Title of each class	Name of each exchange on which registered
Burlington Northern Inc. (now Burlington Northern Railroad Company) Consolidated Mortgage Bonds:	
8 1/2%, Series C, due 1996)	New York Stock Exchange
8.60%, Series D, due 1999)	
12 7/8%, Series G, due 2005)	
9 1/4%, Series H, due 2006)	
St. Louis-San Francisco Railway Company:	
First Mortgage Bonds, 4%, Series A, due 1997)	New York Stock Exchange
Income Debentures, 5%, Series A, due 2006)	

Securities registered pursuant to Section 12(g) of the Act:

None

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such report(s), and (2) has been subject to such filing requirements for the past 90 days. Yes X No____

Indicate the number of shares outstanding of each of the issuer's classes of common stock, as of the close of the latest practicable date.

Class	Outstanding
Common Stock, without par value*	1,000 shares

*Burlington Northern Railroad Company is a wholly-owned subsidiary of Burlington Northern Inc. (Parent Company), and there is no market data with respect to such shares.

DOCUMENTS INCORPORATED BY REFERENCE

List hereunder the following documents if incorporated by reference and the Part of the Form 10-K (e.g. Part I, Part II, etc.) into which the document is incorporated:

None

TABLE OF CONTENTS
1986 FORM 10-K
BURLINGTON NORTHERN RAILROAD COMPANY

NOTE: *Part I, Item 4; Part II, Items 6 and 7; and Part III, Items 10, 11, 12 and 13 have been omitted pursuant to General Instruction J(1)(a) and (b) of Form 10-K for wholly-owned subsidiaries.

PART I

ITEMS 1. AND 2. BUSINESS AND PROPERTIES

Burlington Northern Railroad Company's ("Railroad") principal business activity is railroad transportation and related industrial development properties. Also, Railroad continues ownership of certain natural resource properties ("Resource Properties") managed by subsidiary companies of Parent Company.

RAILROAD TRANSPORTATION

Railroad operates the largest railroad system in the United States in terms of total miles of road. The principal cities served include Chicago, Minneapolis-St. Paul, Fargo-Moorhead, Billings, Spokane, Seattle, Portland, St. Louis, Kansas City, Des Moines, Omaha, Lincoln, Cheyenne, Denver, Fort Worth, Dallas, Houston, Galveston, Tulsa, Wichita, Springfield (Missouri), Memphis, Birmingham, Mobile and Pensacola. As of December 31, 1986, the system consisted of 27,706 miles of track, which included 16,490 miles of main lines, 9,049 miles of branch lines and 2,167 miles of secondary main and branch lines. Railroad's system is shown on the map on page 5.

The contributions of major commodity groups to gross rail freight revenues of Railroad were as follows:

Commodity Groups	Year Ended December 31, 1986	1985	1984
Agricultural Products:			
Grain	10.8%	10.7%	14.2%
Food and Kindred Products	7.7	7.3	6.3
Other	1.9	1.5	1.7
	20.4	19.5	22.2
Forest Products:			
Lumber and Wood Products	8.4	7.7	7.0
Pulp, Paper and Allied Products	3.8	3.6	3.2
	12.2	11.3	10.2
Mine Products:			
Coal	35.3	39.4	40.5
Stone, Clay and Glass Products	2.4	2.5	2.3
Metallic Ores	2.1	2.2	2.3
Non-Metallic Minerals	1.9	1.9	1.8
	41.7	46.0	46.9
Manufactures and Miscellaneous:			
Intermodal	9.9	9.0	7.9
Chemicals and Allied Products	5.1	4.6	4.1
Primary Metal Products	2.5	1.9	2.0
Other	8.2	7.7	6.7
	25.7	23.2	20.7
Total	100.0%	100.0%	100.0%

BURLINGTON NORTHERN RAILROAD

Agricultural Products

Railroad is strategically located to serve the Midwest and Great Plains grain producing regions and is a prominent rail transporter of grain. Railroad serves all the major terminal, storage, feeding and food processing locations as well as major export markets in the Pacific Northwest, Great Lakes and Gulf regions. Railroad grain tonnage strengthened in 1986 with a 12 percent increase over 1985.

Forest Products

Railroad serves the timber producing regions of the Pacific Northwest, Midwest and the South, hauling significant volumes of lumber, plywood and structural panels, wood chips, wood pulp, paper and paper products. Fluctuations in the level of forest products traffic result from general economic conditions as reflected in new housing and industrial production levels, competition with other modes of transportation and export demand.

Coal

The transportation of coal is Railroad's largest source of rail freight revenues. The decrease in coal volumes from 1985 was caused by reduced demand and increased competition from other railroads. Coal transportation revenues for 1986 were reduced by $101 million for coal rate litigation reserves. The following table sets forth relevant information about the transportation of coal:

	Year Ended December 31,		
	1986	1985	1984
Coal transportation revenues (in millions)...	$1,282.6	$1,640.2	$1,861.2
Tons of coal originated (in millions)	121.5	129.5	140.7
Coal revenue ton miles (in billions)	95.4	101.8	111.5

During 1986, approximately 98 percent of the coal tonnage originated by Railroad was carried in unit trains. Unit trains haul a single commodity exclusively from origin to destination and return empty to the point of origin on a continuous basis. Coal unit trains typically consist of 107 or more hopper or gondola cars capable of holding 101 tons of coal each and, depending on the difficulty of the grades encountered, require from three to six locomotive units.

Approximately 95 percent of the coal unit train traffic originated by Railroad in 1986 originated in the Powder River Basin of Montana and Wyoming and was destined for coal-fired electric generating stations in the Midwest, the Great Plains, Oklahoma and Texas. The balance of the coal traffic originated by Railroad in 1986 came from mines in the Midwest and the South.

Railroad has approximately 95 percent of its coal unit train traffic under contract and is actively pursuing negotiations with several utilities for additional contracts.

In the second half of 1984, Chicago & North Western Transportation Company ("C&NW") commenced coal unit train operations over the Orin-Gillette line in the Powder River Basin and the C&NW's newly built connector line with Union Pacific Railroad Company ("Union Pacific"). On May 15, 1985, the C&NW filed an application with the Interstate Commerce Commission ("ICC") for approval to construct and operate a 10.7 mile line extension in the Powder River Basin in Wyoming to serve three additional coal mines north of Coal Creek Junction. On January 15, 1986, the ICC approved the C&NW line extension application. After the ICC decision, Railroad entered into an agreement to sell a one-half interest in its 10.7 mile line in Wyoming, between Coal Creek Junction and Caballo Junction, to C&NW providing C&NW access to serve those additional mines north of Coal Creek Junction. The sale transaction closed on December 15, 1986.

Intermodal

Railroad continued the use of double-stack cars in 1986 together with other new types of intermodal (trailer and container on flatcar) equipment to reduce costs and improve service. Labor agreements, which were negotiated with operating crafts to permit use of two-person crews on special shorter haul intermodal trains, were expanded to include additional traffic in 1986.

Operating Factors

Certain significant freight statistics of Railroad were as follows:

	Year Ended December 31,		
	1986	1985	1984
Revenue ton miles (in millions)	187,223	184,092	200,580
Revenue tons per carload	70.86	71.32	72.01
Revenue tons per train	2,939	3,018	3,174
Freight train miles (in millions) ..	63.7	61.0	63.2

During 1986, Railroad originated approximately 89 percent of all of the rail tonnage it handled.

Road Property

In 1986, approximately 96 percent of the total net ton miles carried by Railroad was handled on its main lines. At December 31, 1986, approximately 18,473 miles of Railroad's tracks consisted of 112-lb. or heavier rail, including approximately 8,647 track miles of 132-lb. or heavier rail. At the same date, 8,593 miles of track were equipped with centralized traffic control. Additions and replacements to road property were as follows:

	Year Ended December 31,		
	1986	1985	1984
Track miles of rail additions and replacements:			
New	581	668	629
Secondhand	377	406	458
Miles of new track and siding included above	15	47	84
Track miles of continuous welded rail laid in rail additions and replacements included above	722	1,028	998
Track miles of new centralized traffic control signaling systems	139	202	135
Track miles surfaced or reballasted	9,631	14,157	13,567
Ties inserted (in thousands)	2,223	3,858	4,559

Equipment

Railroad owned or leased the following units of railroad rolling stock at December 31, 1986:

	Number of Units		
	Owned	Leased	Total
Locomotives:			
Freight	715	1,285	2,000
Passenger	-	25	25
Multi-purpose	283	-	283
Switching	219	-	219
Total locomotives	1,217	1,310	2,527
Auxiliary units	3	-	3
Total locomotives and auxiliary units..	1,220	1,310	2,530
Freight Cars:			
Box-general purpose	2,984	3,346	6,330
Box-specially equipped	4,970	364	5,334
Gondola	6,224	376	6,600
Hopper-open top	8,579	1,856	10,435
Hopper-covered	18,634	708	19,342
Refrigerator	3,333	1,166	4,499
Flat	4,204	18	4,222
Caboose	857	-	857
Other	1,534	6	1,540
Total freight cars	51,319	7,840	59,159
Commuter passenger cars	-	141	141

The average age (in years) of locomotives and freight cars was 13.9 and 15.8, respectively, at December 31, 1986, compared to 13.2 and 15.8, respectively, at December 31, 1985.

The average percentage of Railroad's locomotives and freight cars awaiting repairs during 1986 was 5.2 and 3.5, respectively, compared to 3.9 and 2.6, respectively, in 1985.

In 1986, Railroad incurred a special charge reflecting a write-off of surplus railroad assets (see Note 2 of Notes to Consolidated Financial Statements).

Industrial Development Properties

Railroad is active in the lease, sale and development of its 9,700 acres of industrial properties and parks. Consistent with economic growth patterns in the United States, Railroad is repositioning its land inventory into more productive areas. Railroad has begun the transfer of management of its leasing activities, real estate support work and title and closing work to Glacier Park Company, a wholly-owned subsidiary of Parent Company. Railroad will retain responsibility for a nationally oriented industrial development effort as well as management of track agreements and office leases.

Employees

Railroad had approximately 35,300 and 38,600 employees for 1986 and 1985, respectively. Railroad employment has been steadily decreasing due to implementation of job reduction efforts, efficiency improvements and regulatory changes. Approximate disbursements for payroll and employee benefits were $1.8 billion for both 1986 and 1985.

Approximately 89 percent of Railroad rail employees are covered by collective bargaining agreements with national railroad labor organizations. On October 31, 1985, Railroad reached an agreement with the United Transportation Union, which represents about 25 percent of Railroad unionized work force. The agreement cannot be changed before June 30, 1988. It provides for a 10.9 percent wage increase over its term (or for cost-of-living adjustments if increases in the Consumer Price Index exceed the programmed wage increases). The agreement also provides for a variety of holddowns and productivity improvements which will partially offset the wage increases. An arbitrated agreement with the Brotherhood of Locomotive Engineers, extending to June 30, 1988, was issued May 19, 1986 covering approximately 10 percent of the unionized employees. Agreements extending to June 30, 1988 were also reached with six of Railroad non-operating unions, including the Brotherhood of Railway and Airline Clerks and the Brotherhood of Maintenance of Way Employees, representing about 50 percent of the unionized employees. These agreements provide for approximately 10.5 percent wage increases over their term (with a significant portion of the increase being paid in lump sums), productivity improvements and holddowns on increases for certain classifications such as intermodal workers. Tentative settlements have also been reached with three other non-operating unions, leaving only two unions in active negotiation.

COMPETITION

Railroad encounters extensive competition in its railroad operations from deregulated motor carriers, excess capacity in the barge industry and other Class I and short-line railroads stimulated by the Staggers Rail Act of 1980. On December 23, 1983, Santa Fe Industries, Inc. and Southern Pacific Co., two railroad holding companies, merged. An application to merge the Atchison, Topeka & Santa Fe Railway Company ("Santa Fe") and Southern Pacific Transportation Company ("Southern Pacific") was denied by the ICC on October 10, 1986. Santa Fe and Southern Pacific filed a petition to reopen the decision on December 9, 1986, asserting the merger should be reconsidered in light of agreements reached with certain previously opposing railroads. Railroad is evaluating the potential impact of this new merger plan. On November 14, 1986, the Union Pacific Corporation, Union Pacific and Missouri Pacific Railroad Company ("MP") filed an application to control the Missouri-Kansas-Texas Railroad Company. Railroad is currently assessing the competitive impact of this merger. The Union Pacific Corporation has also filed an application to acquire Overnight Transportation, a trucking company. These merger applications are subject to ICC approval.

NATURAL RESOURCE PROPERTIES AND ENCUMBRANCES

Railroad owns approximately 1.9 million acres of fee interests in the States of Minnesota, North Dakota, Montana, Wyoming, Idaho, Washington and Oregon. All Resource Properties of Railroad are managed by wholly-owned subsidiary companies of Parent Company. Railroad's timberland is managed by Plum Creek Timber Company, Inc., oil and gas operations are managed by Meridian Petroleum Holding Inc. and coal and minerals operations are managed by Meridian Minerals Company. Therefore, while certain amounts relating to results of operations and financial position of Resource Properties are, because of Railroad's ownership, included in the financial statements of Railroad, management rests with the subsidiaries of Parent Company referred to above.

As of December 31, 1986, approximately 2,398 miles of the former Northern Pacific Railway Company's ("NP") main lines and 1,360 miles of NP's branch lines, together with substantially all of Resource Properties, were subject to two mortgages under which there were approximately $117.7 million of bonds outstanding at December 31, 1986, including approximately $69.9 million of 4% bonds which mature in 1997 ("Prior Lien Bonds") and $47.8 million of 3% bonds which mature in 2047 ("General Lien Bonds"). Under the terms of these mortgages, Railroad is permitted to sell timber, land and minerals and to lease mineral interests. However, the proceeds from such sales and leases, net of expenses and taxes, must be deposited with the trustees under such mortgages. Except for $500,000 of such proceeds annually, which must be applied to the purchase on the open market of bonds outstanding under such mortgages, such proceeds are available for withdrawal by Railroad upon certification to the mortgage trustees of additions and betterments to Railroad properties subject to those mortgages. There are no other provisions in these mortgages that would allow withdrawal of such proceeds by Railroad except by modification to the mortgages with the consent of the holders of all the outstanding bonds. Railroad has continued to expend money for additions and betterments to such properties, but it cannot give any assurance that future expenditures will be sufficient to permit the withdrawal of all natural resource proceeds. As of December 31, 1986, Railroad had identified approximately $700 million of such additions and betterments that were available for certification to the mortgage trustees, calculated on the basis of property additions through December 31, 1986 using current ICC accounting procedures for ratable depreciation. Railroad will continue to identify and certify additions and betterments as they become available.

On April 21, 1985, Railroad announced that it entered into agreements ("Agreements") with the trustees of these mortgages, pursuant to which (1) Railroad would commence a tender offer ("Offer) for any and all outstanding Prior Lien Bonds and General Lien Bonds, (2) Railroad would deposit United States Government debt obligations ("Government Bond Portfolio") and cash in irrevocable trusts with the trustees, in amounts sufficient to pay the principal at scheduled maturity of and interest when due on all Prior Lien Bonds and General Lien Bonds that remained outstanding after the expiration of the Offer ("Deposit Plan"), and (3) the trustees would execute necessary documentation to accomplish the release of Resource Properties from the liens of the mortgages. In accordance with the Agreements, Railroad commenced the Offer on April 23, 1985, and later purchased the Government Bond Portfolio.

Subsequent to the commencement of the Offer, actions were brought in New York and Delaware State Courts and in the United States District Court for the Southern District of New York ("District Court") against Railroad and the trustees seeking to enjoin the consummation of the Agreements between Railroad and each of the trustees. The State Court actions are inactive.

On June 21, 1985, the District Court issued an opinion and order granting the plaintiffs' motion for a preliminary injunction. Specifically, the Disrict Court enjoined Railroad and the trustees from: (a) implementing the Agreements; (b) releasing any or all of Resource Properties; and (c) proceeding with the Offer. Following this order, Railroad announced on June 24, 1985, that it was cancelling the Offer. In connection with the cancellation, Railroad sold the Government Bond Portfolio. On July 24, 1985, the District Court modified the preliminary injunction to make clear that the preliminary injunction allowed releases of any or all of Resource Properties in compliance with the mortgages as interpreted in prior practice in customary release transactions.

On February 28, 1986, Railroad filed a motion for summary judgment asking the District Court to dismiss the action because (i) the proposed transactions were lawful, (ii) plaintiffs were not entitled to injunctive relief, and (iii) the issues raised in the plaintiffs' complaint were moot because Railroad had no present intention of engaging in the Deposit Plan. Plaintiffs cross moved for summary judgment to make the preliminary injunction permanent.

On September 3, 1986, the District Court denied both sides' motions for summary judgment. The District Court found that the case was not moot, but it declined to issue a permanent injunction because Railroad had abandoned the proposed transactions. The District Court also said that it "was not fully certain as to the plaintiffs' right to this relief when it issued the preliminary injunction; nothing adduced in relation to this motion diminished our uncertainty." The District Court refused, however, to grant Railroad's motion for summary judgment dismissing the action. On October 6, 1986, Railroad appealed the District Court's decision to the United States Court of Appeals for the 2nd Circuit. The preliminary injunction, which enjoins any releases other than those in compliance with the mortgages as interpreted in prior practice, remains in effect. Railroad intends to continue to develop Resource Properties at a pace and in a manner consistent with restrictions imposed by the mortgages.

ITEM 3. LEGAL PROCEEDINGS

Railroad, Parent Company and several other railroads are defendants in a private antitrust action filed by Energy Transportation Systems, Inc. ("ETSI") in the Federal District Court for the Eastern District of Texas at Beaumont ("Court"). The suit seeks unspecified damages in excess of $940 million from the defendants and injunctive relief. The complaint alleges that the railroad defendants violated antitrust laws by conspiring to restrain trade, monopolizing and attempting to monopolize the transportation of Powder River Basin coal to destinations in Kansas, Texas, Louisiana, Arkansas and Oklahoma. After the suit was filed, Arkansas Power and Light Company ("AP&L") filed a motion to intervene as plaintiff, and ETSI filed a motion to amend its complaint to include Santa Fe as a defendant. The Court granted both motions. Railroad believes it has been in full compliance with the antitrust laws and will vigorously defend this lawsuit. Trial of this case is tentatively scheduled to begin in September 1987.

Railroad, Parent Company and several other railroads have been named as defendants in a lawsuit filed by Houston Lighting and Power Company and Utility Fuels, Inc. in the Federal District Court for the Southern District of Texas. The complaint alleges that the railroad defendants conspired to restrain trade, monopolized and attempted to monopolize the transportation of Powder River Basin coal to destinations in Kansas, Texas, Louisiana, Arkansas and Oklahoma by eliminating the ETSI coal slurry pipeline, or substantially reducing its effectiveness as a competitor, in violation of antitrust laws. The complaint also alleges that defendants violated the Racketeer Influenced and Corrupt Organizations Act and tortiously interfered with a prospective contractual relationship between plaintiffs and ETSI. The suit seeks money damages, punitive damages and injunctive relief. These matters are pending before the court at the present time. Railroad believes it has been in full compliance with all applicable laws and will vigorously defend this lawsuit.

On November 20, 1986, the ICC served a decision requiring Railroad to make approximately $17.9 million plus interest in reparation payments to Omaha Public Power District ("OPPD") in connection with coal rates charged by Railroad for movements of coal from Wyoming to the OPPD power plant near Arbor, Nebraska between July 1982 and January 1986. Railroad has appealed the ICC's decision to the United States Court of Appeals for the 3rd Circuit on the basis that the ICC lacks jurisdiction over the rates which were found to be unreasonably high and that the reparations decision is not legally sound. In addition, on December 19, 1986, Railroad filed a petition with the ICC requesting that the decision be reconsidered or the record reopened to permit additional cost evidence to be submitted.

Railroad is currently involved in administrative proceedings before the ICC concerning the reasonableness of Railroad's and MP's joint and proportional coal rates to AP&L's electric generating facilities near Redfield and Newark, Arkansas. AP&L has alleged that the rates charged by Railroad and MP for the transportation of approximately 25.8 million tons of coal between 1979 and 1984 were unreasonably high and seeks substantial reparations from the railroads together with interest. The ICC decision in the OPPD case could have an adverse impact on the outcome of the AP&L proceeding. Railroad believes that the rates charged to AP&L were reasonable and will challenge any ICC decision ordering rate reparations. On September 18, 1986, Railroad filed a Petition for Leave to File Supplemental Stand-alone Cost Evidence ("Petition") with the ICC in this proceeding. If the ICC grants the Petition, Railroad will submit evidence further demonstrating the reasonableness of the rates at issue.

During 1986, Railroad had two additional coal rate proceedings in litigation before the ICC. The first involved a complaint of City Public Service Board of San Antonio, Texas ("San Antonio") challenging the reasonableness of rates charged for the transportation of coal by Railroad and Southern Pacific between December 1978 and August 1985. The second concerned the reasonableness of Railroad's and C&NW's joint coal rates to the Iowa Public Service Company ("IPS") generating plant near Sergeant Bluff, Iowa between 1979 and 1986. In December 1986, Railroad reached settlement agreements with both utilities which will result in the dismissal of these ICC rate complaint proceedings and related litigation in early 1987.

Railroad does not expect that any additional coal rate cases challenging rates in effect prior to the Staggers Rail Act of 1980 will be brought.

ITEM 4. SUBMISSION OF MATTERS TO A VOTE OF SECURITY HOLDERS

Not applicable - see Table of Contents note on page 3.

PART II

ITEM 5. MARKET PRICE FOR REGISTRANT'S COMMON EQUITY AND RELATED STOCKHOLDER MATTERS

(a) All of the outstanding Common Stock of Railroad is owned of record by Parent Company and therefore not traded on any market.

(b) There is only one stockholder of the Common Stock of Railroad, Parent Company.

(c) For dividend information, see Consolidated Statement of Retained Earnings, page 17.

ITEM 6. SELECTED FINANCIAL DATA

Not applicable - See Table of Contents note on page 3.

ITEM 7. MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS (MANAGEMENT'S NARRATIVE ANALYSIS OF THE RESULTS OF OPERATIONS)

Railroad had a net loss of ($254.7) million in 1986, compared to pro forma net income of $448.7 million in 1985. A special charge in the amount of $352.5 million was recorded in the second quarter of 1986. (See Note 2 of Notes to Consolidated Financial Statements.) The impact of the change in the method of depreciation is reflected in 1986. (See Note 3 of Notes to Consolidated Financial Statements.) The pre-tax effect on income of this change was a decrease of $79.1 million in 1986.

Consolidated results reflect a 7.0 percent decrease in revenues to $3,943.5 million in 1986, principally as a result of freight mix changes, price adjustments to meet competition, and from a charge related to Railroad's settlements with San Antonio and IPS concerning maximum coal rate reasonableness complaint proceedings before the ICC. Charges against 1986 revenues were also taken regarding the ICC decision awarding reparations to OPPD and with respect to the maximum coal rate reasonableness complaint of AP&L currently pending before the ICC. Revenues from Railroad operations decreased 12.8 percent in coal and taconite and increased 12.6 percent in intermodal, 5.2 percent in forest products and 6.0 percent in food and consumer products. Volume increases resulted from a 12.6 percent increase in non-coal traffic, including increases of 20.0 percent in intermodal, 15.2 percent in forest products and 13.9 percent in food and consumer products, offset by a 6.6 percent decrease in coal traffic. The coal volume changes impacted revenues to a greater extent than costs. Revenue per revenue ton mile decreased in 1986 for all commodity groups. Total operating expenses in 1986 increased 9.1% compared to 1985 pro forma operating expenses, primarily due to the special charge of $352.5 million. 1986 operating expenses, excluding the special charge, decreased 1.1% compared to 1985 pro forma operating expenses. The primary reason for this reduction was lower diesel fuel prices. Depreciation, diesel fuel and labor costs were $312.2 million, $261.3 million and $1.8 billion, respectively, in 1986, compared to $234.4 million, $401.1

million and $1.8 billion, respectively, in 1985. Total diesel fuel cost decreased 34.9 percent as average price per gallon decreased 35.5 percent in 1986 compared to 1985, while fuel consumption increased 1.0 percent for the same period. Railroad's operating income of $176.5 million (including the special charge of $352.5 million) decreased 77.5 percent from pro forma operating income of $785.1 million in 1985.

The number of railroad employees during 1986 declined 8.6 percent from the 1985 level. The 1986 Railroad operating ratio increased to 97.3 from 80.7 in 1985. The special charge and the change in the method of depreciation resulted in an increase of 11.5 in the 1986 operating ratio.

In 1986, Railroad entered into agreements to transfer ownership of four low-density rail lines to new operators. These agreements are structured to provide the new rail operators with the opportunity to sustain or increase traffic on these lines through lower operating costs, thereby enhancing the economic viability of the lines and avoiding the alternative of abandonment.

Other Income - Net was $69.2 million in 1986 compared to $70.5 million in 1985. The decrease in 1986 was primarily due to lower interest income and to interest expense on the San Antonio settlement and OPPD rate case decision, partially offset by dividend income and the sale to C&NW of a one-half interest in Railroad's 10.7 mile Coal Creek Junction to Caballo Junction line in the Powder River Basin.

As a result of the Tax Reform Act of 1986 ("Tax Act"), Railroad adjusted its 1986 provision for income taxes to reflect the loss of approximately $22.1 million in investment tax credits ("ITC"). Prospectively, the Tax Act will not have a significant effect on Railroad's financial condition or results of operations.

OTHER MATTERS

Information on litigation is presented on pages 12 and 13.

EFFECT OF INFLATION

Railroad has experienced increased costs in recent years due to the effect of inflation on the cost of labor, plant and equipment. A portion of the increased labor cost directly affects income through increased operating costs. The cumulative impact of inflation over a number of years has resulted in higher depreciation expense and increased costs for current replacement of productive facilities. However, operating efficiencies have partially offset this impact. Competition limits Railroad's ability to price services or products to recover current costs.

Supplementary data concerning the impact of inflation required under the Financial Accounting Standards Board Statement No, 33 is now an optional disclosure. Although having provided this information in the past, Railroad believes that this data has been of questionable value to the investing public and has elected to exclude the supplementary data.

BURLINGTON NORTHERN RAILROAD COMPANY
CONSOLIDATED STATEMENT OF INCOME
(IN THOUSANDS OF DOLLARS)

	Year Ended December 31,		
	1986	1985	1984
Revenues:			
Railroad	$3,800,560	$4,098,464	$4,490,221
Other	142,898	139,735	158,188
Total	3,943,458	4,238,199	4,648,409
Cost and Expenses:			
Railroad:			
Transportation	1,416,098	1,546,317	1,696,708
Way and structures	709,569	616,526	632,061
Equipment	780,729	729,728	778,500
General and administration	388,880	383,749	403,265
Special charge (Note 2)	352,498	-	-
Total	3,647,774	3,276,320	3,510,534
Other	119,136	99,462	131,796
Total	3,766,910	3,375,782	3,642,330
Operating Income	176,548	862,417	1,006,079
Interest Expense	117,966	120,756	114,152
Other Income - Net (Note 9)	69,182	70,537	59,744
Income Before Income Taxes	127,764	812,198	951,671
Provision for Income Taxes (Notes 1 and 7)	46,633	323,688	400,347
Income Before Cumulative Effect of Change in Depreciation Method of Accounting	81,131	488,510	551,324
Cumulative Effect of Change in Depreciation Method of Accounting (Net of Deferred Income Taxes of $314.2 million) (Note 3)	(335,841)	-	-
Net Income (Loss)	$ (254,710)	$ 488,510	$ 551,324
Pro Forma Net Income Assuming Retroactive Effect of Change in Depreciation Method of Accounting		$ 448,723	$ 507,289

See accompanying Notes to Consolidated Financial Statements.

BURLINGTON NORTHERN RAILROAD COMPANY
CONSOLIDATED STATEMENT OF RETAINED EARNINGS
(IN THOUSANDS OF DOLLARS)

	Year Ended December 31,		
	1986	1985	1984
Balance, Beginning of Year	$2,618,813	$2,466,368	$2,231,140
Net Income (Loss)	(254,710)	488,510	551,324
Dividends:			
Cash	(530,000)	(300,000)	(300,000)
Properties	(2,954)	(7,793)	(747)
Accounts receivable from affiliated companies managing resource properties	(26,374)	(28,272)	(15,349)
Total Dividends	(559,328)	(336,065)	(316,096)
Balance, End of Year	$1,804,775	$2,618,813	$2,466,368

See accompanying Notes to Consolidated Financial Statements.

BURLINGTON NORTHERN RAILROAD COMPANY
CONSOLIDATED BALANCE SHEET
(IN THOUSANDS OF DOLLARS)

ASSETS	Year Ended December 31, 1986	1985
Current Assets:		
Cash and short-term investments (Note 4)	$ 651,909	$ 563,011
Accounts receivable	624,492	669,930
Material and supplies	120,591	162,630
Other current assets	30,368	26,677
Total	1,427,360	1,422,248
Properties (Notes 1, 2, 3 and 5):		
Transportation:		
Road and roadway structures	6,116,177	6,592,775
Equipment	1,741,644	1,862,985
Non-transportation	119,585	126,518
Total	7,977,406	8,582,278
Accumulated depreciation and amortization	2,845,189	2,414,237
Properties - net	5,132,217	6,168,041
Other Assets	184,412	135,148
Total Assets	$6,743,989	$7,725,437
LIABILITIES		
Current Liabilities:		
Accounts payable	$ 546,034	$ 513,265
Wages payable	175,165	188,388
Taxes payable	118,815	110,172
Other current liabilities	51,064	53,771
Current portion of long-term debt	121,693	80,590
Total	1,012,771	946,186
Loan Payable to Parent Company (Note 5)	-	50,000
Long-Term Debt (Note 5)	1,294,888	1,146,656
Other Liabilities and Deferred Credits	230,589	187,387
Deferred Income Taxes (Note 7)	1,393,880	1,775,728
COMMON STOCKHOLDER'S EQUITY		
Common Stock, without par value (1,000 shares authorized, issued and outstanding) (Note 6)	1,007,086	1,000,667
Retained Earnings	1,804,775	2,618,813
Total Common Stockholder's Equity	2,811,861	3,619,480
Total Liabilities and Common Stockholder's Equity	$6,743,989	$7,725,437

See accompanying Notes to Consolidated Financial Statements.

BURLINGTON NORTHERN RAILROAD COMPANY
CONSOLIDATED STATEMENT OF CHANGES IN FINANCIAL POSITION
(IN THOUSANDS OF DOLLARS)

	Year Ended December 31,		
	1986	1985	1984
Funds Provided by Operations:			
Net Income (Loss)	$(254,710)	$ 488,510	$ 551,324
Items not affecting cash:			
Depreciation and amortization	312,231	234,412	226,436
Deferred income taxes	(68,305)	194,299	298,353
Special charge (Note 2)	352,498	-	-
Change in depreciation method of accounting	335,841	-	-
Net gain on sales of property	(58,999)	-	-
Other (1)	111,106	(8,716)	(5,187)
Funds provided from operations	729,662	908,505	1,070,926
Other Funds Provided (Used):			
Property dispositions	125,209	36,559	44,088
Working capital changes:			
Accounts receivable	45,438	(37,667)	(57,338)
Material and supplies	42,039	15,434	(30,751)
Other current assets	(3,691)	10,342	(16,171)
Accounts payable	32,769	(11,516)	78,055
Wages payable	(13,223)	(28,115)	11,054
Taxes payable	8,643	(38,941)	36,352
Other current liabilities	(2,707)	2,327	(29)
Additions to properties	(351,196)	(650,560)	(610,894)
Dividends	(559,328)	(336,065)	(316,096)
Advances to Parent Company - net	-	194,900	239,100
Other assets	(49,264)	539	(11,756)
Other	(53,893)	(7,832)	29,018
Funds provided (used) before financing activities	(49,542)	57,910	465,558
Financing Activities:			
Proceeds from long-term financing	275,000	101,933	39,500
Reduction in long-term debt	(136,560)	(85,207)	(83,883)
Total financing activities	138,440	16,726	(44,383)
Increase in Cash and Short-term Investments	88,898	74,636	421,175
Cash and Short-term Investments:			
Beginning of year	563,011	488,375	67,200
End of year	$ 651,909	$ 563,011	$ 488,375

See accompanying Notes to Consolidated Financial Statements.

(1) The 1986 amount includes $122 million for coal rate litigation reserves including interest.

1. Summary of Significant Accounting Policies

The consolidated financial statements include the accounts of Railroad and its majority-owned subsidiaries. All significant intercompany transactions have been eliminated.

Property

In 1986, Railroad adopted a method of depreciation for the majority of its transportation properties that closely approximates a unit method versus the composite method of depreciation previously used (see Note 3). Railroad continues to depreciate mainline track using a units-of-production method. All other transportation properties and railroad equipment are depreciated on a straight-line basis over estimated useful lives. A periodic review of the rates and the accumulated depreciation account is performed and appropriate adjustments are recorded. Significant premature retirements are recorded as gains or losses at the time of their occurrence. These include major casualty losses, abandonments, sales and obsolete assets. Additions are capitalized and repairs and maintenance expenditures are charged to operations. All properties are stated at cost.

Material and Supplies

Material and supplies consist mainly of diesel fuel, repair parts for equipment and other railroad property and are valued at the lower of average cost or market.

Income Taxes

Income taxes are provided based on earnings reported for financial statement purposes. The provision for income taxes includes deferred taxes resulting from items reported in different periods for tax and financial statement purposes. Investment tax credits are accounted for under the "flow-through" method.

2. Special Charge

In the second quarter of 1986, Railroad conducted a review of its physical properties. The special charge of $352.5 million reflects a provision for surplus, obsolete or otherwise unproductive assets including locomotives, rolling stock and abandoned track.

3. Change in Accounting Method

In the second quarter of 1986, Railroad adopted a method of depreciation for the majority of its transportation properties that closely approximates a unit method. Railroad previously used the composite method of depreciation. The new method was adopted to more accurately reflect physical use of assets in the current deregulated transportation environment. This method of depreciation has been applied retroactively to property acquisitions of prior periods and is effective for the full year 1986. Accordingly, the cumulative effect of applying the new method for prior years is reported as an after-tax charge of $335.8 million. The 1986 after-tax effect of applying the new depreciation method, retroactive to January 1, was a charge of $40.6 million.

4. Cash and Short-Term Investments

Railroad participates in an interest-bearing intermingled master account under which cash funds of Railroad and other subsidiaries of Parent Company are held by and managed by Parent Company. At December 31, 1986 and 1985, $638.8 and $552.1 million, respectively, of intermingled master account funds were included in Railroad's balance sheet under the caption of "Cash and short-term investments". The interest rate, which is established at one percent below the prime interest rate, was 6-1/2 percent at December 31, 1986 versus 8-1/2 percent at December 31, 1985.

5. Long-term Debt and Lease Obligations

Long-Term Debt

Long-term debt outstanding is as follows:

	December 31, 1986	December 31, 1985
	(In Thousands)	
Great Northern Railway Company General Mortgage Bonds, 2-5/8% to 3-1/8%, due 1990 to 2010	$ 110,000	$ 110,000
Northern Pacific Railway Company:		
Prior Lien Railway and Land Grant 4% Bonds, due 1997	69,921	69,921
General Lien Railway and Land Grant 3% Bonds, due 2047	47,777	47,777
Chicago, Burlington & Quincy Railroad Company First & Refunding Mortgage Bonds, 3%, due 1990	14,437	14,737
Burlington Northern Inc.(now Burlington Northern Railroad Company) Consolidated Mortgage Bonds, 8-1/2% to 12-7/8%, due 1996 to 2006	528,234	260,205
St. Louis-San Francisco Railway Company:		
First Mortgage Bonds, 4%, Series A, due 1997	37,489	39,239
Income Debentures, 5%, Series A, due 2006	24,075	24,494
Mortgage Notes, 6-3/4% due serially to 1992	3,900	4,050
Loan Payable to Parent Company, 11.85%, due 1990	-	50,000
Equipment and other obligations, 6% to 14-1/4%, due serially to 2018	486,944	559,593
Capitalized lease obligations	112,182	117,179
Unamortized discount on Frisco debt assumed	(18,378)	(19,949)
Total	1,416,581	1,277,246
Less Current Portion	121,693	80,590
Loan Payable to Parent Company	-	50,000
Long-Term Debt	$1,294,888	$1,146,656

In October 1986, Railroad issued $275 million of Consolidated Mortgage 9-1/4% Bonds, Series H, due 2006. The Series H Bonds are not redeemable prior to maturity and are not entitled to any sinking fund.

The aggregate long-term debt maturing during the years ending December 31, 1987 through 1991 is $121,693,000, $95,980,000, $122,510,000, $114,961,000 and $64,931,000, respectively. These amounts do not include repayment requirements that arise when mortgaged property is sold. Additionally, at December 31, 1986, $3,673,000 principal amount of bonds held in treasury were available to reduce the annual repayment requirements specified above.

Certain Other Assets and substantially all Properties are pledged as collateral to or are otherwise restricted under the various long-term debt agreements.

5. Long-term Debt and Lease Obligations (continued)

Lease Obligations

Railroad has substantial lease commitments for railroad track structure and equipment, highway and data processing equipment, office buildings and a taconite dock facility. Transportation and other equipment leases have initial terms of up to 20 years. Substantially all of these leases provide the option to purchase the equipment at fair market value at the end of the lease.

Certain noncancelable leases are classified as capital leases and are included as property. The balance sheets at December 31, 1986 and 1985 include $135,686,000 and $137,181,000, respectively, of properties and $42,501,000 and $38,805,000, respectively, of accumulated amortization relating to capital leases.

Lease rental expense for operating leases is $114,588,000, $114,416,000 and $127,901,000 for the years ended December 31, 1986, 1985 and 1984, respectively.

Minimum annual rental commitments are as follows:

Year Ending December 31:	December 31, 1986 Capital Leases	Operating Leases
	(In Thousands)	
1987	$ 24,150	$110,162
1988	20,825	103,709
1989	16,793	99,081
1990	15,815	91,451
1991	13,256	84,237
Thereafter	85,136	438,471
Total	175,975	$927,111
Less amount representing interest on capital leases	63,793	
Present value of minimum lease payments	$112,182	

6. Common Stock

Railroad is a wholly-owned subsidiary of Parent Company.

	Common Stock	
	Shares Outstanding	Amount (In Thousands)
Balance, December 31, 1983	1,000	$1,000,723
Adjustment to prior contribution of capital from Parent Company	-	(56)
Balance, December 31, 1984 and 1985............	1,000	1,000,667
Contribution of capital from Parent Company ...	-	6,419
Balance, December 31, 1986	1,000	$1,007,086

7. Income Taxes

Railroad's operations are included in the consolidated federal income tax return of Parent Company. Each company within the consolidated group calculates its provision for income taxes in accordance with an income tax provision and settlement policy. Under this policy, tax liability computed on the basis of a separate income tax return shall reflect the usage or limitations of certain tax benefits as they are utilized by the consolidated group in the current year.

The provision for income taxes excluding the effect of the change in depreciation method of accounting is as follows:

	Year Ended December 31,		
	1986	1985	1984
		(In Thousands)	
Current:			
Federal	$ 98,817	$118,002	$ 77,600
State	16,121	11,387	24,394
	114,938	129,389	101,994
Deferred:			
Federal	(61,958)	166,779	288,365
State	(6,347)	27,520	9,988
	(68,305)	194,299	298,353
Total	$ 46,633	$323,688	$400,347

7. Income Taxes (continued)

Reconciliation of the statutory income tax rate to the effective tax rate is as follows:

	Year Ended December 31, 1986	1985	1984
Statutory rate	46.0 %	46.0 %	46.0 %
Investment tax credit	(2.7)	(7.6)	(4.2)
Capital gains tax rates	(12.4)	(1.1)	(1.3)
State income taxes net of federal tax benefit	3.7	2.6	2.0
Dividend exclusion	(6.5)	-	-
Other	8.4	-	(0.4)
Effective Rate	36.5 %	39.9 %	42.1 %

Deferred tax expense consists of the following:

	Year Ended December 31, 1986	1985	1984
		(In Thousands)	
Excess of tax over book depreciation	$ 85,043	$177,344	$155,377
Write-down of property	(162,149)	-	-
Accruals for casualties, claims and expenses not deductible in the current year	(43,007)	31,275	(26,900)
Investment credit applicable to deferred taxes	26,713	(61,542)	149,705
Other	25,095	47,222	20,171
Total	$ (68,305)	$194,299	$298,353

Effective January 1, 1986, the Tax Act repealed the ITC for qualified properties purchased after December 31, 1985, except in the instances where contracts or letters of commitment were made prior to December 31, 1985 (transitional property). ITC generated for the years 1986 to 1984 are $3,000,000, $62,000,000 and $40,000,000, respectively. These tax credits reduced the current federal tax provision only to the extent they were utilized by the consolidated group. At December 31, 1986, all 1986 credits and $30,000,000 of 1985 credits were available to offset future tax liabilities for up to 15 years, subject to the ITC carryover reduction rules. The investment tax credit for ITC carryovers utilized after December 31, 1986, will be reduced by 17.5 percent in 1987. The benefit of the ITC has been recognized for accounting purposes.

As a result of the Tax Act, the provision for income taxes for the fourth quarter 1986 was adjusted to reflect the loss of approximately $22.1 million in investment tax credit which had been recorded in the first three quarters of 1986.

8. Pension Plan

Railroad participates in Parent Company's pension plans, which are non-contributory defined benefit plans covering substantially all non-union employees. The benefits are based on years of credited service and highest average compensation levels. Contributions to the plans are determined by Parent Company and are limited to amounts that are currently deductible for tax purposes.

Effective January 1, 1986, Parent Company adopted Statement of Financial Accounting Standards No. 87, "Employer's Accounting for Pensions". Adoption of this statement, along with the change in the discount rate from 9 percent to 10 percent, had the effect of reducing 1986 pension expense by $3,358,000. Pension expense was $28,231,000, $27,487,000 and $33,999,000 in 1986, 1985 and 1984, respectively.

9. Other Income - Net

Other Income-Net as shown in the accompanying Consolidated Statement of Income includes the following:

	Year Ended December 31, 1986	1985	1984
		(In Thousands)	
Interest income on advances to and funds managed by Parent Company (Note 4)....	$ 42,539	$62,313	$ 72,393
Dividend income	21,459	-	-
Gains on disposal of property	25,349	1,343	-
Interest expense	(21,162)	(246)	(468)
Miscellaneous - net	997	7,127	(12,181)
Net..................................	$ 69,182	$70,537	$ 59,744

10. Commitments and Contingent Liabilities

In October 1986, Railroad entered into an electrical power purchase agreement under which payment is based on the number of megawatt hours of energy consumed, subject to a specified take-or-pay minimum. The agreement requires a number of locomotives sufficient to provide the necessary megawatt hours to Railroad. Railroad's absolute, annualized minimum payment obligation is $12,520,000 over the 15 year term of the agreement. This payment will vary upward depending on mechanical practices and performance and utilization. Based on current availability and usage, Railroad's payment in 1987 will equal or exceed $29,000,000. As of December 31, 1986, Railroad had purchased $1,900,000 of electrical power under this agreement.

10. Commitments and Contingent Liabilities (continued)

In connection with the San Antonio settlement, Railroad has committed to obtain an irrevocable letter of credit for an amount not to exceed $59,449,000 effective in 1987 and declining in amount until expiration on January 15, 1994.

Effective August 1986, Railroad is no longer contingently liable under a service interruption arrangemant with other railroads as it has withdrawn from the arrangement.

See "Legal Proceedings" on pages 12 and 13 for information concerning litigation and other matters.

11. Related Party Transactions

During 1986, Railroad sold non-operating property to Glacier Park Company, a wholly-owned subsidiary of Parent Company, resulting in a gain of $21,747,000 recorded in Railroad Revenue.

REPORT OF INDEPENDENT CERTIFIED PUBLIC ACCOUNTANTS

To the Stockholder and Directors of
Burlington Northern Railroad Company:

We have examined the consolidated financial statements and the financial statement schedules of Burlington Northern Railroad Company and subsidiaries as listed in item 14(a) of this Form 10-K. Our examinations were made in accordance with generally accepted auditing standards and, accordingly, included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, the financial statements referred to above present fairly the consolidated financial position of Burlington Northern Railroad Company and subsidiaries as of December 31, 1986 and 1985, and the consolidated results of their operations and changes in their financial position for each of the three years in the period ended December 31, 1986, in conformity with generally accepted accounting principles, which, except for the change, with which we concur, in the method of accounting for railroad transportation properties as described in Note 3 to the financial statements, have been applied on a consistent basis. In addition, the financial statement schedules referred to above, when considered in relation to the basic financial statements taken as a whole, present fairly the information required to be included therein.

COOPERS & LYBRAND

St. Paul, Minnesota
January 22, 1987

BURLINGTON NORTHERN RAILROAD COMPANY
QUARTERLY FINANCIAL DATA
(In Thousands)

	1986			
	4th	3rd	2nd	1st (3)
Revenues........................	$968,612	$1,005,628	$954,964	$1,014,254
Special Charge..................			352,498 (1)	
Operating Income (Loss).........	82,690	188,846	(241,238)(2)	146,250
Income (Loss) Before Cumulative Effect of Change in Depreciation Method of Accounting....................	31,695	102,860	(123,095)	69,671
Net Income (Loss)...............	31,695	102,860	(123,095)	(266,170

	1985			
	4th	3rd	2nd	1st
Revenues........................	$1,032,726	$1,066,689	$1,043,463	$1,095,321
Operating Income................	196,372	244,312	212,390	209,343
Pro Forma Net Income Assuming Retroactive Effect of Change in Depreciation Method of Accounting....................	98,153	135,221	105,412	109,937

(1) The non-cash, pre-tax special charge of $352.5 million represents a write-off of surplus railroad assets (see Note 2 of Notes to Consolidated Financial Statements).

(2) The second quarter operating income includes the effect of the special charge noted above.

(3) In the second quarter of 1986, Railroad changed depreciation methods (see Note 3 of Notes to Consolidated Financial Statements). The reduction of $344.4 million in net income for the first quarter of 1986 was the result of a combination of the reduction in operating income of $16.7 million, the corresponding reduction in income taxes of $8.1 million and the cumulative effect of change in depreciation method of accounting of $335.8 million (net of income taxes).

ITEM 9. DISAGREEMENTS ON ACCOUNTING AND FINANCIAL DISCLOSURE

None

PART III

ITEMS 10, 11, 12, and 13. DIRECTORS AND EXECUTIVE OFFICERS OF THE REGISTRANT; EXECUTIVE COMPENSATION; SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT; AND CERTAIN RELATIONSHIPS AND RELATED TRANSACTIONS

Not Applicable - see Table of Contents Note on page 3.

PART IV

ITEM 14. EXHIBITS, FINANCIAL STATEMENT SCHEDULES AND REPORTS ON FORM 8-K

(a) The following documents are filed as part of this Form 10-K, Annual Report:

1. Financial Statements - Index to Financial Statements
   Included in Part II of this report:

   Consolidated Statement of Income for the three years ended December 31, 1986, page 16.
   Consolidated Statement of Retained Earnings for the three years ended December 31, 1986, page 17.
   Consolidated Balance Sheet at December 31, 1986 and 1985, page 18.
   Consolidated Statement of Changes in Financial Position for the three years ended December 31, 1986, page 19.
   Notes to Consolidated Financial Statements, pages 20 to 27.
   Report of Independent Certified Public Accountants, page 28.

2. Financial Statement Schedules
   Included in Part IV of this report:

Schedule II	Amounts Receivable from Related Parties and Underwriters, Promotors and Employees Other Than Related Parties
Schedule V	Property, Plant and Equipment
Schedule VI	Accumulated Depreciation, Depletion and Amortization of Property, Plant and Equipment
Schedule X	Supplementary Income Statement Information

All schedules listed are for the three years ended December 31, 1986. Schedules other than those listed above are omitted for the reason that they are not required or are not applicable, or the required information is shown in the financial statements or notes thereto.

3. Exhibits

   Burlington Northern Railroad Company's Restated Certificate of Incorporation and By-Laws.

(b) During the fourth quarter of 1986 there were no reports filed on Form 8-K.

BURLINGTON NORTHERN RAILROAD COMPANY
AMOUNTS RECEIVABLE FROM RELATED PARTIES AND UNDERWRITERS,
PROMOTERS AND EMPLOYEES OTHER THAN RELATED PARTIES
FOR THE YEARS ENDED DECEMBER 31, 1986, 1985 and 1984
(IN THOUSANDS)

Column A	Column B	Column C	Column D		Column E	
	Balance at Beginning of Period		Deductions		Balance at End of Period	
Name of Debtor		Additions	Amounts Collected	Amounts Written Off	Current	Not Current
DECEMBER 31, 1986:						
Walter A. Drexel	$200		$200			-
DECEMBER 31, 1985:						
Walter A. Drexel	$200					$200
DECEMBER 31, 1984:						
Walter A. Drexel	$200					$200

(1) During 1981, Mr. Walter A. Drexel, Chairman of the Board and Chief Executive Officer, President and Chief Operating Officer of Railroad, pursuant to his employment contract, received a loan from Parent Company in the principal amount of $200,000, evidenced by a promissory note that is unsecured, non-interest bearing and payable on demand. During 1982 this loan was transferred to Railroad, and in January, 1986 it was transferred back to Parent Company. Mr. Drexel's current position is Vice Chairman with Parent Company.

BURLINGTON NORTHERN RAILROAD COMPANY
PROPERTY, PLANT, AND EQUIPMENT
FOR THE YEARS ENDED DECEMBER 31, 1986, 1985 AND 1984
(IN THOUSANDS)

COLUMN A CLASSIFICATION	COLUMN B BALANCE AT BEGINNING OF PERIOD	COLUMN C ADDITIONS AT COST	COLUMN D RETIREMENTS	COLUMN E OTHER(1)	COLUMN BALANC AT ENC OF PERIC
DECEMBER 31, 1986:					
Road and roadway structures	$6,592,775	$324,239	$220,778	$(580,059)	$6,116,17
Transportation equipment	1,862,985	24,690	63,632	(82,399)	1,741,64
Non-transportation properties	126,518	2,267	9,200	-	119,58
TOTAL	$8,582,278	$351,196	$293,610	$(662,458)	$7,977,40
DECEMBER 31, 1985:					
Road and roadway structures	$6,322,815	$545,892	$275,932	-	$6,592,77
Transportation equipment	1,874,502	100,486	112,003	-	1,862,98
Non-transportation properties	140,373	4,182	18,037	-	126,51
TOTAL	$8,337,690	$650,560	$405,972	-	$8,582,27
DECEMBER 31, 1984:					
Road and roadway structures	$5,912,714	$553,063	$142,962	-	$6,322,815
Transportation equipment	1,932,465	52,405	110,368	-	1,874,502
Non-transportation properties	136,043	5,426	1,096	-	140,373
TOTAL	$7,981,222	$610,894	$254,426	-	$8,337,690

(1) The reduction shown in Column E is the result of the special charge incurred by Railroad in 1986 (see Note 2 of Notes to Consolidated Financial Statements).

See Note 1 on page 20 of this Annual Report Form 10-K for information regarding property accounting policies.

BURLINGTON NORTHERN RAILROAD COMPANY
ACCUMULATED DEPRECIATION, DEPLETION, AND AMORTIZATION
OF PROPERTY, PLANT, AND EQUIPMENT
FOR THE YEARS ENDED DECEMBER 31, 1986, 1985 AND 1984
(IN THOUSANDS)

COLUMN A CLASSIFICATION	COLUMN B BALANCE AT BEGINNING OF PERIOD	COLUMN C ADDITIONS AT COST	COLUMN D RETIREMENTS	COLUMN E OTHER(1)	COLUMN F BALANCE AT END OF PERIOD
DECEMBER 31, 1986:					
Road and roadway structures	$1,753,917	$230,493	$ 89,700	$233,659	$2,128,369
Transportation equipment	648,333	81,104	130,494	106,381	705,324
Non-transportation properties	11,987	634	1,125	-	11,496
TOTAL	$2,414,237	$312,231	$221,319	$340,040	$2,845,189
DECEMBER 31, 1985:					
Road and roadway structures	$1,840,962	$166,987	$254,032	-	$1,753,917
Transportation equipment	683,935	66,786	102,388	-	648,333
Non-transportation properties	15,118	639	3,770	-	11,987
TOTAL	$2,540,015	$234,412	$360,190	-	$2,414,237
DECEMBER 31, 1984:					
Road and roadway structures	$1,792,448	$161,693	$113,179	-	$1,840,962
Transportation equipment	704,890	63,976	84,931	-	683,935
Non-transportation properties	13,772	767	265	$ 844	15,118
TOTAL	$2,511,110	$226,436	$198,375	$ 844	$2,540,015

(1) The adjustment to accumulated depreciation, depletion, and amortization recorded in Column E for 1986 is the result of a special charge incurred by Railroad (see Note 2 of Notes to Consolidated Financial Statements), and the change in depreciation method (see Note 3 of Notes to Consolidated Financial Statements).

See Note 1 on page 20 of this Annual Report Form 10-K for information regarding property accounting policies.

BURLINGTON NORTHERN RAILROAD COMPANY
CONSOLIDATED SUPPLEMENTARY INCOME STATEMENT INFORMATION
FOR THE YEARS ENDED DECEMBER 31, 1986, 1985 and 1984
(IN THOUSANDS)

COLUMN A ITEM	COLUMN B CHARGED TO COSTS AND EXPENSES
1986:	
Maintenance and repairs	$1,490,339
Taxes, other than payroll and income taxes:	
Property	59,961
Other	26,382
1985:	
Maintenance and repairs	$1,344,281
Taxes, other than payroll and income taxes:	
Property	49,235
Other	33,167
1984:	
Maintenance and repairs	$1,403,897
Taxes, other than payroll and income taxes:	
Property	38,273
Other	30,070

SIGNATURE

Pursuant to the requirements of 13 or 15(d) of the Securities Exchange Act of 1934, the Burlington Northern Railroad Company has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

BURLINGTON NORTHERN RAILROAD COMPANY

By /s/ D. W. Gaskins, Jr.
D. W. Gaskins, Jr.
President, Chief Executive Officer
and Chief Operating Officer

Date January 29, 1987

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of Burlington Northern Railroad Company and in the capacities and on the dates indicated.

Signature	Title	Date
/s/ D. W. Gaskins, Jr. D. W. Gaskins, Jr.	President, Chief Executive Officer and Chief Operating Officer	January 29, 1987
/s/ T. J. Matthews T. J. Matthews	Senior Vice President Administration	January 29, 1987
/s/ M. L. McManus M. L. McManus	Vice President, Treasurer & Controller	January 29, 1987
/s/ W. A. Drexel W. A. Drexel	Director	January 29, 1987
/s/ D. R. Wood, Jr. D. R. Wood, Jr.	Director	January 29, 1987

The foregoing constitutes a majority of Burlington Northern Railroad Company's Board of Directors.

MANAGEMENT'S DISCUSSION AND ANALYSIS
OF FINANCIAL CONDITION

Results of Operations - Second Paragraph

Operating Loss for 1986 was $129 million which includes a pre-tax Special Charge of $957 million compared to pro forma Operating Income (adjusted for the impact of the change in Railroad depreciation method of $77 million and $85 million in 1985 and 1984, respectively) of $1.169 billion and $1.289 billion in 1985 and 1984, respectively.

NOTE: The above Paragraph is amended to correct two typographical errors. The changes are underlined.

BURLINGTON NORTHERN INC.

INDEX TO FINANCIAL STATEMENTS, SUPPLEMENTAL FINANCIAL STATEMENT SCHEDULES AND EXHIBITS

Schedules other than those listed above are omitted for the reason that they are not required or not applicable, or the required information is shown in the financial statements or notes thereto.

*Previously filed with Form 10-K

REPORT OF INDEPENDENT CERTIFIED PUBLIC ACCOUNTANTS

Burlington Northern Inc.

Our report on the consolidated financial statements of Burlington Northern Inc. at December 31, 1986 and 1985, and for each of the three years in the period ended December 31, 1986, is included in its 1986 Annual Report on Form 10-K. In connection with our examinations of such financial statements, we also examined the related consolidated financial statement schedules listed in the Index on Page 3 of this Form 8, Amendment No. 1 to the aforementioned Form 10-K.

In our opinion, the financial statement schedules referred to above, when considered in relation to the basic financial statements taken as a whole, present fairly the information required to be included therein.

COOPERS & LYBRAND

Seattle, Washington
January 22, 1987

BURLINGTON NORTHERN INC.
Amounts Receivable From Related Parties And Underwriters, Promoters, And Employees Other Than Related Parties

For the Years Ended December 31, 1986, 1985 and 1984

Column A Name of Debtor	Column B Balance at Beginning of Period	Column C Additions	Column D Deductions Amounts Collected	Column D Deductions Amounts Written Off	Column E Balance at End of Period Current	Column E Balance at End of Period Not Current
DECEMBER 31, 1986:						
Richard M. Bressler	$450,000					$450,000
Walter A. Drexel	200,000					200,000
	$650,000					$650,000
DECEMBER 31, 1985:						
Richard M. Bressler	$450,000					$450,000
Walter A. Drexel	200,000					200,000
	$650,000					$650,000
DECEMBER 31, 1984:						
Richard M. Bressler	$450,000					$450,000
Walter A. Drexel	200,000					200,000
	$650,000					$650,000

Note: Pursuant to an employment contract, Mr. Richard M. Bressler, Chairman of the Board, President and Chief Executive Officer, received a loan in the principal amount of $450,000, which is presently outstanding, evidenced by a promissory note that is unsecured, non-interest bearing and payable on demand.

Mr. Walter A. Drexel, Vice Chairman of the Board and Director of Burlington Northern Inc., pursuant to an employment contract, received a loan in the principal amount of $200,000, which is presently outstanding, evidenced by a promissory note that is unsecured, non-interest bearing and payable on demand.

BURLINGTON NORTHERN INC.
PROPERTY, PLANT AND EQUIPMENT

For the Years Ended December 31, 1986, 1985 and 1984
(In Thousands)

Column A Classification	Column B Balance at Beginning of Period	Column C Additions at Cost	Column D Retire-ments	Column E Other Changes Add (Deduct)	Column F Balance At End of Period
December 31, 1986					
Railroad	$ 8,582,279	$ 351,196	$293,611	$(662,458) 1/	$ 7,977,406
Natural Gas Operations	1,556,829	72,010	107,795	(110,394) 2/	1,410,650
Oil and Gas	2,159,128	116,063	44,603	1,133,914 3/ (604,594) 4/ (173,758) 2/	2,586,150
Other	321,087	52,218	34,564	-	338,741
Total	$12,619,323	$ 591,487	$480,573	$(417,290)	$12,312,947
December 31, 1985					
Railroad	$ 8,337,690	$ 650,560	$405,971		$ 8,582,279
Natural Gas Operations	1,510,201	94,977	48,349		1,556,829
Oil and Gas	1,887,131	334,846	152	56,162 2/ (118,859) 5/	2,159,128
Other	209,281	50,979	15,358	76,185 6/	321,087
Total	$11,944,303	$1,131,362	$469,830	$ 13,488	$12,619,323
December 31, 1984					
Railroad	$ 7,962,717	$ 610,855	$235,882		$ 8,337,690
Natural Gas Operations	1,455,799	57,096	2,694		1,510,201
Oil and Gas	1,682,549	232,111	5,431	43,809 2/ 8,555 (74,462) 5/	1,887,131
Other	233,897	31,968	56,584	-	209,281
Total	$11,334,962	$ 932,030	$300,591	$ (22,098)	$11,944,303

1/ Writeoff of surplus Railroad assets. See Note 3 of Notes to Consolidated Financial Statements.
2/ Principally El Paso acquisition adjustments.
3/ Consolidation of Southland, previously accounted on the equity method. See Note 9 of Notes to Consolidated Financial Statements.
4/ Writedown of oil and gas properties. See Note 3 of Notes to Consolidated Financial Statements.
5/ Restatement for change to successful efforts method of accounting for oil and gas properties. See Note 2 of Notes to Consolidated Financial Statements.
6/ Motor carrier acquisitions.

See Accounting Policies and Notes to Consolidated Financial Statements for information regarding depreciation methods and other matters.

BURLINGTON NORTHERN INC.
ACCUMULATED DEPRECIATION, DEPLETION AND AMORTIZATION
OF PROPERTY, PLANT AND EQUIPMENT

For the Years Ended December 31, 1986, 1985 and 1984
(In Thousands)

Column A Classification	Column B Balance at Beginning of Period	Column C Additions Charged to Costs and Expenses	Column D Retire-ments	Column E Other Changes Add (Deduct)		Column F Balance At End of Period
December 31, 1986						
Railroad	$2,414,237	$312,231	$221,319	$(309,960)	1/	$2,845,189
				650,000	2/	
Natural Gas Operations	170,593	67,262	86,470	-		151,385
Oil and Gas	316,381	179,724	31,744	45,201	3/	509,562
Other	91,714	37,129	22,603	-		106,240
Total	$2,992,925	$596,346	$362,136	$385,241		$3,612,376
December 31, 1985						
Railroad	$2,540,015	$234,411	$360,189	$ -		$2,414,237
Natural Gas Operations	108,865	96,622	34,894	-		170,593
Oil and Gas	193,458	120,324	334	2,933		316,381
Other	74,127	24,274	6,687	-		91,714
Total	$2,916,465	$475,631	$402,104	$ 2,933		$2,992,925
December 31, 1984						
Railroad	$2,501,997	$225,836	$187,818	$ -		$2,540,015
Natural Gas Operations	3,744	98,367	5,347	12,101	4/	108,865
Oil and Gas	92,336	106,823	5,701	-		193,458
Other	78,175	19,875	23,923	-		74,127
Total	$2,676,252	$450,901	$222,789	$ 12,101		$2,916,465

1/ Writeoff of surplus railroad assets. See Note 3 of Notes to Consolidated Financial Statements.

2/ Cumulative effect of change in Railroad depreciation method of accounting. See Note 2 of Notes to Consolidated Financial Statements.

3/ Principally reserve for sale of properties and El Paso acquisition adjustments.

4/ Principally transfer of capital leases.

See Accounting Policies and Notes to Consolidated Financial Statements for information regarding depreciation methods and other matters.

BURLINGTON NORTHERN INC.
SUPPLEMENTARY INCOME STATEMENT INFORMATION

For the Years Ended December 31, 1986, 1985, and 1984
(In Thousands)

Column A Item	Column B Charged to Costs and Expenses
1986:	
Maintenance and repairs	$1,577,719
Taxes, other than payroll and income taxes:	
Property	96,116
Other	69,104
1985:	
Maintenance and repairs	$1,427,324
Taxes, other than payroll and income taxes:	
Property	61,800
Other	103,711
1984:	
Maintenance and repairs	$1,484,101
Taxes, other than payroll and income taxes:	
Property	70,329
Other	140,342

Note: Items omitted are either less than 1 percent of consolidated revenues or are disclosed elsewhere in the Consolidated Financial Statements or notes thereto.

Each exhibit set forth below is incorporated herein by reference to a prior filing as indicated.

Exhibit 3:

Certificate of Incorporation of Burlington Northern Inc. (March 31, 1985, Form 10-Q, No. 1-8159, filed May, 1985).

By-Laws of Burlington Northern Inc. as Amended Through April 14, 1985 (March 31, 1985, Form 10-Q No. 1-8159, filed May, 1985).

Exhibit 4:

Form of Rights Agreement dated as of July 14, 1986, between Burlington Northern Inc. and The First National Bank of Boston which includes, as Exhibit A thereto, the form of Certificate of Designation specifying the terms of the Preferred Stock and, as Exhibit B thereto, the form of Rights Certificate (Form 8-A, No. 1-8159, filed July, 1986).

The Company and its subsidiaries either have previously filed with the Securities and Exchange Commission or upon request will furnish a copy of any instruments with respect to long term debt of the Company and its subsidiaries.

Exhibit 10:

Revolving Credit Agreement, dated as of May 6, 1986 between Burlington Northern Inc. and Citibank, N.A., as agent (June 30, 1986, Form 10-Q, No. 1-8159, filed July, 1986).

Note Issuance Facility Agreement, dated as of May 6, 1986 between Burlington Northern Inc. and Morgan Guaranty Trust Company of New York, as agent (June 30, 1986, Form 10-Q, No. 1-8159, filed July, 1986).

Exhibit 18:

Letter from independent public accountants regarding change in accounting principle (June 30, 1986, Form 10-Q, No. 1-8159, filed July, 1986).

CONSENT OF INDEPENDENT CERTIFIED PUBLIC ACCOUNTANTS

Burlington Northern Inc.

We consent to the incorporation by reference in the registration statements of Burlington Northern Inc. on Form S-3 (File No. 33-4019), and on Forms S-8 (File Nos. 2-61005, 2-61077, 2-80478 and 2-97533) of our report, dated January 22, 1987, on our examinations of the consolidated financial statements of Burlington Northern Inc. at December 31, 1986 and 1985, and for each of the three years in the period ended December 31, 1986, which report is included in its 1986 Annual Report on Form 10-K.

We also consent to the incorporation by reference in the aforementioned registration statements of our report, dated January 22, 1987, on our examinations of the consolidated financial statement schedules related to the above financial statements, which report is included in this Form 8, Amendment No. 1 to the aforementioned Form 10-K.

COOPERS & LYBRAND

Seattle, Washington
March 2, 1987

MILLER AND LENTS, LTD
OIL AND GAS CONSULTANTS
TWENTY-FIRST FLOOR
910 TRAVIS STREET
HOUSTON, TEXAS 77002
TELEPHONE 713 651-9455
CABLE "MILLENT"
TELEX 791254

January 28, 1987

Burlington Northern Inc.
999 Third Ave.
Seattle, Washington 98104-4097

Gentlemen:

We hereby consent to the use in the Annual Report on Form 10-K of Burlington Northern Inc. for the fiscal year ended December 31, 1986 of our report to The El Paso Company, dated January 7, 1987 or portions thereof, and to the use of our name as an expert therein.

Yours very truly,

MILLER AND LENTS, LTD.

By S/ C. E. Logan
C. E. Logan, Vice President

CEL/hp

Charles M. Harper	Director	January 22, 1987
Pemberton Hutchinson	Director	January 22, 1987
Ben F. Love	Director	January 22, 1987
Thomas H. O'Leary	Director	January 22, 1987
Travis H. Petty	Director	January 22, 1987
Gerald C. Ryan	Director	January 22, 1987
Arnold R. Weber	Director	January 22, 1987

______________________ Charles M. Harper	Director	January 23, 1987
Pemberton Hutchinson Pemberton Hutchinson	Director	January 23, 1987
______________________ Ben F. Love	Director	January 23, 1987
______________________ Thomas H. O'Leary	Director	January 23, 1987
______________________ Travis H. Petty	Director	January 23, 1987
______________________ Gerald C. Ryan	Director	January 23, 1987
______________________ Arnold R. Weber	Director	January 23, 1987

PR

FORM 8

SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549

AMENDMENT TO APPLICATION OR REPORT
Filed pursuant to Section 12, 13 or 15(d) of
THE SECURITIES EXCHANGE ACT OF 1934

BURLINGTON NORTHERN INC.
AMENDMENT NO. 1

The undersigned registrant hereby amends the following items, financial statements, exhibits or other portions of its 1986 Annual Report on Form 10-K as set forth in the pages attached hereto.

Management's Discussion and Analysis of Financial Condition and Results of Operations
    Results of Operations - Second Paragraph

Index to Financial Statements, Supplemental Financial Statement Schedules and Exhibits

Report of Independent Certified Public Accountants on Consolidated Financial Statement Schedules

Supplemental Financial Statement Schedules:

II Amounts Receivable from Related Parties and Underwriters, Promoters, and Employees Other Than Related Parties

V Property, Plant and Equipment

VI Accumulated Depreciation, Depletion and Amortization of Property, Plant and Equipment

X Supplementary Income Statement Information

Exhibits:

3 Articles of Incorporation and By-Laws

4 Instruments Defining the Rights of Security Holders Including Indentures

10 Material Contracts

18 Letter Regarding Change in Accounting Principles

24 Consents of Experts and Counsel

Pursuant to the requirements of the Securities Exchange Act of 1934, the registrant has duly caused this amendment to be signed on its behalf by the undersigned thereunto duly authorized.

BURLINGTON NORTHERN INC.

Date: March 4, 1987

/s/ Frank J. Winnermark
Frank J. Winnermark
Vice President and Controller

7E98

SIGNATURES REQUIRED FOR FORM 10 K

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, Burlington Northern Inc. has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

BURLINGTON NORTHERN INC.

By ______________________
Richard M. Bressler
Chairman of the Board, President
and Chief Executive Officer

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of Burlington Northern Inc. and in the capacities and on the dates indicated.

By ______________________ Richard M. Bressler	Chairman of the Board, President and Chief Executive Officer	January 22, 1987
______________________ Luino Dell'Osso, Jr.	Senior Vice President, Finance & Planning	January 22, 1987
______________________ Frank J. Winnermark	Vice President & Controller, Chief Accounting Officer	January 22, 1987
______________________ Royal D. Alworth, Jr.	Director	January 22, 1987
______________________ Zane E. Barnes	Director	January 22, 1987
______________________ Daniel P. Davison	Director	January 22, 1987
______________________ Walter A. Drexel	Director	January 22, 1987
______________________ Mary Garst	Director	January 22, 1987
______________________ Richard C. Grayson	Director	January 22, 1987
______________________ Gerald Grinstein	Director	January 22, 1987

SIGNATURES REQUIRED FOR FORM 10-K

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, Burlington Northern Inc. has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

BURLINGTON NORTHERN INC.

By ______________________________

Richard M. Bressler
Chairman of the Board, President
and Chief Executive Officer

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of Burlington Northern Inc. and in the capacities and on the dates indicated.

By ______________________ Richard M. Bressler	Chairman of the Board, President and Chief Executive Officer	January 22, 1987
______________________ Luino Dell'Osso, Jr.	Senior Vice President, Finance & Planning	January 22, 1987
______________________ Frank J. Winnermark	Vice President & Controller, Chief Accounting Officer	January 22, 1987
______________________ Royal D. Alworth, Jr.	Director	January 22, 1987
______________________ Zane E. Barnes	Director	January 22, 1987
______________________ Daniel P. Davison	Director	January 22, 1987
______________________ Walter A. Drexel	Director	January 22, 1987
______________________ Mary Garst	Director	January 22, 1987
______________________ Richard C. Grayson	Director	January 22, 1987
______________________ Gerald Grinstein	Director	January 22, 1987

SIGNATURES REQUIRED FOR FORM 10-K

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, Burlington Northern Inc. has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

BURLINGTON NORTHERN INC.

By ______________________________

Richard M. Bressler
Chairman of the Board, President
and Chief Executive Officer

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of Burlington Northern Inc. and in the capacities and on the dates indicated.

By ______________________ Richard M. Bressler	Chairman of the Board, President and Chief Executive Officer	January 22, 1987
______________________ Luino Dell'Osso, Jr.	Senior Vice President, Finance & Planning	January 22, 1987
______________________ Frank J. Winnerwark	Vice President & Controller, Chief Accounting Officer	January 22, 1987
______________________ Royal D. Alworth, Jr.	Director	January 22, 1987
______________________ Zane E. Barnes	Director	January 22, 1987
______________________ Daniel P. Davison	Director	January 22, 1987
______________________ Walter A. Drexel	Director	January 22, 1987
______________________ Mary Garst	Director	January 22, 1987
______________________ Richard C. Grayson	Director	January 22, 1987
______________________ Gerald Grinstein	Director	January 22, 1987

SIGNATURES REQUIRED FOR FORM 10-K

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, Burlington Northern Inc. has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

BURLINGTON NORTHERN INC.

By ______________________

Richard M. Bressler
Chairman of the Board, President
and Chief Executive Officer

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of Burlington Northern Inc. and in the capacities and on the dates indicated.

By ______________________ Richard M. Bressler	Chairman of the Board, President and Chief Executive Officer	January 22, 1987
______________________ Luino Dell'Osso, Jr.	Senior Vice President, Finance & Planning	January 22, 1987
______________________ Frank J. Winnermark	Vice Pres[illegible]oller, Chief Accou[illegible]cer	January 22, 1987
______________________ Royal D. Alworth, Jr.	Director	January 22, 1987
______________________ Zane E. Barnes	Director	January 22, 1987
______________________ Daniel P. Davison	Director	January 22, 1987
______________________ Walter A. Drexel	Director	January 22, 1987
______________________ Mary Garst	Director	January 22, 1987
______________________ Richard C. Grayson	Director	January 22, 1987
______________________ Gerald Grinstein	Director	January 22, 1987

SIGNATURES REQUIRED FOR FORM 10-K

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, Burlington Northern Inc. has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

BURLINGTON NORTHERN INC.

By ______________________

Richard M. Bressler
Chairman of the Board, President
and Chief Executive Officer

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of Burlington Northern Inc. and in the capacities and on the dates indicated.

By ______________________ Richard M. Bressler	Chairman of the Board, President and Chief Executive Officer	January 22, 1987
______________________ Luino Dell'Osso, Jr.	Senior Vice President, Finance & Planning	January 22, 1987
______________________ Frank J. Winnermark	Vice President & Controller, Chief Accounting Officer	January 22, 1987
______________________ Royal D. Alworth, Jr.	Director	January 22, 1987
Zane E. Barnes Zane E. Barnes	Director	January 22, 1987
______________________ Daniel P. Davison	Director	January 22, 1987
______________________ Walter A. Drexel	Director	January 22, 1987
______________________ Mary Garst	Director	January 22, 1987
______________________ Richard C. Grayson	Director	January 22, 1987
______________________ Gerald Grinstein	Director	January 22, 1987

SIGNATURES REQUIRED FOR FORM 10-K

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, Burlington Northern Inc. has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

BURLINGTON NORTHERN INC.

By ______________________________

Richard M. Bressler
Chairman of the Board, President
and Chief Executive Officer

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of Burlington Northern Inc. and in the capacities and on the dates indicated.

By ______________________ Richard M. Bressler	Chairman of the Board, President and Chief Executive Officer	January 22, 1987
______________________ Luino Dell'Osso, Jr.	Senior Vice President, Finance & Planning	January 22, 1987
______________________ Frank J. Winnermark	Vice President & Controller, Chief Accounting Officer	January 22, 1987
______________________ Royal D. Alworth, Jr.	Director	January 22, 1987
______________________ Zane E. Barnes	Director	January 22, 1987
______________________ Daniel P. Davison	Director	January 22, 1987
______________________ Walter A. Drexel	Director	January 22, 1987
______________________ Mary Garst	Director	January 22, 1987
______________________ Richard C. Grayson	Director	January 22, 1987
______________________ Gerald Grinstein	[illegible]	January 22, 1987

SIGNATURES REQUIRED FOR FORM 10-K

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, Burlington Northern Inc. has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

BURLINGTON NORTHERN INC.

By ______________________________
Richard M. Bressler
Chairman of the Board, President
and Chief Executive Officer

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of Burlington Northern Inc. and in the capacities and on the dates indicated.

By ______________________________ Richard M. Bressler	Chairman of the Board, President and Chief Executive Officer	January 22, 1987
______________________________ Luino Dell'Osso, Jr.	Senior Vice President, Finance & Planning	January 22, 1987
______________________________ Frank J. Winnemark	Vice President & Controller, Chief Accounting Officer	January 22, 1987
______________________________ Royal D. Alworth, Jr.	Director	January 22, 1987
______________________________ Zane E. Barnes	Director	January 22, 1987
______________________________ Daniel P. Davison	Director	January 22, 1987
______________________________ Walter A. Drexel	Director	January 22, 1987
______________________________ Mary Garst	Director	January 22, 1987
______________________________ Richard C. Grayson	Director	January 22, 1987
______________________________ Gerald Grinstein	Director	January 22, 1987

SIGNATURES REQUIRED FOR FORM 10-K

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, Burlington Northern Inc. has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

BURLINGTON NORTHERN INC.

By ______________________________
Richard M. Bressler
Chairman of the Board, President
and Chief Executive Officer

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of Burlington Northern Inc. and in the capacities and on the dates indicated.

By ______________________ Richard M. Bressler	Chairman of the Board, President and Chief Executive Officer	January 22, 1987
______________________ Luino Dell'Osso, Jr.	Senior Vice President, Finance & Planning	January 22, 1987
______________________ Frank J. Winnermark	Vice President & Controller, Chief Accounting Officer	January 22, 1987
______________________ Royal D. Alworth, Jr.	Director	January 22, 1987
______________________ Zane E. Barnes	Director	January 22, 1987
______________________ Daniel P. Davison	Director	January 22, 1987
______________________ Walter A. Drexel	Director	January 22, 1987
Mary Garst ______________________ Mary Garst	Director	January 22, 1987
______________________ Richard C. Grayson	Director	January 22, 1987
______________________ Gerald Grinstein	Director	January 22, 1987

SIGNATURES REQUIRED FOR FORM 10-K

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, Burlington Northern Inc. has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

BURLINGTON NORTHERN INC.

By ______________________

Richard M. Bressler
Chairman of the Board, President
and Chief Executive Officer

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of Burlington Northern Inc. and in the capacities and on the dates indicated.

By ______________________ Richard M. Bressler	Chairman of the Board, President and Chief Executive Officer	January 22, 1987
______________________ Luino Dell'Osso, Jr.	Senior Vice President, Finance & Planning	January 22, 1987
______________________ Frank J. Winnermark	Vice President & Controller, Chief Accounting Officer	January 22, 1987
______________________ Royal D. Alworth, Jr.	Director	January 22, 1987
______________________ Zane E. Barnes	Director	January 22, 1987
______________________ Daniel P. Davison	Director	January 22, 1987
______________________ Walter A. Drexel	Director	January 22, 1987
______________________ Mary Garst	Director	January 22, 1987
______________________ Richard C. Grayson	Director	January 22, 1987
______________________ Gerald Grinstein	Director	January 22, 1987

SIGNATURES REQUIRED FOR FORM 10-K

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, Burlington Northern Inc. has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

BURLINGTON NORTHERN INC.

By ______________________________

Richard M. Bressler
Chairman of the Board, President
and Chief Executive Officer

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of Burlington Northern Inc. and in the capacities and on the dates indicated.

By ______________________ Richard M. Bressler	Chairman of the Board, President and Chief Executive Officer	January 22, 1987
______________________ Luino Dell'Osso, Jr.	Senior Vice President, Finance & Planning	January 22, 1987
Frank J. Winnemark	Vice President & Controller, Chief Accounting Officer	January 22, 1987
______________________ Royal D. Alworth, Jr.	Director	January 22, 1987
______________________ Zane E. Barnes	Director	January 22, 1987
______________________ Daniel P. Davison	Director	January 22, 1987
______________________ Walter A. Drexel	Director	January 22, 1987
______________________ Mary Garst	Director	January 22, 1987
______________________ Richard C. Grayson	Director	January 22, 1987
______________________ Gerald Grinstein	Director	January 22, 1987

Charles M. Harper	Director	January 22, 1987
Pemberton Hutchinson	Director	January 22, 1987
C. Ben F. Love Ben F. Love	Director	January 22, 1987
Thomas H. O'Leary	Director	January 22, 1987
Travis H. Petty	Director	January 22, 1987
Gerald C. Ryan	Director	January 22, 1987
Arnold R. Weber	Director	January 22, 1987

Charles M. Harper	Director	January 22, 1987
Pemberton Hutchinson	Director	January 22, 1987
Ben F. Love	Director	January 22, 1987
Thomas H. O'Leary	Director	January 22, 1987
Travis H. Petty	Director	January 22, 1987
Gerald C. Ryan	Director	January 22, 1987
Arnold R. Weber	Director	January 22, 1987

Charles M. Harper	Director	January 22, 1987
Pemberton Hutchinson	Director	January 22, 1987
Ben F. Love	Director	January 22, 1987
Thomas H. O'Leary	Director	January 22, 1987
Travis H. Petty	Director	January 22, 1987
Gerald C. Ryan	Director	January 22, 1987
Arnold R. Weber	Director	January 22, 1987

Charles M. Harper	Director	January 22, 1987
Pemberton Hutchinson	Director	January 22, 1987
Ben F. Love	Director	January 22, 1987
Thomas [illegible] O'Leary	Director	January 22, 1987
Travis H. Petty	Director	January 22, 1987
Gerald C. Ryan	Director	January 22, 1987
Arnold R. Weber	Director	January 22, 1987

Charles M. Harper	Director	January 22, 1987
Pemberton Hutchinson	Director	January 22, 1987
Ben F. Love	Director	January 22, 1987
Thomas H. O'Leary	Director	January 22, 1987
Travis H. Petty	Director	January 22, 1987
Gerald C. Ryan	Director	January 22, 1987
Arnold R. Weber	Director	January 22, 1987

CHARLES M. HARPER Charles M. Harper	Director	January 22, 1987
PEMBERTON HUTCHINSON Pemberton Hutchinson	Director	January 22, 1987
BEN F. LOVE Ben F. Love	Director	January 22, 1987
THOMAS H. O'LEARY Thomas H. O'Leary	Director	January 22, 1987
TRAVIS H. PETTY Travis H. Petty	Director	January 22, 1987
GERALD C. RYAN Gerald C. Ryan	Director	January 22, 1987
ARNOLD R. WEBER Arnold R. Weber	Director	January 22, 1987

REPORT OF MANAGEMENT

To the Stockholders and Directors of Burlington Northern Inc.:

The accompanying financial statements have been prepared by management in conformity with generally accepted accounting principles. The fairness and integrity of these financial statements, including any judgments, estimates and selection of appropriate generally accepted accounting principles, are the responsibility of management, as is all other information presented in this Annual Report Form 10-K.

In the opinion of management, the financial statements are fairly stated, and, to that end, the Company maintains a system of internal control which: provides reasonable assurance that transactions are recorded properly for the preparation of financial statements; safeguards assets against loss or unauthorized use; maintains accountability for assets; and, requires proper authorization and accounting for all transactions. Management is responsible for the effectiveness of internal control. This is accomplished through established codes of conduct, accounting and other control systems, policies and procedures, employee selection and training, appropriate delegation of authority and segregation of responsibilities. To further ensure compliance with established standards and related control procedures, the Company conducts a substantial corporate audit program.

Our independent certified public accountants provide an objective independent review by their examination of the Company's financial statements. Their examination is conducted in accordance with generally accepted auditing standards and includes a review of internal accounting control to the extent deemed necessary for the purposes of their examination.

The Audit Committee of the Board of Directors, composed solely of outside directors, meets regularly with the independent certified public accountants, management, and corporate audit to review the work of each and to ensure that each is properly discharging its financial reporting and internal control responsibilities. To ensure complete independence, the certified public accountants and corporate audit have full and free access to the Audit Committee to discuss the results of their examinations, the adequacy of internal accounting controls and the quality of financial reporting.

January 22, 1987

Luino Dell'Osso, Jr.
Senior Vice President,
Finance & Planning

Frank J. Winnermark
Vice President & Controller

DIRECTORS OF BURLINGTON NORTHERN INC.

Royal D. Alworth, Jr (2)
Chairman of the Board
Oneida Realty Company

Zane E. Barnes (3)
Chairman of the Board,
President and
Chief Executive Officer
Southwestern Bell Corporation

Richard M. Bressler (2) (3) (4)
Chairman of the Board,
President and Chief
Executive Officer
Burlington Northern Inc

Daniel P. Davison (2) (4)
Chairman of the Board
and Chief Executive
Officer
United States Trust
Company of New York

Walter A. Drexel (2) (4) (5)
Vice Chairman of the Board
Burlington Northern Inc.

Mary Garst (1)
Cattle Manager
The Garst Company

Richard C. Grayson (3) (4) (5)
Retired

Gerald Grinstein (3) (5)
Chairman and Chief
Executive Officer
Western Air Lines, Inc

Charles M. Harper
Chairman and Chief
Executive Officer
ConAgra, Inc

Pemberton Hutchinson (1) (4)
President and Chief Operating
Officer
Westmoreland Coal Company

Ben F. Love (2)
Chairman of the Board
and Chief Executive Officer
Texas Commerce Bancshares,
Inc

Thomas H. O'Leary (2) (4)
Vice Chairman of the Board
Burlington Northern Inc.

Travis H. Petty (2) (4)
Vice Chairman of the Board
Burlington Northern Inc

Gerald C. Ryan (1)
President
Ryan Potato Company

Arnold R. Weber (2) (5)
President
Northwestern University

Committee Assignments
(1) Audit
(2) Finance
(3) Compensation and
Nominating
(4) Executive
(5) Railroad Review Board

CORPORATE INFORMATION

Principal Corporate Office
Burlington Northern Inc
999 Third Avenue
Seattle, Washington 98104 4097
(206) 467 3838

Stock Transfer Agent and Registrar
The First National Bank
of Boston
Shareholder Services
P.O. Box 644
Boston, Massachusetts 02102
(617) 929 5445

Stock Exchange Listings
New York Stock Exchange
Midwest Stock Exchange
Pacific Stock Exchange
Symbol BNI

Annual Meeting
The Annual Meeting of Stockholders will be in Seattle, Washington, on April 3, 1987. Formal notice of the meeting will be mailed in advance

Additional copies of this Annual Report are available, without charge, by writing or calling

Ms. Leslie S. Gibbs
Corporate Secretary
Burlington Northern Inc
999 Third Avenue
Seattle, Washington 98104 4097
(206) 467 3838

BURLINGTON NORTHERN INC.

EARNINGS (LOSS) PER SHARE COMPUTATION

EXHIBIT 11

Year Ended December 31,	1986		1985		1984	
(In Thousands, Except Per Share Amounts)	Earnings	Shares	Earnings* (Restated)	Shares	Earnings* (Restated)	Shares
Primary earnings (loss) per common share						
Earnings (loss)	$(860,405)	-	$596,488	-	$569,204	-
Preferred dividend requirements	33,108	-	(65,637)	-	(76,996)	-
Net earnings (loss) available for common stock and weighted average common shares outstanding	(893,513)	73,743	530,851	73,436	492,208	73,943
Stock options deemed to be common stock equivalents	-	285	-	414	-	334
Total net earnings (loss) and primary common shares	$(893,513)	74,028	$530,851	73,850	$492,208	74,277
Primary earnings (loss) per common share	$ (12.07)	-	$ 7.19	-	$ 6.63	-
Fully diluted earnings (loss) per common share						
Net earnings (loss) available for common stock and weighted average common stock outstanding	$(893,513)	73,743	$530,851	73,436	$492,208	73,943
Stock options deemed to be common stock equivalents	-	285	-	489		376
Convertible subordinated notes, the conversion of which would dilute earnings per common share	1,512	969	1,706	969	-	-
Total net earnings (loss) and fully diluted common shares	$(892,001)	74,997	$532,557	74,894	$492,208	74,319
Fully diluted earnings (loss) per common share	$ (11.89)	-	$ 7.11	-	$ 6.62	-

* Previously reported amounts have been restated for successful efforts method of accounting for oil and gas properties. See Note 2 of Notes to Consolidated Financial Statements.

7006

BURLINGTON NORTHERN INC.

SUBSIDIARIES OF THE REGISTRANT

EXHIBIT 22

The following is a list of the subsidiaries of Burlington Northern Inc. showing the place of incorporation and the percentage of voting securities owned.

Name of Company	Jurisdiction of Incorporation	Percentage of Voting Securities Owned Directly or Indirectly by Immediate Parent
Burlington Northern Railroad Company	Delaware	100%
The El Paso Company	Delaware	100%
El Paso Natural Gas Company	Delaware	99%
Meridian Oil Holding Inc.	Delaware	100%
Southland Royalty Company	Delaware	100%
Plum Creek Timber Company, Inc.	Delaware	100%
Burlington Northern Motor Carriers Inc.	Delaware	100%

The names of certain subsidiaries are omitted as such subsidiaries, considered as a single subsidiary, would not constitute a significant subsidiary.

EXHIBIT B

FCC Form 430

Common Carrier and Satellite

Radio License Qualification Report

FCC 430

FEDERAL COMMUNICATIONS COMMISSION
WASHINGTON, D.C. 20554

Approved By OMB 3060-0105 Expires 3/31/87

COMMON CARRIER AND SATELLITE RADIO LICENSEE QUALIFICATION REPORT

INSTRUCTIONS

A. The "Filer" of this report is defined to include: (1) An applicant, where this report is submitted in connection with applications for common carrier and satellite radio authority as required for such applications; or (2) A licensee or permittee, where this report is required by the Commission's Rules to be submitted on an annual basis.

B. Submit an original and one copy (sign original only) to the Federal Communications Commisison, Washington, D.C. 20554. If more than one radio service is listed in item 6, submit an additional copy for each such additional service. If this report is being submitted in connection with an application for radio authority, attach it to that application.

C. Do not submit a fee with this report.

1. Business Name and Address (Number, Street, City, State and ZIP Code) of Filer's Principal Office:

National Exchange, Inc.
1505 Planning Research Drive
McLean, Virginia 22102

2. (Area Code) Telephone Number
(703) 883-8833

3. If this report supercedes a previously filed report, specify its date:
April 1, 1985

4. Filer is (check one):
☐ Individual ☐ Partnership ☒ Corporation
☐ Other *(Specify)*:

5. Under the laws of what State (or other jurisdiction) is the Filer organized?
Deleware

6. List the common carrier and satellite radio services in which Filer has applied or is a current licensee or permittee:

Domestic Fixed-Satellite Service
Direct Broadcast Satellite Service

7(a) Has the Filer or any party to this application had any FCC station license or permit revoked or had any application for permit, license or renewal denied by this Commission? ☒ Yes ☐ No
If **"YES,"** attach as Exhibit I, a statement giving call sign and file number of license or permit revoked and relating circumstances.
See Exhibit I.

(b) Has any court finally adjudged the Filer, or any person directly or indirectly controlling the Filer, guilty of unlawfully monopolizing or attempting unlawfully to monopolize radio communication, directly or indirectly, through control of manufacture or sale of radio apparatus, exclusive traffic arrangement, or other means of unfair methods of competition? ☐ Yes ☒ No
If **"YES,"** attach as Exhibit II a statement relating the facts.

(c) Has the Filer, or any party to this application, or any person directly or indirectly controlling the Filer ever been convicted of a felony by any state or Federal Court? ☐ Yes ☒ No
If **"YES,"** attach as Exhibit III a statement relating the facts.

(d) Is the Filer, or any person directly or indirectly controlling the Filer, presently a party in any matter referred to in items 7(b) and 7(c)? ☐ Yes ☒ No
If **"YES,"** attach as Exhibit IV a statement relating the facts.

8. Is the Filer, directly or indirectly, through stock ownership, contract or otherwise, currently interested in the ownership or control of any other radio stations licensed by this Commission? ☒ Yes ☐ No
If **"YES"** submit as Exhibit V, the name of each such licensee and the licensee's relation to the Filer.
See Exhibit V.

If Filer is an individual (sole proprietorship) or partnership, answer the following and Item 11: N/A

9(a) Full Legal Name and Residential Address (Number, Street, City, State and ZIP Code) of Individual or Partners:

(b) Is individual or each member of a partnership a citizen of the United States? ☐ Yes ☐ No

(c) Is individual or any member of a partnership a representative of an alien or of a foreign government? ☐ Yes ☐ No

Previous editions of Form FCC 430 are obsolete.

If Filer is a corporation, answer the following and Item 11:

10(a) Attach as Exhibit VI, the names, addresses, and citizenship of those stockholders owning of record and/or voting 10 percent or more of the Filer's voting stock and the percentages so held. In the case of fiduciary control, indicate the beneficiary(ies) or class of beneficiaries.

See Exhibit VI.

(b) List below, or attach in Exhibit VII, the names and addresses of the officers and directors of the Filer.

See Exhibit VII.

(c) Is the Filer directly or indirectly controlled by any other corporation? ☒ Yes ☐ No

If "**YES,**" attach as Exhibit VIII a statement (including organizational diagrams where appropriate) which fully and completely identifies the nature and extent of control. Include the following: (1) the address and primary business of the controlling corporation and any intermediate subsidiaries; (2) the names, addresses, and citizenship of those stockholders holding 10 percent or more of the controlling corporation's voting stock; (3) the approximate percentage of total voting stock held by each such stockholder; and (4) the names and addresses of the president and directors of the controlling corporation.

See Exhibit VIII.

(d) Is any officer or director of the Filer an alien? ☐ Yes ☒ No

(e) Is more than one-fifth of the capital stock of the Filer owned of record or voted by aliens or their representatives, or by a foreign government or representatives thereof, or by a corporation organized under the laws of a foreign country? ☐ Yes ☒ No

(f) Is the Filer directly or indirectly controlled: (1) by any other corporation of which any officer or more than one-fourth of the directors are aliens, or (2) by any foreign corporation or corporation of which more than one-fourth of the capital stock is owned or voted by aliens or their representatives, or by a foreign government or representatives thereof. ☐ Yes ☒ No

(g) If any answer to questions (d), (e) or (f) is "**YES,**" attach as Exhibit IX a statement identifying the aliens or foreign entities, their nationality, their relationship to the Filer, and the percentage of stock they own or vote.

11. CERTIFICATION

This report constitutes a material part of any application which cross-references it, and all statements made in the attached exhibits are a material part hereof. The ownership information contained in this report does not constitute an application for, or Commission approval of, any transfer of control or assignment of radio facilities. The undersigned, individually and for the Filer, hereby certifies that the statements made herein are true, complete and correct to the best of Filer's knowledge and belief, and are made in good faith.

WILLFUL FALSE STATEMENTS MADE ON THIS APPLICATION ARE PUNISHABLE BY FINE AND IMPRISONMENT [U.S. Code, Title 18, Section 1001] AND/ OR REVOCATION OF ANY STATION LICENSE OR CONSTRUCTION PERMIT [U.S. Code, Title 47, Section 312(a)(1)]	Date 9/15/87	Filer *(Must correspond with that shown in Item 1).* National Exchange, Inc.	Typed or Printed Name George S. Kush
	Signature George S. Kush		Title Executive Vice President

NOTICE TO INDIVIDUALS REQUIRED BY PRIVACY ACT OF 1974 AND THE PAPERWORK REDUCTION ACT OF 1980

The solicitation of personal information requested in this form is to determine if you are qualified to become or remain a licensee in a common carrier or satellite radio service pursuant to the Communications Act of 1934, as amended. No authorization can be granted unless all information requested is provided. Response is required to obtain the requested authorization or retain an authorization.

National Exchange, Inc.
McLean, Virginia

Exhibit I
FCC Form 430
September 14, 1987

APPLICATIONS OF NATIONAL EXCHANGE, INC. THAT HAVE BEEN DENIED BY THE COMMISSION

The Filer, National Exchange, Inc. ("NEX"), had its applications for three Ku-band domestic fixed-satellites -- two in-orbit and one ground spare (File Nos. 1824-DSS-P/LA-83, 1825-DSS-P/LA-83, and 1828-DSS-P-84) -- denied by the Commission on the ground that NEX had failed to meet the Commission's financial qualifications standards. * Order, FCC 85-417 (released Aug. 19, 1987).

By order released October 3, 1986, the Commission cancelled the interim direct broadcast permit, File No. DBS-84-03, which had been awarded to NEX, for failure to meet the Commission's due diligence requirements; Tempo Enterprises, Inc., et al., FCC 86-408 (released Oct. 3, 1986).

---

* At NEX's request, the Commission also had previously dismissed its companion applications for two C-band domestic satellites (File Nos. 1826-DSS-P/LA-84, 1827-DSS-P-LA-84, 956-DSS-P/LA, and 957-DSS-P/LA-84). See Order FCC 85-417 (released Aug. 19, 1985).

National Exchange, Inc.
McLean, Virginia

Exhibit V
FCC Form 430
September 14, 1987

OWNERSHIP AND CONTROL OF OTHER RADIO STATIONS

National Exchange, Inc. ("NEX") is 90% owned by Burlington Northern, Inc., a long-standing licensee in the Private Radio Service. Additionally, NEX has pending applications for 900 MHz SMR licenses in various different markets.

National Exchange, Inc.
McLean, Virginia

Exhibit VI
FCC Form 430
September 14, 1987

STOCKHOLDERS OWNING OF RECORD AND/OR VOTING 10% OR MORE OF VOTING STOCK OF NEX

Stockholder	Amount Held
Burlington Northern, Inc. 999 Third Avenue Seattle, Washington 98104	90%

National Exchange, Inc.
McLean, Virginia

Exhibit VII
FCC Form 430
September 14, 1987

NAMES AND ADDRESS OF THE OFFICERS AND DIRECTORS OF NEX

Directors

Richard M. Bressler
999 Third Avenue
Seattle, Washington 98104

Luino Dell'Osso, Jr.
999 Third Avenue
Seattle, Washington 98104

Clay T. Whitehead
1505 Planning Research Drive
McLean, Virginia 22102

Robert E. LaBlanc
323 Highland Avenue
Ridgewood, New Jersey 07450

Officers

Clay T. Whitehead
President
1505 Planning Research Drive
McLean, Virginia 22102

George S. Kush
Executive Vice President
Secretary
1505 Planning Research Drive
McLean, Virginia 22102

National Exchange, Inc.
McLean, Virginia

Exhibit VIII
FCC Form 430
September 14, 1987

CONTROLLING CORPORATION

(1) National Exchange, Inc. is 90% owned by Burlington Northern, Inc. ("BNI"), 999 Third Avenue, Seattle, Washington 98104. BNI is primarily engaged in the transportation and natural resources businesses.

(2) No one individual or entity owns 10 persent or more of the stock of BNI.

(3) The names and address of the president and directors of BNI are as follows:

Richard M. Bressler
Chairman of the Board,
President and Chief Executive
Officer and Director
999 Third Avenue
Seattle, Washington 98104

Gerald Grinstein
Vice Chairman of the Board
and Director
1715 Western Avenue
Ft. Worth, Texas 76107

Allan R. Boyce
Senior Vice President,
Human Resources
4335 N.E. 43rd Street
Seattle, Washington 98105

Luino Dell'Osso, Jr.
Senior Vice President,
Finance and Planning
4591 E. Mercer Way
Mercer Island, WA 98104

Travis H. Petty
Vice Chairman of the Board
and Director
P.O. Box 1492
El Paso, Texas 79978

Christopher T. Bayley
Senior Vice President,
Corporate Affairs
3702 East Prospect Street
Seattle, Washington 98112

Thomas H. O'Leary
Vice Chairman of the Board
and Director
999 Third Avenue
Seattle, Washington 98104

James W. Becker
Vice President and
General Counsel
4231 90th Avenue
Mercer Island, WA 98104

National Exchange, Inc.
McLean, Virginia

Exhibit VIII
FCC Form 430
September 14, 1987

George E. Howison
Vice President and
Treasurer
3030 80th Avenue, S.E.
Mercer Island, WA 98104

Leslie S. Gibbs
Corporate Secretary
5805 145th Avenue, S.E.
Bellevue, Washington 98104

Royal D. Alworth, Jr.
Director
1605 Alworth Building
Duluth, Minnesota 55802

Zane E. Barnes
Director
One Bell Center, Suite 4200
St. Louis, Missouri 63101

Daniel P. Davidson
Director
45 Wall Street
New York, New York 10005

Mary Garst
Director
Box 267
Coon Rapids, Iowa 50058

Richard C. Grayson
Director
One Centerre Plaza, Suite 1660
St. Louis, Missouri

Charles M. Harper
Director
One Central Park Plaza
Omaha, Nebraska 68102

Pemberton Hutchinson
Director
2500 Fidelity Building
Philadelphia, PA 19109

Ben F. Love
Director
P. O. Box 2558
Houston, Texas 77252

Gerald C. Ryan
Director
Box 388
East Grand Forks, MN 56721

Arnold R. Weber
Director
633 Clark Street
Evanston, Illinois 60201

II. SPOTNET 1: 101° W.L.

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of the Application of	)	
NATIONAL EXCHANGE, INC.	)	File No.
For Authority to Construct, Launch and Operate a Hybrid Domestic Communications Satellite to be Fixed in Geosynchronous Orbit at 101° West Longitude.	)	

APPLICATION

National Exchange, Inc. ("NEX"), pursuant to Sections 308, 309, and 319 of the Communications Act of 1934, as amended, 47 U.S.C. §§ 308, 309, 319, hereby applies for authority to construct, launch and operate a domestic communications satellite that will function in both the 4/6-GHz and 12/14-GHz frequency bands. The specific satellite for which authorization is being sought in this application (which appears as Part II of NEX's overall SpotNet system application) is referred to as SpotNet 1. NEX requests that the Commission reserve a geosynchronous orbital position at 101° W.L. for this satellite. In support of this Application, NEX respectfully states:

A. Applicant.

National Exchange, Inc.
1505 Planning Research Drive
McLean, Virginia 22102
(703) 883-8833

B. Correspondence.

Correspondence with respect to this application should be sent to the following person at the above address and telephone number:

George S. Kush
Executive Vice President

with a copy to:

Henry Goldberg, Esq.
Jeffrey H. Olson, Esq.
Goldberg & Spector
1229 Nineteenth Street, N.W.
Washington, D.C. 20036
(202) 429-4900

C. Technical Description Including Radio Frequency and Polarization Plan.

The satellite for which construction, launch and operating authority is requested herein is an integral part of the SpotNet domestic communications satellite system that is being proposed by NEX. The satellite will perform communications functions in the 4-GHz (downlink) and 6-GHz (uplink) frequency bands, and in the 12-GHz (downlink) and 14-GHz (uplink) frequency bands. Tracking, telemetry and command ("TT&C") functions will also be performed in the 12-GHz and 14-GHz frequency bands. The satellite is one of two in-orbit hybrid satellites that NEX proposes to operate at separate orbital locations.

The SpotNet 1 satellite will carry electronics for eighteen spot beams, as described more fully in Part I. Because of the unique design of the Ku-Band system, SpotNet does not contain

transponders _per se_; its payload may best be described in terms of the equivalent usable spectrum, which is 3,750 MHz. From the 101° W.L. location, the SpotNet 1 satellite will provide coverage of the continental United States, Hawaii, Puerto Rico, the Virgin Islands and portions of Alaska, as shown in Figure 1B, _supra_. The antenna design of the satellite provides a range of pattern sizes from a small circular coverage of Eastern urban areas to a one-fifth CONUS coverage for lower population density areas. Each satellite will have electronics to receive nine uplinks of 250 MHz each and another nine of 167 MHz, and to transmit nine downlinks of 250 MHz and another nine of 167 MHz each. The EIRP at the center of the downlink pattern is 63 dBW for the 250 MHz patterns, and 61 dBW for the 167 MHz patterns, except for three patterns in lower rainfall zones west of the Mississippi, which are rated at 60 dBW.[1]

The SpotNet 1 satellite will also carry 24 operational C-Band transponders, with 34 dBW EIRP center-of-beam coverage of the contiguous 48 states. As shown in Figure 1B, Hawaii and portions of Alaska will also receive C-Band coverage, as well as Puerto Rico and the Virgin Islands.

---

[1] The EIRP figures denote the saturated EIRP available in the total bandwidth of the pattern. When considered in proportion to the 36 MHz bandwidth typical in the industry, and when adjusted for the fact that SpotNet Ku-Band HPAs are designed to operate with a 3 dB backoff when fully loaded, the EIRPs are equivalent to 52 dBW, 52 dBW, and 51 dBW for the patterns referred to above.

The satellite will be designed for a mission and orbital life of 10 years. Its technical characteristics are summarized in Table 1 and a block diagram of the spacecraft's Ku-Band communications subsystem is shown in Figure 2. The C-Band communications subsystem block diagram is shown in Figure 4.

Table 1
Operational Satellite Characteristics

Parameter	Type or Value
Launch vehicle	Domestic ELV, Ariane or Long March
Launch date	See Schedule
Satellite mission life/ design life	10 years
North-south stationkeeping accuracy	0.05°
East-west stationkeeping accuracy	0.05°
Eclipse capability	100%
Stabilization	Spin or 3-axis stabilized
RF output power	Ku-Band: 3 @ 10 watts 4 @ 15 watts 1 @ 20 watts 2 @ 30 watts 1 @ 50 watts 4 @ 75 watts 3 @ 120 watts C-Band: 24 @ 9 watts
Communications channelization	Ku-Band: 9 "Spots" @ 250 MHz 9 "Beams" @ 167 MHz C-Band: 24 transponders @ 36 MHz
Communications EIRP	Ku-Band: 9 "Spots" @ 63 dBW/250 MHz 6 "Beams" @ 61 dBW/167 MHz 3 "Beams" @ 60 dBW/167 MHz C-Band: CONUS, 34 dBW Alaska, 30 dBW Hawaii, 27 dBW Puerto Rico, 28 dBW
Communications Receive G/T	Ku-Band: 3 western "Beams" at +5 dB/K; other patterns from +8 to +19 dB/K C-Band: CONUS at -5.9 dB/°K Alaska at -8.4 dB/°K Hawaii at -10.4 dB/°K Puerto Rico at -10.0dB/°K
Communications Receive SFD	C-Band: -89.9 to -96.9 dBW/m^2 Ku-Band: No direct equivalent parameter; uplink power is controlled to a level of -110 dBW/m^2 (or less) per 1.5 MHz channel.

12/14-GHz communications frequencies:	
Transmit	11.700 to 12.200 GHz
Receive	14.000 to 14.500 GHz
4/6-GHz communications frequencies:	
Transmit	3.700 to 4.200 GHz
Receive	5.925 to 6.425 GHz
TT&C EIRP	To be determined (TBD)
TT&C Receive	TBD
flux density	TBD
TT&C frequencies:	
Telemetry	TBD
Command	TBD
Communications polarization:	Ku-Band: 9 "Spot" patterns horizontal on uplink and downlink; 9 "Beams" patterns vertical on uplink and downlink
	C-Band: 12 transponders with vertical uplink and horizontal downlink, 12 transponders with horizontal uplink and vertical downlink
TT&C polarization	
Telemetry	TBD
Command	TBD

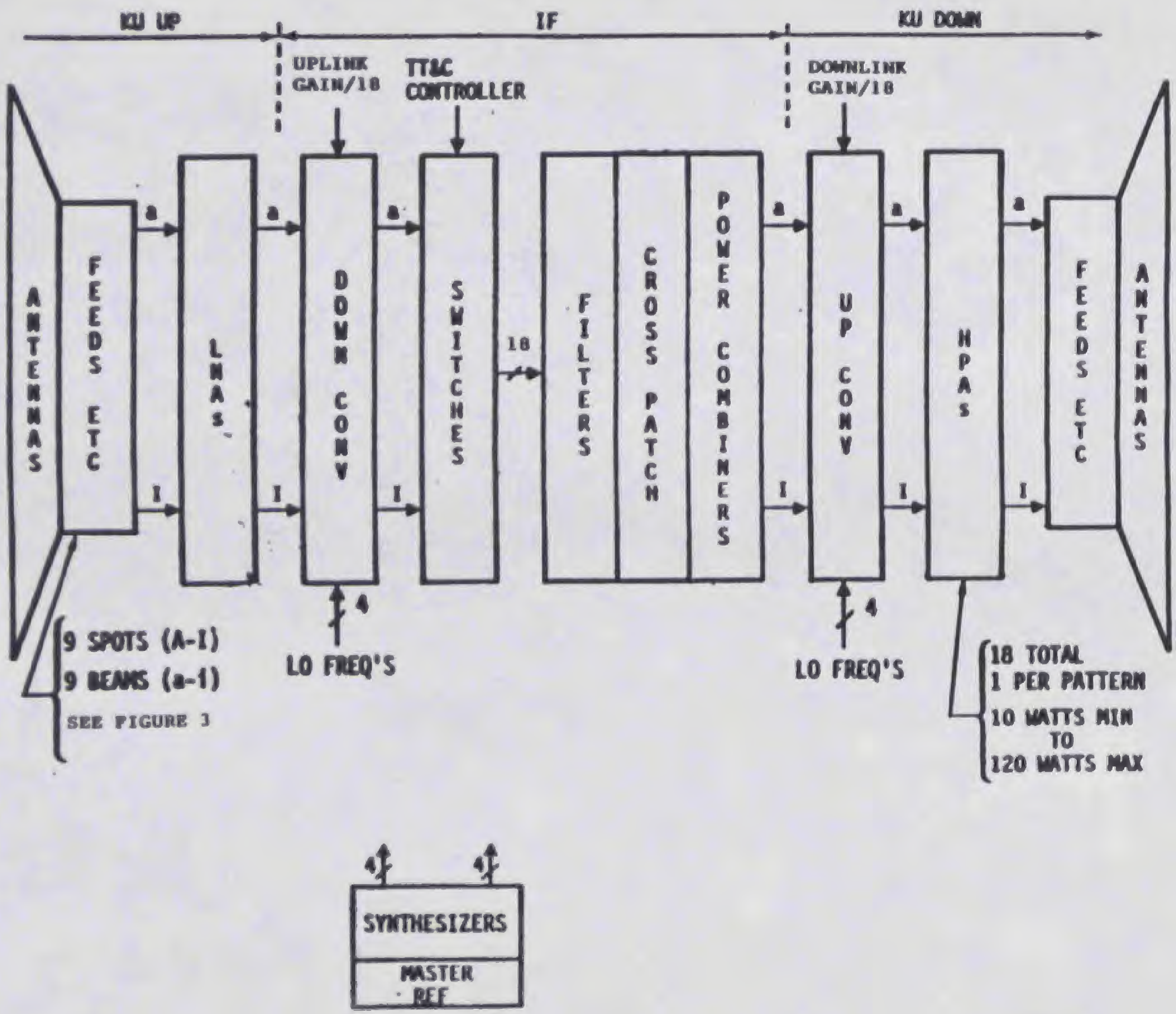


Figure 2. Organization of the Ku-Band Payload for Spotnet Satellite

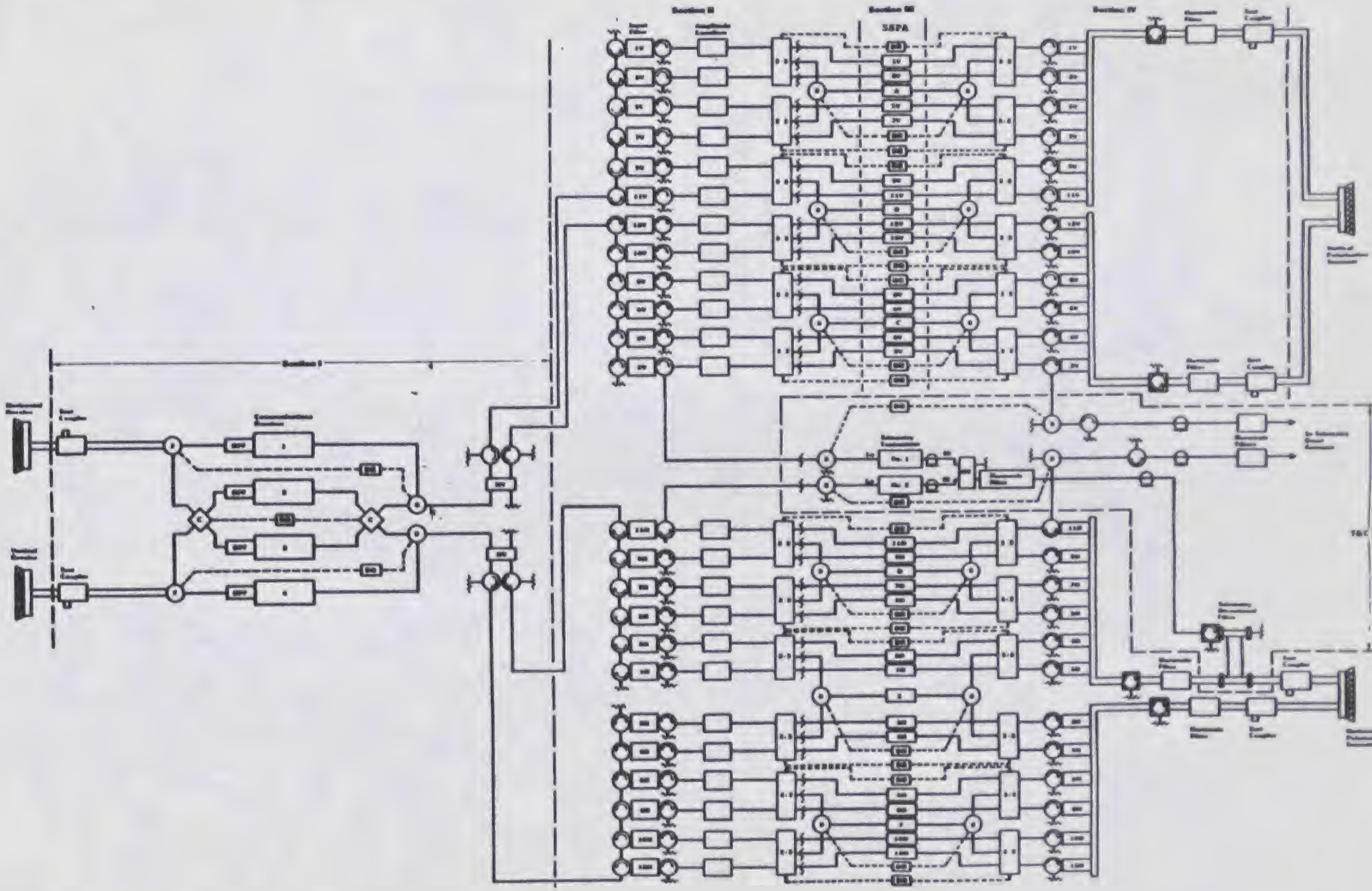
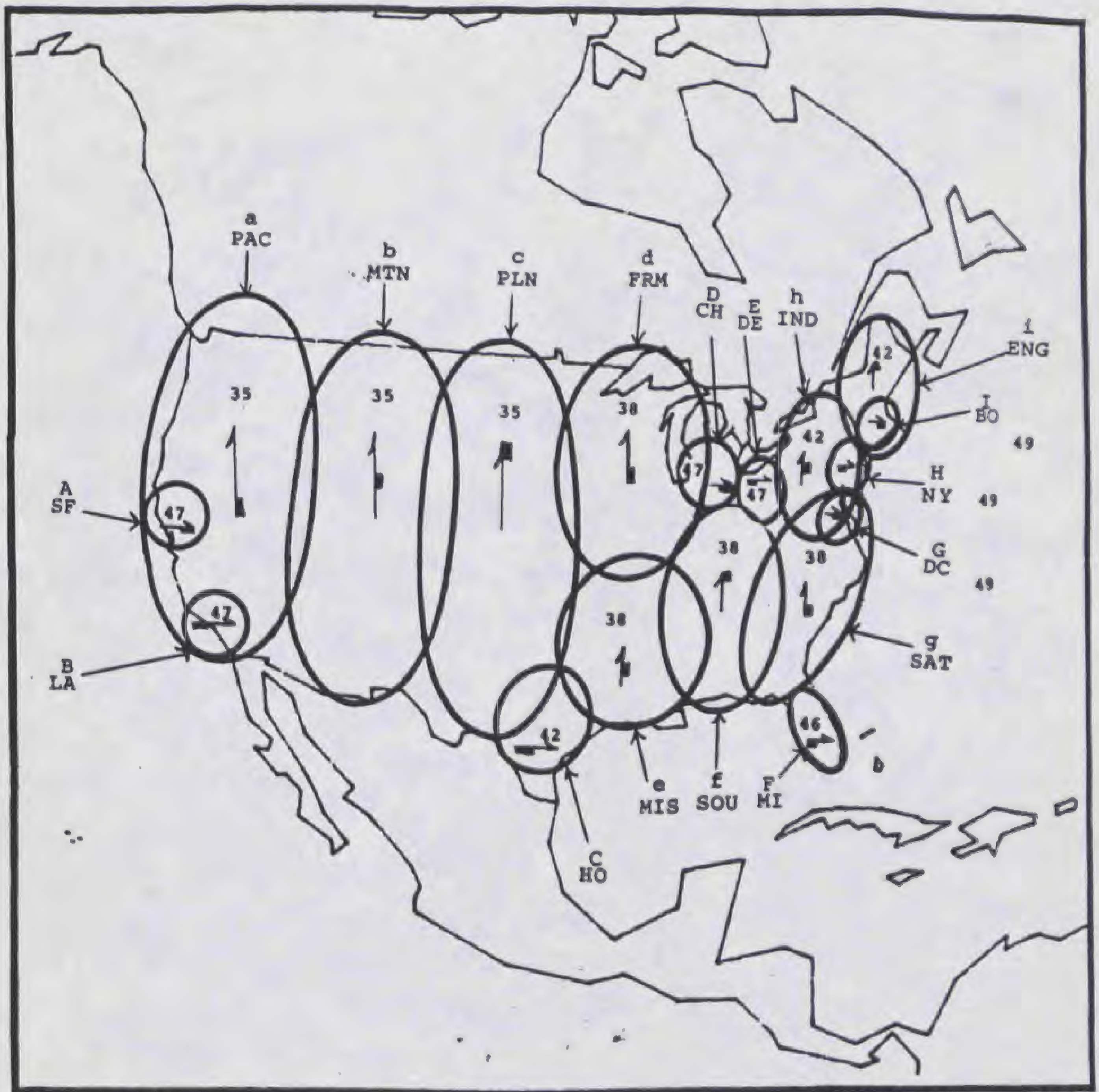


Figure 4. C-Band Subsystem

The spatial, frequency, and polarization plan for Ku-Band usage in SpotNet 1 is shown in Figure 3. The TT&C signals will occupy part of the 11.7-12.2-GHz and 14.0-14.5-GHz bands, using frequencies and polarizations that are not occupied by the normal communications signals. Because final selection of a satellite bus has not been made, the exact command frequencies, polarizations, and transmission characteristics (including emission designators) cannot be specified at this time. They will be supplied by separate cover as soon as practicable.

The SpotNet Ku-Band service will consist of 1536 Kbps and 96 Kbps usage as described in Part I. Coherent phase shift-keying is used in both services, with the 1536 Kbps service being QPSK and the 96 Kbps service being BPSK. Both services use error control coding, as described in Part I. Channelization for the 1,536 Kbps service is 1,500 KHz per carrier and the 96 Kbps service is channelized as 300 KHz subchannels of the 1,500 KHz channels.



NOTES: 1. ASSUMED 14' (4.3M) ANTENNA ON SPACECRAFT.

2. UPPER CASE DESIGNATES "SPOT" - HORIZONTALLY POLARIZED - 250 MHz BW's.

3. LOWER CASE DESIGNATES "BEAM" - VERTICALLY POLARIZED - 167 MHz BW's.

4 NUMBERS INDICATE ANTENNA DOWNLINK GAIN IN DBI.

POTENTIAL REUSE RATIO = 7.5

LEGEND:

VERTICAL LOWER 3rd

VERTICAL MIDDLE 3rd

VERTICAL UPPER 3rd

HORIZONTAL LOWER HALF

HORIZONTAL UPPER HALF

Figure 3 Frequency and Polarization Usage

The satellite will also have 24 transponders operating in the standard 4/6-GHz domestic fixed bands. Table 20 details the exact channel center frequency assignments and polarizations for each transponder.

Emission designators for the C-Band communications functions will vary with the precise nature of traffic being carried. The following list reflects NEX's best present estimates regarding traffic in the proposed system:

FDM/FM - 200 F9 up to 36000 F9

TV/FM - 36000 F5

Teleconferencing - 4000 F5

SCPC/FM 20 F9

SCPC/FM 50 F9

The satellite's C-Band communications system will utilize solid-state final amplifiers. These amplifiers will have an RF output of 9 watts (9.5 dBW). Losses between the final amplifier and the input port of the reflector antenna amount to 1.1 dB. This output and loss combination, together with the CONUS contour for the reflector antenna, provides a minimium EIRP of 34.0 dBW. All transponders are connected to each antenna beam.

Table 20

C-BAND TRANSPONDER CENTER FREQUENCIES

Satellite-to-Earth		Earth-to-Satellite	
Frequency, MHz	Polarization	Frequency, MHz	Polarization
3720	Horizontal 1	5945	Vertical 1
3740	Vertical 2	5965	Horizontal 2
3760	Horizontal 3	5985	Vertical 3
3780	Vertical 4	6005	Horizontal 4
3800	Horizontal 5	6025	Vertical 5
3820	Vertical 6	6045	Horizontal 6
3840	Horizontal 7	6065	Vertical 7
3860	Vertical 8	6085	Horizontal 8
3880	Horizontal 9	6105	Vertical 9
3900	Vertical 10	6125	Horizontal 10
3920	Horizontal 11	6145	Vertical 11
3940	Vertical 12	6165	Horizontal 12
3960	Horizontal 13	6185	Vertical 13
3980	Vertical 14	6205	Horizontal 14
4000	Horizontal 15	6225	Vertical 15
4020	Vertical 16	6245	Horizontal 16
4040	Horizontal 17	6265	Vertical 17
4060	Vertical 18	6285	Horizontal 18
4080	Horizontal 19	6305	Vertical 19
4100	Vertical 20	6325	Horizontal 20
4120	Horizontal 21	6345	Vertical 21
4140	Vertical 22	6365	Horizontal 22
4160	Horizontal 23	6385	Vertical 23
4180	Vertical 24	6405	Horizontal 24

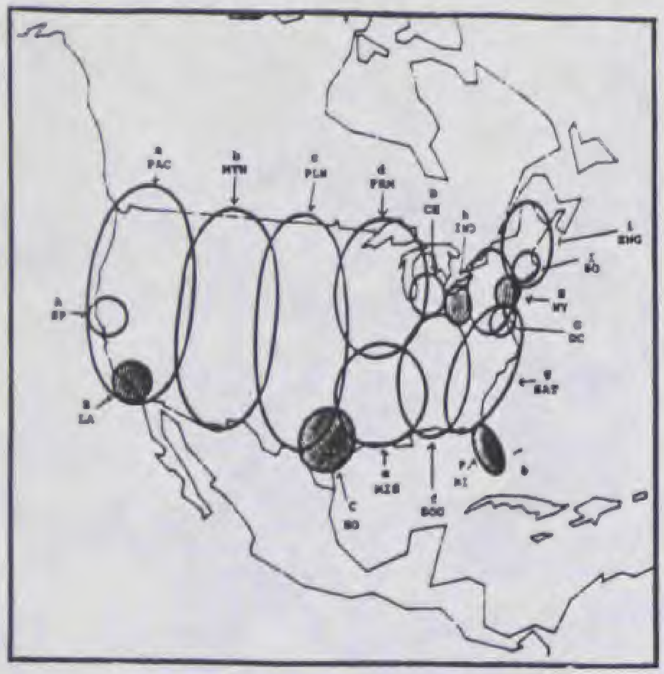
An analysis of potential harmful inter-satellite interference due to the satellite's operation is included in Section G of Part I and Appendix A, supra.

D. Orbital Location Information.

This phase of the SpotNet satellite system will require the assignment of two orbital locations. Because of SpotNet 1's unique Ku-Band spot beam design, it will be technically feasible for NEX to add additional Ku-Band satellites at these same locations in the future. For this first phase, NEX is requesting a location of 101° W.L. for SpotNet 1 and a location of 93° W.L. for SpotNet 2. The public interest rationale for such an assignment is discussed in Section H of Part I, supra.

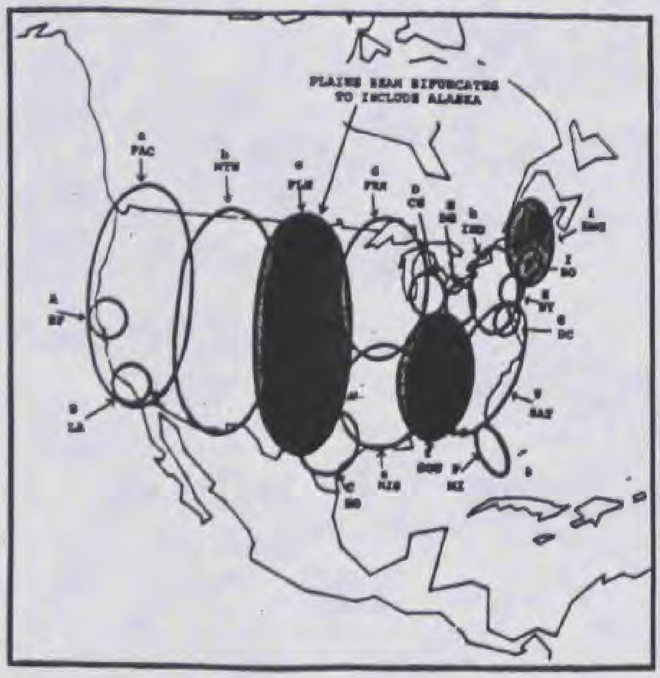
E. Predicted Space Station Coverage Contours for Each Antenna Beam at Nominal Orbital Location Requested.

Coverage contours for each of the eighteen Ku-Band patterns are displayed in Figure 10. These contours denote the approximate limits of coverage (-4 dBi relative to peak gain) of the patterns and are based on a traffic load balancing formula developed by NEX, rather than on the results of a detailed antenna and feed design. When a spacecraft vendor is selected, these patterns will be refined and the results supplied to the Commission. These patterns have been reviewed by expert spacecraft designers and have been judged to be achievable (with perhaps slight departure from the contours of Figure 10) with existing spacecraft technology. The patterns are applicable to both uplink and downlink Ku-Band transmission for SpotNet I.



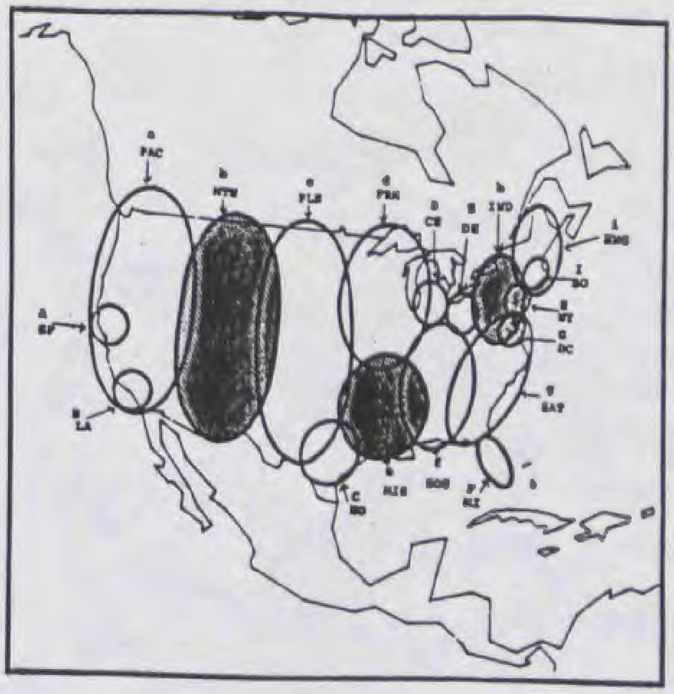
(A) REUSE OF HORIZONTAL - LOWER 250 MHz
(SPOTS B, C, E, F, H)

(B) REUSE OF HORIZONTAL - UPPER 250 MHz
(SPOTS A, D, G, I)

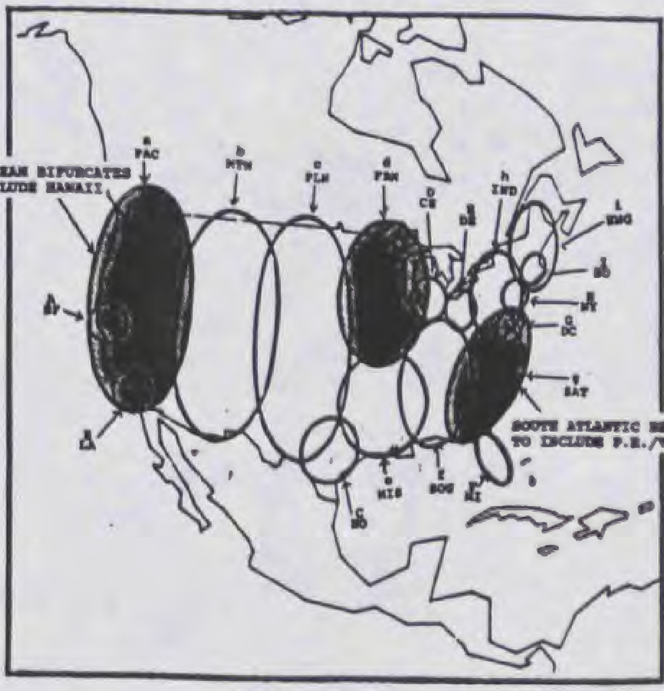


(C) REUSE OF VERTICAL - MIDDLE 167 MHz
(BEAMS c, f, i)

Figure 10. Ku-Band Patterns at 101° W.L.
(1 of 2)



(D) REUSE OF VERTICAL - MIDDLE 167 MHz
(BEAMS b, e, h)

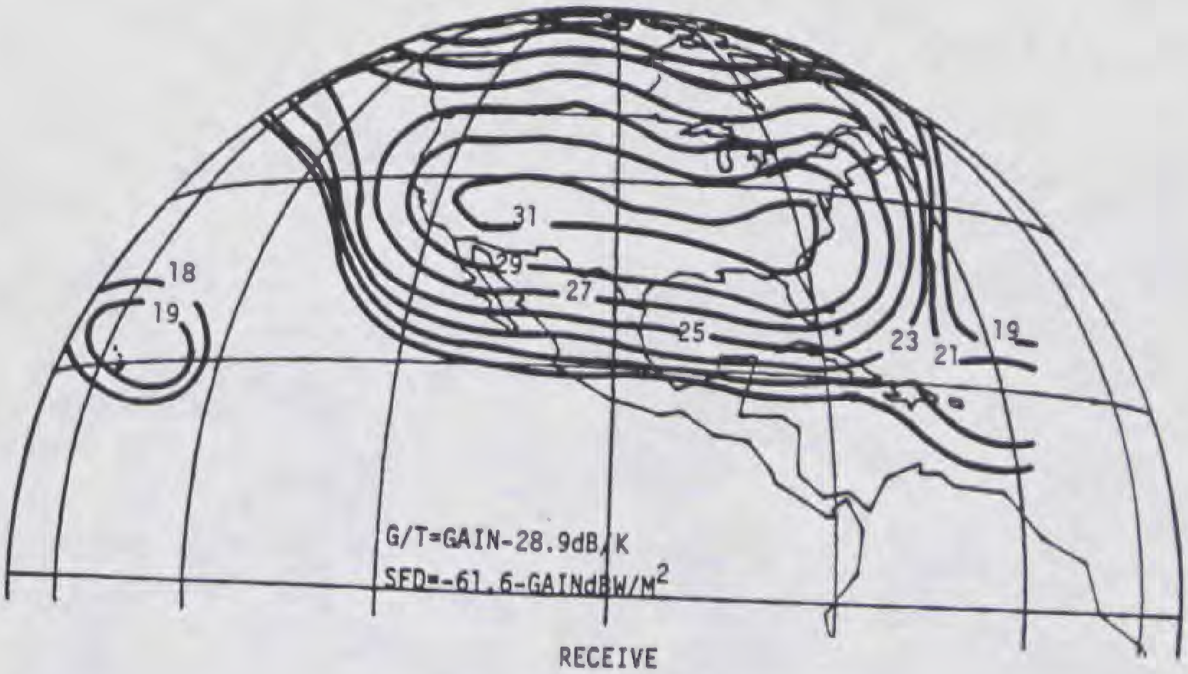


(E) REUSE OF VERTICAL - LOWER 167 MHz
(BEAMS a, d, g)

Figure 10. Ku-Band Patterns at 101° W.L.
(2 of 2)

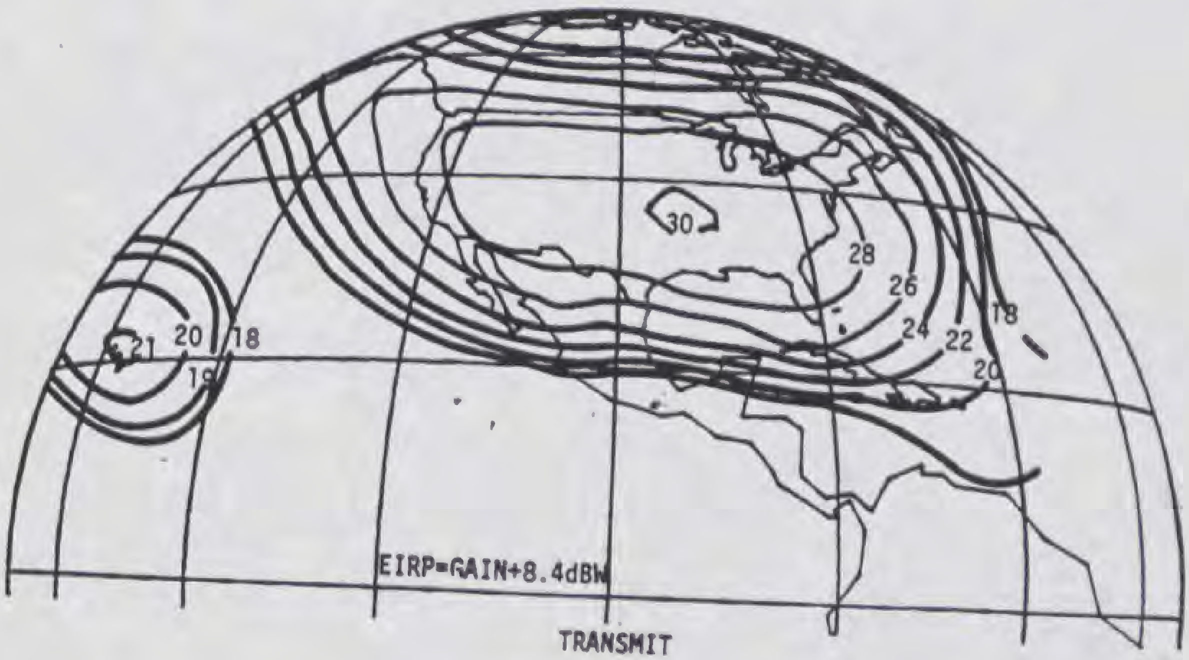
The C-Band coverage contours for the space station applied for in this Application are contained in Figures 6 and 8 for the vertically polarized receive and transmit antennas and horizontally polarized receive and transmit antennas. The contours provided are overlaid on perspective maps as seen from the geostationary orbit and show the coverage for each satellite and the satellite horizon from that point.

C-Band EIRP contours can be determined from the gain contour figures by adding 8.4 dBW to the transmit gain contour values. Similarly, G/T contours can be obtained by subtracting 28.9 dB/K from the receive gain contour values. The transponder saturation flux density (SFD) can be obtained by adding -61.6 dBW/m^2 to the receive gain contours.



RECEIVE

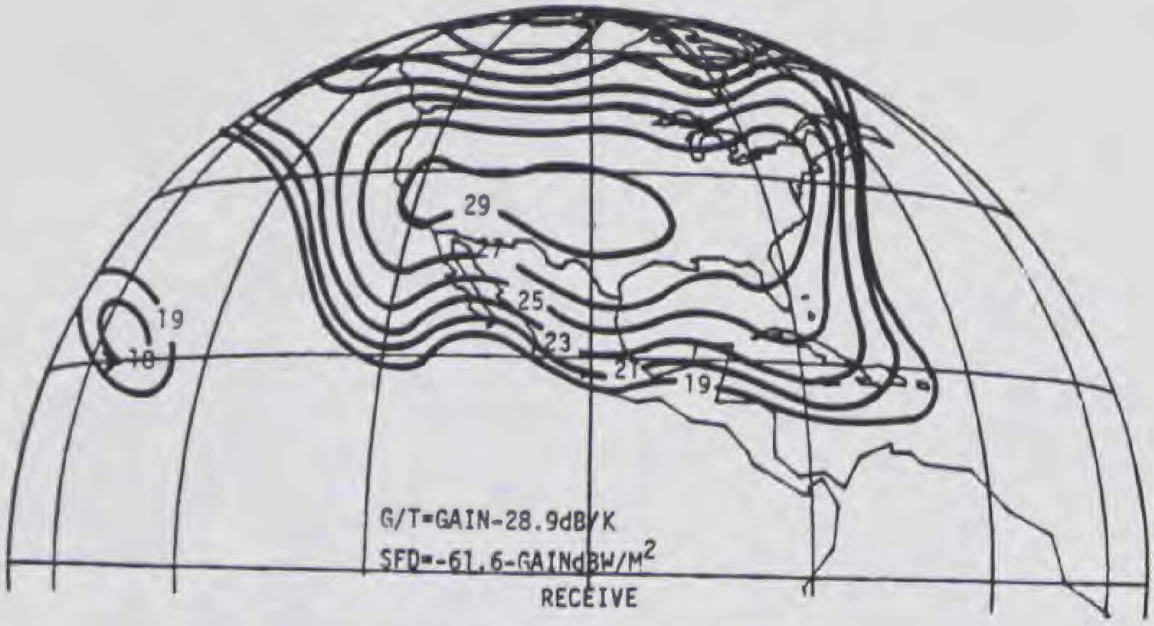
HORIZONTAL GAIN CONTOURS (101° WEST)



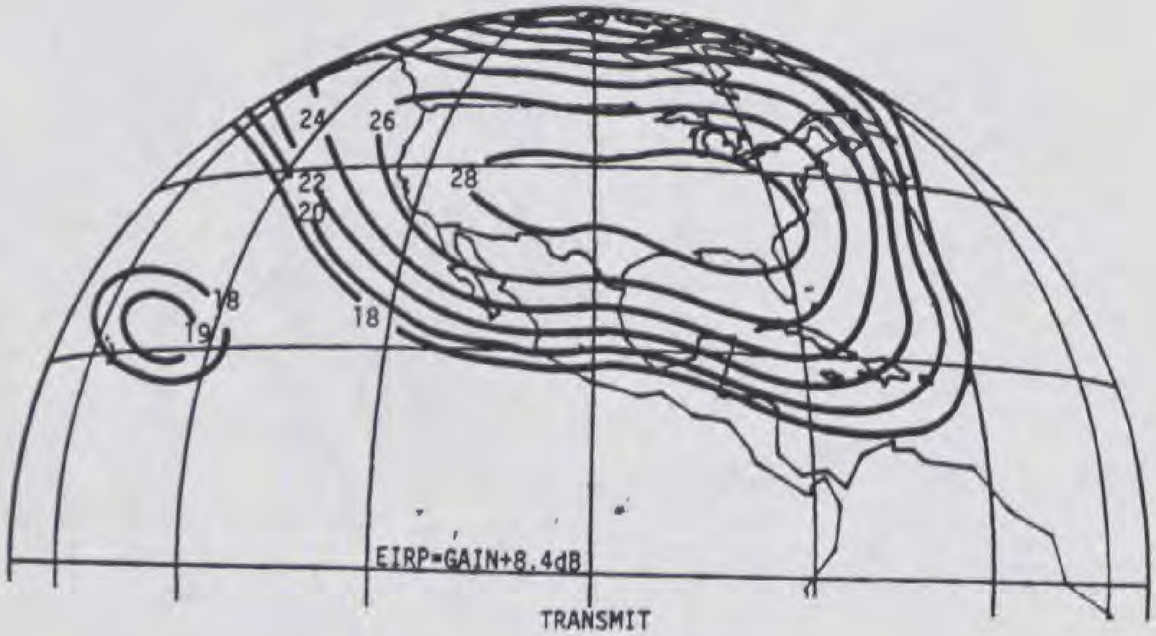
TRANSMIT

HORIZONTAL GAIN CONTOURS (101° WEST)

Figure 6 Horizontal Gain Countours (101° W.L.)



VERTICAL GAIN CONTOURS (101° WEST)



VERTICAL GAIN CONTOURS (101° WEST)

Figure 8 Vertical Gain Countours (101° W.L.)

F. Physical Characteristics of Space Station.

1. Accuracy with Which Orbital Parameters Will Be Maintained.

a. Orbital Inclination.

The NEX satellites will be designed to maintain the inclination of the orbit to ± 0.05 degrees or less and the longitude position to within ± 0.05 degrees.

b. Antenna Axis Attitude/ Longitudinal Drift.

The propulsion subsystem will be sized for and loaded with sufficient propellant to maintain operational attitude and station-keeping control for at least 10 years. Additional propellant will also be incorporated to provide correction of the initial orbit, initial attitude acquisition, satellite spin or despin if required, and limited orbital repositioning during the lifetime of the satellite. Sufficient propellant will also be reserved for removing the spacecraft from orbit after its mission is complete.

2. Accuracy of Spacecraft Antenna Pointing Toward the Earth.

The NEX SpotNet satellites will be designed to maintain a pointing accuracy of .05° or less.

3. Estimated Lifetime of Satellite In-Orbit.

The satellite will be designed for an operational and mission life of 10 years, which is determined primarily by the amount of station-keeping propellant that is carried. The final amplifiers

for the Ku-Band downlink patterns are solid state and are formed by the parallel action of multiple devices. Redundant devices are provided for each final amplifier to the extent required to ensure a 10-year lifetime of each downlink with a high reliability. The C-Band transponder configuration provides a high degree of reliability with a 30-for-24 TWTA redundancy. Life and reliability of the other components and subsystems will be maximized by using proven satellite hardware and proven reliability in the equipment design.

4. Description of Spacecraft Attitude Stabilization and Station-Keeping Systems.

The satellites will be either three-axis-stabilized or spin-stabilized, with the actual technique being selected during the satellite procurement process. The satellites will include an attitude control subsystem to provide pointing accuracies consistent with the achievement of the specified communications performance and inclusive of all error sources (e.g., attitude perturbations, thermal-induced distortions, misalignments, orbital tolerances, and perturbations produced by station-keeping maneuvers).

5. Electrical Energy System Description.

The electrical power subsystem will be designed so that at the end of the spacecraft life, sufficient power will be available to operate all C-Band transponders and all Ku-Band electronics and the housekeeping loads. Sufficient battery capacity will be furnished to provide power for all housekeeping functions and the

entire communications payload during the eclipse periods at end of life.

The primary source of power will be solar cells with energy-storage batteries for eclipse operation. No single failure in the electrical energy system will cause spacecraft failure.

G. Emission Limitations.

The overall selectivity of the input and output filters and other circuitry will attenuate all spurious emissions from the SpotNet satellite to values well below those specififed in Section 25.202 of the FCC Rules and Regulations. Precise values of attenuation will be submitted to the Commission at the time a satellite vendor is chosen.

H. Dates by Which Construction Will Be Commenced and Completed, Launch Date, and Estimated Date of Placement into Service.

A detailed schedule specifying concrete dates by which significant milestones in establishment of the SpotNet satellite system are planned to be achieved is included as Table 18 in Part I of the overall application.

I. Waiver of Claims.

The Applicant waives any claim to the use of any particular frequency or of the ether as against the regulatory power of the United States because of the previous use of the same, whether by license or otherwise, and requests construction and launch authority in accordance with this application. All statements

made in the attached exhibits are a material part hereof, and are incorporated herein as if set out in full in this application.

J. Public Interest Considerations.

Part I of NEX's application set forth the public interest considerations and the financial, legal and technical qualifications of the applicant, as well as other information pertinent to this Application, and that information is incorporated herein by reference.

K. Certification of Person Responsible for Preparing Engineering Information Submitted in This Application.

I hereby certify that I am the technically qualified person responsible for preparation of the engineering information contained in this application, and that I am familiar with Parts 21 and 25 of the Commission's Rules. In preparing this application, I relied upon the expertise of NEX's consultants: Rubin, Bednarek & Associates, Washington, D.C.; David Wright of DataWrights, Solana Beach, California; M/A-COM Linkabit, Inc., San Diego, California; the Spacecraft Engineering Division of Telesat Canada, Ottawa, Canada; and Dale N. Hatfield Associates, Boulder, Colorado. I oversaw the final compilation of the technical material contained herein and I certify that this application is complete and accurate to the best of my knowledge.

By: [signature]
Philip A. Rubin
Rubin, Bednarek & Associates
1001 22nd Street, N.W.
Washington, D.C. 20037
(202) 296-9380

Dated: September 15, 1987

The undersigned certifies individually and for NEX that the statements made in this application are true, complete, and correct to the best of his knowledge and belief, and are made in good faith.

WHEREFORE, NEX requests that the Commission grant this application.

Respectfully submitted,

NATIONAL EXCHANGE, INC.

By [signature]
George S. Kush
Executive Vice President

Dated: September 15, 1987

III. SPOTNET 2: 93° W.L.

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of the Application of	)	
NATIONAL EXCHANGE, INC.	)	File No.
For Authority to Construct, Launch and Operate a Hybrid Domestic Communications Satellite to be Fixed in Geosynchronous Orbit at 93° West Longitude.	)	

APPLICATION

National Exchange, Inc. ("NEX"), pursuant to Sections 308, 309, and 319 of the Communications Act of 1934, as amended, 47 U.S.C. §§ 308, 309, 319, hereby applies for authority to construct, launch and operate a domestic communications satellite that will function in both the 4/6-GHz and 12/14-GHz frequency bands. The specific satellite for which authorization is being sought in this application (which appears as Part III of NEX's overall SpotNet system application) is referred to as SpotNet 2. NEX requests that the Commission reserve a geosynchronous orbital position at 93° W.L. for this satellite. In support of this Application, NEX respectfully states:

A. Applicant.

National Exchange, Inc.
1505 Planning Research Drive
McLean, Virginia 22102
(703) 883-8833

B. Correspondence.

Correspondence with respect to this application should be sent to the following person at the above address and telephone number:

George S. Kush
Executive Vice President

with a copy to:

Henry Goldberg, Esq.
Jeffrey H. Olson, Esq.
Goldberg & Spector
1229 Nineteenth Street, N.W.
Washington, D.C. 20036
(202) 429-4900

C. Technical Description Including Radio Frequency and Polarization Plan.

The satellite for which construction, launch and operating authority is requested herein is an integral part of the SpotNet domestic communications satellite system that is being proposed by NEX. The satellite will perform communications functions in the 4-GHz (downlink) and 6-GHz (uplink) frequency bands, and in the 12-GHz (downlink) and 14-GHz (uplink) frequency bands. Tracking, telemetry and command ("TT&C") functions will also be performed in the 12-GHz and 14-GHz frequency bands. The satellite is one of two in-orbit hybrid satellites that NEX proposes to operate at separate orbital locations.

The SpotNet 2 satellite will carry electronics for eighteen spot beams, as described more fully in Part I. Because of the unique design of the Ku-Band system, SpotNet does not contain

transponders per se; its payload may best be described in terms of the equivalent usable spectrum, which is 3,750 MHz. From the 93° W.L. location, the SpotNet 2 satellite will provide coverage of the continental United States, Hawaii, Puerto Rico, the Virgin Islands and portions of Alaska, as shown in Figure 1A, supra. The antenna design of the satellite provides a range of pattern sizes from a small circular coverage of Eastern urban areas to a one-fifth CONUS coverage for lower population density areas. Each satellite will have electronics to receive nine uplinks of 250 MHz each and another nine of 167 MHz, and to transmit nine downlinks of 250 MHz and another nine of 167 MHz each. The EIRP at the center of the downlink pattern is 63 dBW for the 250 MHz patterns, and 61 dBW for the 167 MHz patterns, except for three patterns in lower rainfall zones west of the Mississippi, which are rated at 60 dBW.[1]

The SpotNet 2 satellite will also carry 24 operational C-Band transponders, with 34 dBW EIRP center-of-beam coverage of the contiguous 48 states. As shown in Figure 1A, Hawaii and portions of Alaska will also receive C-Band coverage, as well as Puerto Rico and the Virgin Islands.

---

1 The EIRP figures denote the saturated EIRP available in the total bandwidth of the pattern. When considered in proportion to the 36 MHz bandwidth typical in the industry, and when adjusted for the fact that SpotNet Ku-Band HPAs are designed to operate with a 3 dB backoff when fully loaded, the EIRPs are equivalent to 52 dBW, 52 dBW, and 51 dBW for the patterns referred to above.

The satellite will be designed for a mission and orbital life of 10 years. Its technical characteristics are summarized in Table 1 and a block diagram of the spacecraft's Ku-Band communications subsystem is shown in Figure 2. The C-Band communications subsystem block diagram is shown in Figure 4.

Table 1
Operational Satellite Characteristics

Parameter	Type or Value	
Launch vehicle	Domestic ELV, Ariane or Long March	
Launch date	See Schedule	
Satellite mission life/ design life	10 years	
North-south stationkeeping accuracy	0.05°	
East-west stationkeeping accuracy	0.05°	
Eclipse capability	100%	
Stabilization	Spin or 3-axis stabilized	
RF output power	Ku-Band:	3 @ 10 watts 4 @ 15 watts 1 @ 20 watts 2 @ 30 watts 1 @ 50 watts 4 @ 75 watts 3 @ 120 watts
	C-Band:	24 @ 9 watts
Communications channelization	Ku-Band:	9 "Spots" @ 250 MHz 9 "Beams" @ 167 MHz
	C-Band:	24 transponders @ 36 MHz
Communications EIRP	Ku-Band:	9 "Spots" @ 63 dBW/250 MHz 6 "Beams" @ 61 dBW/167 MHz 3 "Beams" @ 60 dBW/167 MHz
	C-Band:	CONUS, 34 dBW Alaska, 30 dBW Hawaii, 27 dBW Puerto Rico, 28 dBW
Communications Receive G/T	Ku-Band:	3 western "Beams" at +5 dB/K; other patterns from +8 to +19 dB/K
	C-Band:	CONUS at -5.9 dB/°K Alaska at -8.4 dB/°K Hawaii at -10.4 dB/°K Puerto Rico at -10.0dB/°K
Communications Receive SFD	C-Band:	-89.9 to -96.9 dBW/m^2
	Ku-Band:	No direct equivalent parameter; uplink power is controlled to a level of -110 dBW/m^2 (or less) per 1.5 MHz channel.

12/14-GHz communications frequencies:	
Transmit	11.700 to 12.200 GHz
Receive	14.000 to 14.500 GHz
4/6-GHz communications frequencies:	
Transmit	3.700 to 4.200 GHz
Receive	5.925 to 6.425 GHz
TT&C EIRP	To be determined (TBD)
TT&C Receive	TBD
flux density	TBD
TT&C frequencies:	
Telemetry	TBD
Command	TBD
Communications polarization:	Ku-Band: 9 "Spot" patterns horizontal on uplink and downlink; 9 "Beams" patterns vertical on uplink and downlink
	C-Band: 12 transponders with vertical uplink and horizontal downlink, 12 transponders with horizontal uplink and vertical downlink
TT&C polarization	
Telemetry	TBD
Command	TBD

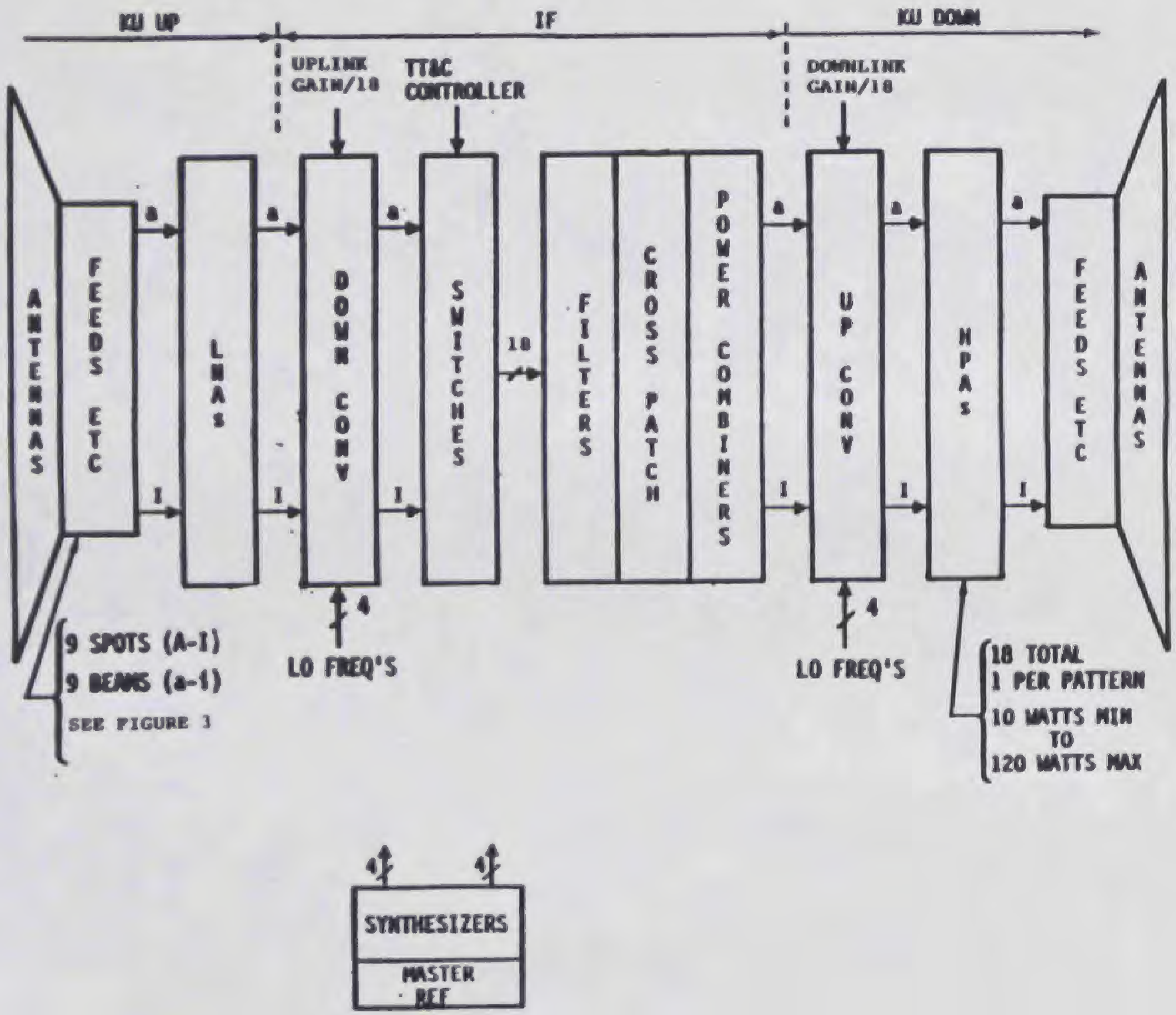


Figure 2. Organization of the Ku-Band Payload for Spotnet Satellite

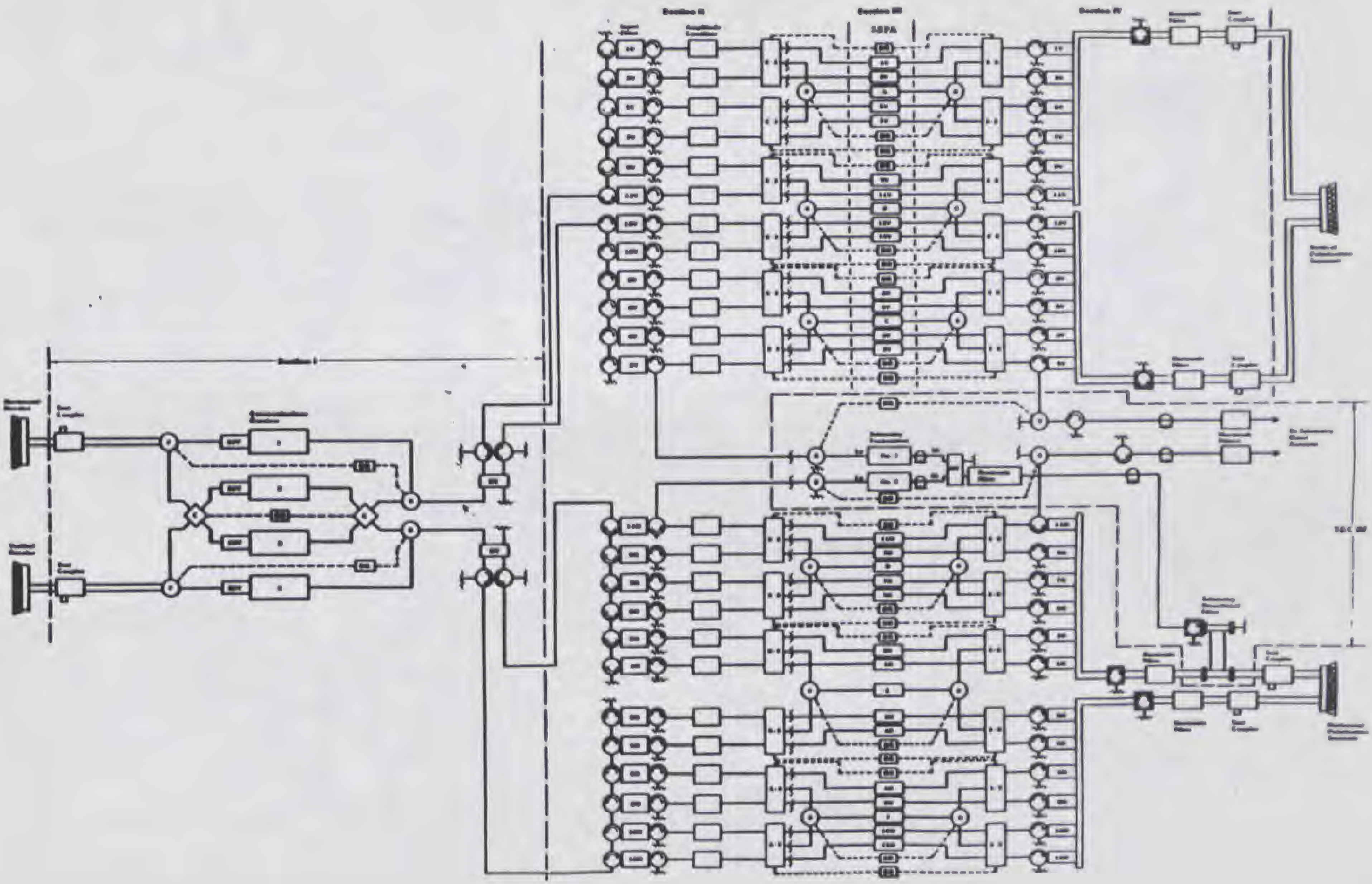
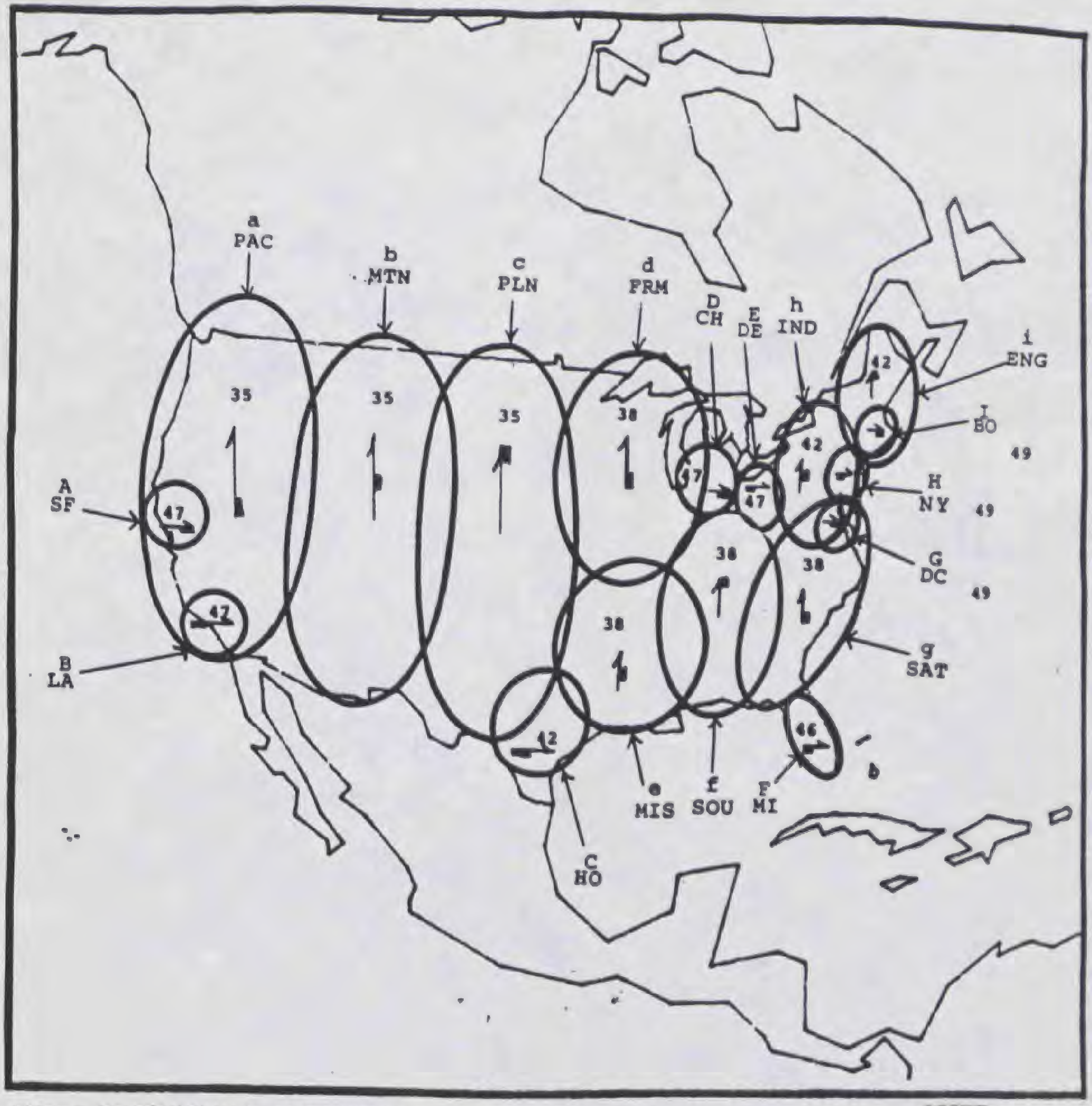


Figure 4.   C-Band Subsystem

The spatial, frequency, and polarization plan for Ku-Band usage in SpotNet 2 is shown in Figure 3. The TT&C signals will occupy part of the 11.7-12.2-GHz and 14.0-14.5-GHz bands, using frequencies and polarizations that are not occupied by the normal communications signals. Because final selection of a satellite bus has not been made, the exact command frequencies, polarizations, and transmission characteristics (including emission designators) cannot be specified at this time. They will be supplied by separate cover as soon as practicable.

The SpotNet Ku-Band service will consist of 1536 Kbps and 96 Kbps usage as described in Part I. Coherent phase shift-keying is used in both services, with the 1536 Kbps service being QPSK and the 96 Kbps service being BPSK. Both services use error control coding, as described in Part I. Channelization for the 1,536 Kbps service is 1,500 KHz per carrier and the 96 Kbps service is channelized as 300 KHz subchannels of the 1,500 KHz channels.



NOTES: 1. ASSUMED 14' (4.3M) ANTENNA ON SPACECRAFT.

2. UPPER CASE DESIGNATES "SPOT" - HORIZONTALLY POLARIZED - 250 MHz BW's.

3. LOWER CASE DESIGNATES "BEAM" - VERTICALLY POLARIZED - 167 MHz BW's.

4 NUMBERS INDICATE ANTENNA DOWNLINK GAIN IN DBI.

POTENTIAL REUSE RATIO = 7.5

LEGEND:

VERTICAL LOWER 3rd

VERTICAL MIDDLE 3rd

VERTICAL UPPER 3rd

HORIZONTAL LOWER HALF

HORIZONTAL UPPER HALF

Figure 3 Frequency and Polarization Usage

The satellite will also have 24 transponders operating in the standard 4/6-GHz domestic fixed bands. Table 20 details the exact channel center frequency assignments and polarizations for each transponder.

Emission designators for the C-Band communications functions will vary with the precise nature of traffic being carried. The following list reflects NEX's best present estimates regarding traffic in the proposed system:

FDM/FM - 200 F9 up to 36000 F9

TV/FM - 36000 F5

Teleconferencing - 4000 F5

SCPC/FM 20 F9

SCPC/FM 50 F9

The satellite's C-Band communications system will utilize solid-state final amplifiers. These amplifiers will have an RF output of 9 watts (9.5 dBW). Losses between the final amplifier and the input port of the reflector antenna amount to 1.1 dB. This output and loss combination, together with the CONUS contour for the reflector antenna, provides a minimium EIRP of 34.0 dBW. All transponders are connected to each antenna beam.

Table 20

C-BAND TRANSPONDER CENTER FREQUENCIES

Satellite-to-Earth		Earth-to-Satellite	
Frequency,MHz	Polarization	Frequency,MHz	Polarization
3720	Horizontal 1	5945	Vertical 1
3740	Vertical 2	5965	Horizontal 2
3760	Horizontal 3	5985	Vertical 3
3780	Vertical 4	6005	Horizontal 4
3800	Horizontal 5	6025	Vertical 5
3820	Vertical 6	6045	Horizontal 6
3840	Horizontal 7	6065	Vertical 7
3860	Vertical 8	6085	Horizontal 8
3880	Horizontal 9	6105	Vertical 9
3900	Vertical 10	6125	Horizontal 10
3920	Horizontal 11	6145	Vertical 11
3940	Vertical 12	6165	Horizontal 12
3960	Horizontal 13	6185	Vertical 13
3980	Vertical 14	6205	Horizontal 14
4000	Horizontal 15	6225	Vertical 15
4020	Vertical 16	6245	Horizontal 16
4040	Horizontal 17	6265	Vertical 17
4060	Vertical 18	6285	Horizontal 18
4080	Horizontal 19	6305	Vertical 19
4100	Vertical 20	6325	Horizontal 20
4120	Horizontal 21	6345	Vertical 21
4140	Vertical 22	6365	Horizontal 22
4160	Horizontal 23	6385	Vertical 23
4180	Vertical 24	6405	Horizontal 24

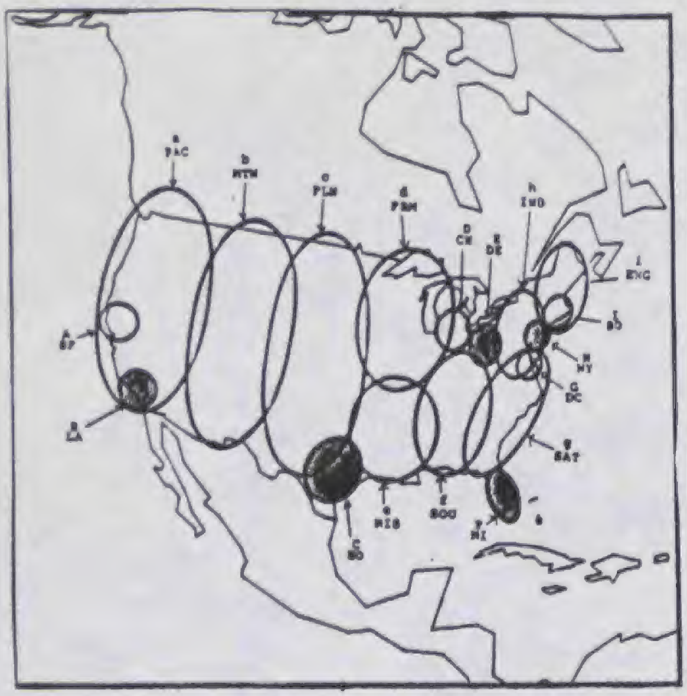
An analysis of potential harmful inter-satellite interference due to the satellite's operation is included in Section G of Part I and Appendix A, supra.

D. Orbital Location Information.

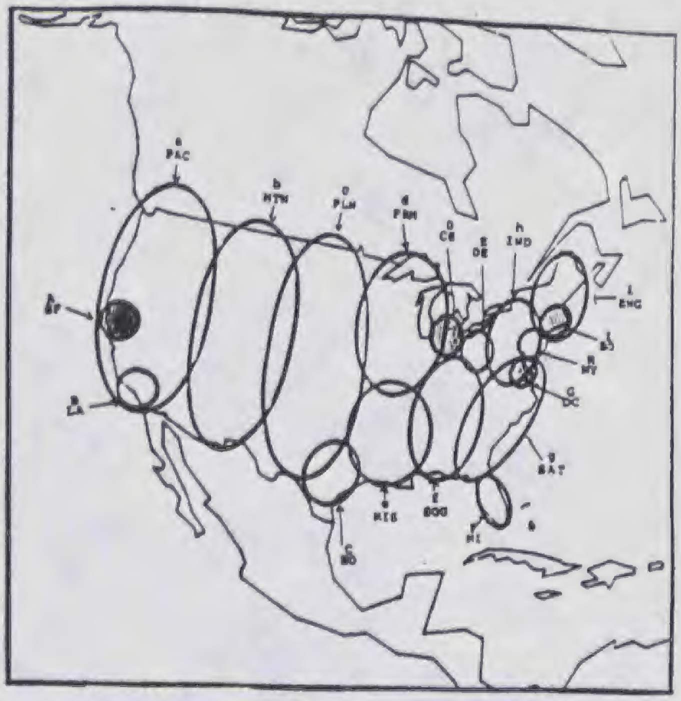
This phase of the SpotNet satellite system will require the assignment of two orbital locations. Because of SpotNet 1's unique Ku-Band spot beam design, it will be technically feasible for NEX to add additional Ku-Band satellites at these same locations in the future. For this first phase, NEX is requesting a location of 101° W.L. for SpotNet 1 and a location of 93° W.L. for SpotNet 2. The public interest rationale for such an assignment is discussed in Section H of Part I, supra.

E. Predicted Space Station Coverage Contours for Each Antenna Beam at Nominal Orbital Location Requested.

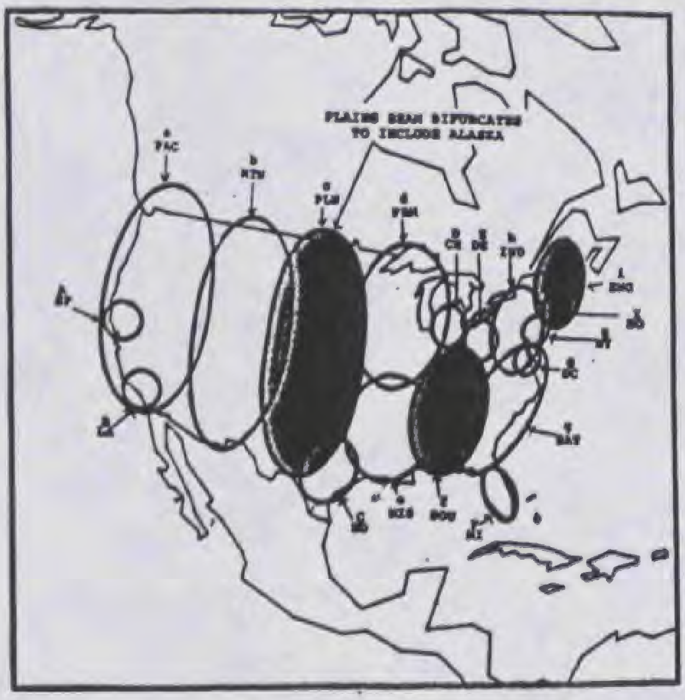
Coverage contours for each of the eighteen Ku-Band patterns are displayed in Figure 11. These contours denote the approximate limits of coverage (-4 dBi relative to peak gain) of the patterns and are based on a traffic load balancing formula developed by NEX, rather than on the results of a detailed antenna and feed design. When a spacecraft vendor is selected, these patterns will be refined and the results supplied to the Commission. These patterns have been reviewed by expert spacecraft designers and have been judged to be achievable (with perhaps slight departure from the contours of Figure 11) with existing spacecraft technology. The patterns are applicable to both uplink and downlink Ku-Band transmission for SpotNet 2.



(A) REUSE OF HORIZONTAL - LOWER 250 MHz
(SPOTS B, C, E, F, H)

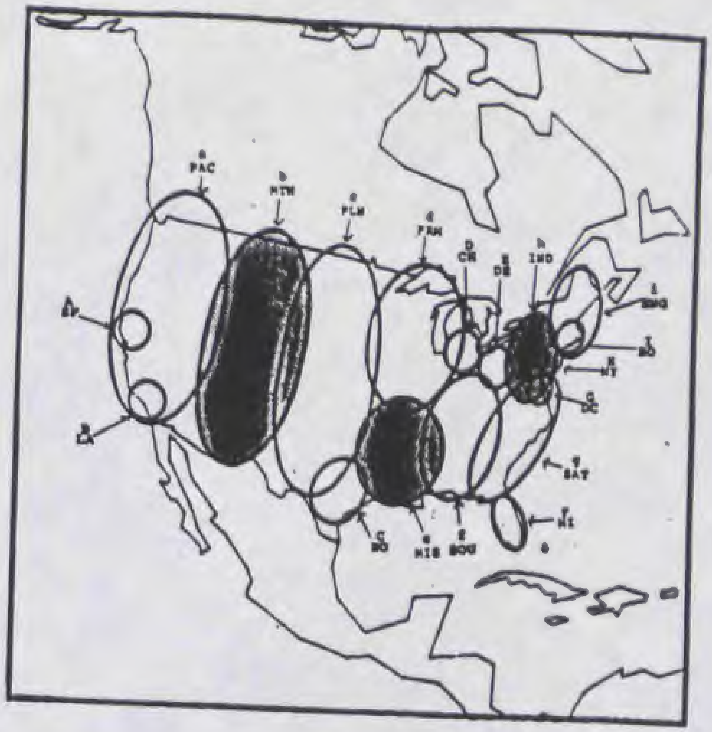


(B) REUSE OF HORIZONTAL - UPPER 250 MHz
(SPOTS A, D, G, I)

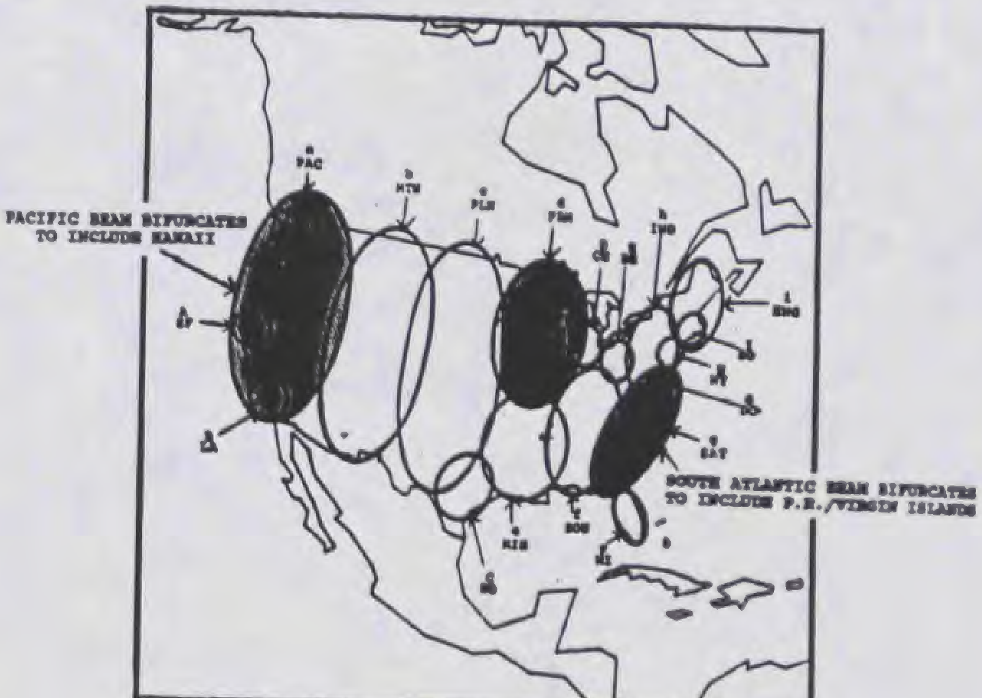


(C) REUSE OF VERTICAL - MIDDLE 167 MHz
(BEAMS c, f, i)

Figure 11. Ku-Band Patterns at 93° W.L.
(1 of 2)



(D) REUSE OF VERTICAL - MIDDLE 167 MHz
(BEAMS b, e, h)

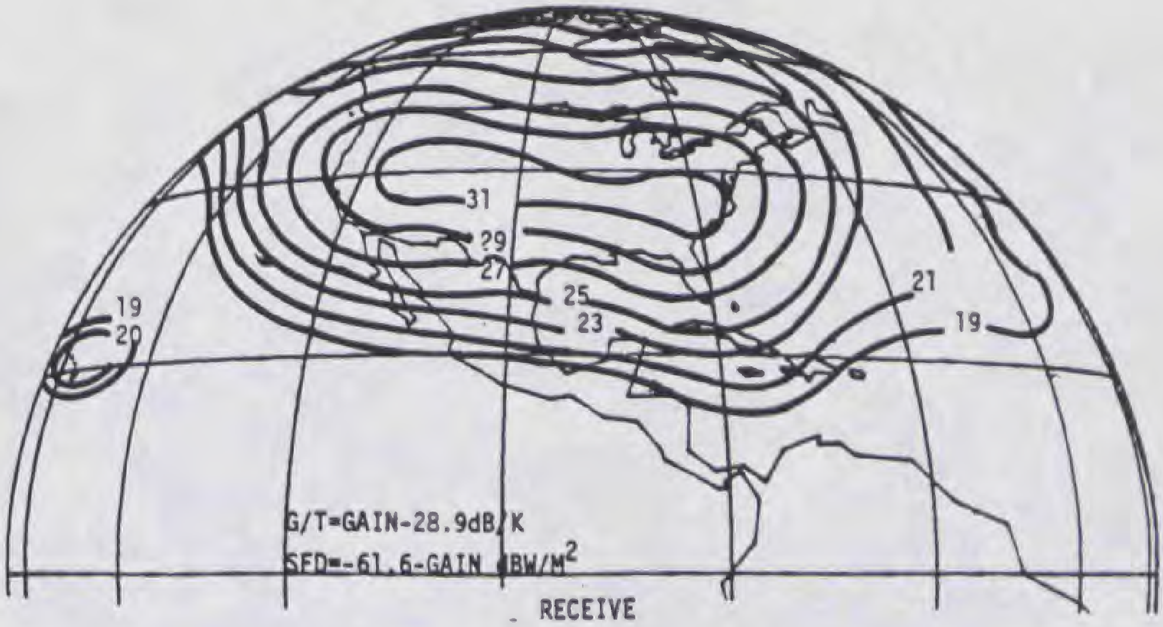


(E) REUSE OF VERTICAL - LOWER 167 MHz
(BEAMS a, d, g)

Figure 11. Ku-Band Patterns at 93° W.L.
(2 of 2)

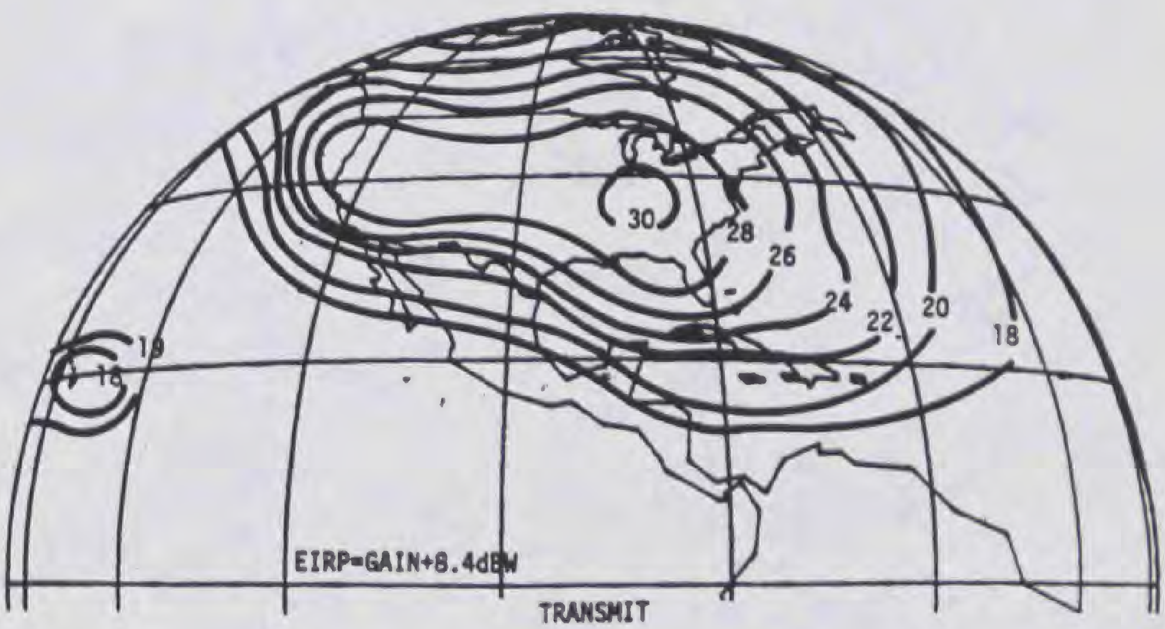
The C-Band coverage contours for the space station applied for in this Application are contained in Figures 7 and 9 for the vertically polarized receive and transmit antennas and horizontally polarized receive and transmit antennas. The contours provided are overlaid on perspective maps as seen from the geostationary orbit and show the coverage for each satellite and the satellite horizon from that point.

C-Band EIRP contours can be determined from the gain contour figures by adding 8.4 dBW to the transmit gain contour values. Similarly, G/T contours can be obtained by subtracting 28.9 dB/K from the receive gain contour values. The transponder saturation flux density (SFD) can be obtained by adding -61.6 dBW/m^2 to the receive gain contours.



RECEIVE

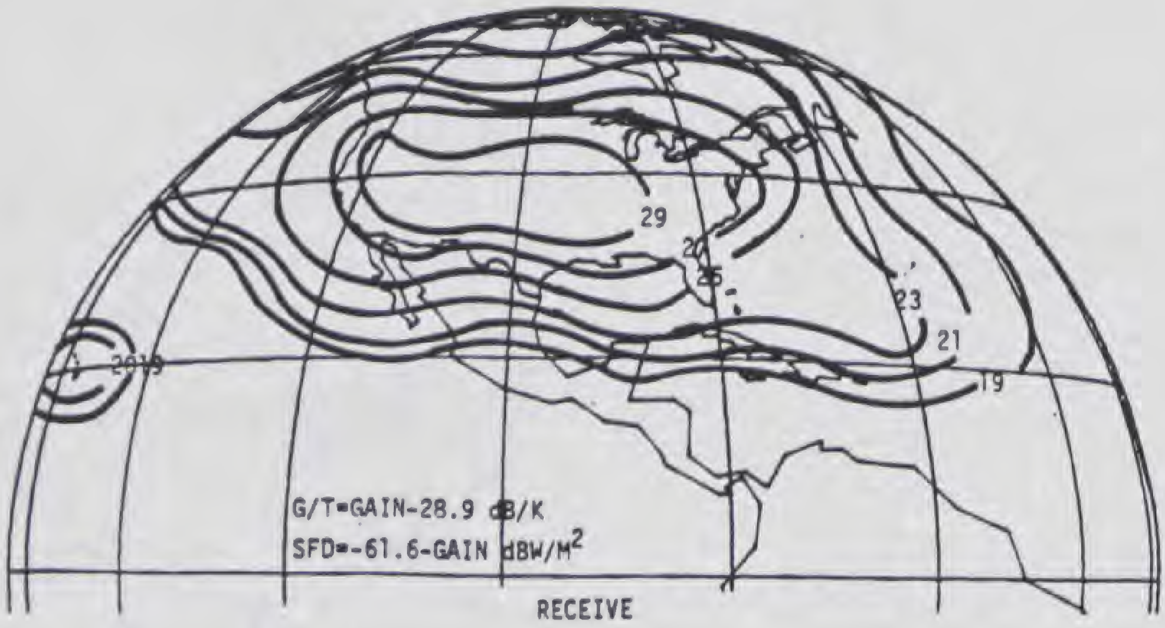
HORIZONTAL GAIN CONTOURS (93° WEST)



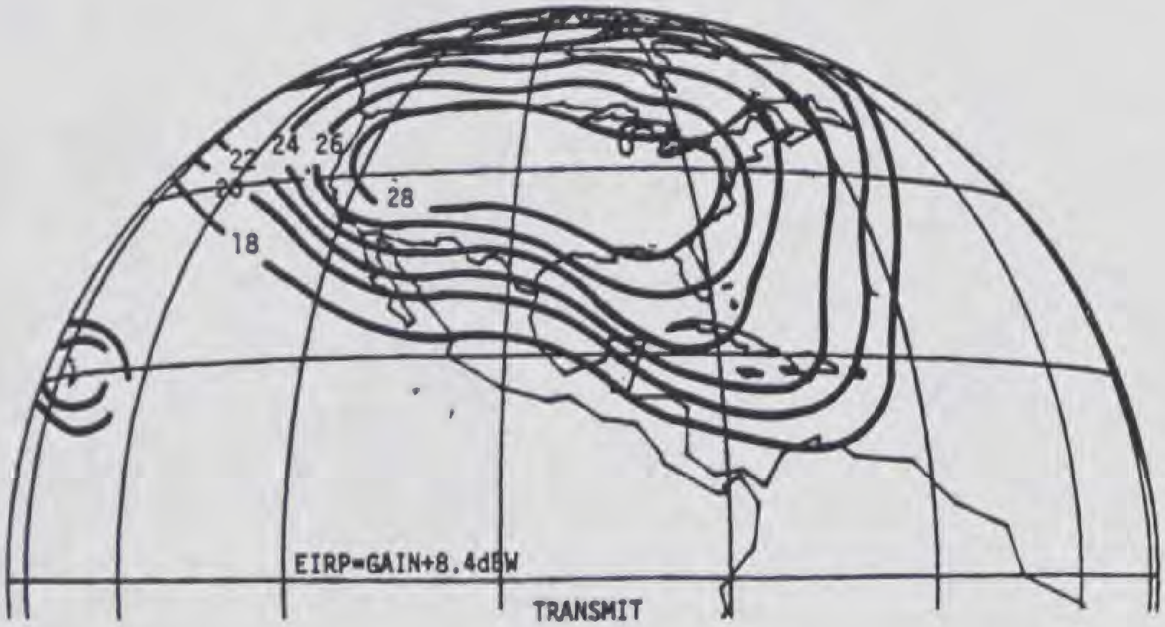
TRANSMIT

HORIZONTAL GAIN CONTOURS (93° WEST)

Figure 7 Horizontal Gain Countours (93° W.L.)



VERTICAL GAIN CONTOURS (93° WEST)



VERTICAL GAIN CONTOURS (93° WEST)

Figure 9 Vertical Gain Countours (93° W.L.)

F. Physical Characteristics of Space Station.

1. Accuracy With Which Orbital Parameters Will Be Maintained.

a. Orbital Inclination.

The NEX satellites will be designed to maintain the inclination of the orbit to ± 0.05 degrees or less and the longitude position to within ± 0.05 degrees.

b. Antenna Axis Attitude/ Longitudinal Drift.

The propulsion subsystem will be sized for and loaded with sufficient propellant to maintain operational attitude and station-keeping control for at least 10 years. Additional propellant will also be incorporated to provide correction of the initial orbit, initial attitude acquisition, satellite spin or despin if required, and limited orbital repositioning during the lifetime of the satellite. Sufficient propellant will also be reserved for removing the spacecraft from orbit after its mission is complete.

2. Accuracy of Spacecraft Antenna Pointing Toward the Earth.

The NEX SpotNet satellites will be designed to maintain a pointing accuracy of .05° or less.

3. Estimated Lifetime of Satellite In-Orbit.

The satellite will be designed for an operational and mission life of 10 years, which is determined primarily by the amount of station-keeping propellant that is carried. The final amplifiers

for the Ku-Band downlink patterns are solid state and are formed by the parallel action of multiple devices. Redundant devices are provided for each final amplifier to the extent required to ensure a 10-year lifetime of each downlink with a high reliability. The C-Band transponder configuration provides a high degree of reliability with a 30-for-24 TWTA redundancy. Life and reliability of the other components and subsystems will be maximized by using proven satellite hardware and proven reliability in the equipment design.

4. Description of Spacecraft Attitude Stabilization and Station-Keeping Systems.

The satellites will be either three-axis-stabilized or spin-stabilized, with the actual technique being selected during the satellite procurement process. The satellites will include an attitude control subsystem to provide pointing accuracies consistent with the achievement of the specified communications performance and inclusive of all error sources (e.g., attitude perturbations, thermal-induced distortions, misalignments, orbital tolerances, and perturbations produced by station-keeping maneuvers).

5. Electrical Energy System Description.

The electrical power subsystem will be designed so that at the end of the spacecraft life, sufficient power will be available to operate all C-Band transponders and all Ku-Band electronics and the housekeeping loads. Sufficient battery capacity will be furnished to provide power for all housekeeping functions and the

entire communications payload during the eclipse periods at end of life.

The primary source of power will be solar cells with energy-storage batteries for eclipse operation. No single failure in the electrical energy system will cause spacecraft failure.

G. Emission Limitations.

The overall selectivity of the input and output filters and other circuitry will attenuate all spurious emissions from the SpotNet satellite to values well below those specifed in Section 25.202 of the FCC Rules and Regulations. Precise values of attenuation will be submitted to the Commission at the time a satellite vendor is chosen.

H. Dates by Which Construction Will Be Commenced and Completed, Launch Date, and Estimated Date of Placement into Service.

A detailed schedule specifying concrete dates by which significant milestones in establishment of the SpotNet satellite system are planned to be achieved is included as Table 18 in Part I of the overall application.

I. Waiver of Claims.

The Applicant waives any claim to the use of any particular frequency or of the ether as against the regulatory power of the United States because of the previous use of the same, whether by license or otherwise, and requests construction and launch authority in accordance with this application. All statements

made in the attached exhibits are a material part hereof, and are incorporated herein as if set out in full in this application.

J. Public Interest Considerations.

Part I of NEX's application set forth the public interest considerations and the financial, legal and technical qualifications of the applicant, as well as other information pertinent to this Application, and that information is incorporated herein by reference.

K. Certification of Person Responsible for Preparing Engineering Information Submitted in This Application.

I hereby certify that I am the technically qualified person responsible for preparation of the engineering information contained in this application, and that I am familiar with Parts 21 and 25 of the Commission's Rules. In preparing this application, I relied upon the expertise of NEX's consultants: Rubin, Bednarek & Associates, Washington, D.C.; David Wright of DataWrights, Solana Beach, California; M/A-COM Linkabit, Inc., San Diego, California; the Spacecraft Engineering Division of Telesat Canada, Ottawa, Canada; and Dale N. Hatfield Associates, Boulder, Colorado. I oversaw the final compilation of the technical material contained herein and I certify that this application is complete and accurate to the best of my knowledge.

By: Philip A. Rubin
Philip A. Rubin
Rubin, Bednarek & Associates
1001 22nd Street, N.W.
Washington, D.C. 20037
(202) 296-9380

Dated: September 15, 1987

The undersigned certifies individually and for NEX that the statements made in this application are true, complete, and correct to the best of his knowledge and belief, and are made in good faith.

WHEREFORE, NEX requests that the Commission grant this application.

Respectfully submitted,

NATIONAL EXCHANGE, INC.

By George S. Kush
George S. Kush
Executive Vice President

Dated: September 15, 1987

IV. SPOTNET 3: GROUND-SPARE.

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of the Application of NATIONAL EXCHANGE, INC. For Authority to Construct a Hybrid Domestic Communications Satellite to be a Ground-Spare.	))))))))))	File No.

APPLICATION

National Exchange, Inc. ("NEX"), pursuant to Sections 308, 309, and 319 of the Communications Act of 1934, as amended, 47 U.S.C. §§ 308, 309, 319, hereby applies for authority to construct, launch and operate a domestic communications satellite that will function in both the 4/6-GHz and 12/14-GHz frequency bands and to hold that satellite in reserve as a ground spare for its in-orbit Spotnet system. The specific satellite for which authorization is being sought in this application (which appears as Part IV of NEX's overall SpotNet system application), is referred to as SpotNet 3. In support of this Application, NEX respectfully states:

A. Applicant.

National Exchange, Inc.
1505 Planning Research Drive
McLean, Virginia 22102
(703) 883-8833

B. Correspondence.

Correspondence with respect to this application should be sent to the following person at the above address and telephone number:

George S. Kush
Executive Vice President

with a copy to:

Henry Goldberg, Esq.
Jeffrey H. Olson, Esq.
Goldberg & Spector
1229 Nineteenth Street, N.W.
Washington, D.C. 20036
(202) 429-4900

C. Technical Description Including Radio Frequency and Polarization Plan.

The satellite for which construction, launch and operating authority is requested herein is an integral part of the SpotNet domestic communications satellite system that is being proposed by NEX. The satellite will perform communications functions in the 4-GHz (downlink) and 6-GHz (uplink) frequency bands, and in the 12-GHz (downlink) and 14-GHz (uplink) frequency bands. Tracking, telemetry and command ("TT&C") functions will also be performed in the 12-GHz and 14-GHz frequency bands. The satellite will serve as a ground spare for the two in-orbit hybrid satellites that NEX proposes to operate at separate orbital locations.

The SpotNet 3 satellite will carry electronics for eighteen spot beams, as described more fully in Part I. Because of the unique design of the Ku-Band system, SpotNet does not contain

transponders *per se*; its payload may best be described in terms of the equivalent usable spectrum, which is 3,750 MHz. The SpotNet 3 satellite will provide coverage of the continental United States, Hawaii, Puerto Rico, the Virgin Islands and portions of Alaska, as shown in Figure 1A or 1B, dependent on orbital placement. The antenna design of the satellite provides a range of pattern sizes from a small circular coverage of Eastern urban areas to a one-fifth CONUS coverage for lower population density areas. Each satellite will have electronics to receive nine uplinks of 250 MHz each and another nine of 167 MHz, and to transmit nine downlinks of 250 MHz and another nine of 167 MHz each. The EIRP at the center of the downlink pattern is 63 dBW for the 250 MHz patterns, and 61 dBW for the 167 MHz patterns, except for three patterns in lower rainfall zones west of the Mississippi, which are rated at 60 dBW.[1]

The SpotNet 3 satellite will also carry 24 operational C-Band transponders, with 34 dBW EIRP center-of-beam coverage of the contiguous 48 states. As shown in Figure 1A and 1B, Hawaii and portions of Alaska will also receive C-Band coverage, as well as Puerto Rico and the Virgin Islands.

---

[1] The EIRP figures denote the saturated EIRP available in the total bandwidth of the pattern. When considered in proportion to the 36 MHz bandwidth typical in the industry, and when adjusted for the fact that SpotNet Ku-Band HPAs are designed to operate with a 3 dB backoff when fully loaded, the EIRPs are equivalent to 52 dBW, 52 dBW, and 51 dBW for the patterns referred to above.

The satellite will be designed for a mission and orbital life of 10 years. Its technical characteristics are summarized in Table 1 and a block diagram of the spacecraft's Ku-Band communications subsystem is shown in Figure 2. The C-Band communications subsystem block diagram is shown in Figure 4.

Table 1
Operational Satellite Characteristics

Parameter	Type or Value
Launch vehicle	Domestic ELV, Ariane or Long March
Launch date	See Schedule
Satellite mission life/ design life	10 years
North-south stationkeeping accuracy	0.05°
East-west stationkeeping accuracy	0.05°
Eclipse capability	100%
Stabilization	Spin or 3-axis stabilized
RF output power	Ku-Band: 3 @ 10 watts 4 @ 15 watts 1 @ 20 watts 2 @ 30 watts 1 @ 50 watts 4 @ 75 watts 3 @ 120 watts C-Band: 24 @ 9 watts
Communications channelization	Ku-Band: 9 "Spots" @ 250 MHz 9 "Beams" @ 167 MHz C-Band: 24 transponders @ 36 MHz
Communications EIRP	Ku-Band: 9 "Spots" @ 63 dBW/250 MHz 6 "Beams" @ 61 dBW/167 MHz 3 "Beams" @ 60 dBW/167 MHz C-Band: CONUS, 34 dBW Alaska, 30 dBW Hawaii, 27 dBW Puerto Rico, 28 dBW
Communications Receive G/T	Ku-Band: 3 western "Beams" at +5 dB/K; other patterns from +8 to +19 dB/K C-Band: CONUS at -5.9 dB/°K Alaska at -8.4 dB/°K Hawaii at -10.4 dB/°K Puerto Rico at -10.0dB/°K
Communications Receive SFD	C-Band: -89.9 to -96.9 dBW/m^2 Ku-Band: No direct equivalent parameter; uplink power is controlled to a level of -110 dBW/m^2 (or less) per 1.5 MHz channel.

12/14-GHz communications frequencies:	
Transmit	11.700 to 12.200 GHz
Receive	14.000 to 14.500 GHz
4/6-GHz communications frequencies:	
Transmit	3.700 to 4.200 GHz
Receive	5.925 to 6.425 GHz
TT&C EIRP	To be determined (TBD)
TT&C Receive	TBD
flux density	TBD
TT&C frequencies:	
Telemetry	TBD
Command	TBD
Communications polarization:	Ku-Band: 9 "Spot" patterns horizontal on uplink and downlink; 9 "Beams" patterns vertical on uplink and downlink
	C-Band: 12 transponders with vertical uplink and horizontal downlink, 12 transponders with horizontal uplink and vertical downlink
TT&C polarization	
Telemetry	TBD
Command	TBD

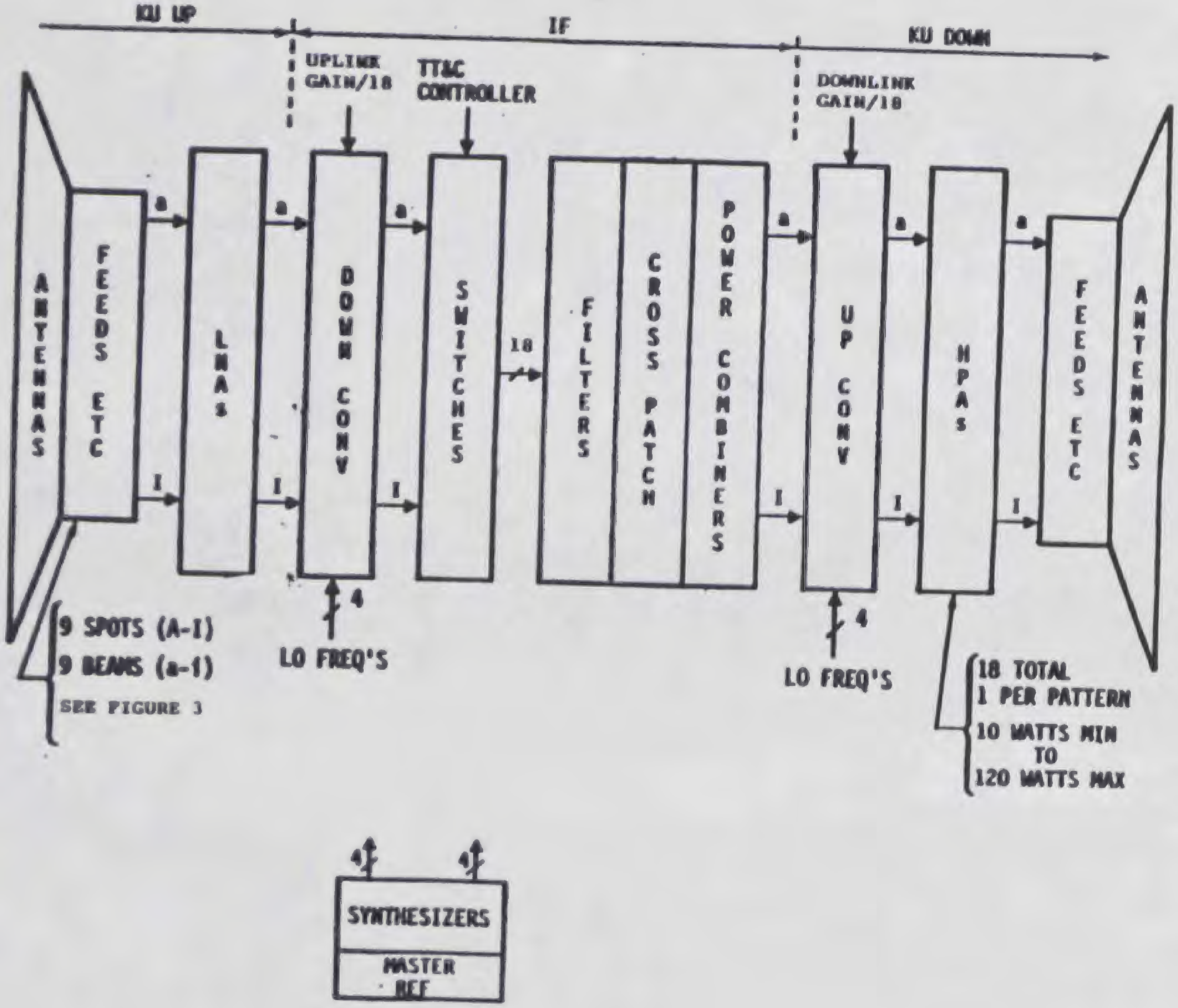


Figure 2. Organization of the Ku-Band Payload for Spotnet Satellite

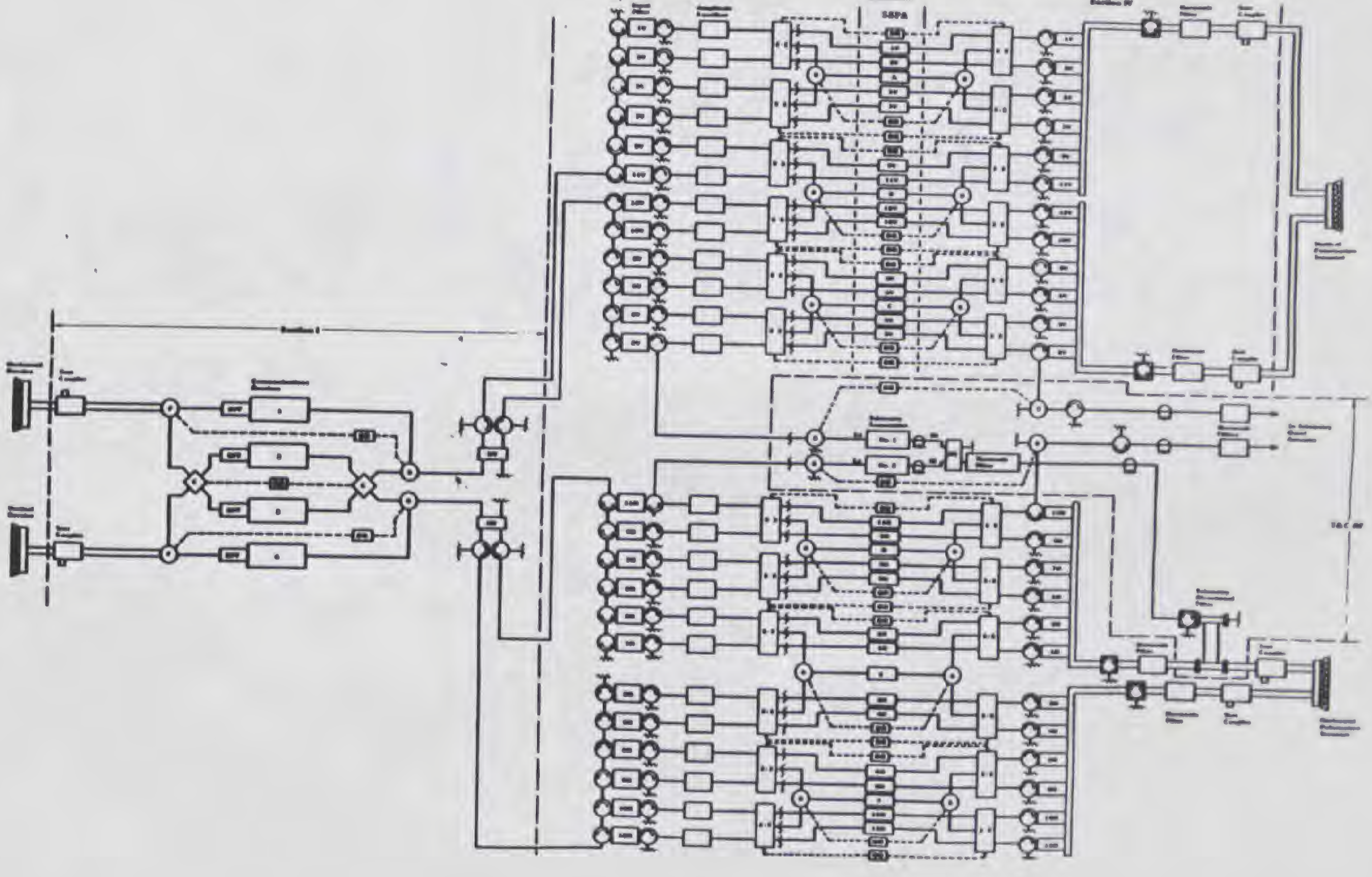
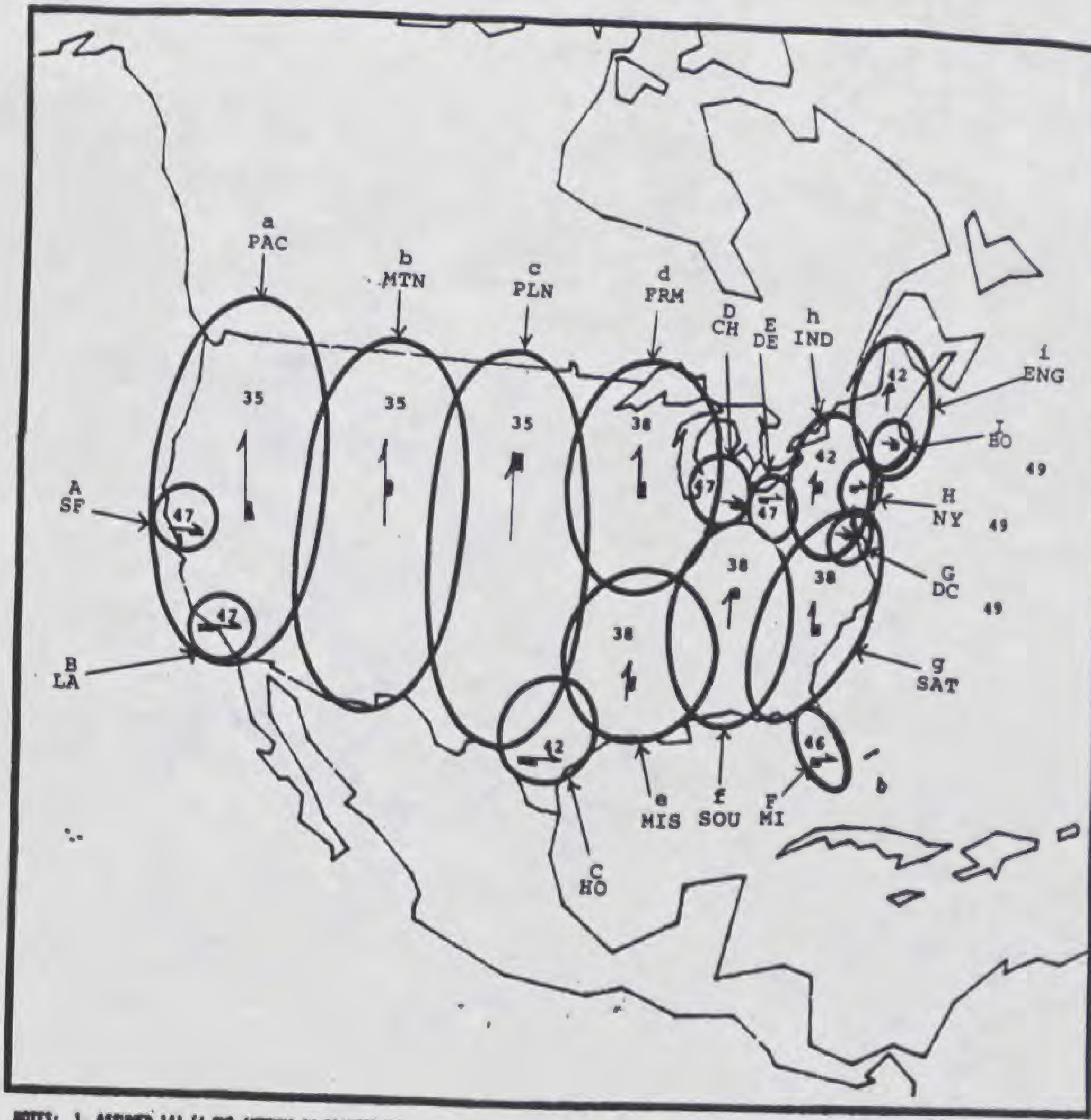


Figure 4. C-Band Subsystem

The spatial, frequency, and polarization plan for Ku-Band usage in SpotNet 3 is shown in Figure 3. The TT&C signals will occupy part of the 11.7-12.2-GHz and 14.0-14.5-GHz bands, using frequencies and polarizations that are not occupied by the normal communications signals. Because final selection of a satellite bus has not been made, the exact command frequencies, polarizations, and transmission characteristics (including emission designators) cannot be specified at this time. They will be supplied by separate cover as soon as practicable.

The SpotNet Ku-Band service will consist of 1536 Kbps and 96 Kbps usage as described in Part I. Coherent phase shift-keying is used in both services, with the 1536 Kbps service being QPSK and the 96 Kbps service being BPSK. Both services use error control coding, as described in Part I. Channelization for the 1,536 Kbps service is 1,500 KHz per carrier and the 96 Kbps service is channelized as 300 KHz subchannels of the 1,500 KHz channels.



NOTES: 1. ASSUMED 14' (4.3M) ANTENNA ON SPACECRAFT.

2. UPPER CASE DESIGNATES "SPOT" - HORIZONTALLY POLARIZED - 250 MHz BW's.

3. LOWER CASE DESIGNATES "BEAM" - VERTICALLY POLARIZED - 167 MHz BW's.

4 NUMBERS INDICATE ANTENNA DOWNLINK GAIN IN DBI.

POTENTIAL REUSE RATIO = 7.5

LEGEND:

VERTICAL LOWER 3rd

VERTICAL MIDDLE 3rd

VERTICAL UPPER 3rd

HORIZONTAL LOWER HALF

HORIZONTAL UPPER HALF

Figure 3 Frequency and Polarization Usage

The satellite will also have 24 transponders operating in the standard 4/6-GHz domestic fixed bands. Table 20 details the exact channel center frequency assignments and polarizations for each transponder.

Emission designators for the C-Band communications functions will vary with the precise nature of traffic being carried. The following list reflects NEX's best present estimates regarding traffic in the proposed system:

FDM/FM - 200 F9 up to 36000 F9

TV/FM - 36000 F5

Teleconferencing - 4000 F5

SCPC/FM 20 F9

SCPC/FM 50 F9

The satellite's C-Band communications system will utilize solid-state final amplifiers. These amplifiers will have an RF output of 9 watts (9.5 dBW). Losses between the final amplifier and the input port of the reflector antenna amount to 1.1 dB. This output and loss combination, together with the CONUS contour for the reflector antenna, provides a minimium EIRP of 34.0 dBW. All transponders are connected to each antenna beam.

Table 20

C-BAND TRANSPONDER CENTER FREQUENCIES

Satellite-to-Earth		Earth-to-Satellite	
Frequency, MHz	Polarization	Frequency, MHz	Polarization
3720	Horizontal 1	5945	Vertical 1
3740	Vertical 2	5965	Horizontal 2
3760	Horizontal 3	5985	Vertical 3
3780	Vertical 4	6005	Horizontal 4
3800	Horizontal 5	6025	Vertical 5
3820	Vertical 6	6045	Horizontal 6
3840	Horizontal 7	6065	Vertical 7
3860	Vertical 8	6085	Horizontal 8
3880	Horizontal 9	6105	Vertical 9
3900	Vertical 10	6125	Horizontal 10
3920	Horizontal 11	6145	Vertical 11
3940	Vertical 12	6165	Horizontal 12
3960	Horizontal 13	6185	Vertical 13
3980	Vertical 14	6205	Horizontal 14
4000	Horizontal 15	6225	Vertical 15
4020	Vertical 16	6245	Horizontal 16
4040	Horizontal 17	6265	Vertical 17
4060	Vertical 18	6285	Horizontal 18
4080	Horizontal 19	6305	Vertical 19
4100	Vertical 20	6325	Horizontal 20
4120	Horizontal 21	6345	Vertical 21
4140	Vertical 22	6365	Horizontal 22
4160	Horizontal 23	6385	Vertical 23
4180	Vertical 24	6405	Horizontal 24

An analysis of potential harmful inter-satellite interference due to the satellite's operation is included in Section G of Part I and Appendix A, supra.

D. Orbital Location Information.

This phase of the SpotNet satellite system will require the assignment of two orbital locations. Because of SpotNet's unique Ku-Band spot beam design, it will be technically feasible for NEX to add additional Ku-Band satellites at these same locations in the future. For this first phase, NEX is requesting a location of 101° W.L. for SpotNet 1, and a location of 93° W.L. for SpotNet 2. The public interest rationale for such an assignment is discussed in Section H of Part I, supra. Spotnet 3 will function as a ground spare for both in-orbit satellites.

E. Predicted Space Station Coverage Contours for Each Antenna Beam at Nominal Orbital Location Requested.

Coverage contours for each of the eighteen Ku-Band patterns are displayed in Figures 10 and 11. These contours denote the approximate limits of coverage (-4 dBi relative to peak gain) of the patterns and are based on a traffic load balancing formula developed by NEX, rather than on the results of a detailed antenna and feed design. When a spacecraft vendor is selected, these patterns will be refined and the results supplied to the Commission. These patterns have been reviewed by expert spacecraft designers and have been judged to be achievable (with perhaps slight departure from the contours of Figures 10 and 11) with existing spacecraft technology. The patterns are applicable to both uplink and downlink Ku-Band transmission for SpotNet 1 and 2.

The C-Band coverage contours for the space station applied for in this Application are contained in Figures 6 through 9 for the vertically polarized receive and transmit antennas and horizontally polarized receive and transmit antennas. The contours provided are overlaid on perspective maps as seen from the geostationary orbit and show the coverage for each satellite and the satellite horizon from that point.

C-Band EIRP contours can be determined from the gain contour figures by adding 8.4 dBW to the transmit gain contour values. Similarly, G/T contours can be obtained by subtracting 28.9 dB/K from the receive gain contour values. The transponder saturation flux density (SFD) can be obtained by adding -61.6 dBW/m^2 to the receive gain contours.

F. Physical Characteristics of Space Station.

1. Accuracy with Which Orbital Parameters Will Be Maintained.

a. Orbital Inclination.

The NEX satellites will be designed to maintain the inclination of the orbit to $\pm$ 0.05 degrees or less and the longitude position to within $\pm$ 0.05 degrees.

b. Antenna Axis Attitude/ Longitudinal Drift.

The propulsion subsystem will be sized for and loaded with sufficient propellant to maintain operational attitude and station-keeping control for at least 10 years. Additional propellant will also be incorporated to provide correction of the initial orbit, initial attitude acquisition, satellite spin or despin if required, and limited orbital repositioning during the lifetime of the satellite. Sufficient propellant will also be reserved for removing the spacecraft from orbit after its mission is complete.

2. Accuracy of Spacecraft Antenna Pointing Toward the Earth.

The NEX SpotNet satellites will be designed to maintain a pointing accuracy of .05° or less.

3. Estimated Lifetime of Satellite In-Orbit.

The satellite will be designed for an operational and mission life of 10 years, which is determined primarily by the amount of station-keeping propellant that is carried. The final amplifiers

for the Ku-Band downlink patterns are solid state and are formed by the parallel action of multiple devices. Redundant devices are provided for each final amplifier to the extent required to ensure a 10-year lifetime of each downlink with a high reliability. The C-Band transponder configuration provides a high degree of reliability with a 30-for-24 TWTA redundancy. Life and reliability of the other components and subsystems will be maximized by using proven satellite hardware and proven reliability in the equipment design.

4. Description of Spacecraft Attitude Stabilization and Station-Keeping Systems.

The satellites will be either three-axis-stabilized or spin-stabilized, with the actual technique being selected during the satellite procurement process. The satellites will include an attitude control subsystem to provide pointing accuracies consistent with the achievement of the specified communications performance and inclusive of all error sources (e.g., attitude perturbations, thermal-induced distortions, misalignments, orbital tolerances, and perturbations produced by station-keeping maneuvers).

5. Electrical Energy System Description.

The electrical power subsystem will be designed so that at the end of the spacecraft life, sufficient power will be available to operate all C-Band transponders and all Ku-Band electronics and the housekeeping loads. Sufficient battery capacity will be furnished to provide power for all housekeeping functions and the

entire communications payload during the eclipse periods at end of life.

The primary source of power will be solar cells with energy-storage batteries for eclipse operation. No single failure in the electrical energy system will cause spacecraft failure.

G. Emission Limitations.

The overall selectivity of the input and output filters and other circuitry will attenuate all spurious emissions from the SpotNet satellite to values well below those specifed in Section 25.202 of the FCC Rules and Regulations. Precise values of attenuation will be submitted to the Commission at the time a satellite vendor is chosen.

H. Dates by Which Construction Will Be Commenced and Completed, Launch Date, and Estimated Date of Placement into Service.

A detailed schedule specifying concrete dates by which significant milestones in establishment of the SpotNet satellite system are planned to be achieved is included as Table 18 in Part I of the overall application.

I. Waiver of Claims.

The Applicant waives any claim to the use of any particular frequency or of the ether as against the regulatory power of the United States because of the previous use of the same, whether by license or otherwise, and requests construction and launch authority in accordance with this application. All statements

made in the attached exhibits are a material part hereof, and are incorporated herein as if set out in full in this application.

J. Public Interest Considerations.

Part I of NEX's application set forth the public interest considerations and the financial, legal and technical qualifications of the applicant, as well as other information pertinent to this Application, and that information is incorporated herein by reference.

K. Certification of Person Responsible for Preparing Engineering Information Submitted in This Application.

I hereby certify that I am the technically qualified person responsible for preparation of the engineering information contained in this application, and that I am familiar with Parts 21 and 25 of the Commission's Rules. In preparing this application, I relied upon the expertise of NEX's consultants: Rubin, Bednarek & Associates, Washington, D.C.; David Wright of DataWrights, Solana Beach, California; M/A-COM Linkabit, Inc., San Diego, California; the Spacecraft Engineering Division of Telesat Canada, Ottawa, Canada; and Dale N. Hatfield Associates, Boulder, Colorado. I oversaw the final compilation of the technical material contained herein and I certify that this application is complete and accurate to the best of my knowledge.

By: Philip A. Rubin

Philip A. Rubin
Rubin, Bednarek & Associates
1001 22nd Street, N.W.
Washington, D.C. 20037
(202) 296-9380

Dated: September 15, 1987

The undersigned certifies individually and for NEX that the statements made in this application are true, complete, and correct to the best of his knowledge and belief, and are made in good faith.

WHEREFORE, NEX requests that the Commission grant this application.

Respectfully submitted,

NATIONAL EXCHANGE, INC.

By George S. Kush

George S. Kush
Executive Vice President

Dated: September 15, 1987