digital data transmission
- . Simultaneous two-way transmission (full duplex) — existing switched services generally cannot handle full-duplex transmission; this leads to reduced throughput and wasteful line reversal time
- . Wide selection of switched speed offerings — the basic switched services, originally intended only for voice and record, provide only two major speed selections; many new applications require faster and more varied choices
- . Low incidence of network busy conditions — attempts to establish a switched connection for data transmission can be impeded by the high incidence of busy signals currently being experienced in points and times of heavy user concentration
- . Asymmetry — communication between terminal devices utilizing different line speeds is not possible in most existing major networks
- . Lower minimum charge period — many data transmissions can be completed in far less than the minimum charge periods now in force.
- . Flexibility to interconnect with and share facilities — recent Commission rulings and private interests have forced the common carriers to drop barriers against sharing and interconnection, but much confusion and difficulty continues to exist in user attempts to apply this flexibility

3. FEATURES OF THE PROPOSED SYSTEM RESPONSIVE TO PUBLIC NEEDS

Many of the unmet needs of data transmission users stem from the fact that common carriers' existing switched facilities were originally engineered only for voice and record analog transmission services. As described below, this constraint does not exist in the applicant's digital system.

(1) The Proposed System Is Engineered Specifically For, And Dedicated To, Digital Data Transmission

As described fully in Exhibit No. 1, the system is composed of three basic elements: trunking system, switching system, and local distribution system.

These elements are integrated into an end-to-end digital data communications system specifically designed for the transmission of digital data.

In the proposed system, a subscriber need not convert his digital signals to a different (analog) transmission mode, since the system transmits the subscriber's signal in its original form. Further, as the signal is transmitted through the system, it is continuously regenerated into a new, clean and conditioned signal. Thus, system noise that is amplified in present analog systems is eliminated in the proposed system.

The TDM transmission mode of the system provides for maximum conservation of the frequency spectrum. For data transmission purposes, the proposed system provides a significant channellization advantage over a fully loaded Frequency Division Multiplexing (FDM) type of system.

The TDM mode also increases the efficiency of the transmission of data by allowing more effective use of the transmission power of the system in its application to individual communications circuits.

(2) The Proposed System Will Meet Current And Projected Data Transmission Needs

Features of the proposed system include:

- . Low-cost — see samples of the proposed charges in Exhibit No. 8
- . End-to-end compatibility — no costly analog/digital conversion required
- . Rapid connection — connection will be made within 3 seconds after receipt of last destination address indicator
- . High reliability — no more than one bit error in 10^7 transmitted bits
- . Simultaneous two-way transmission (full-duplex) — the proposed system operates entirely in full-duplex mode
- . Wide selection of switched speed offerings — the initial system will provide 150, 4,800, 9,600, and 14,400 bps switched service

- . Low incidence of network busy conditions — a service goal of P.01 providing on an average no more than one busy signal in one hundred attempts
- . Lower minimum charge — the sample proposed charges, described in Exhibit No. 8, include provision for a minimum charge duration of only six seconds
- . Flexibility to interconnect with and share facilities — the applicant will provide ample flexibility for potential users to interconnect user-provided facilities and to share the proposed system among more than one user
- . Asymmetry — the system will provide capability for communication between all terminals on the network, regardless of their varying transmission needs

4. COMPETITION IN COMMUNICATIONS — THE PUBLIC INTEREST

Full realization of the public interest in computer technology requires achievement of appropriate specialized communications services. The users of computer technology are not obtaining adequate services from systems built upon, and dedicated to, voice and record transmission needs. The proposed system is likely to stimulate innovations and to encourage economies by all carriers.

(1) A Major Price Paid For Monopoly Is The Reduced Incentive For Innovation

The proposed system offers data transmission users the benefits of proven "state-of-the-art" technology. The introduction of this competition into the provision of data transmission services to all users will spark further technical development and innovation, and the applicant recognizes — and supports — the need for continuing development and introduction of new technology to satisfy the primary objective of the information systems and services industry; namely, the instant delivery of high quality computer power and output to the point of use.

The expansion of communications services — including data communications services — is closely related to the application of advanced communications technology. If innovation can lower the cost of a service, or provide a better service at the same cost, that service will attract a larger market, or create new markets.

Ultimately the benefits of computer technology can be brought to their full potential, for the nation's economy as a whole (and the general public who have made such an enormous investment in technical innovation), only by a versatile, low-cost communications network uniquely structured for digital data communications.

In addition to current computer users, medium and small-sized organizations which are now constrained by the costs of communications, will realize the benefits of the system.

(2) The Proposed System Encourages Economies By All Carriers Through The Simplified Application Of New Standards And Measures For Costs of Services

The benefits of the regulatory process are most readily obtained when the regulated system's structure, customers and services are easily identified and quantified. Indeed, the advent of satellite communications has made possible the identification of long haul, wideband point-to-point costs to the benefit of both the users and the public at large.

5. CONCLUSION

In summary, the applicant is confident that its proposed services are in the public interest for several convincing reasons.

First, a rapidly expanding demand for data transmission services exists in all major economic sectors.

Second, the effective utilization of existing data processing technology is constrained by present common carrier communication services. Both major economic segments and the public as a whole are not deriving the full benefits of today's data processing technology.

Third, the design and development of new computer applications requiring data transmission is constrained by high cost as well as unreliable and inflexible service. The information systems and services industry will not reach its full potential, and

may be discouraged from further technological developments, until this situation is remedied.

Fourth, available transmission technology, such as digital data transmission, is not being brought to bear on the communications problems of the using public. Transmission facilities designed and installed for voice and record transmission are not adequate for data transmission.

Finally, competition in data communications services will stimulate additional innovation in communications technology and spur all common carriers to measure and control costs more effectively in the public interest.

In view of the foregoing, the applicant submits that (1) its proposed system will serve the public interest, convenience, and necessity, and that (2) its applications should be granted.

ATTACHMENT A

This section describes the general characteristics of ten major economic segments which create a substantial demand for the proposed data transmission service of the applicant. Its purpose is to outline applications unique to each economic segment and to describe potential data transmission requirements.

(1) Retailing

Of the approximately 1.25 million retailing establishments in the United States, about 260,000 represent requirements for data communications facilities because they are outlets of multi-unit chains with centralized credit, inventory control, purchasing, distribution, and billing functions. Requirements for data communications among store, warehouse, and headquarters locations fall into two major application areas:

- . Merchandise control, including stock ordering, inventory control, and cost/revenue accounting
- . Customer credit accounting, including credit inquiries, billing and accounts receivable processing

These applications require the frequent transmission of large amounts of data from "point-of-sale" outlets to centralized computer facilities.

Some specific applications include:

- . Order Entry — Recording of inventory replenishment orders at the retail establishment, batch transmission of orders on a daily basis to a computing center, and generation of appropriate warehouse shipping notices — each day, over 25,000 establishments will have the need to transmit data economically and accurately.
- . Point-of-sale data entry — Recording of each sale at the "check-out" or sales register, transmission to a computing/data base center on either a "real-time" or end-of-day batch basis — in this type of system each item sale results in a data transmission, either "real-time" or delayed, and the concept requires the availability of flexible, low-cost data transmission capabilities — features include:

- A real-time system would compute totals (possibly updated inventories), store the transaction, and transmit a transaction receipt back to the point-of-sale.
- Both batch and real-time systems would update an inventory data base and generate appropriate shipping notices.
- The real-time approach could be expanded to accommodate "cash-less buying" —this involves a return transmission from the central credit data base authorizing or denying credit.
- . Catalog Buying — Transmission of catalog sales, shipping and inventory data between regional distribution points and a central corporate data base — catalog sales constitutes a substantial portion of total industry sales — under this concept each catalog sales item involves data transmission.

(2) Manufacturing

Of the approximately 325,000 existing manufacturing establishments in the United States (including remote sales, administrative and warehousing offices) about 74,000 locations are elements of multi-unit manufacturing companies.

Four key areas of computer applications are prevalent in manufacturing concerns:

- . Basic operations systems, including order entry, production control, production scheduling, inventory management, and process control.
- . Financial and accounting systems, including payroll, billing and receivable processing.
- . Marketing systems, including customer, territory and product line analyses.
- . Research and engineering applications, including new product design and management science techniques.

The manufacturing segment currently utilizes more remote terminals than any other segment, even though the concentration of data processing activity today is primarily in accounting-oriented systems such as payroll and invoicing. Current trends identified by manufacturing concerns indicate a tremendous growth in their data communications requirements as they achieve greater

breadth and sophistication in their operating and marketing systems. Specific areas of systems development activity include:

- . Order Processing — Collection of sales orders at "in-house" sales offices, by regional or district manufacturing sales representatives and by home-based salesmen and transmission of sales data to the appropriate financial, manufacturing and/or distributor point(s) on either an individual order or batched order basis — the transmission of each order requires accurate, low-cost transmission capabilities.
- . Integrated Production/Inventory Management — Based on the receipt of new orders, market forecasts and other inputs, central and regional computer centers produce production schedules, materials allocation, manpower schedules, and purchasing notices for local use and for transmission to plants, raw material stock piling locations and purchasing agents — in some cases the flow of manufacturing steps/processes is controlled and/or monitored by real-time and batch data collection/transmission systems to remote computing locations — many manufacturing companies with multi-plant or multi-warehouse locations have begun to control production and inventory centrally — this involves large amounts of transmission as raw materials are tracked step-by-step from initial entry into the manufacturing process, through fabrication and finished parts inventory, to finished goods inventory.
- . Distribution — Transmission of shipping notices (and invoices), transportation schedules, and loads from computing and sales points to warehouse and manufacturing plants, and return transmission of "when-shipped" notices from distribution points to sales offices, plants and accounting offices — data transmission can speed the flow of goods, but will require large volumes of low cost, accurate transmission.
- . Remote Job Entry and Computer Load Leveling — The batch transmission of entire computing application inputs/application outputs between the source location and a central or regional computing center, and the distribution of total computing loads among more than one computing location to offset peak demands and to improve total computer utilization — this requires the availability of high-speed, reliable transmission for relatively brief periods and represents a largely untapped area of major data transmission demands.

As these areas are developed, data communications requirements for manufacturing concerns will swell significantly both in volume and scope of required services.

(3) Processing Industries

Facilities of the processing industries in the United States include about 21,000 operational, distribution, sales and administrative locations. Moreover, these processing organizations service over 200,000 retail outlets not included in the estimated demand potential for the retail segment.

The main corporations in this important economic segment are characterized generally by three factors making them particularly noteworthy to the study.

- . They have been involved continuously in the initial research and development of new technical processes and products.
- . They are in many respects completely vertically integrated (e.g., oil companies drill, pump, refine, distribute, and sell oil at retail).
- . They have tended to be among the first to implement innovative automated applications.

Currently, the potential data communications-oriented applications in these industries range from nation-wide credit card sales and accounting systems to process control systems for refinery and chemical processes. Several major application areas will contribute significantly to their overall data communications requirements:

- . Order processing — as described under "manufacturing"
- . Integrated production/inventory management — as described under "manufacturing", with the added dimension of potentially large volumes of data transmission from drilling and mining sites to computing and manufacturing locations
- . Retail gasoline point-of-sale data entry — similar to point-of-sale data entry described under "retail", the purpose being to enable process industry organizations to better serve these retail outlets and the public as a whole — because of the large volume of gasoline purchases by the public, major data transmission traffic will be generated — each sale can result in either a "real-time" or delayed transmission if the costs of data transmission are low enough and reliability and access high enough to provide economic and technical justification for this application.
- . Other applications which will involve substantial data transmissions include:

- Degree day analyses to schedule and control fuel deliveries.
- Oil field sample analysis.
- Automatic control and operation of oil pipeline systems.

All these applications require transmission of data from a number of remote locations for processing and storage at one or more centralized locations.

(4) Securities Industry

In recent years, investment banking and brokerage firms (over 7,000 sales and accounting offices), stock exchanges, banks and the investing public as a whole (over 26 million investors) have been the victims of a severe logjam in the processing of the paper and information necessary to the conduct of their complex and vital business.

Significant effort is being expended and planned to ensure:

- . An orderly market place for the exchange of securities.
- . The elimination of fraud and embezzlement of securities.
- . Rapid access to recent quotations and current investor account information.
- . Prompt settlement of transactions through rapid and effective flow of cash and securities between investors, investment banking houses, banks, and transfer agents.

Toward these objectives, several communications-oriented information systems are fully operational in the investment banking community. These can be subdivided into two major areas: (1) services provided to the industry, such as odd lot and round lot trades, quotations on listed and unlisted securities, last sale ticker and block trading capability; and (2) applications such as order and trade processing, and customer information retrieval which are operated by individual firms for their own use.

From a communications standpoint, these systems represent significant data transmission requirements, including:

- . Entry and handling of all trade orders, acknowledgement of the orders, and confirmation of the resulting trades (current volumes of about 100,000 trades/day, with as many as 16 direct transmissions/trade).
- . Handling of over 2.5 million quotations on an average trading day — over 50,000 ticker and quotation devices are installed currently.
- . Submittal of all trade data by each investment banking house to the appropriate clearing house and/or certificate service.
- . Substantial data transmission for on-line portfolio analysis, block trading systems and many other applications in the securities industry which will depend on data communications for rapid, accurate transmission of financial data.

These requirements will increase dramatically in the near future as a result of two factors. First, growth in the number of investors and availability of quotation information to larger numbers of individuals will increase the demand for currently available services. Second, new services are contemplated by several firms which will lead to even greater communications requirements.

These include:

- . On-line capture of all movements of securities and cash between buyers and sellers.
- . Central capture of all trade information to minimize subsequent clearing problems.

(5) Banking

Currently, this industry is striving to speed and simplify the flow of financial data in order to provide funds and credit where and when they are needed. There are over 33,000 national, state and private banking locations, not including many thousands of consumer finance and savings and loan institutions.

Major requirements for data transmission in the banking industry include:

- . On-line teller services — demand deposit accounting, savings, loans, payments.
- . Credit cards — charges, inquiries, and accounting — at recent count there were 1 million merchant members, about 50 million cardholders and \$1.8 billion in credit outstanding.

- . Transfer of funds among banks — existing computerized bank wire system.
- . Security movement and control — personal trust, correspondent banks, broker clearing, mutual funds, corporate trust.

The sum of these applications represent major current demand for data transmission services. Savings alone is ranked among the five top current data communications applications in all economic segments. Financial information demands rapid access and highly reliable transmission. In the future, as banks move to the "checkless" or "less-check" society, attention will be focused on the electronic clearing of checks. Currently, about 22 billion checks are written annually. Some 300 million demand and time deposit accounts exist in national, state and local banking institutions, representing about \$500 billion in deposits. The volume of financial exchanges is likely to grow dramatically as financial transactions are captured at the source and the movement of paper replaced with data transmission.

To become a reality, electronic check clearing will require data transmission capabilities not now readily available including:

- . Ultra-high reliability.
- . A selection of switched service speeds.
- . Lower costs.
- . End-to-end compatibility.
- . High circuit availability.

(6) Insurance

Some 98,000 insurance companies and independent agent offices currently serve the U. S. public. The insurance industry is attempting to expand and enlarge the base of casualty, property and health coverage.

This industry is among the largest users of data processing equipment. Several large underwriters have implemented major data processing systems to:

- . Enter, underwrite and issue new policies (in 1968, 346 million new life and health policies and \$25 billion of casualty insurance were written) — under this concept, now installed at a few carriers, each policy receives input transmission of policy holder and coverage data and the output transmission of underwriting and full policy information.
- . Provide customers with personal financial assessments and recommended insurance programs — the transmission of customer financial needs to a central computing location and the return transmission of alternative insurance plans could greatly facilitate more efficient and effective insurance coverage in this country.
- . Enter claims by the input of basic claim data at sales offices (and, in the case of health, at hospitals and physician's offices) — the computing center checks coverage and transmits back authorization information — in hospital admittances an additional pair of transmissions is made at check-out time to initiate payment processes.
- . Transmit key health insurance data from private carriers to Medicare and Medicaide authorities and receive, by transmission, the results of government agency data processing.

Most of the large insurance companies are currently re-evaluating their data processing efforts with the objective of concentrating computing hardware and technical skills in as few locations as possible. Realization of this objective in conjunction with implementation of planned third generation systems identified above will drastically increase the industry's requirements for the transmission of data to and from these centralized locations. Many of these applications will require high-speed transmission facilities in short bursts.

(7) Computer Services

Major users of data processing capabilities are suppliers of generalized and specialized services in two major categories: (1) time-sharing, where users have, at their discretion, access to the full computational powers of a large computing facility shared by several users simultaneously, and (2) service bureaus, where full data processing services are made available on an "as needed" basis, usually to meet the daily data processing needs of several customers.

The computer service industry is characterized by several factors which simultaneously suppress its current volume and provide it with tremendous growth opportunities if these suppressing conditions can be overcome. These include the following:

- . High data volume applications for which input and output documents are manually transported achieve less than optimum results because of the prohibitive cost of automated data transmission.
- . Use of time-sharing facilities is limited by geographical considerations because of high long-distance data communications costs.

Shared data processing services offer a viable economic alternative for those potential data processing users who either cannot justify their own in-house facility or have infrequent requirements for data processing services which exceed in size and sophistication the capabilities of their in-house systems. Such potential users include small manufacturers, merchants and self-employed professionals, among others. In addition, many larger organizations augment in-house business data processing installations with the use of time-sharing terminals for engineering, scientific, statistical and operations research applications. Computer-related services also include specialized services for information retrieval (real estate, publications, general information, etc.). Most industry experts project a ten-fold or greater growth in industry revenues within the next five or six years. (Currently estimated at close to \$100 million.)

(8) Education

The dramatic increase in the student population, an ever-growing demand for quality education at all levels and a critical percentage of qualified teachers pose a pressing demand on data processing technology to assist in the development of new educational techniques. There are several application areas in which research has begun and practical results have already been achieved for which computer/telecommunication systems play a critical role. Major information

retrieval systems have been established to minimize search time by subject, author, date, or any other parameter. In these systems, each inquiry is transmitted to a central data base where modern search techniques extract pertinent data and transmit it back (often in sizeable quantities) to the source inquirer.

The role of data communications in the development of these vital applications should be to provide a reliable, inexpensive means of connecting elementary, high school, college and graduate students with central computers for library data banks and programmed instruction courses.

These applications demand low-cost, rapid access data transmission as described below:

- . Computer-aided instruction in the fundamentals of course materials frees up teaching professionals for the more important activities of advanced instruction and guidance, and provides instruction when no teacher is available. Currently, over 50 million students are potential users of data transmission services — each user transmits answers in response to computer-operated instruction and testing — a single lesson for one student may entail several dozen transmissions.
- . Cataloging and referencing large amounts of information make available to the public as a whole and students in particular immediate access to the rapidly expanding base of published learning — terminals in classrooms, service centers and libraries will greatly facilitate this type of public service — each inquiry will require rapid access, low cost transmission of selected information — each individual is a potential user with students accessing these systems on a daily basis.

Although this form of instruction can be provided by an “on-site” teaching unit — computer-controlled learning affords greater flexibility and responsiveness in monitoring and recording student progress.

(9) Health Care

While the number of patients per doctor is expected to remain fairly constant in the United States in the near future, the demand for medical services is increasing because of the greater proportion of the total population projected for

the over-65 bracket. Simultaneously, the costs of medical services are rising as hospital care, drugs, and private care become more expensive.

These two disturbing trends point up the need to use new technology as effectively as possible to sustain high levels of medical care while keeping costs under control. The potential of the medical profession for using computer/telecommunications technology is limitless.

- . On line inquiry systems by low-speed terminals from doctors' offices and hospital locations directly to centralized medical data banks could reduce critical diagnostic time requirements. This type of transmission requires high-speed, ultra-high reliability transmission.
- . Data transmission among hospitals, physicians, and insurance carriers can reduce admission, treatment and claims-handling times substantially.
- . Many joint ventures by hospitals and doctors have already been formed to provide computer service on a shared-basis to each participant by the transmission of all accounting and operating data from health care centers to computing centers with the resulting transmission back of reports, exception conditions and accounting information.
- . Remote monitoring of patients in hospitals and nursing homes through data communications will provide better health care but will require extensive, accurate, low-cost data transmission.

(10) Government

The Federal Government is currently the largest single user of computers, terminals and communications systems in our economy.

The range of existing data processing application is as broad as federal government activities.

However, additional processing requirements are being identified constantly, and advanced data processing/communications requirements are entirely feasible with today's technology. These include:

- . Nationwide integrated air-traffic control.
- . A national social welfare system, combining the information necessary for existing social security, welfare and medicare systems.
- . Air and water pollution monitoring.
- . National crime control and criminal information.
- . Computer load leveling.
- . Message switching and administrative traffic handling between all government agencies.
- . Automatic collection, analysis and selective distribution of census information.
- . Organization, selective retrieval and distribution of legislative and judicial proceedings.

Many of these applications require ultra-high reliability, rapid access and high-speed transmission, flexibility to interconnect quickly with many different points — the volumes of data is huge and will probably grow enormously, as government services are increased.

The identification and development of large-scale information systems for state and local government use has been expanding rapidly in recent years. Several large cities have already implemented or are planning near-term implementation of sophisticated crime control systems. Welfare accounting systems are essential if communities and states are to control effectively their large health and other public assistance programs. Population data base development and utilization will be essential to urban planning and renewal efforts. The role of data transmission in these, and other programs, will be significant especially in facilitating the interchange of data among states.

Inquiry and retrieval of police information on highway traffic, force deployment, and criminal activity entail complex communications systems linking central data bases with state and local police agencies, and frequently national

law enforcement agencies. Effective welfare administration requires not only control systems for recording financial activity, but techniques for locating, re-training and re-employment opportunities, matching welfare recipients with appropriate opportunities, and coordinating with federal welfare agencies. Regionalized census data bases will provide a wealth of information for urban areas attempting to solve their imposing problems. State-wide motor vehicle and driver registration and licensing systems considerably alleviate the clerical load of local offices and provide more effective control over information files. These systems require the exchange of data among states on a demand basis via data transmission.

Automated project management systems for controlling large highway and building construction projects can contribute significantly toward more effective tax dollar utilization in the development of major public facilities.