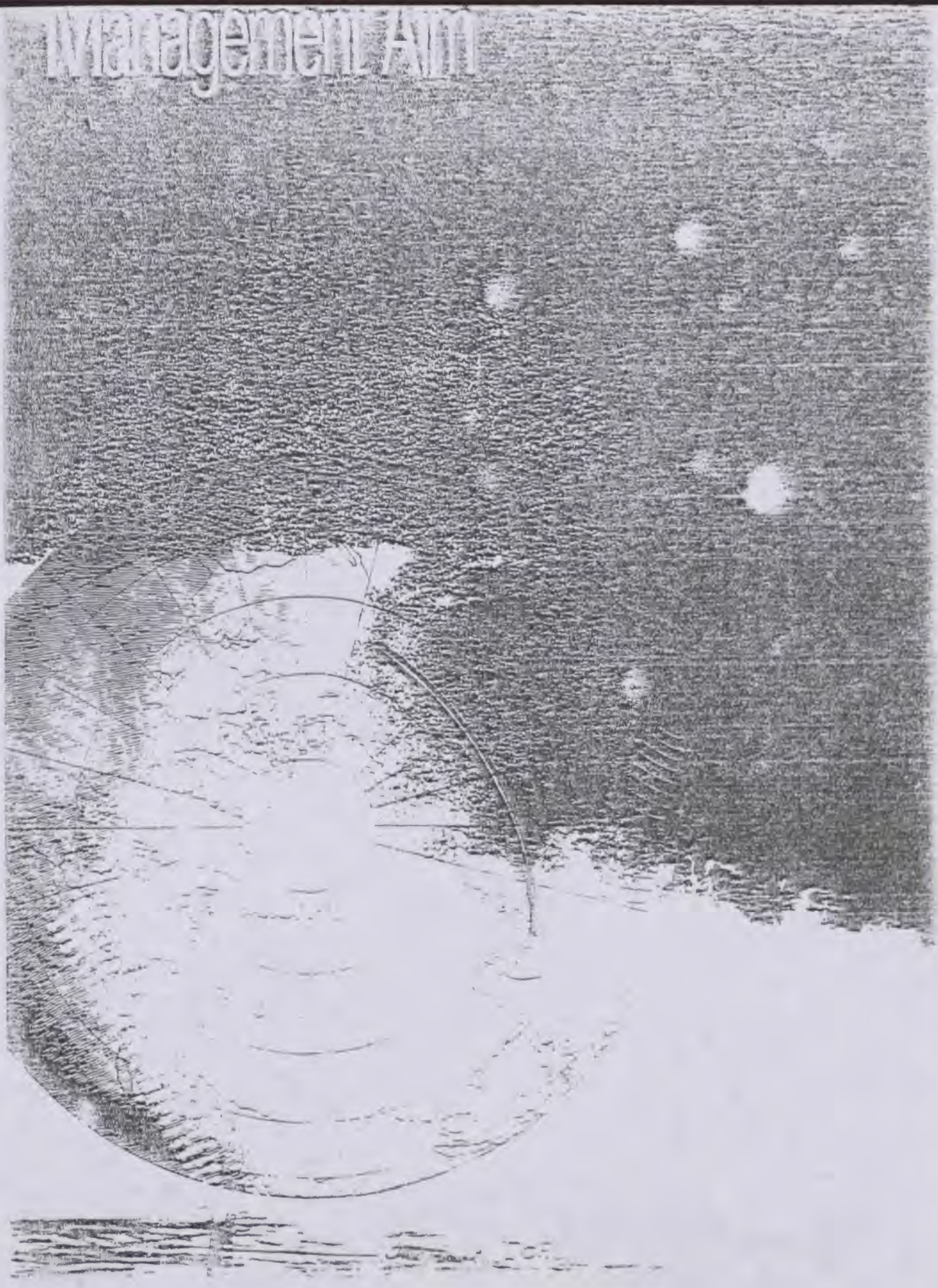

TELECOMMUNICATIONS
IDC
International Digital Communications, Inc.


Management

To Contribute to the Prosperity of the International Community

Gentaro Tsuji Chairman

Hideo Suetsugu President

The aim inspiring International Digital Communications Inc. since its inception is to provide high-quality international communications services at reasonable costs, taking full account of the customer's varied needs.

The increasing sophistication of information gathering and dissemination in today's society is bringing about major changes in the cultural, economic and other aspects of our daily lives. Within Japanese industry specifically, the new emphasis on information is encouraging still further the internationalization of enterprises and their organization into networks, with a corresponding growth in the importance of telecommunications as a means of exchanging information. The twenty-first century will almost certainly be an age in which industry as a whole will make enormous strides thanks to developments in the handling of information and in communications.

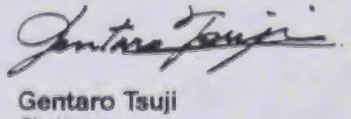
Under such circumstances, there had been an increasing hope for dynamic progress and change within the field of international communications – for a whole variety of high-quality services to be made available at low cost.

In response to such hope, International Digital Communications Inc. commenced, in May, 1989, international leased circuit services for private business featuring highly reliable and economical digital facilities. In October, 1989, IDC followed with an international public telephone service accessible throughout Japan by dialling 0061.

In order to make such services generally available to our customers, we established installations making the fullest use of digital technology, which will form the mainstay of telecommunications henceforth, while work has also started on the laying of the "North Pacific Cable" directly linking Japan and North America by means of the latest optical fiber telecommunications technology. In addition to such basics, we shall be providing end-to-end services in cooperation with telecommunications carriers overseas. In such ways, we look forward to helping make Japan, in the near future, a hub center of international communications similar to New York and London.

Via its exclusive services, bringing together the best in Japanese, American and British telecommunications technology and knowhow, International Digital Communications Inc. intends to respond flexibly to the needs of its customers, playing a positive part in their development and, in turn, contributing to the prosperity of the international community as a whole.

IDC will be a growing concern in the years to come. We sincerely hope that you will take full advantage of all that we have to offer.



Gentaro Tsuji
Chairman

Hideo Suetsugu
President

Corporate Policy

Attention to Customers' Needs

IDC will make a point of seeking the views of its potential customers in all fields so as to keep in touch with their changing needs in international telecommunications and provide prompt service as and when required.

Efficient Business Management

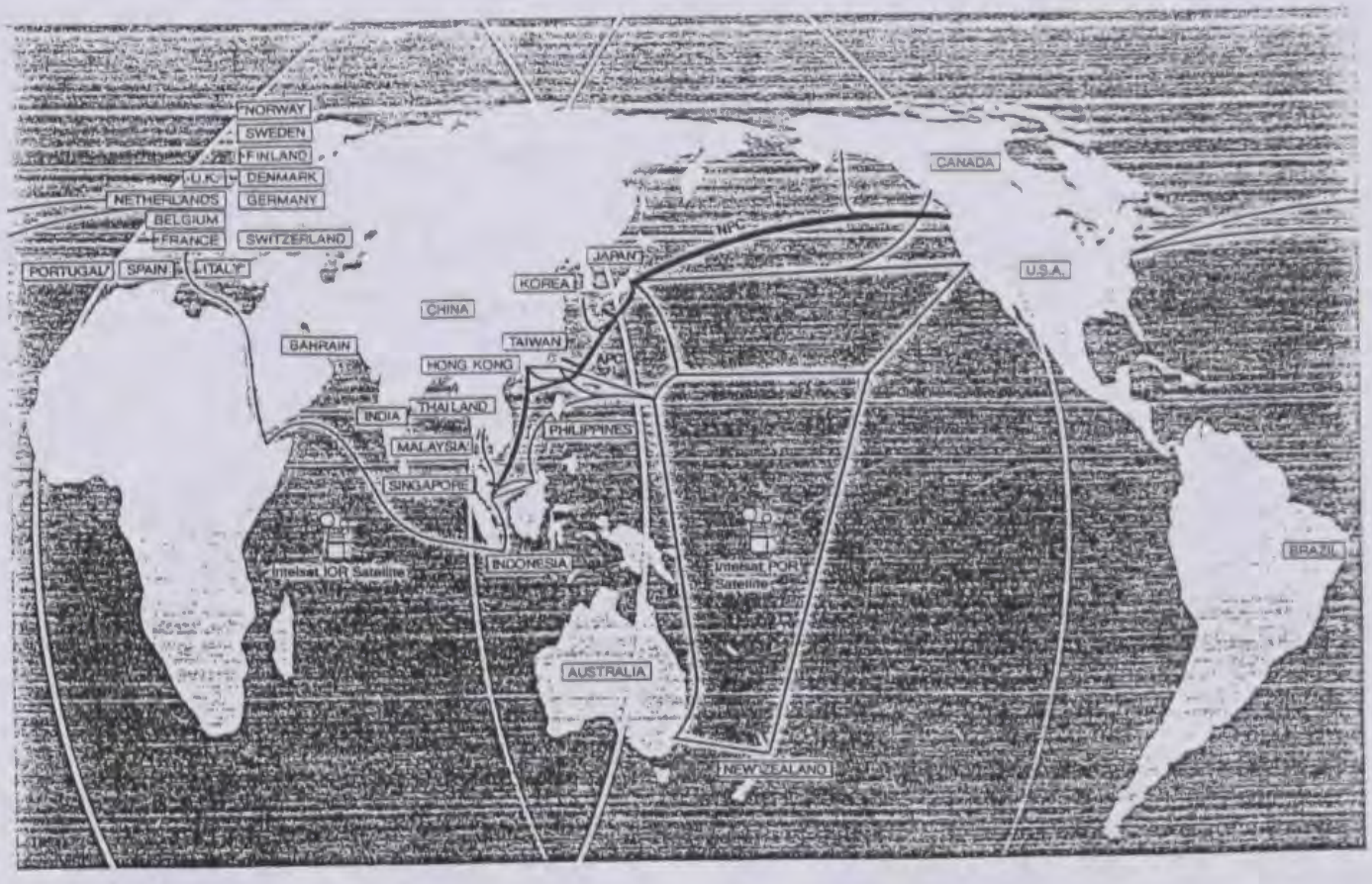
IDC will actively seek to maintain high management efficiency and economically costed services through the flexible handling of its operations and a streamlined organization.

Owned Facilities and Use of Digital Technology

IDC will direct the full potentialities of its own optical fiber submarine cable system, Intelsat earth stations, digital switching equipment and other state-of-the-art facilities utilizing digital technology to provide high quality, high reliability and economically costed services.

Access to Japanese and Foreign Operating Experience

IDC's access to a wide range of both Japanese and foreign technology and knowhow will enable it to satisfy its customer's international telecommunications needs on a well coordinated, end-to-end basis.



Liberalization of Telecommunications Services! Extra Attention to Customers' Needs

Operations Plan

■ Services Provided

International Telephone Service

This service, concentrates on international direct dialing, and will be of a sufficient quality to handle facsimile and data transmission.

IDC will further enhance its service by providing advanced facilities allowing for the introduction of Integrated Services Digital Network (ISDN) and other similar services which will form the future basis of international telecommunications.

International Leased Circuit Service

In line with international trends, this service, concentrates on the provision of digital circuits. Customer's needs will be responded to on an end-to-end basis.

■ Areas Served

The number of countries to which both switched telephone service and leased circuit service are available will be progressively increased.

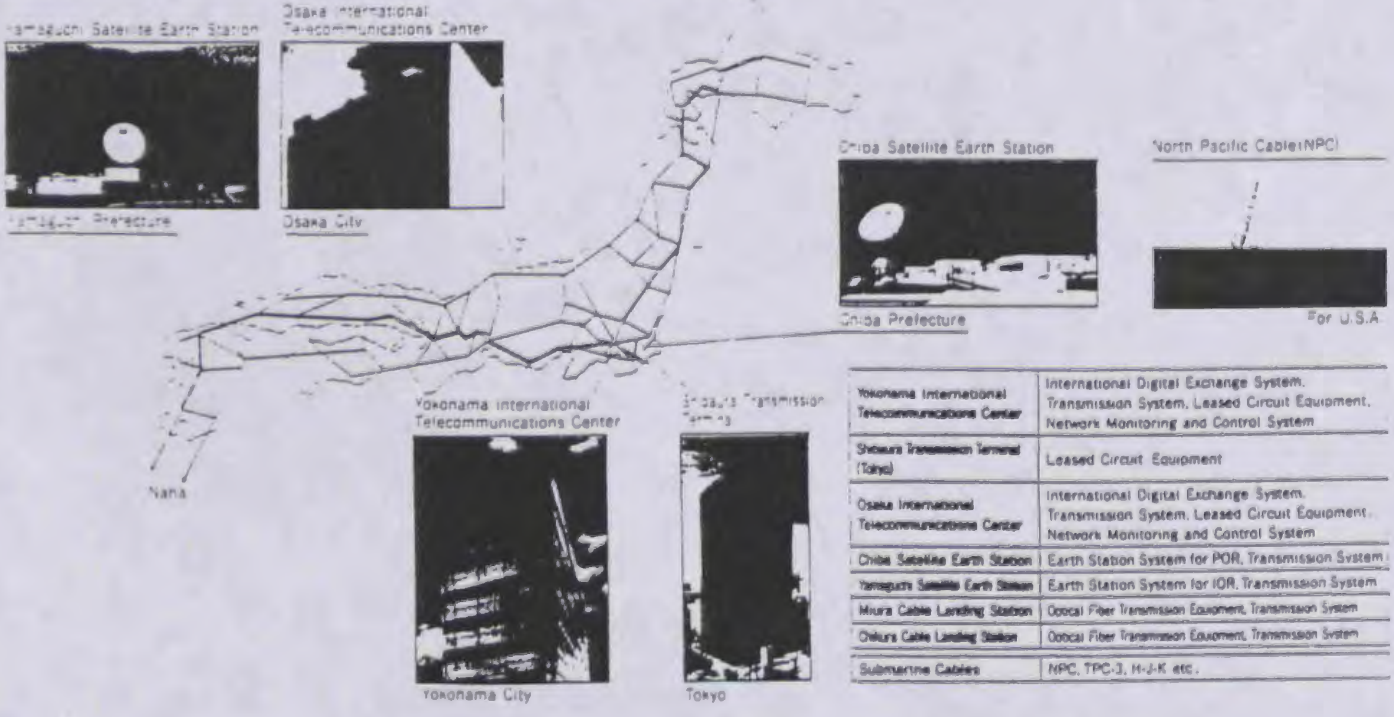
Realiability

To ensure reliable service, IDC combines the latest facilities with systems designed to cope promptly with all eventualities. Thus it :

- uses the most advanced digital facilities with superior ability to detect and diagnose faults;
- uses a centralized monitoring and control system with 24-hour maintenance coverage;
- uses multiplicity of international and domestic transmission routes;
- equips its telecommunications centers with the appropriate security and fire prevention systems.

Principal Telecommunications Facilities

In organizing its international telecommunications network, IDC installs its own facilities. These facilities employ all-digital equipment embodying the very latest technology which will be capable of accommodating ISDN and other similar services.



Yokohama International Telecommunications Center	International Digital Exchange System, Transmission System, Leased Circuit Equipment, Network Monitoring and Control System
Shibaura Transmission Terminal (Tokyo)	Leased Circuit Equipment
Osaka International Telecommunications Center	International Digital Exchange System, Transmission System, Leased Circuit Equipment, Network Monitoring and Control System
Chiba Satellite Earth Station	Earth Station System for POR, Transmission System
Yamaguchi Satellite Earth Station	Earth Station System for IOR, Transmission System
Miura Cable Landing Station	Optical Fiber Transmission Equipment, Transmission System
Chikura Cable Landing Station	Optical Fiber Transmission Equipment, Transmission System
Submarine Cables	NPC, TPC-3, H-J-K etc.

Telephone Service

0061 "International Direct Dialing Call"

An International Direct Dialing Call service is equivalent to the conventional "001".

You can make overseas call by direct dialing at much cheaper rates.

This service is available all over Japan where 001 service is available.

Facsimile via 0061

Direct dialing by 0061 is also available for facsimile or electronic data transmissions at the same rates as for normal voice communication.

0064"Auto Call Back"

At present, due to the type of the NTT exchange, there are certain areas in Japan from which you cannot direct dial overseas calls. In that case, if your telephone line is a push-tone type, the IDD call service is available by dialing "0064" for "Auto Call Back"

* The "Auto Call Back" is an IDC unique service. No application formality is necessary.

0061 from Public Telephone

The 0061 service can be used at green public telephones with an "International & Domestic Card/Coin Telephone" legend at the upper 1/4 left of the coin box.

* The charge by units of 100 yen.

No application necessary for 0061

Subscriber's domestic contract with NTT, unless requested otherwise, is automatically considered to enter into a contract with IDC the "International Telephone Service Contract".

Therefore any application formalities for using 0061 is not required.

0061: As Simple as 1-2-3

Just use 0061 and all the advantages of IDC's international dialing service are yours.

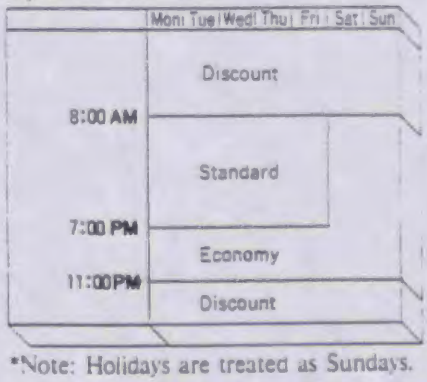
Significant Savings

- Save whenever – and wherever – you call.
- IDC's telephone rates apply to calls made from anywhere in Japan.
- The basic charge unit is an economic 6 seconds. You do not pay for time you didn't use.
- After the first minute, the cost of each 6-second unit drops even further.

Off-Peak Rates

- 20% Reduction with Economy rates for evening or holiday calls.
- A BIG 40% Reduction with Discount rates for late-night calls!

Daytime and Off-Peak Time



*Note: Holidays are treated as Sundays.

How to call N.Y. 123-4567

0061 ➡ 1 ➡ 212 ➡ 123-4567

U.S.A. COUNTRY CODE	N.Y. AREA CODE	NUMBER OF YOUR PARTY

Note: Depending on the exchange you are calling from, you may need to wait briefly for a second dial tone (a series of rapid beeps) before dialing the country code.

Easy to Access Economic International Dialing

Other Services

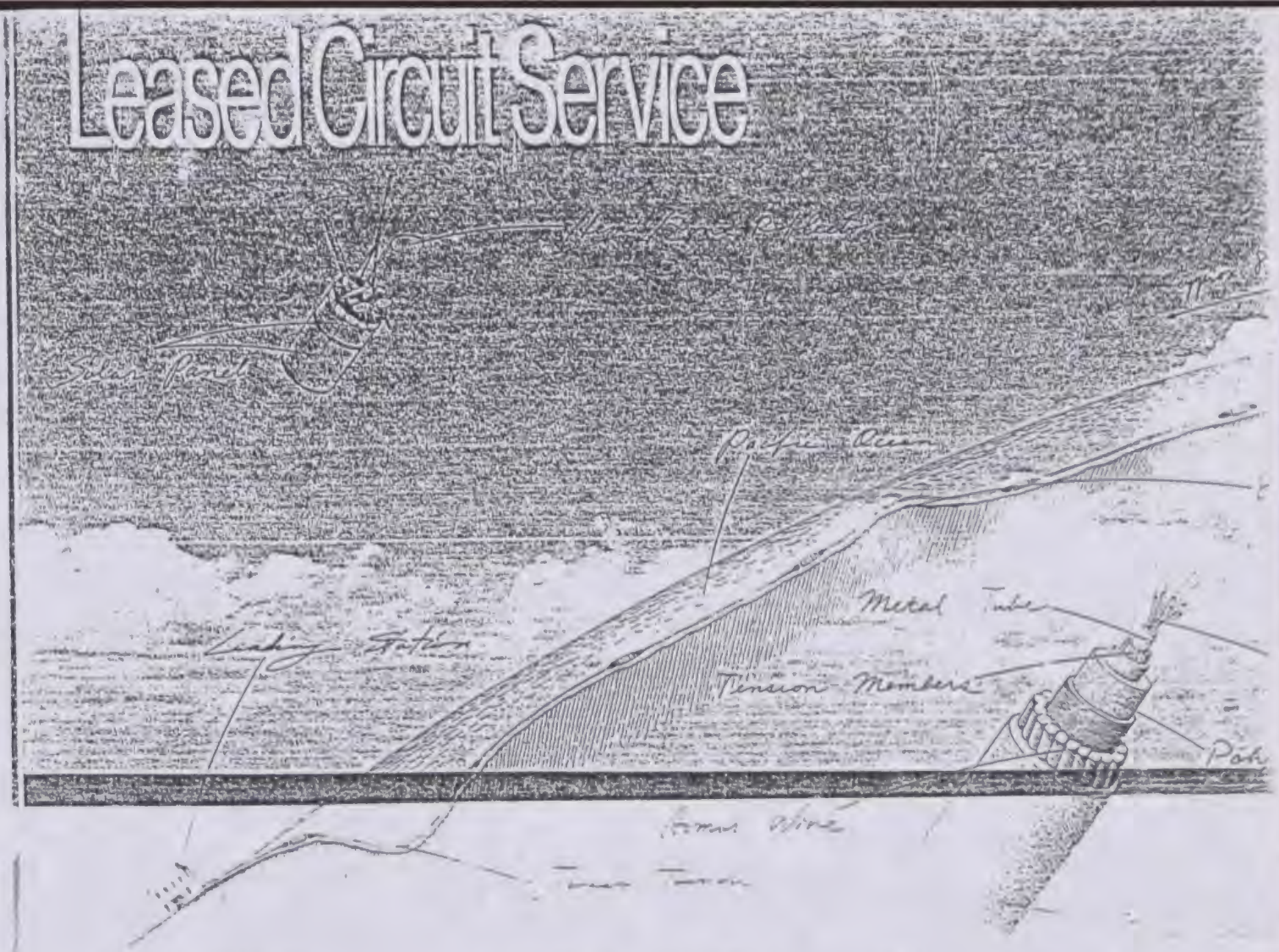
IDC also introduced other services such as:

Service	Access No.	Description	Features
Charge Notification Service	0062	This service provides automatic notification of the call charge as soon as call ends.	This service gives an easy control over the telecommunication expenses.
Auto Charge Transfer*	0063	International telephone service charges made from a preregistered telephone are automatically charged to a different customer-designated telephone.	There is now no need to stay late at night at the office just to make international business calls. Calls made from your home can be automatically charged to your company.
Auto Call Back	0064	Provides a direct dial service without registration, from anywhere in Japan for those customers normally unable to dial direct.	Both Call Charge Notification and Auto Charge Transfer Services are available with 0064 access.
IDC Credit Calls*	0065	International calls may be made from touch phones and billed to the registered user's own account.	Cashless communication becomes possible when you use an international telephone credit number registered with IDC.

* Auto Charge Transfer and IDC Credit Calls require registration.
Green Japanese pay phones with a gold plate will accept IDC international direct dialing calls and credit calls.

0061

Leased Circuit Service



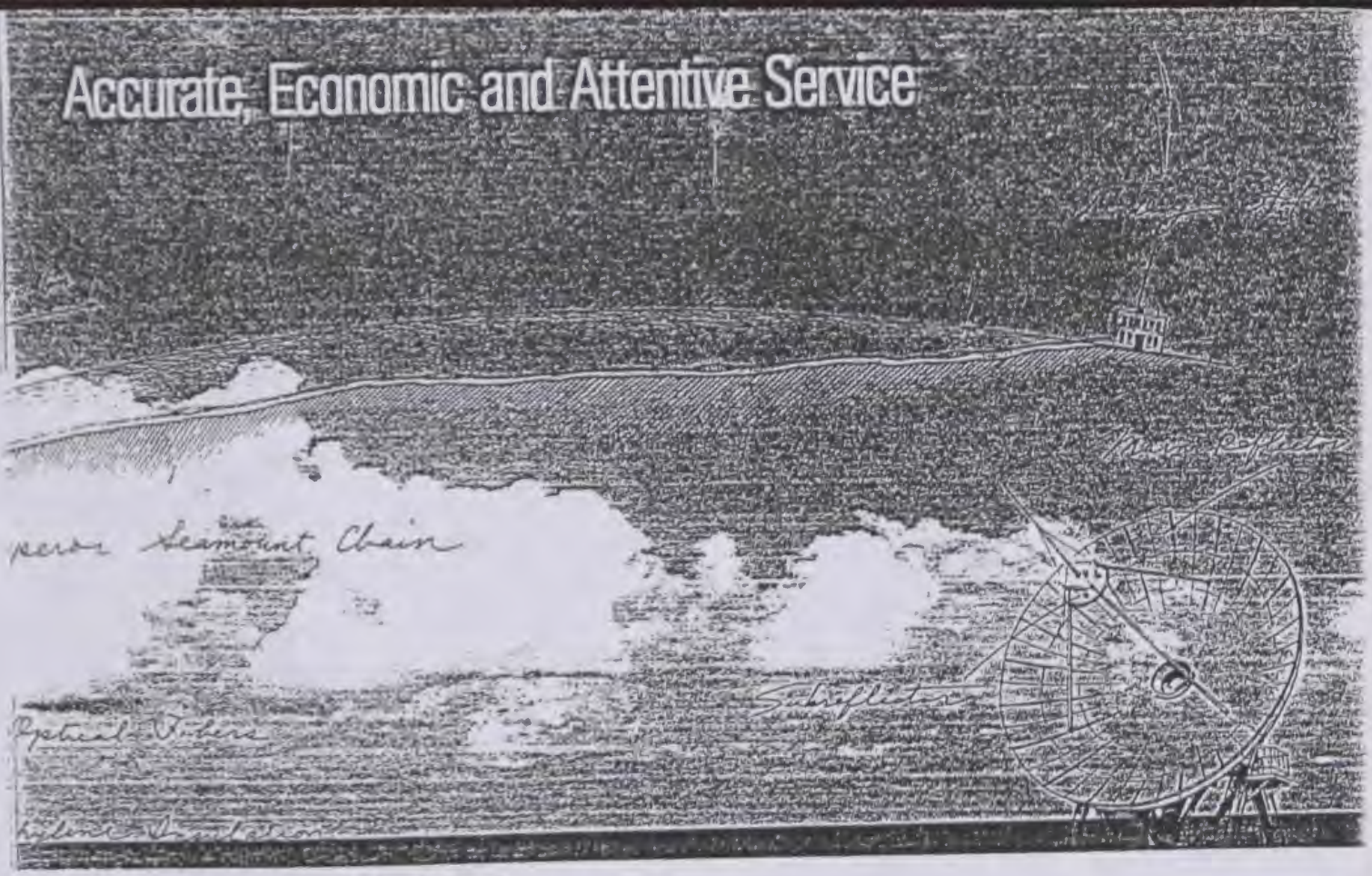
Leased Circuit Service

- High Quality and Reliable at Low Costs
- Wide Range of Digital Services
- End-to-End Coordination

As demonstrated, IDC's leased circuit service is ideal for customers who

- want to be more efficient in their use of international telecommunications services,
- need high speed, high capacity circuits,
- require high quality, high reliability means of telecommunications,
- plan to expand and/or upgrade their international leased circuits.

Accurate, Economic and Attentive Service

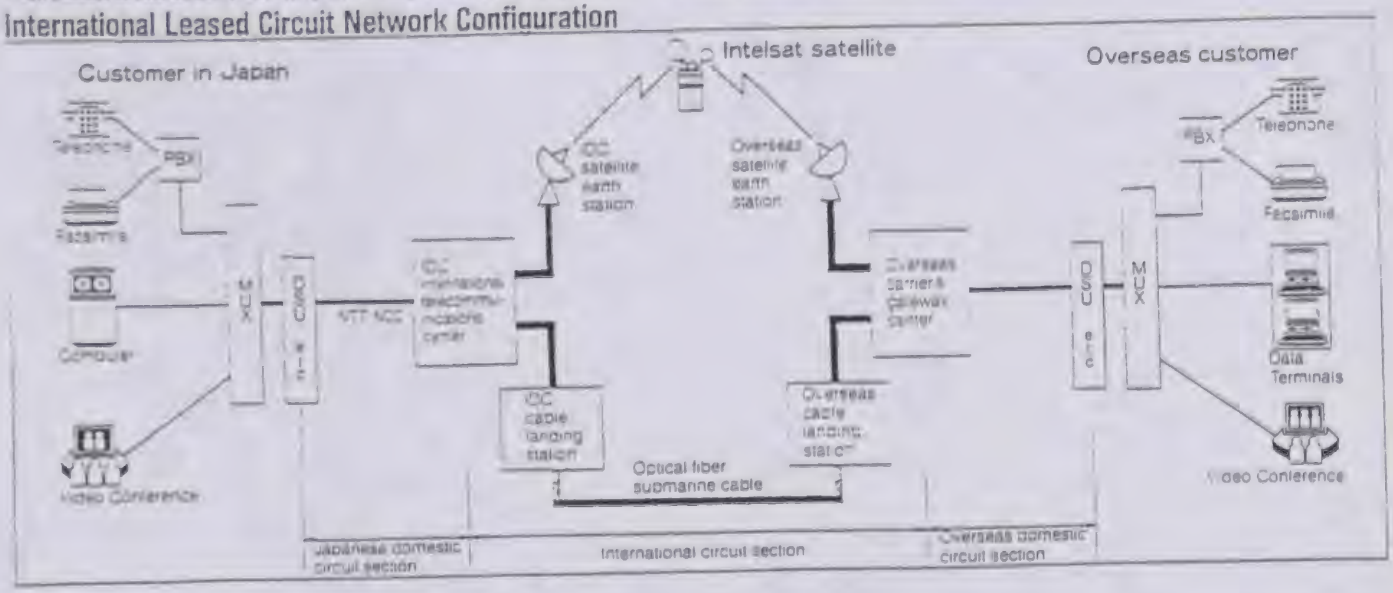


IDC International Leased Circuit Service

Class	Type of Service	Principal Uses						
		Tele-phone	Facsimile G3	Facsimile G4	Data Trans-mission	Packet Trans-mission	High Speed Data Trans-mission	Video-phone	Video Confer-encing
Medium Speed Digital Service	4.8Kb/s 9.6Kb/s								
High Speed Digital Service	56Kb/s 64Kb/s 128Kb/s 192Kb/s 256Kb/s 384Kb/s 512Kb/s 768Kb/s 1.5Mb/s [illegible] 2Mb/s [illegible]								
Bandwidth Service	Voice Grade Standard Quality (M1040) Special Quality (M1020)								
	Voice Only								

- Some services may not be available depending on the situation in the overseas country concerned.
- New Enhanced Services, Satellite Digital Relaying, Optical Switching, Multiplex Services for domestic Circuits and Back up Services for domestic International Circuits

International Leased Circuit Network Configuration



Company Profile

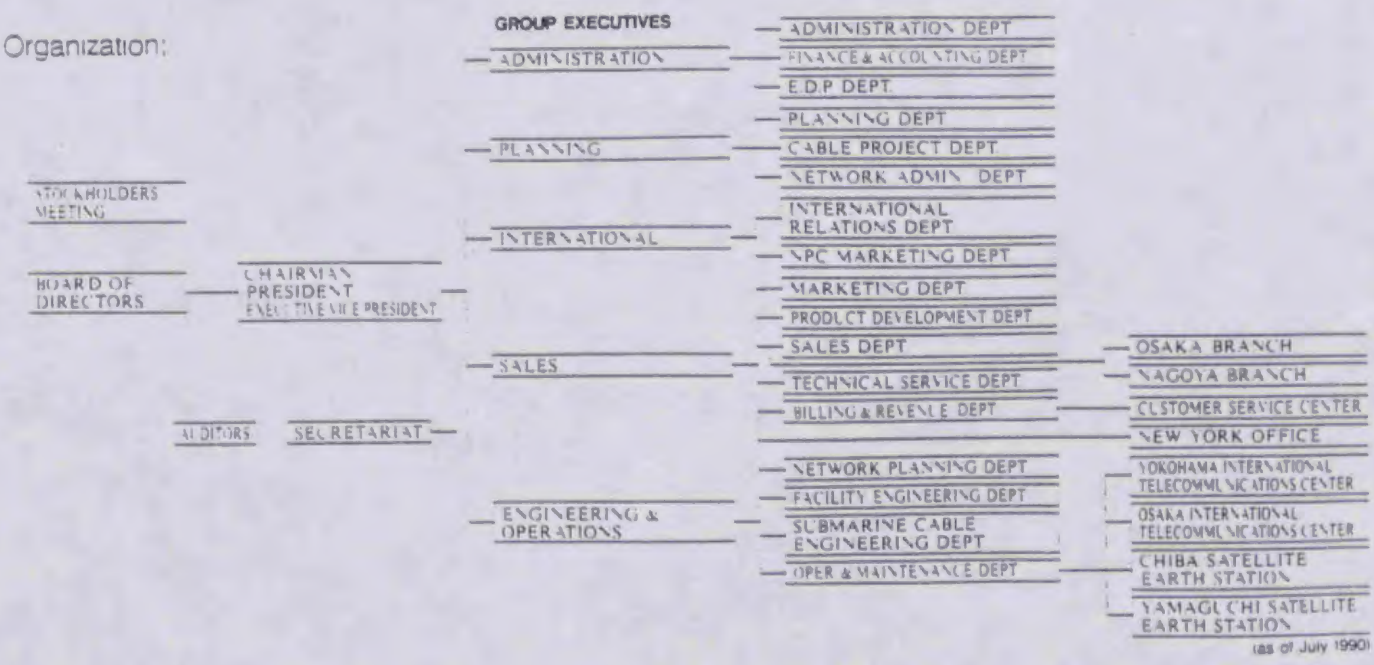
Company Name:	International Digital Communications Inc. (IDC)
Established:	November 17, 1986
Paid-in-Capital:	16 billion Yen
Business Activities:	International Telecommunications Services

Board of Directors

Chairman: Gentaro Tsuji (Senior Advisor to the Board, TOYOTA MOTOR)
President: Hideo Suetsugu
Executive Vice President: Toshio Horiuchi
Managing Directors:
Shigenori Horiguchi, Shigeru Iijima
Barry A. Moul, Paul W. Sage
Directors:
Kozaburo Aoki, Ei-ichi Isomura
Takuji Tsuba, Mitsuo Kurachi
Shigeo Tsuda, Tsutomu Tsukada
Jonathan H. Solomon (Director, Cable and Wireless)
Seijiro Yokoyama (Vice President and Director, NEC)
Motojiro Shiromizu (Exective Director, FUJITSU)
Courtney F. Jones (Executive Vice President, Merrill Lynch)
Hidehiko Iwasaki (Managing Director, NIPPON STEEL)
Shinji Tateishi (Senior Managing Director, C. Itoh)
Koichi Kitabatake (Director, Cable and Wireless Japan)
Aziz Qureshi (Vice President, Pacific Telesis International)
Auditors:
Michio Yamasaki
Hironobu Jibiki (Director and General Manager, Long-Term Credit Bank of Japan)
Hiroaki Shiota (General Manager, Tokai Bank)

Head Office:	17-1, Toranomon 3-chome, Minato-ku, Tokyo, Japan. Tel : 03-5470-5111 Fax: 03-459-4524
Osaka Branch:	3-14-24, Fukushima, Fukushima-ku, Osaka, Japan. Tel : 06-451-4511 Fax: 06-451-0991
Nagoya Branch:	3-6-29, Nishiki, Naka-ku, Nagoya-shi, Aichi, Japan. Tel : 052-953-7616 Fax: 052-953-7618
New York Office:	450 Park Avenue, Suite 2704, New York, N.Y. 10022 Tel : +1-212-355-0577 Fax: +1-212-355-0626

Organization:



(as of July 1990)

Shareholders

C. ITOH & CO., LTD.
CABLE AND WIRELESS PLC
TOYOTA MOTOR CORPORATION
PACIFIC TELESIS INTERNATIONAL

THE INDUSTRIAL BANK OF JAPAN, LIMITED
THE DAI-ICHI KANGYO BANK, LIMITED
THE LONG-TERM CREDIT BANK OF JAPAN, LIMITED
NEC CORPORATION
FUJITSU LIMITED
MERRILL LYNCH & CO., INC.

FINANCIAL INSTITUTION

THE BANK OF TOKYO, LTD.
THE BANK OF YOKOHAMA, LTD.
THE CHUO TRUST AND BANKING CO.,LTD.
THE DAIWA BANK, LIMITED
THE FUJI BANK, LIMITED
THE HOKKAIDO TAKUSHOKU BANK, LIMITED
THE KYOWA BANK, LTD.
THE MITSUBISHI BANK, LIMITED
THE MITSUBISHI TRUST AND BANKING CORPORATION
THE MITSUI TAIYO KOBE BANK, LIMITED
THE MITSUI TRUST AND BANKING COMPANY, LIMITED
THE NIPPON CREDIT BANK, LTD.
THE SAITAMA BANK, LTD.
THE SANWA BANK, LIMITED
SAISON BARCLAYS FINANCE LTD.
CREDIT SAISON CO., LTD.
THE SUMITOMO BANK, LIMITED
THE SUMITOMO TRUST AND BANKING COMPANY, LIMITED
THE TOKAI BANK, LIMITED
THE TOYO TRUST AND BANKING CO.,LTD.
THE YASUDA TRUST AND BANKING COMPANY, LIMITED

SECURITIES

COSMO SECURITIES CO.,LTD.
DAIWA SECURITIES CO.,LTD.
KOKUSAI SECURITIES CO.,LTD.
THE NEW JAPAN SECURITIES CO.,LTD.
THE NIKKO SECURITIES CO.,LTD.
THE NIPPON KANGYO KAKUMARU SECURITIES CO.,LTD.
THE NOMURA SECURITIES CO.,LTD.
OKASAN SECURITIES CO.,LTD.
SANYO SECURITIES CO.,LTD.
WAKO SECURITIES CO.,LTD.
YAMAICHI SECURITIES COMPANY, LIMITED

INSURANCE

THE CHIYODA FIRE AND MARINE INSURANCE COMPANY, LIMITED
THE DOWA FIRE AND MARINE INSURANCE COMPANY, LIMITED
THE NIPPON FIRE & MARINE INSURANCE COMPANY, LIMITED
TAISHO MARINE AND FIRE INSURANCE COMPANY, LIMITED
THE TOKIO MARINE AND FIRE INSURANCE COMPANY, LIMITED
THE YASUDA FIRE & MARINE INSURANCE CO., LTD.

LIFE INSURANCE

ASAHI MUTUAL LIFE INSURANCE COMPANY
THE DAI-ICHI MUTUAL LIFE INSURANCE CO.,
NIPPON LIFE INSURANCE COMPANY
SUMITOMO LIFE INSURANCE

LEASING

CENTURY LEASING SYSTEM, INC.
IBJ LEASING CO.,LTD.
JAPAN LEASING CORPORATION
ORIX CORPORATION

CONSTRUCTION

CHIYODA CORPORATION
JGC CORPORATION
KAJIMA CORPORATION
OHBAYASHI CORPORATION
SHIMIZU CONSTRUCTION CO.,LTD.
TAISEI CORPORATION
TAKENAKA KOMUTEN CO.,LTD.

HEAVY INDUSTRY

KAWASAKI STEEL CORP.
KOBE STEEL,LTD.
NKK CORPORATION
NIPPON STEEL CORPORATION
NIPPON MINING COMPANY, LIMITED
SUMITOMO METAL INDUSTRIES, LTD.

ELECTRIC/ELECTRONIC

FUJI ELECTRIC CO.,LTD.
FUJIKURA LTD.
THE FURUKAWA ELECTRIC CO.,LTD.
HITACHI, LTD.
OKI ELECTRIC INDUSTRY CO.,LTD.
OMRON CORPORATION
PIONEER ELECTRONICS CORPORATION
SHARP CORPORATION
SUMITOMO ELECTRIC INDUSTRIES, LTD.
TDK CORPORATION
TOSHIBA CORPORATION

AUTOMOTIVE INDUSTRY

FUJI HEAVY INDUSTRIES LTD.
ISUZU MOTORS LIMITED
MAZDA MOTOR CORPORATION
NISSAN MOTOR CO.,LTD.
SUZUKI MOTOR CO.,LTD.

MANUFACTURING

AISIN SEIKI CO.,LTD.
AKEBONO BRAKE INDUSTRY CO.,LTD.
CANON INC.
FUJI XEROX CO.,LTD.
KOITO MUNUFACTURING CO.,LTD.
KOMATSU LTD.
NHK SPRING CO.,LTD.
NIPPON DENSO CO.,LTD.
NIPPON SEIKO K.K.
NOK CORPORATION
RICHO CO.,LTD.
SEIKO EPSON CORPORATION
YAZAKI CORPORATION
YOSHIDA KOGYO K.K.

PRINTING

DAI NIPPON PRINTING CO.,LTD.
TOPPAN PRINTING COMPANY, LIMITED

RUBBER/GLASS

ASAHI GLASS COMPANY, LIMITED
BRIDGESTONE CORPORATION
NIPPON SHEET GLASS COMPANY, LIMITED
SUMITOMO RUBBER INDUSTRIES, LTD.

PETROLEUM

ESSO SEKIYU K.K.
IDEMITSU KOSAN CO.,LTD.
COSMO OIL COMPANY, LIMITED
KYODO OIL CO.,LTD.
NIPPON OIL COMPANY, LIMITED
SHOWA SHELL SEKIYU K.K.

CHEMICAL

SUMITOMO CHEMICAL COMPANY, LIMITED
TOSOH CORPORATION

TEXTILE

TORAY INDUSTRIES, INC.
TOYOBO CO.,LTD.

FOODS

AJINOMOTO CO.,INC.
NISSIN FOODS PRODUCTS CO.,LTD.
SUNTORY LTD.

POWER GENERATING

CHUBU ELECTRIC POWER COMPANY, INCORPORATED
THE KANSAI ELECTRIC POWER COMPANY, INCORPORATED
THE TOKYO ELECTRIC POWER COMPANY, INCORPORATED

TRANSPORTATION

ALL NIPPON AIRWAYS CO.,LTD.
JAPAN AIR LINES CO.,LTD.
KAWASAKI KISEN KAISHA, LTD.
MITSUI O.S.K.LINES, LTD.
NIPPON EXPRESS CO.,LTD.
NIPPON YUSEN KABUSHIKI KAISHA
YAMATO TRANSPORT CO.,LTD.

TRADING

TOYOTA TSUSHO CORPORATION

HOTEL/LEISURE

IMPERIAL HOTEL LTD.
JAPAN TRAVEL BUREAU CO.,
THE NEW OTANI
HOTEL OKURA CO.,LTD.
PALACE HOTEL CO.,LTD.
THE ROYAL HOTEL,LTD.
TOKYU HOTEL CHAIN CO.,LTD.

JOURNALISM

ASAHI SHIMBUN PUBLISHING COMPANY
NIHON KEIZAI SHINBUN, INC.
REUTERS JAPAN LIMITED

SERVICE

DENTSU INC.
RECRUIT
SECOM CO.,LTD.
S.W.I.F.T. RE


Fujitakanko Toranomon Building (7F), 1, Toranomon 3-Chome, Minato-ku, Tokyo, Japan
Telephone:03-5470-5151 (Sales Dept.) 03-5470-5181 (International Operations Dept.)
Fax:03-459-4524 Telex:242-5567 IBC TYO

INTERNATIONAL TELECOM JAPAN

ITJ's International Private Leased Circuit Service is tuned to Tomorrow's International Business

The world of international business does not sleep.
To realize the most of opportunities in the age of increasing global interdependence, an enterprise must be ready to take action at any time.
This necessitates the gathering of real-time data from all over the world and responding to it immediately which determines success in international business.
ITJ's PLC service provides you with private business lines that link you with the world 24 hours a day.
ITJ's PLC service will greatly expand opportunities for all types of corporations.

Wide Service Selection

Each customer has unique requirements depending on the size and characteristics of his business, the volume of communications traffic, and the type of equipment used. ITJ offers a variety of PLC services for international telecommunications, enabling each customer to select the optimum service.

Service Menu			Principal Applications
Bandwidth services	Voice-grade circuits	Standard quality circuit (M.1040)	Primarily analogue transmission for voice, fax and other data
		Special quality circuit (M.1020)	Primarily digital transmission for data (quality is higher than on M.1040 circuits)
	Voice-only		Transmission for voice only
Data transmission services	Medium-speed data transmission circuits	2.4kbps, 4.8kbps, 9.6kbps	Transmission for data, packet switching
	High-speed data transmission circuits	56kbps, 64kbps, 128kbps, 192kbps, 256kbps, 384kbps, 512kbps, 768kbps, 1.5Mbps (1.536Mbps) (1.544Mbps) 2 Mbps (1.920Mbps) (1.984Mbps)	1. Integrated networks for transmission of digitized voice, high-speed data and fax, etc. 2. High-speed data file transmission between computers 3. High-definition color fax transmission 4. Videophone 5. Newspaper transmission 6. TV conferencing 7. CAD/CAM

• Some service may not be available due to conditions determined by overseas telecommunications carriers.
• ITJ also is ready to offer you various value added services, please refer to the brochure for ITJ's PLC services for further details.

As of Oct. 10, '90

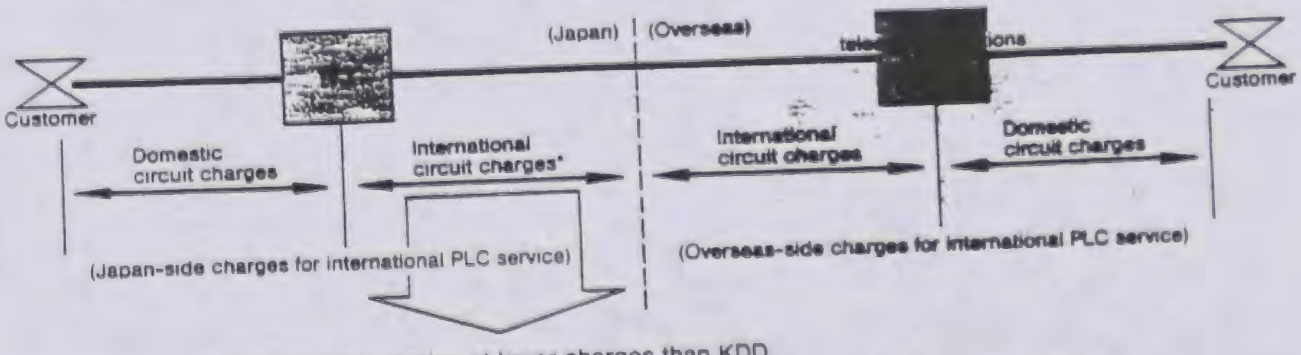
Service Area

USA, Canada, UK, France, Germany, Netherlands, Belgium, Italy, Denmark, Norway, Sweden, Rep. of Korea, Taiwan, Hong Kong, Singapore, Philippines, Malaysia, Thailand, Australia, New Zealand.
And we will expand our service network successively to such countries as Indonesia, China, Switzerland, Spain, etc.

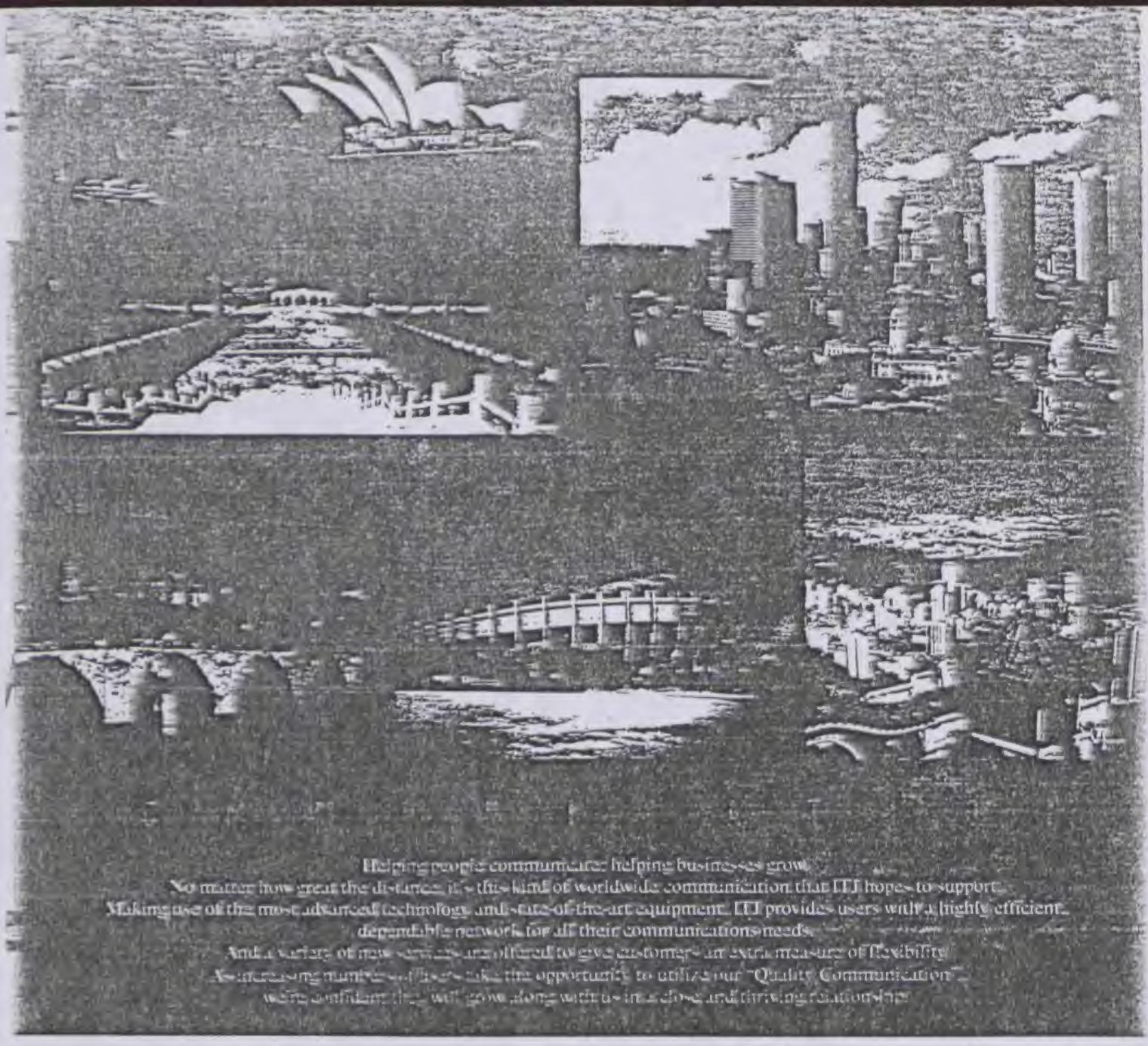
Charges & Other Fees

1. Charges for PLC services (monthly)
   These vary depending on the countries involved, but in practice they are less than KDD's charges. For details, please refer to ITJ's PLC services tariff table.
2. Charges for domestic circuits (monthly)
   Connection charges established by NTT or NCC will be applicable.
3. Installation fees (one time only)
   Installation fees and other incidental costs related to installation are decided by NTT or NCC.

Tariff Structure



*ITJ offers this portion at lower charges than KDD.



Helping people communicate: helping businesses grow.
No matter how great the distances, it's this kind of worldwide communication that ITJ hopes to support.
Making use of the most advanced technology and state-of-the-art equipment, ITJ provides users with a highly efficient, dependable network for all their communications needs.
And a variety of new services are offered to give customers an extra measure of flexibility.
As increasing numbers of users take the opportunity to utilize our "Quality Communication", we're confident they will grow along with us in a close and thriving relationship.

Sumio Okahashi
Chairman

Noboru Takahashi
President

INTERNATIONAL TELECOM JAPAN INC.

Corporate Information

Name: International Telecom Japan, Inc.
Established: July 1, 1985
Business Objectives: ① To provide international telecommunications services
② All other businesses incidental or related to the above
Paid-in capital: ¥10 billion
President: Noboru Takahashi
Shareholders: Mitsubishi Corporation, Mitsui & Co., Ltd., Sumitomo Corporation, Matsushita Electric Industrial, Co., Ltd., Marubeni Corporation, Nissho Iwai Corporation, The Bank of Tokyo, Ltd. and 129 other firms.

136 Companies (as of Oct. 10, 1990)

Shareholders

Mitsubishi Corporation
Mitsui & Co., Ltd.
Sumitomo Corporation
Matsushita Electric Industrial Co., Ltd.
Marubeni Corporation
Nissho Iwai Corporation
The Bank of Tokyo, Ltd.
The Tokyo Electric Power Co., Inc.
Taisei Corporation
Ohbayashi Corporation
Shimizu Construction Co., Ltd.
Kumagai Gumi Co., Ltd.
JGC Corporation
Nissin Food Products Co., Ltd.
Suntory Ltd.
Toyobo Co., Ltd.
Toray Industries, Inc.
Sumitomo Chemical Co., Ltd.
Takeda Chemical Industries, Ltd.
Yamanouchi Pharmaceutical Co., Ltd.
Idemitsu Kosan Co., Ltd.
Bridgestone Corporation
Nippon Steel Corporation
Kawasaki Steel Corporation
NKK Corporation
Sumitomo metal Industries, Ltd.
Kobe Steel, Ltd.
The Furukawa Electric Co., Ltd.
Sumitomo Electric Industries, Ltd.
The Fujikura Cable Works, Ltd.
Komatsu Ltd.
Toyo Engineering Corporation
Chiyoda Corporation
Hitachi, Ltd.
Toshiba Corporation
Mitsubishi Electric Corporation
Fuji Electric Co., Ltd.
NEC Corporation
Fujitsu Ltd.
Oki Electric Industry Co., Ltd.
Sony Corporation
Casio Computer Co., Ltd.
Kyocera Corporation
Seiko Epson Corp.
Nippon Denshin Kogyo Co., Ltd.
Mitsubishi Heavy Industries, Ltd.
Ishikawajima-Harima Heavy Industries Co., Ltd.
Nissan Motor Co., Ltd.
Toyota Motor Corporation
Mazda Motor Corporation
Suzuki Motor Co., Ltd.
Canon Inc.
Ricoh Co., Ltd.
Toppan Printing Co., Ltd.
Dai Nippon Printing Co., Ltd.
Tomen Corporation
Kanematsu-Gosho Ltd.
The Industrial Bank of Japan, Ltd.
The Long-Term Credit Bank of Japan, Ltd.
The Nippon Credit Bank Ltd.
The Dai-ichi Kangyo Bank, Ltd.
The Hokkaido Takushoku Bank, Ltd.
The Taiyo Kobe Mitsui Bank, Ltd.
The Mitsubishi Bank, Ltd.
The Fuji Bank, Ltd.
The Sumitomo Bank, Ltd.
The Daiwa Bank, Ltd.
The Sanwa Bank, Ltd.
The Tokai Bank, Ltd.
The Kyowa Bank, Ltd.
The Saitama Bank, Ltd.
The Bank of Yokohama, Ltd.
The Yamaguchi Bank, Ltd.
The Mitsui Trust & Banking Co., Ltd.
The Mitsubishi Trust & Banking Corporation
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Sanyo Securities Co., Ltd.
New Japan Securities Co., Ltd.
Kankaku Securities Co., Ltd.
Wako Securities Co., Ltd.
Okasan Securities Co., Ltd.
Cosmo Securities Co., Ltd.
Kokusai Securities Co., Ltd.
Meiko Securities Co., Ltd.
The Tokio Marine and Fire Insurance Co., Ltd.
Taisho Marine and Fire Insurance Co., Ltd.
The Sumitomo Marine and Fire Insurance Co., Ltd.
The Nippon Fire & Marine Insurance Co., Ltd.
The Yasuda Fire & Marine Insurance Co., Ltd.
The Dai-Tokyo Fire & Marine Insurance Co., Ltd.
Nippon Express Co., Ltd.
Nippon Yusen K.K.
Mitsui O.S.K. Lines Ltd.
Daiichi Chuo Kisen Kaisha
Japan Air Lines Co., Ltd.
All Nippon Airways Co., Ltd.
Nihon Keizai Shinbun Inc.
The Mainichi Newspapers
Chubu Electric Power Co., Inc.
The Kansai Electric Power Co., Ltd.
Tokyo Gas Co., Ltd.
Osaka Gas Co., Ltd.
Imperial Hotel Ltd.
Hotel Okura Co., Ltd.
The New Otani
Japan Travel Bureau, Inc.
Secom Co., Ltd.
Daiko Advertising Inc.
Dentsu Inc.
Recruit Inc.
Sumitomo Life Insurance Company
Nippon Life Insurance Company
Mitsui Mutual Life Insurance Company
The Meiji Mutual Life Insurance Company

Foreign based Companies

British Telecommunications P.L.C.
France Cable et Radio S.A.
Investexport
County NatWest Securities Japan Ltd.
The Royal Bank of Canada (Cayman) Ltd.
CIGNA Insurance Company
Citilease Co., Ltd.
Chase Manhattan Asia Ltd.
Seibu Barclays Finance Ltd.
Unisys Corporation
Fuji XEROX Co., Ltd.
Showa Shell Sekiyu K.K.
S.G. Warburg Securities (Japan) Inc.
Schroder Securities (Japan) Limited.

ITJ

INTERNATIONAL TELECOM JAPAN

*For further details and inquiries, please call:

0120-44-0041 (toll free)

[Head Office] Tsukiji KY Bldg., 7-5, Tsukiji 4-Chome, Chuo-ku, Tokyo, 104 Japan Tel: 03-5565-0111 FAX: 03-5565-0007 TLX: J28169ITJ
[Kansai Branch] Shinmachi Bldg., 7-5, Shinmachi 2-Chome, Nishi-ku, Osaka, 550 Japan Tel: 06-538-0111 FAX: 06-536-0007
[New York Liaison Office] 12 East 49th Street, 21st Floor, New York, N.Y. 10017 Tel: 1-212-319-2531 FAX: 1-212-319-2535 TLX: 6790620 ITJUW

1990. 10. 10. 5,000. ×04E-03

We've Got a More Cost-Effective Way To Send Your Season's Greetings

If you'll be home for the holidays only in your dreams,
sending personal season's greetings will bring you and the ones you love closer together.
Using ITJ-0041 direct service, which costs less than KDD-001,
you can deliver even more holiday messages this year.

How to use ITJ

For Getting in Touch with Your Family or Friends in New York

ITJ access number — New York City area code

0041 ▷ 1 ▷ 212 ▷ 123-4567

USA country code — Local number

For Sending Your Message of Love to Paris

ITJ access number — Paris area code

0041 ▷ 33 ▷ 1 ▷ 41 23 45 67

France country code — Local number

ITJ
INTERNATIONAL TELECOM JAPAN

0041

Your Cost-Effective, Instant Overseas Access Number: 0041

Guide to International Telephone Charges

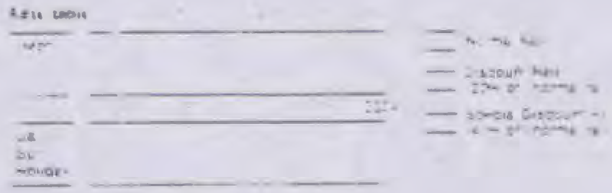
As of November 1, 1990

	Normal Rate Mon. thru Fri. 8:00-19:00			Discount Rate Mon. thru Fri. 19:00-23:00 Sat., Sun., Holiday 8:00-23:00			Special Discount Rate Sun. thru Sat. 23:00-8:00		
	3min	5min	10min	3min	5min	10min	3min	5min	10min
USA (incl. Hawaii) Guam									
0041 (ITJ)	670	1,010	1,860	540	820	1,520	400	600	1,100
001 (KDD)	680	1,020	1,870	550	830	1,530	420	640	1,190
France UK Germany Monaco Andorra									
0041 (ITJ)	1,020	1,620	3,120	810	1,290	2,490	620	980	1,880
001 (KDD)	1,050	1,650	3,150	840	1,320	2,520	630	990	1,890
Rep. of Korea									
0041 (ITJ)	660	1,020	1,870	550	830	1,530	400	600	1,100
001 (KDD)	700	1,060	1,960	550	830	1,530	420	640	1,190
Taiwan Hong Kong									
0041 (ITJ)	730	1,110	2,060	580	880	1,630	430	650	1,200
001 (KDD)	760	1,140	2,090	600	900	1,650	450	670	1,220
Singapore Philippines									
0041 (ITJ)	810	1,250	2,350	660	1,020	1,920	480	740	1,390
001 (KDD)	840	1,300	2,450	660	1,020	1,920	510	790	1,490
Canada Australia New Zealand Thailand Malaysia									
0041 (ITJ)	810	1,250	2,350	660	1,020	1,920	480	740	1,390
001 (KDD)	860	1,320	2,470	680	1,040	1,940	520	800	1,500
Netherlands Italy Vatican City San Marino Denmark Sweden Norway									
0041 (ITJ)	1,020	1,620	3,120	810	1,290	2,490	620	980	1,880
001 (KDD)	[illegible]	1,690	3,240	860	1,360	[illegible]	660	1,030	1,980

[illegible]

Contact the World from a Pay Telephone

[illegible]
Domestic/International
[illegible]
simply use hundred yen coins
or a telephone card with at least ten units remaining



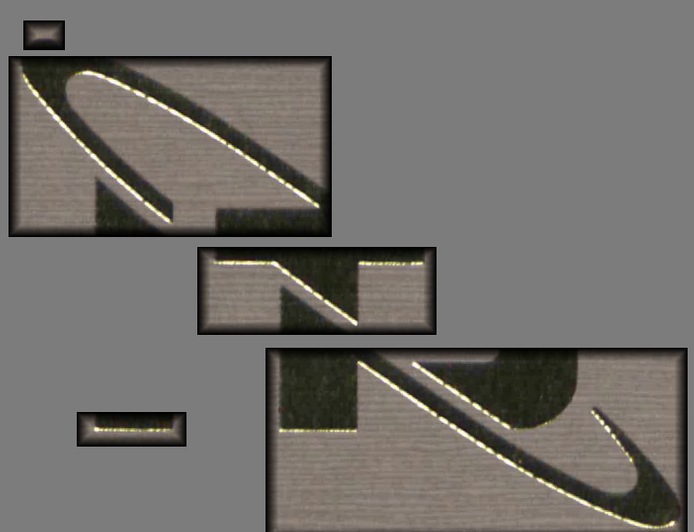
[illegible] approach to placing an overseas phone call: simply dial 0041. No preregistration or application form is necessary.
For more information [illegible] the automatic bank transfer service, just call the ITJ Customer [illegible] Center 0120-44-0041 (toll-free 24 hours a day).
[illegible]

Head Office: [illegible] Tel 03-5565-0111
[illegible] Branch [illegible] Osaka [illegible] Japan Tel 06-536 [illegible]
New York Liaison Office [illegible] New York, N.Y. [illegible]

INTERNATIONAL TELECOM JAPAN

For more information call toll-free

0120-44-0041



NTERNATIONAL TELECOM JAPAN INC.

INTERNATIONAL TELECOM JAPAN INC.

Tsukiji KY Bldg., 7-5, Tsukiji 4-Chome
Chuo-ku, Tokyo, 104 Japan
PHONE (03)5565-0111 TELEX J28169
FAX (03)5565-0007 (03)5565-0006

PANAMSAT PRESENTATION

1. DATE : Monday, January 21, 1991 (14:00~16:00)

2. PLACE : ITJ Head Office in Tokyo

3. PARTICIPANTS :

PANAMSAT

Mr. F. Landman	President and Chief Executive Officer, PANAMSAT
Mr. C. Whitehead	President, Clay Whitehead Associates
Mr. G. Gorman	Senior Vice President, Donaldson, Lufkin & Jenrette
Mr. A. Rush	Vice President, Donaldson, Lufkin & Jenrette
Mr. M. Tatsui	Director, Tokyo Representative Office, Donaldson, Lufkin & Jenrette
Mr. N. Yabushita	Assistant Manager, Satellite Business Team Nissho Iwai

ITJ

Mr. N. Takahashi	President
Mr. N. Ito	Executive Vice President
Mr. H. Ohashi	Managing Director
Mr. K. Ito	Managing Director
Mr. K. Hiiro	Manager, International Dept.
Mr. D. Jayamanne	Assistant Manager Satellite Communications Dept.

ITJ Tokyo Telecom Center

Beyond All Boundaries: ITJ Offers International Telecommunications with Improved Performance and Quality

As we approach the 21st century, it is clear that Japan has already entered the "Era of Information". According to a report released by the Commission on Telecommunications (established by the Ministry of Posts & Telecommunications), Japanese investment in equipment related to the information/telecommunications industry is expected to grow at an annual compound rate of 10.5% – from 9.28 trillion yen in 1985, to 16.85 trillion yen in 1991. Japan has, of course, come to play an essential role in the world economy, as is reflected by the growing presence in this country of international corporations and financial institutions. Japan has now become one of the world's major centers for business, finance and information. Consequently, the importance of international telecommunication networks is growing every day.

It was for the purpose of contributing to such global telecommunications services that International Telecom Japan (ITJ) was established on July 1, 1986 by major users of international telecommunications services. After conducting a variety of feasibility studies with a view to full commercialization, ITJ changed its status to an operating company on August 28,1987. On November 30 of the same year, ITJ obtained government approval to engage in operations. It then proceeded to establish private leased circuits for international services from April 1, 1989, and commenced international telephone srevices from October 1, 1989.

As the traffic of international telecommunications increases, we are now seeing a growing demand for more diversity as well as a corresponding improvement in quality. At ITJ, what we are aiming at is worldwide "Quality Communication": offering customers maximum benefit and added value in the form of services tailored to the specific requirements of each customer.

ITJ will offer the most up-to-date communication technology, reliable networks supported by a sophisticated maintenance system, a wide variety of services, lower charges, and a responsive attitude to meet customer needs. We are certain that this is the only way to provide international telecommunication services offering both high quality and excellent cost-performance.

ITJ has a bright future. We look forward to sharing it with you.

Sumio Okahashi,
Chairman

Noboru Takahashi,
President

INTERNATIONAL TELECOM JAPAN INC.

QUALITY COMMUNICATION

ITJ's International Telecommunication Services Make the Globe Smaller.

Helping people communicate; helping businesses grow.
No matter how great the distance, it is this kind of worldwide communication that ITJ hopes to support.
Making use of the most advanced technology and state-of-the-art equipment,
ITJ provides users with a highly efficient, dependable network for all their communications needs.
And a variety of new services are offered to give customers an extra measure of flexibility.
As increasing numbers of users take the opportunity to utilize our "Quality Communication",
we are confident they will grow along with us in a close and thriving relationship.

ITJ's International Telephone Services Link the Globe.

ITJ offers various international telephone services at very economical tariff rates. More people can communicate more, without any difficulties – international calls made through ITJ's network are fresh and enjoyable. ITJ's international telephone services ensure easier and more economical communications of the highest quality.

0041 – International Direct Dialling Service

By dialling the 0041 access code before the overseas number, users can reach their party directly. There are basically no registration or subscriber charges for this service. In addition, calls can be made from anywhere – and billed to a specified number. And ITJ's 0041 is also completely usable for facsimile and data transmission operations.

– **Call from Outside, or even from Your Car!** – Of course, 0041 may be used to call overseas from any public telephone in Japan for which this service is specified. In the near future, ITJ's services will also be available to the growing numbers of automobile telephone users, helping to keep them in touch with the world wherever they go.

0042 – Automatic Charge Transfer Service

This new service is designed to help users keep their telephone billings in order. Calls on behalf of a company, for example, made from one's home will be automatically billed to a designated company. (prior registration is required)

0043 – Credit Call Service

By dialling the international credit number issued by ITJ (prior registration is required), users have the option of making "cashless" calls. Its charge will be billed to a designated account upon the registration.

In addition, ITJ is in the process of developing a variety of new services that will provide our customers with greater value and performance.

Service Area & Service-in Schedule

In Service (as of Mar. 1, 1990)

Area	Country code	Area	Country Code
U.S.A.	1	Netherlands	31
U.K.	44	Singapore	65
France	33	Hong Kong	852
Monaco	33	Taiwan/ROC	886
Andorra	33	Philippines	63

We will expand our service area gradually to such countries as Australia, Italy, Canada, Malaysia, Korea, Thailand, New Zealand, Belgium, F.R. Germany, Switzerland, Spain, Indonesia, China...

Charges

Charges are according to economical 6-seconds unit. The rate becomes even lower for calls exceeding 1 minute.
Discounts of 20 to 40 percent are also available on weekends and off-peak hours.
For further details, please refer to ITJ's rate table.

Round-the-Clock Service. ITJ's International Private Leased Circuit to Tomorrow's International Business.

The world of international business does not sleep. To make the most of opportunities in the age of increasing global interdependence, an enterprise must be ready to take action at any time. This necessitates the gathering of real-time data from all over the world and responding to it immediately which determines success in international business. ITJ's PLC service provides you with private business lines that link you with the world 24 hours a day. ITJ's PLC service will greatly expand opportunities for all types of corporations.

■ Make the Most of Time Difference

Our PLC service will help you to exploit rather than suffer from time difference. For instance, during business hours, priority can be given to voice communications, but during evening/night hours (other than business hours when the other party is absent) multiple documents can be transmitted between fax terminals and large volumes of computer-based information can be sent via high-speed data transmission. Also, if you set up a triangular link with Japan and two other countries, it is possible to communicate with any one of them using two separate circuits — one direct and the other via the third country. Besides providing enhanced transmission capacity, this kind of circuit configuration also offers greater efficiency.

■ Round-the-Clock Communications

ITJ's PLC service is accessible 24 hours a day, providing your own private link between, say, head office and an overseas branch. The circuits are always available – no need to worry about busy lines in an emergency. And there is no risk of missing out on a business opportunity.

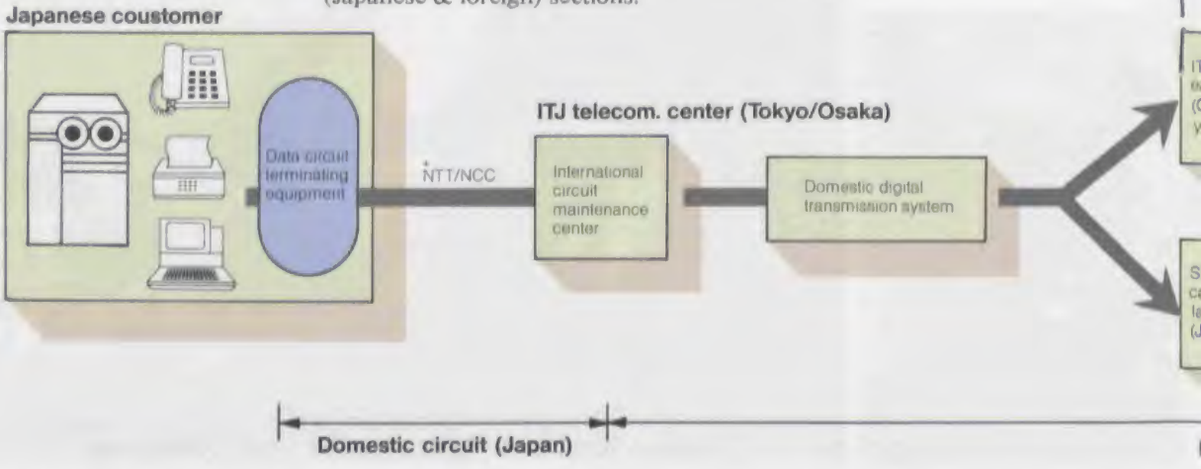
■ Fixed Charges Mean Substantial Savings

Fixed monthly charges will be applicable for ITJ's PLC service. This means it offers substantial savings for anyone with high-volume communications requirements – whether for voice, data, or fax – between fixed locations. The more you use the circuits, the greater value you will get from them.

■ End-to-End Link Offers High Performance

Unlike standard telephone circuits which at times must pass through several exchanges, ITJ's PLC service will link customers directly to eliminate the risk of wrong connections. This type of "end-to-end" link is a communications medium that assures high-quality, high-performance information transfer.

CIRCUIT CONFIGURATION: A PLC service consists of both international(country-to-country) and domestic (Japanese & foreign) sections.



*If it is possible to link a customer's office and one of our communication centers with an NCC circuit, it will be possible to use both NCC and NTT circuits [NTT = Nippon Telegraph & Telephone Corporation; NCC = New Common Carriers]

*ITJ is also considering the establishment of direct digital microwave links with customers — the "ITJ Direct Route."

(PLC) Service is Tuned

■ Wide Service Selection

Each customer has unique requirements depending on the size and characteristics of his business, the volume of communications traffic, and the type of equipment used. ITJ offers a variety of PLC services for international telecommunications, enabling each customer to select the optimum service.

Service Menu			Principal Applications
Bandwidth services	Voice-grade circuits	Standard quality circuit (M.1040)	Primarily analogue transmission for voice, fax and other data
		Special quality circuit (M.1020)	Primarily digital transmission for data (quality is higher than on M.1040 circuits)
	Voice-only		Transmission for voice only
Data transmission services	Medium-speed data transmission circuits	2.4kbps, 4.8kbps, 9.6kbps	Transmission for data, packet switching
	High-speed data transmission circuits	56kbps, 64kbps, 128kbps, 192kbps, 256kbps, 384kbps, 512kbps, 768kbps, 1.5Mbps, 2Mbps	1. Integrated networks for transmission of digitized voice, high-speed data and fax etc. 2. High-speed data file transmission between computers 3. High-definition color fax transmission 4. Videophone 5. Newspaper transmission 6. TV conferencing 7. CAD/CAM

- Please note that ITJ is willing to consider offering telecommunications services other than those listed above if so desired by the customer.
- Some services may not be available due to conditions determined by overseas telecommunications carriers.

Service Area

North America	USA, Canada
Europe	UK, France, F.R.Germany, Netherlands, Italy, Belgium
Asia	Hong Kong, Korea, Singapore, Taiwan, Thailand, Philippines
Oceania	Australia

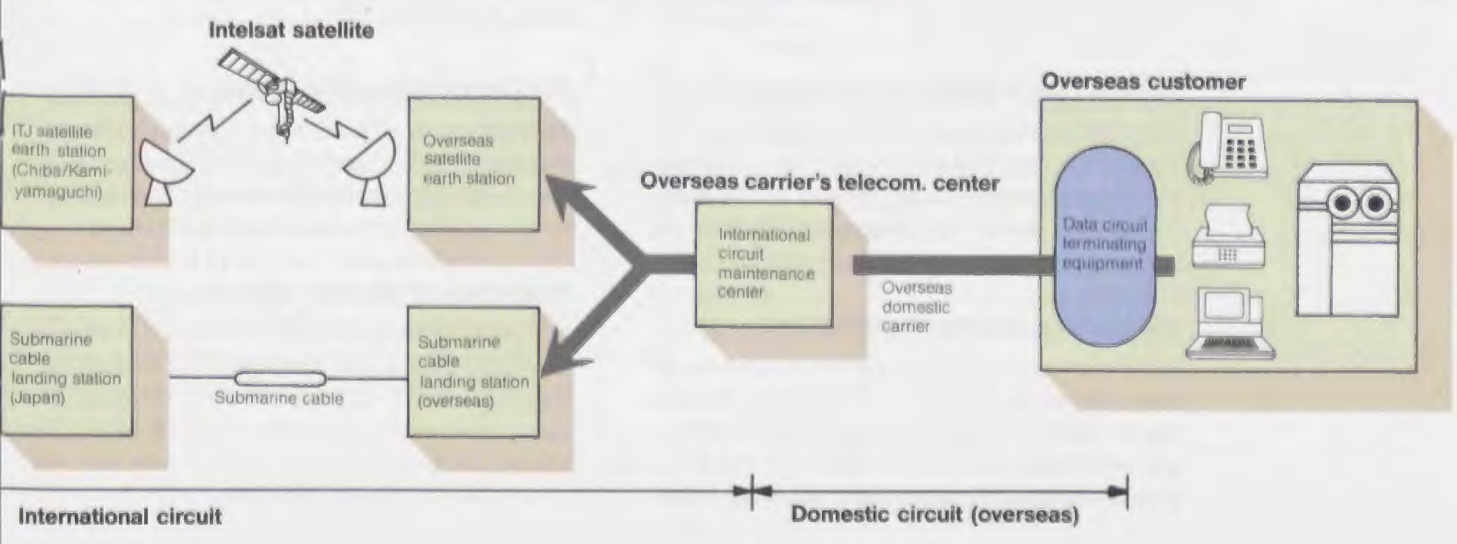
(Operations will be gradually expanded to other countries)

Charges & Other Fees

① Charges for PLC services (monthly)
These vary depending on the countries involved, but in practice they are approx. 7% less in average than KDD's charges. (as of Mar. 1, 1990). As for detailed information, please refer to ITJ tariff table.

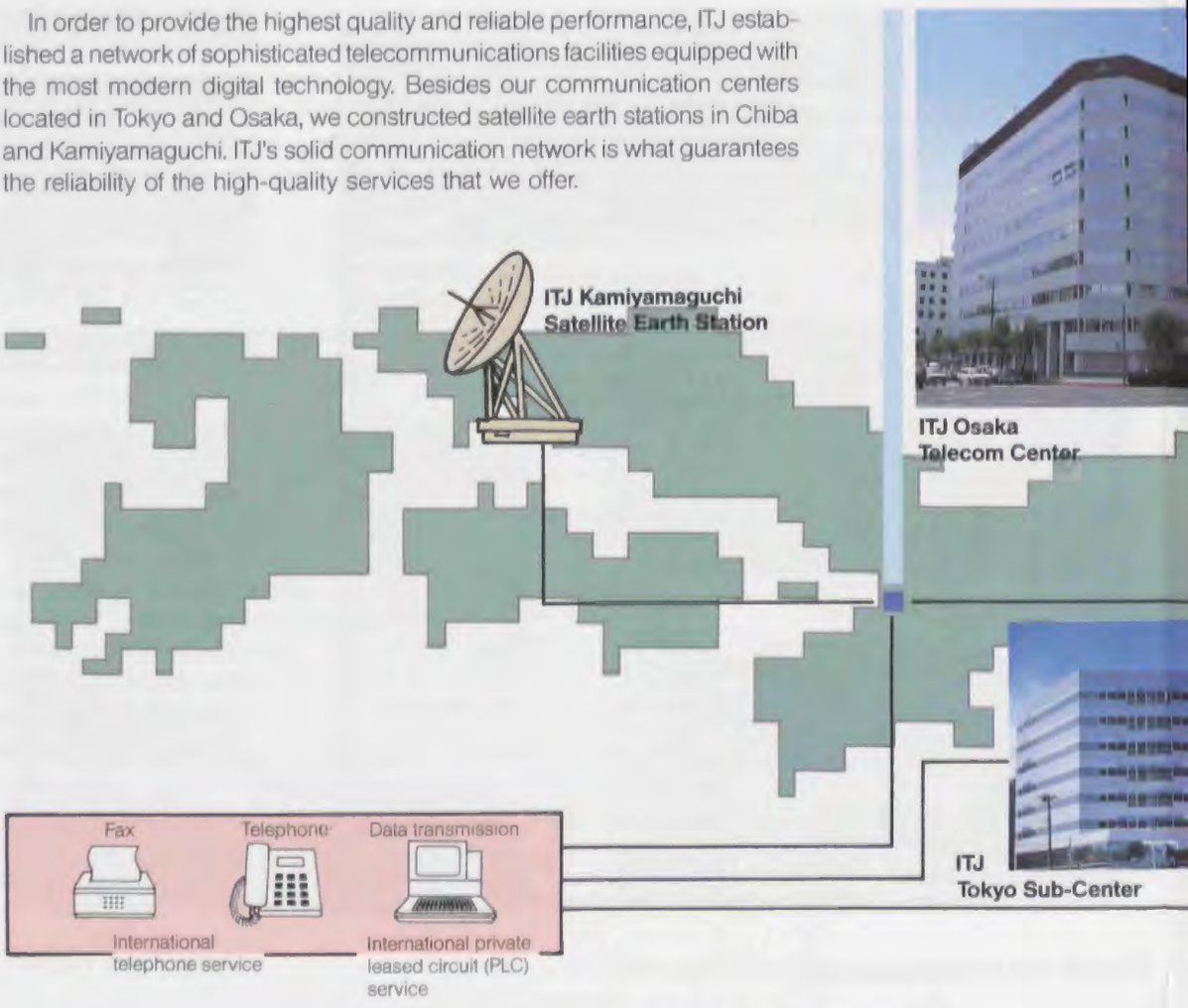
② Charges for domestic circuits (monthly)
Connection charges established by NTT or NCC are applicable.

③ Installation fees (one time only)
Installation fees and other incidental costs related to installation are decided by NTT or NCC.



ITJ's Unique Communications Facilities in International Telecommunications Servic by a 24-Hour Care & Maintenance System

In order to provide the highest quality and reliable performance, ITJ established a network of sophisticated telecommunications facilities equipped with the most modern digital technology. Besides our communication centers located in Tokyo and Osaka, we constructed satellite earth stations in Chiba and Kamiyamaguchi. ITJ's solid communication network is what guarantees the reliability of the high-quality services that we offer.



24-Hour Care & Maintenance Service

ITJ employs a centralized administration and control system. This enables us to provide round-the-clock care and maintenance. Should any malfunction occur, ITJ service teams will contact the customer and take an immediate corrective action to restore services.

Backup Systems Assure Reliability

ITJ has prepared extra communications equipment, digital circuits, power supplies, etc. Backup systems have been installed for both the hardware and communications circuits, and these will be activated automatically in response to a malfunction.

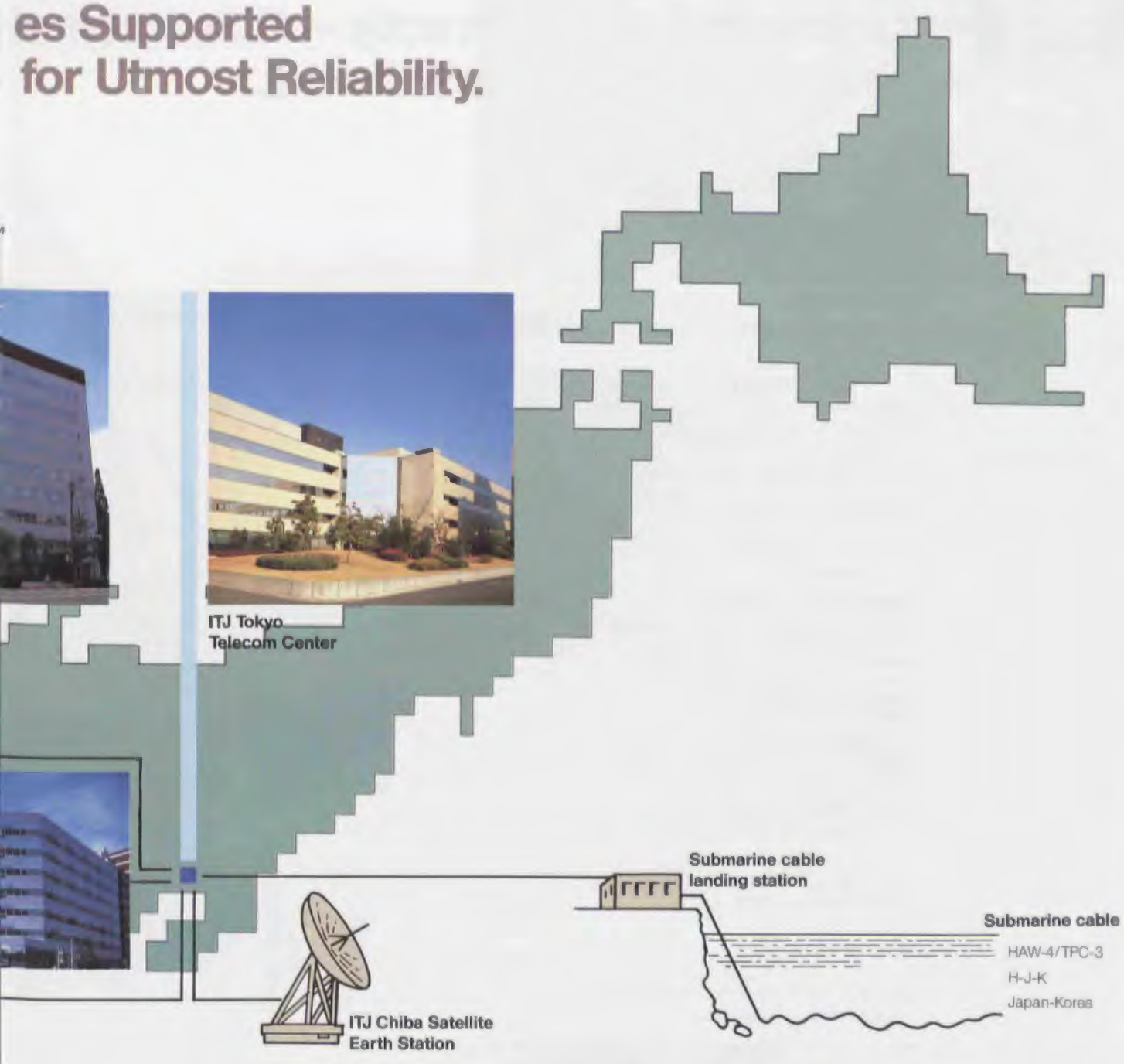
Satellites & Submarine Cables

Multiple routes – involving satellites and submarine cables – will be provided for international telecommunications so that if one route malfunctions it can be effectively replaced by another.

Sophisticated Security Systems

Our communication centers in Japan are located in so-called "intelligent" buildings that feature the latest in security systems and state-of-the-art disaster prevention capabilities. You can always be assured of the integrity of ITJ's services and the privacy of your communications.

Japan.
es Supported
for Utmost Reliability.



Fiber-Optic Cable Links Japan and USA

Telecommunications demand is large between Japan and the USA, and is expected to increase rapidly. From the commencement of ITJ's services you will be able to utilize the high-quality digital circuits offered by the 3rd Transpacific Submarine Cable (HAW-4/TPC-3), which uses advanced fiber-optic technology. There are plans to lay similar cables along other routes, and ITJ is considering to expand its telecommunication networks using this advanced medium.

Sophisticated Satellite Links

Employment of the latest model of antennae (conforming to the Intelsat new standard A-type), will allow ITJ to have access to Intelsat communications satellites covering the Pacific and Indian Ocean regions respectively with advanced digital equipment.

Superior Detection & Diagnosis

To ensure maintenance of a high standard of quality and performance, our communication centers in Tokyo and Osaka are provided with state-of-the-art digital communications equipments incorporating advanced malfunction detection and diagnostic capabilities.

Linking the World Directly – ITJ's Internat Telecommunications Network.

ITJ's Principal International Telecommunications Routes

Cable Routes

Name of Cable	Type of Cable
(HAW-4/TPC-3) 3rd Transpacific Submarine Cable	Fiber Optic Cable
(TPC-4) 4th Transpacific Submarine Cable Scheduled for completion in 1992	Fiber Optic Cable
(H-J-K) Hong Kong-Japan-Korea-Submarine Cable Scheduled for completion in 1990	Fiber Optic Cable
(J-K) Japan-Korea Submarine Cable	Coaxial Cable
(G-P-T) Guam-Philippines-Taiwan Submarine Cable	Fiber Optic Cable
(S-H) Singapore-Hong Kong Submarine Calbe	Coaxial Cable
(TAIGU) Taiwan-Guam Subnarine Cable	Coaxial Cable
(HONTAI-2) Hong Kong-Taiwan Submarine Cable Scheduled for completion in 1990	Fiber Optic Cable
(PACRIM-WEST) Guam-Australia Submarine Cable Scheduled for completion in 1994	Fiber Optic Cable
(PACRIM-EAST) Hawai-New Zealand Submarine Cable Scheduled for completion in 1993	Fiber Optic Cable
(TASMAN-2) Australia-New Zealand Submarine Cable Scheduled for completion in 1991	Fiber Optic Cable
(TAT-8) USA-UK/France Submarine Cable	Fiber Optic Cable
(TAT-9) USA/Canada-UK/France/Spain Submarine Cable Scheduled for completion in 1991	Fiber Optic Cable
(ASEAN) Philippines-Thailand-Malaysia-Singapore-Indonesia Submarine Cable Under Planning	Fiber Optic Cable

Satellite Routes

Name of Satellite
INTELSAT (POS) Intelsat Pacific Ocean Satellite
INTELSAT (IOS) Intelsat Indian Ocean Satellite

ional

ITJ's International Communications Network

Please note: The actual location of communications satellites is approximately 36,000km above the equator.

Corporate Profile

Name
International Telecom Japan Inc. (ITJ)

Date of Establishment
July 1, 1986

Business Objectives
① To provide international telecommunications services
② All other businesses incidental or related to the above

Capital
10 billion yen

Address
[Head Office]
Tsukiji KY Bldg., 7-5, Tsukiji 4-chome
Chuo-ku, Tokyo 104 Japan
Tel: 03-5565-0111
Fax: 03-5565-0007
Tlx: J28169ITJ

[Kansai Branch]
Shinmachi Bldg., 7-5, Shinmachi 2-chome
Nishi-ku, Osaka, 550 Japan
Tel: 06-538-0111
Fax: 06-536-0007

[New York Liaison Office]
12 East 49th Street, 21st Floor,
New York, N.Y. 10017
Tel: 1 (212) 319-2531
Fax: 1 (212) 319-2535

Board of Directors

Chairman: Sumio Okahashi (Senior Advisor; Sumitomo Corporation)

President: Noboru Takahashi

Executive Vice President: Nobuo Ito

Executive Vice President: Sekiya Sugimoto

Executive Vice President: Akira Nishiyama

Senior Managing Director: Yozo Kanemitsu

Managing Director: Hiroshi Ohashi

Managing Director: Yuichi Nomachi

Managing Director: Kikuzo Itoh

Managing Director: Masami Orima

Director: Yuichiro Kihara

Director: Akira Utsumi (Managing Director; Mitsui & Co., Ltd.)

Director: Yoshio Taniguchi (Executive Vice-President; Mitsubishi Corporation)

Director: Tomiichi Akiyama (Executive Vice-President; Sumitomo Corporation)

Director: Keiya Toyonaga (Senior Managing Director; Matsushita Electric Industrial Co., Ltd.)

Director: Susumu Hayashi (Managing Director; Marubeni Corporation)

Director: Reiichi Yoshimoto (Managing Director; Nissho Iwai Corporation)

Director: Takenobu Tanno (Director; Mitsui & Co., Ltd.)

Director: Shunpachiro Yao (Director, Corporate Service Division; Matsushita Electric Industrial Co., Ltd.)

Director: Toshihiko Kobayakawa (Senior Managing Director; The Bank of Tokyo, Ltd.)

Director: Katsumi Iwasaki (Managing Director; The Tokyo Electric Power Co., Inc.)

Standing Auditor: Junichi Ohtsuki

Standing Auditor: Hiroshi Watanabe

Auditor: Haruhisa Kawasaki (General Manager, Capital Markets Planning Division; The Mitsui Bank, Ltd.)

Auditor: Fumio Iwasaki (Chief Manager, Corporate Banking Planning Division; The Mitsubishi Bank, Ltd.)

Organization Chart (as of March 1, 1990)

Shareholders

Mitsubishi Corporation
Mitsui & Co., Ltd.
Sumitomo Corporation
Matsushita Electric Industrial Co., Ltd.
Marubeni Corporation
Nissho Iwai Corporation
The Bank of Tokyo, Ltd.

The Tokyo Electric Power Co., Inc.

Taisei Corporation
Ohbayashi Corporation
Shimizu Construction Co., Ltd.
Kumagai Gumi Co., Ltd.
JGC Corporation
Nissin Food Products Co., Ltd.
Suntory Ltd.
Toyobo Co., Ltd.
Toray Industries, Inc.
Sumitomo Chemical Co., Ltd.
Takeda Chemical Industries, Ltd.
Yamanouchi Pharmaceutical Co., Ltd.
Idemitsu Kosan Co., Ltd.
Bridgestone Corporation
Nippon Steel Corporation
Kawasaki Steel Corporation
NKK Corporation
Sumitomo Metal Industries, Ltd.
Kobe Steel, Ltd.
The Furukawa Electric Co., Ltd.
Sumitomo Electric Industries, Ltd.
The Fujikura Cable Works, Ltd.
Komatsu Ltd.
Toyo Engineering Corporation
Chiyoda Corporation
Hitachi, Ltd.
Toshiba Corporation
Mitsubishi Electric Corporation
Fuji Electric Co., Ltd.
NEC Corporation
Fujitsu Ltd.
Oki Electric Industry Co., Ltd.

Sony Corporation
Casio Computer Co., Ltd.
Kyocera Corporation
Seiko Epson Corp.
Nippon Denshin Kogyo Co., Ltd.
Mitsubishi Heavy Industries, Ltd.
Ishikawajima-Harima Heavy Industries Co., Ltd.
Nissan Motor Co., Ltd.
Toyota Motor Corporation
Mazda Motor Corporation
Suzuki Motor Co., Ltd.
Canon Inc.
Ricoh Co., Ltd.
Toppan Printing Co., Ltd.
Dai Nippon Printing Co., Ltd.
Tomen, Ltd.
Kanematsu-Gosho Ltd.
The Industrial Bank of Japan, Ltd.
The Long-Term Credit Bank of Japan, Ltd.
The Nippon Credit Bank, Ltd.
The Dai-Ichi Kangyo Bank, Ltd.
The Hokkaido Takushoku Bank, Ltd.
The Mitsui Bank, Ltd.
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Yamaichi Securities Co., Ltd.
The Nikko Securities Co., Ltd.
The Nomura Securities Co., Ltd.
Sanyo Securities Co., Ltd.
New Japan Securities Co., Ltd.
The Nippon Kangyo Kakumaru Securities Co., Ltd.
Wako Securities Co., Ltd.
Okasan Securities Co., Ltd.
Cosmo Securities Co., Ltd.
Kokusai Securities Co., Ltd.
Meiko Securities Co., Ltd.
The Tokio Marine and Fire Insurance Co., Ltd.
Taisho Marine and Fire Insurance Co., Ltd.
The Sumitomo Marine and Fire Insurance Co., Ltd.
The Nippon Fire & Marine Insurance Co., Ltd.
The Yasuda Fire & Marine Insurance Co., Ltd.
The Dai-Tokyo Fire & Marine Insurance Co., Ltd.
Nippon Express Co., Ltd.
Nippon Yusen K.K.
Mitsui O.S.K. Lines Ltd.
Daiichi Chuo Kisen Kaisha
Japan Air Lines Co., Ltd.
All Nippon Airways Co., Ltd.
Nihon Keizai Shinbun Inc.
The Mainichi Newspapers
Chubu Electric Power Co., Inc.
The Kansai Electric Power Co., Ltd.
Tokyo Gas Co., Ltd.
Osaka Gas Co., Ltd.
Imperial Hotel Ltd.
Hotel Okura Co., Ltd.
The New Otani
Japan Travel Bureau, Inc.
Secom Co., Ltd.
Daiko Advertising Inc.
Dentsu Inc.
Recruit Inc.
Sumitomo Life Insurance Company
Nippon Life Insurance Company
Mitsui Mutual Life Insurance Company
The Meiji Mutual Life Insurance Company

Foreign based Companies

British Telecommunications P.L.C.
France Cables et Radio S.A.
Investexport
County NatWest Securities Japan Ltd.
The Royal Bank of Canada (Cayman) Ltd.
CIGNA Insurance Company
Citilease Co., Ltd.
Chase Manhattan Asia Ltd.
Seibu Barclays Finance Ltd.
Unisys Corporation
Fuji XEROX Co., Ltd.
Showa Shell Sekiyu K.K.
S.G. Warburg Securities (Japan) Inc.
Schroder Securities (Japan) Limited.

137 Companies
(as of March 1, 1990)

INTERNATIONAL TELECOM JAPAN

*For further details and inquiries, please call.

0120-44-0041 (toll free)

<Head Office> Tsukiji KY Bldg., 7-5, Tsukiji 4-chome, Chuo-ku, Tokyo, 104 Japan TEL. (03) 5565-0111 FAX. (03) 5565-0007 TLX. J28169 ITJ
<Kansai Branch> Shinmachi Bldg., 7-5, Shinmachi 2-chome, Nishi-ku, Osaka, 550 Japan TEL. (06) 538-0111 FAX. (06) 536-0007
<New York Liaison Office> 12 East 49th Street, 21st Floor, New York, N.Y. 10017 TEL. 1 (212) 319-2531 FAX. 1 (212) 319-2535 TLX. 6790620 ITJUW

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世界とクォリティコミュニケーション

ITJ国際専用回線サービスのご案内

INTERNATIONAL PRIVATE LEASED CIRCUIT SERVICE

国際専用回線サービスは、ITJ。
インターナショナルビジネスの可能性を無限に拡げます。

International Private Leased Circuit (PLC) Service.
ITJ Offers the Means to Expand International Business Opportunities Beyond All Boundaries.

A 24時間オンライン。ビジネスチャンスを逃がしません。

ITJの国際専用回線は、24時間オンライン。たとえば、国内のA地点と海外のB地点を常時おつなぎしていますので、緊急の場合でも「待ち時間なし」で連絡OK。突然やってくるビジネスチャンスも逃がしません。いわば、ITJの国際専用回線は企業戦略に欠かせないホットラインです。

A Round-the-Clock Service – No Lost Opportunities

ITJ international private leased circuit (PLC) service for international telecommunications is accessible 24 hours a day. Location A in Japan can thus be linked up with location B overseas to enable instant and exclusive communications whenever the need arises – no waiting. So there is no danger of missing out on a sudden business opportunity. ITJ PLC service provides, in effect, a hotline that is essential for the success of your international corporate operations.

B 時差も、有効に活用。ムダなく、より大量の情報通信が可能です。

ビジネスアワーは音声による会話を優先し、相手側が夜間不在の時間帯はファクシミリによる大量のドキュメント伝送、高速データ伝送によるファイル情報の転送など、時差を活用したムダのない通信が可能です。また、日本、A国、B国間をトライアングルに専用回線で結んでご使用になると、たとえば夜間でトラフィックの少ないA国を経由して、日本からB国への情報を日本→A国→B国というルートで通信することも可能。あたかも日本からB国へ2回線有している使い方ができ、より効率的、大量の通信ができます。

B Making the Most of Time Differentials – Efficient, High-Volume Information Transfer

Communications between time zones are normally thought of as being inconvenient, but ITJ international PLC service allows you to get maximum advantage from such time differentials. For example, during business hours, priority can be given to voice communications, but when there is no one on the other end of the line during night hours, documents can be transmitted between fax terminals and large volumes of computer-based information can be sent via high-speed data transmission.

Furthermore, if you set up a triangular link with Japan and two other countries, it is possible to communicate with any one of them using two separate circuits, one direct and the other via the third country as the intermediate country will reduce telecommunications traffic during night hours. Besides providing enhanced transmission capacity, this kind of circuit configuration also offers greater efficiency.

C 料金は毎月定額。使えば使うほどおトクです。

ITJの国際専用回線は、月額定額料金です。ですから、固定した地点間に、電話・データ通信・ファクシミリ通信など、一定量以上の通信ニーズがあるお客さまには、たいへん経済的です。24時間使いたい時に使えて、しかも使えば使うほどおトクなITJの国際専用回線サービスは、コストパフォーマンスの高い国際通信です。

C Fixed Monthly Charges – The More You Use, The More You Benefit

Fixed monthly charges will be applicable for ITJ international PLC service. This means they are extremely economical for anyone with high-volume communications requirements – whether for voice, data, or fax – between fixed locations. So on top of receiving round-the-clock service, you have the advantage of knowing that the more you use the circuits, the greater value you will get from them. ITJ PLC service offers international telecommunications with high cost-performance.

D エンド・ツー・エンドの回線。高品質な情報伝送が可能です。

ITJの国際専用回線サービスは、お客さま同士をダイレクトにおつなぎしていますので、電話交換機を多数経由する一般の電話回線に比べ、回線のふさがりや誤接続の心配がない回線特性があります。いわば、エンド・ツー・エンドで、高品質な情報伝送が可能な通信メディアといえます。

D End-to-End Circuits – Assuring High Performance

ITJ international PLC service will link customers directly. This means that it is far superior to public telephone service which must pass through several exchanges: there is no risk of busy lines or wrong connections. This type of "end-to-end" link is a communications medium that enables high-quality, high-performance information transfer.

E お客さまのニーズにあわせた、最適なサービスメニューをご案内します。

お客さまにより、通信の量・形態はさまざまです。また、お客さまが専用回線でご使用になられる通信機器もさまざまです。まず、私どもITJにお客さまのニーズをお聞かせください。音声級、音声伝送専用、中速デジタル、高速デジタルの中から最適なサービスメニューをご案内させていただきます。

E A Multitude of Services to Satisfy All Requirements

Each telecommunications service customer has unique requirements as regards locations, links, types of applications, and traffic volume. Furthermore, different users employ different communications equipment. To meet such diverse requirements, ITJ provides a multitude of specially designed services. Just tell us what your particular needs are, and we will advise you on the optimum service.

きめ細かく、あくまでユーザー本位に。
ITJの国際専用回線サービスは、クオリティで差をつけます。

ITJ's Service Puts the Customer First.
Our International PLC Service Is No. 1 in Quality.

Aより信頼性高く。

- 集中監視・制御システムの導入と、24時間保守体制により、万一の障害時もお客さまとの連絡・保守等を迅速に行う万全のアフターケア体制を敷いています。
- 通信機器、デジタル伝送路、電源等は、予備系も準備し、障害時には自動切替えを行うなど、設備や通信ルートの二重化システムをとりいれています。
- 国際間伝送路は、通信衛星と海底ケーブルによる複数ルート。万一の障害時は相互にバックアップができる体制をとっています。
- 国内の通信センターは、最新のセキュリティシステムと優れた防災能力を完備したインテリジェントビルに設置。お客さまの情報を安全に伝送いたします。

A Superior Reliability

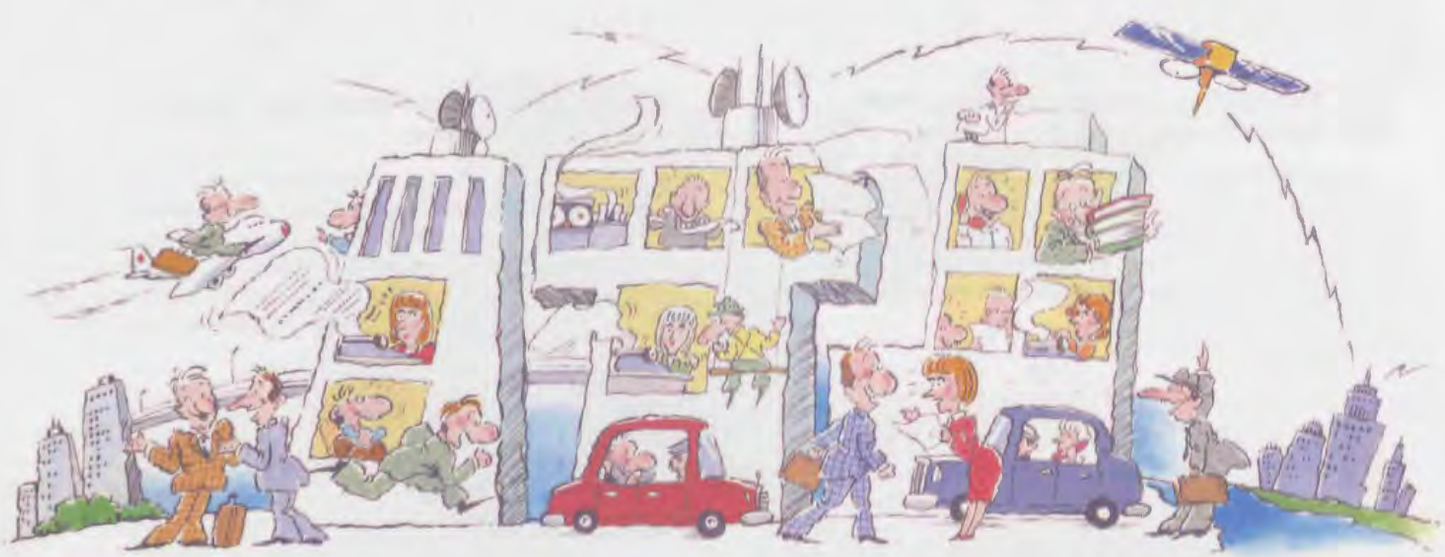
- Our centralized administration, control system and round-the-clock care/maintenance enable us to take corrective action swiftly and surely in the rare event of a malfunction occurring.
- Backup systems have been installed for both the hardware and communications circuits; all of which activate automatically in response to a malfunction.
- Multiple routes – involving satellites and submarine cables – will be provided for international telecommunications so that if one route malfunctions it can be effectively replaced by another.
- ITJ communication centers in Japan are located in "intelligent" buildings that feature the latest in security systems and state-of-the-art disaster prevention capabilities. You can always be assured of the integrity of your communications links.

Bより高品質に。

- 海底ケーブルは、HAW-4/TPC-3, H-J-K, G-P-T, TPC-4, TAT-9他、光ファイバーケーブルを経由いたしますので高品質な回線がご利用になれます。
- 衛星通信は、最新のインテルサット新標準A型地球局設備を採用した衛星通信局により、太平洋およびインド洋地域の通信衛星に高品質なデジタル信号でアクセスします。
- 各通信センターには、優れた障害検出・診断機能を備えた最新鋭デジタル通信設備を設置。通信品質の向上をはかるとともに、今後も最新の技術導入を積極的に行う予定です。

B Higher Quality

- You will be able to use the high-quality circuits accessable by transmissions through such submarine cable routes as HAW-4/TPC-3 (3rd Transpacific), H-J-K (HK-Japan-Korea), G-P-T (Guam-Philippines-Taiwan), TPC-4 (4th Transpacific), TAT-9 (USA-UK/France/Spain) using the advanced optic-fiber technology.
- Employing the latest in INTELSAT earth station equipment (conforming to the new A-type standard), ITJ will access communications satellites covering the Pacific and Indian Ocean regions with high-quality digital transmissions.
- Each communication center is provided with state-of-the-art digital communications equipment that features advanced malfunction detection and diagnostic capabilities. In line with our policy of continual improvement, ITJ will strive to introduce new technology as soon as it becomes available.



C より多彩な付加サービスを。

ITJの専用回線サービスはお客さまのご要望に沿えるよう、多彩な付加サービスをご用意しております。

- 異なった経路で高速デジタル回線を2本設定し、相互に補完関係を保ちながらも常時ご使用いただける。
  "Concurrent Diverse Routing Service"
- 1本の国際専用回線をITJの多重化装置により分割し複数の回線に分岐してご利用いただける"Circuit Branching Service"。
- 複数の国際専用回線をお持ちの場合、それぞれの回線に接続される日本側国内回線を多重化して1本の回線に集約する"Domestic Multiplex Service"。
- 日本側国内回線部分における障害が発生した場合に備える"Domestic Circuit Back-up Service"。
- 日本側、もしくは外国側の片側にて申込書受付から料金のお支払いまで一括して行える"One Stop Shopping Service"。

C Wider Range of Value-added Services

To better respond to the needs of the customers, ITJ international PLC service is geared to offer a wide variety of value-added services.

- **Concurrent Diverse Routing Service:** This service enables you to install 2 diverse high-speed digital circuits.
  While maintaining a complementary relationship with each other the circuits are usable at all times.
- **Circuit Branching Service:** This system enables the users the access to multiple circuits from a single international private circuit which can be branched off by ITJ's multiplexer.
- **Domestic Multiplex Service:** If you have several international private circuits, this multiplex service makes it possible to concentrate the Japan-side circuits connected to each of them into a single circuit by multiplexing.
- **Domestic Circuit Back-up Service:** This back-up service is prepared to take corrective action just in case a malfunction should occur on the Japan-side section of the circuit.
- **One Stop Shopping Service:** A system with the convenience enables either the Japanese or foreign side to handle everything from applications to payment of charges in a one package deal.

D よりきめ細かなユーザーサポートを。

国際専用回線の導入にあたっては、ITJの優れたスタッフがつぎのようなさまざまな問題の解決について、きめ細かく対応いたします。

- 公衆回線から専用回線への切替えにあたっての経済性比較のご案内。
- 外国や国内の回線料金や利用制度、お申込みから回線をご利用いただけるまでのリードタイム等に関する幅広い情報のご案内。
- 国際専用回線を使った情報通信ネットワーク構築にあたってのご提案や総合コンサルティング。
- 情報通信端末機器の種類、性能、価格等に関する情報提供やメーカー/代理店のご紹介。
- 国際専用回線の国内回線部分の手配、折衝の代行および外国側通信事業者への契約申込みや回線開通試験のアシスト等。

D Better User Support

If you are considering installing ITJ international PLC service, you will find that our trained staff can offer detailed assistance and advice in response to your particular requirements.

- We will advise you on the comparative financial benefits of changing from public telephone service to ITJ international PLC service.
- We will provide extensive information on every aspect of using ITJ PLC service, including charges for both domestic and overseas circuits, the lead time from application to installation, etc.
- We will provide advice and comprehensive consulting services covering the establishment of networks using ITJ international PLC service.
- We will offer detailed information on terminal equipment – types, specifications, prices, etc. – and, if requested, introduce manufacturers/vendors of such equipment to you.
- We can make the necessary arrangements for the domestic section of our international PLC service. We can act as your agent to enter into negotiations with overseas telecommunications carriers and assist in the drawing up of contracts with them. And we will conduct tests to ascertain the integrity of circuits once established.
  For these and other services, just apply to ITJ.

E より低料金で。

ITJの国際専用回線サービスは、各サービスメニューとも、KDD料金よりお安く提供致しますので、毎月の通信コストの大幅な節約を実現いたします。

E Lower Costs

International PLC services offered by ITJ are available at lower than KDD's charges. This will translate into substantial savings on monthly telecommunications costs for our customers.

ITJ国際専用回線サービスの回線構成と国内通信ネットワーク

ITJ International PLC Service Configuration & Domestic Communications Network

■ITJの主な通信設備

ITJは国際専用回線サービスを提供するため、東京、大阪に国際通信センターを設置。また、千葉、上山口に衛星通信局を建設し、ネットワーク構築の基盤としています。これらの設備には、最新のデジタル技術を駆使した高性能、高信頼性を誇る各種通信機器を配備するとともに、各通信センター、衛星通信局相互間は光ファイバー回線で結び、来るべき国際ISDN(総合デジタル化)時代にも万全の対応をはかっています。

■ ITJ Principal Telecommunications Facilities

ITJ has established communication centers in Tokyo and Osaka and together with our satellite earth stations in Chiba and Kami-Yamaguchi, these form the hub of ITJ telecommunication network. Featuring advanced digital communications equipment to assure unparalleled performance and reliability, these facilities have been linked via fiber optic circuits, thus paving the way for the coming era of international ISDN (Integrated Services Digital Network).

■国際専用回線サービスの回線構成

ITJの国際専用回線は、国際回線区間及び日本側・外国側の国内回線区間により構成されます。(右のシステム図参照)。また、ITJ通信センターとお客さまのオフィスとの間にTTNetもしくはOMPの回線が設定可能であれば、NTT回線の他にこちらの回線もご利用になれます。
ITJでは、これらの回線構成のほかにも、デジタル無線で直接お客さまとITJを結ぶITJダイレクトルートも検討しています。

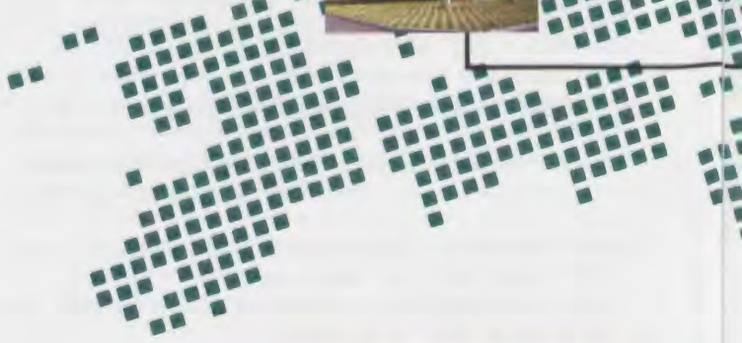
■ ITJ International PLC Service Configuration

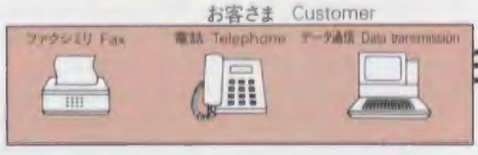
As illustrated on the accompanying diagram, ITJ PLC service is comprised of international and domestic (Japanese & foreign) sections. Furthermore, if it is possible to link your offices and one of our communications centers with a TTNet or an OMP circuit, you will be able to use these circuits in addition to the NTT circuit. ITJ is also considering the establishment of direct digital microwave links with customers.

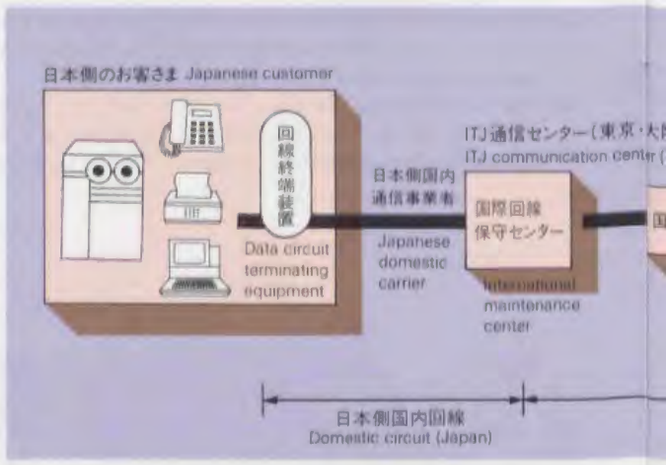
NTT：日本電信電話株式会社
Nippon Telegraph & Telephone Corporation
TTNet：東京通信ネットワーク株式会社
Tokyo Telecommunication Network Co.,Inc.
OMP：大阪メディアポート株式会社
Osaka Media Port Corporation

ITJ 大阪通信センター
ITJ Osaka Telecom Center

ITJ 上山口衛星通信局
ITJ Kamiyamaguchi Satellite Earth Station



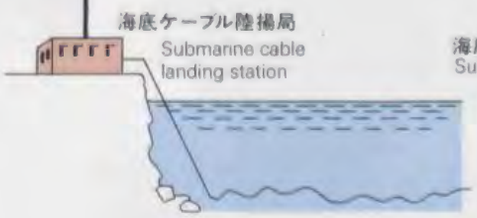


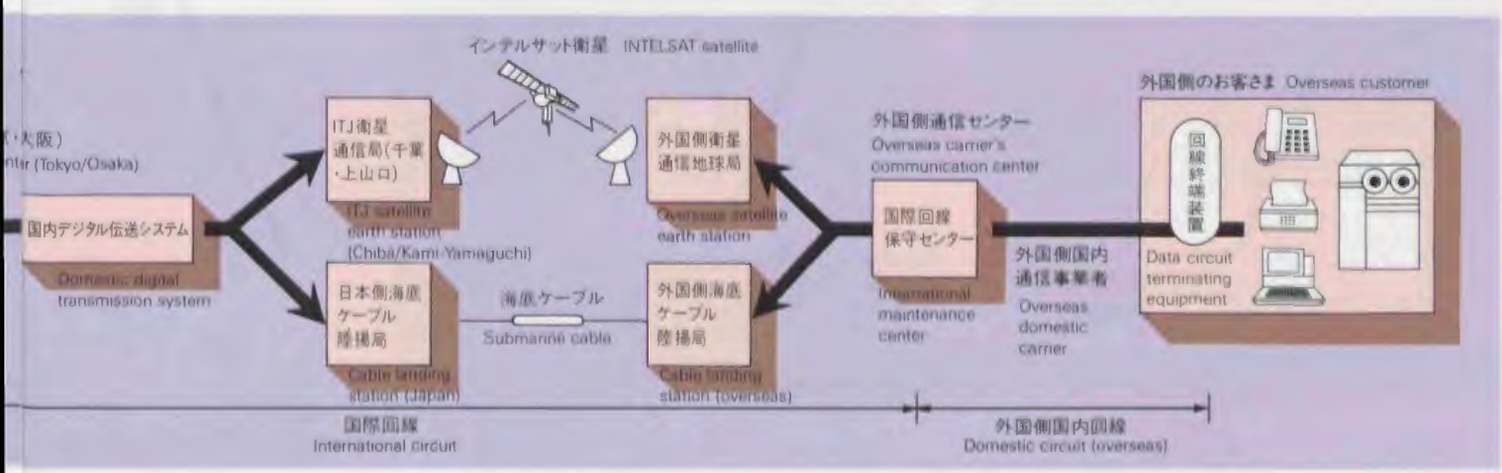


ITJ 東京通信センター
ITJ Tokyo
Telecom Center

ITJ 東京サブセンター
ITJ Tokyo Sub-Center

ITJ 千葉衛星通信局
ITJ Chiba
Satellite Earth Station





ITJの国際通信ネットワーク

ITJ International Telecommunications Network

■ITJの国際通信ネットワーク ITJ Principal International Telecommunications Routes

■概念図である為、通信衛星の位置は、実際と異なります。(実際には、赤道上約36,000kmに位置しています。)
Please note: The actual location of communications satellites is approximately 36,000km above the equator.

■ITJの主な国際通信伝送路
ITJ International Transmission Paths

ケーブル系
Cable Routes

ケーブル名 Name of Cable	使用ケーブル Type of Cable
(HAW-4/TPC-3) 第3太平洋横断海底光ケーブル 3rd Transpacific Submarine Cable	光ファイバー Fiber Optic Cable
(TPC-4) 第4太平洋横断海底光ケーブル 4th Transpacific Submarine Cable 1992年完成予定 scheduled for completion in 1992	光ファイバー Fiber Optic Cable
(H-J-K) 香港－日本－韓国間海底光ケーブル Hong Kong-Japan-Korea Submarine Cable	光ファイバー Fiber Optic Cable
(J-K) 日本－韓国間海底ケーブル Japan-Korea Submarine Cable	同軸 Coaxial Cable
(KYU-TAI) 日本(九州)－台湾間海底光ケーブル Japan(Kyushu)－Taiwan Submarine Cable 1993年完成予定 scheduled for completion in 1993	光ファイバー Fiber Optic Cable
(G-P-T) グアム－フィリピン－台湾間海底光ケーブル Guam-Philippines-Taiwan Submarine Cable	光ファイバー Fiber Optic Cable
(S-H) シンガポール－香港間海底ケーブル Singapore-Hong Kong Submarine Cable	同軸 Coaxial Cable
(TAIGU) 台湾－グアム間海底ケーブル Taiwan-Guam Submarine Cable	同軸 Coaxial Cable
(HONTAI-2) 香港－台湾間海底ケーブル Hong Kong-Taiwan Submarine Cable 1990年完成予定 scheduled for Completion in 1990	光ファイバー Fiber Optic Cable
(PACRIM-WEST) グアム－オーストラリア間海底光ケーブル Guam-Australia Submarine Cable 1996年完成予定 scheduled for completion in 1994	光ファイバー FiberOptic Cable
(PACRIM-EAST) ハワイ－ニュージーランド間海底ケーブル Hawaii-NewZealand Submarine Cable 1993年完成予定 scheduled for completion in 1993	光ファイバー Fiber Optic Cable
(TASMAN-2) オーストラリア－ニュージーランド間海底光ケーブル Australia-NewZealand Submarine Cable 1991年完成予定 scheduled for completion in 1991	光ファイバー Fiber Optic Cable
(TAT-8) 米国/カナダ－英国/フランス間海底光ケーブル USA/Canada-UK/France Submarine Cable	光ファイバー Fiber Optic Cable
(TAT-9) 米国－英国/フランス/スペイン間海底光ケーブル USA-UK/France/Spain Submarine Cable 1991年完成予定 scheduled for completion in 1991	光ファイバー Fiber Optic Cable
(ASEAN) フィリピン－タイ－マレーシア－シンガポール－インドネシア間 海底光ケーブル Philippines-Thailand-Singapore-Indonesia Submarine Cable 計画中 under planning	光ファイバー Fiber Optic Cable

衛星系
Satellite Routes

衛星名 Name of Satellite
インテルサット 太平洋衛星 INTELSAT Pacific Ocean Satellite
インテルサット インド洋衛星 INTELSAT Indian Ocean Satellite

■サービス対地国と開始予定時期
Service Area and Service-in Schedule

1. サービス中 Present Service Area

平成2年5月1日現在
(As of May 1, 1990)

サービス対地国 Service Area		国際間伝送路 International Routes	
		衛星 Satellite	ケーブル Cable
北米 N.America	アメリカ U.S.A.	太平洋 Pacific	HAW-4/TPC-3 (TPC-4)
	カナダ Canada		
アジア Asia	韓国 Korea	太平洋 Pacific	J-K/H-J-K
	台湾 Taiwan/Roc	太平洋 Pacific	G-P-T, TAIGU, (KYU-TAI)
	香港 Hong Kong	太平洋 Pacific	H-J-K
	シンガポール Singapore	太平洋 Pacific	H-J-K/S-H
	フィリピン Philippines	太平洋 Pacific	G-P-T (KYU-TAI)
	タイ Thailand	太平洋 Pacific	(ASEAN)
オセアニア Oceania	オーストラリア Australia	太平洋 Pacific	(PACRIM-WEST) (PACRIM-EAST)
ヨーロッパ Europe	イギリス U.K.	インド洋 Indian	HAW-4/TPC-3 TAT-8 (TPC-4) (TAT-9)
	フランス France		
	西ドイツ F.R.Germany		
	オランダ Netherlands		
	イタリー Italy		
	ベルギー Belgium		

2. 拡大予定 Expanded Service Area (planned)

下記の対地にも順次ネットワークを広げます。
We will expand our service network to the following countries gradually.

サービス対地国 Service Area		国際間伝送路 International Routes	
		衛星 Satellite	ケーブル Cable
アジア Asia	マレーシア Malaysia	太平洋 Pacific	(ASEAN)
	インドネシア Indonesia	太平洋 Pacific	(ASEAN)
	中国 China	太平洋 Pacific	未定 Pending
オセアニア Oceania	ニュージーランド New Zealand	太平洋 Pacific	(PACRIM-WEST) (TASMAN-2) (PACRIM-EAST)
ヨーロッパ Europe	スイス Switzerland	インド洋 Indian	HAW-4/TPC-3 TAT-8 (TPC-4) (TAT-9)
	スペイン Spain		

( ) ー利用予定海底ケーブル Submarine cables planned to be used.
なお、上記以外の対地国についても、お客様のご要望に応じ検討させていただきます。
Areas other than above will be considered at customers' requests.

ITJが提供するさまざまなサービスメニュー。ニーズにあわせて、お選びください。

ITJ Offers a Wide Range of Services to Meet Your Needs

■ITJ国際専用回線サービス品目

区分		品目	主な用途
帯域品目	音声級専用回線	通常品質(M.1040)	電話、ファクシミリ、データ伝送など主にアナログ伝送
		特別品質(M.1020)	データ伝送など主にデジタル伝送(M.1040回線より高品質です)
	音声伝送用専用回線		電話専用
符号品目	中速デジタル専用回線	2.4kbps, 4.8kbps, 9.6kbps	データ伝送、パケット伝送
	高速デジタル専用回線	56kbps, 64kbps, 128kbps, 192kbps, 256kbps, 384kbps, 512kbps, 768kbps, 1.5Mbps, 2Mbps (1.536Mbps/1.544Mbps) (1.920Mbps/1.984Mbps)	①デジタル電話、高速データ伝送、高速ファクシミリ伝送等の複合ネットワーク ②コンピュータ間の高速データファイル伝送 ③高精細カラーファクシミリ伝送 ④テレビ電話 ⑤紙面伝送 ⑥テレビ会議 ⑦CAD/CAM

- 上記以外のサービスについてもお客さまのご要望に応じて検討させていただきます。
- 外国通信事業者の事情により、ご提供できないサービス品目もございます。

■Service

Service Menu			Principal Applications
Band-width services	Voice-grade circuits	Standard quality circuit (M.1040)	Primarily analogue transmission for voice, fax and other data
		Special quality circuit (M.1020)	Primarily digital transmission for data (quality is higher than on M.1040 circuits)
	Voice-only		Transmission for voice only
Data trans-mission services	Medium-speed data transmis-sion circuits	2.4kbps, 4.8kbps, 9.6kbps	Transmission for data, packet switching
	High-speed data transmis-sion circuits	56kbps, 64kbps, 128kbps, 192kbps, 384kbps, 512kbps, 768kbps, 1.5Mbps, 2Mbps (1.536Mbps/1.544Mbps) (1.920MBbps/1.984Mbps)	1. Integrated networks for transmission of digitized voice, high-speed data and fax, etc. 2. High-speed data file transmission between computers 3. High-definition color fax transmission 4. Videophone 5. Newspaper transmission 6. TV conferencing 7. CAD/CAM

- Please note that ITJ is willing to consider offering telecommunications services other than those listed above if so desired by the customer.
- Some services may not be available due to conditions determined by overseas telecommunications carriers.

音声級専用回線 Voice-Grade Circuits

電話・ファクシミリ・データ伝送など、利用範囲の広い回線。料金も経済的です。

This economical service covers a wide range of telecommunications applications, including voice, fax, and data transmission.

サービス品目	通常品質(M.1040) 特別品質(M.1020)

本社、支店、営業所間で、電話、ファクシミリ、データ通信などの国際通信をひんぱんに使用している場合、お手軽に、しかも経済的な料金でご利用いただける電話規格の回線です。また、TDM(時分割多重装置)やモデムなどを接続することにより、電話とデータ伝送を同時に行うこともできる、大変利用範囲の広い回線です。

Selection	Standard quality (M.1040) Special quality (M.1020)

It is expressly designed for businesses that require frequent international communications – whether telephone, fax, or computer-based – between a head office and its branches or other offices. Also, by connecting a TDM (Time Division Multiplexer). and MODEM, it becomes possible to send computer data and conduct voice communications simultaneously, making this an extremely versatile service.

音声伝送用専用回線 Voice-Only Circuit

電話専用のアナログ回線。
ディーリング等、音声のみご利用のお客様にとっては最適の回線です。

Analog circuit for voice only is an optimum service system for customers who use voice communication only in such matters as money dealings, etc.

中速デジタル専用回線 Medium-Speed Data Transmission Circuits

データ伝送・パケット伝送などに最適。
コストパフォーマンスの高いデジタル回線です。

This service is ideal for the transmission of data, whether in packets or not, offering digital circuits with high cost-performance.

サービス品目	2.4kbps 4.8kbps 9.6kbps

データ伝送をはじめ、お客さまの構築される通信システムで、CPUによる情報処理やパケット通信に適した回線です。お客さまの情報量やアプリケーションに応じて、2.4kbpsから9.6kbpsまで3種の通信速度が選べる、利用価値の高いデジタル回線です。

Selection:	2.4kbps 4.8kbps 9.6kbps

Designed primarily for data transmission, these circuits are suited to CPU-based data processing and packet transfer within your telecommunications system. It is possible to select from 3 circuit speeds – ranging from 2.4kbps to 9.6kbps – to match your requirements as regards data volume and applications, making this digital service a highly valuable component of your international operations.

高速デジタル専用回線

High-Speed Data Transmission Circuits

デジタル電話、高速データ伝送など、より高速・大容量の情報伝送ができる、高速デジタル回線です。

With high-speed digital circuits it is possible to transfer large volumes of information quickly from one location to another.

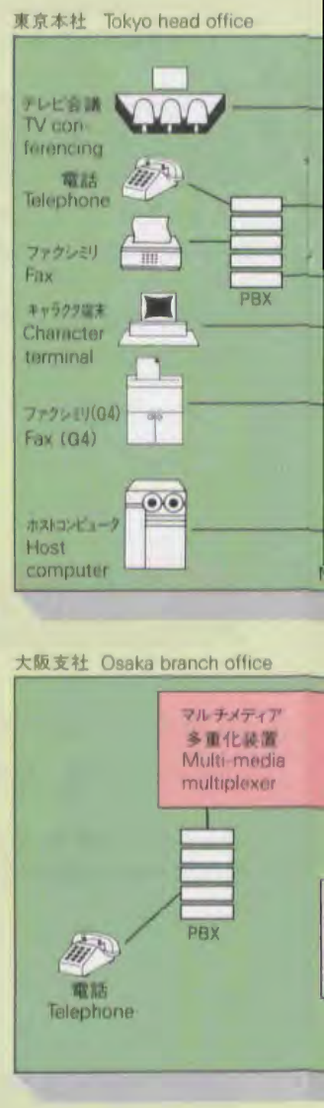
サービス品目	56kbps, 64kbps, 128kbps, 192kbps, 256kbps, 384kbps, 512kbps, 768kbps, 1.5Mbps, 2Mbps (1.536Mbps / 1.544Mbps) (1.920Mbps / 1.984Mbps)

デジタル電話、高速データ伝送、高速ファクシミリ伝送、画像伝送など、さまざまな用途を自由に組み合わせて利用できる、高速かつ大容量のデジタル専用回線です。企業内における多様な用途に応えられる複合デジタルネットワーク構築に最適な品質です。お客さまのアプリケーションに応じて56kbpsから2Mbpsまで10種類の品目をご用意。いずれも、通信コストの大幅な削減と共に、日常業務の効率化を促進します。

Selection:	56kbps, 64kbps, 128kbps, 192kbps, 256kbps, 384kbps, 512kbps, 768kbps, 1.5Mbps, 2Mbps (1.536Mbps / 1.544Mbps) (1.920Mbps / 1.984Mbps)

These exclusive, high-capacity, high-speed digital circuits provide you the unrestricted opportunity to combine a variety of telecommunications applications, including the transmission of digitized voice, high-speed data, high-speed fax, and graphics. They are ideal for building integrated networks to serve a variety of functions within an organization. And, so that the circuit is perfectly matched to your particular needs, ITJ offers a wide selection of transmission speeds, ranging from 56kbps up to 2Mbps. This service will greatly enhance the efficiency of daily corporate communications, at the same time as realizing significant savings.

▼ネットワーク構築例 **Configuration of**



□: 回線終端装置 CSU: (customer service unit)

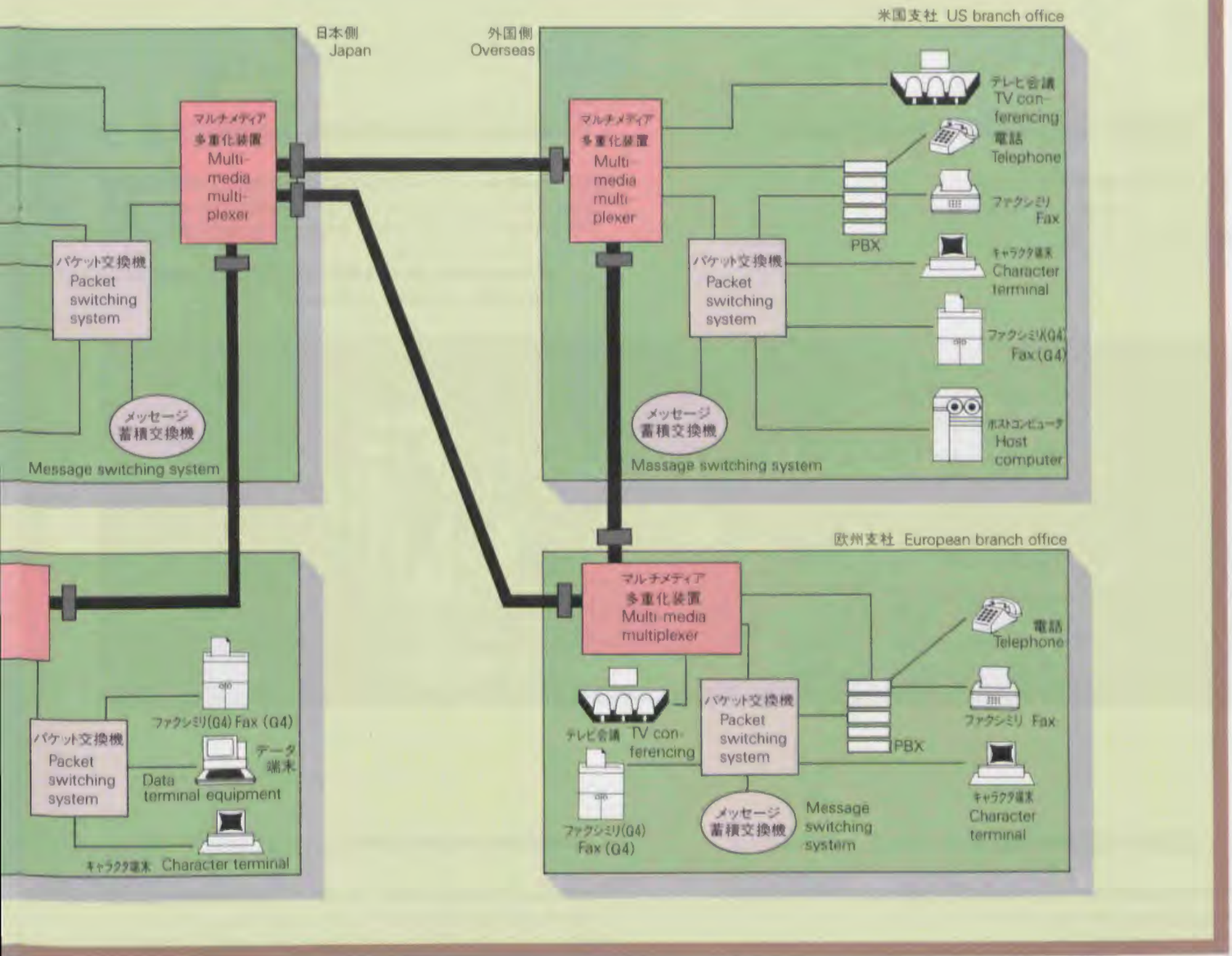
■端末接続インタフェース等

区分	品目	使用する国内回線の品目(一般例)	引込線の伝送媒体(一般例)			ITJ提供予定の端末設備等とのインターフェース		
						電気的条件	論理的条件	コネクタの形状
音声級	通常品質(M.1040)	一般専用サービスの3.4kHz	メタリック					
	特別品質(M.1020)							
音声伝送用						CCITT勧告V.28に準拠	CCITT勧告V.24に準拠	ISO標準IS2110(25ピンコネクタ)に準拠
中速デジタル	2.4kbps							
	4.8kbps							
	9.6kbps							
高速デジタル	56kbps	高速デジタル伝送サービスの64kbps			デジタル	CCITT勧告V.35またはV.10/11に準拠	CCITT勧告V.24	ISO標準IS2593(34ピンコネクタ)またはIS4902(37ピンコネクタ)に準拠
	64kbps							
	128kbps	同 192kbps		光ファイバー		CCITT勧告V.10/11またはG.703に準拠	CCITT勧告V.24またはG.704に準拠	ISO標準IS4902(37ピンコネクタ)またはIS4903(15ピンコネクタ)に準拠
	192kbps							
	256kbps	同 384kbps						
	384kbps							
	512kbps	同 768kbps						
	768kbps							
	1.5Mbps	同 1.5Mbps						
	2Mbps	同 3Mbps						

次のようなさまざまなアプリケーションを組み合せた、複合デジタル通信が高能率かつ経済的に行えます。

of Terminal Equipments

Through combination of the following applications, integrated digital telecommunications offer superior performance plus reduced costs



■ Terminal Interface Standards

	Service/ Selection	Domestic circuit				Terminal connection interface with CSU		
		Type	Media			Electrical cond.	Logical cond.	Connector conf.
Voice-grade circuits	Standard quality (M.1040)	3.4kHz standard analogue service	Metallic					
	Special quality (M.1020)							
Voice-only circuit								
Medium-speed data transmission circuits	2.4kbps					CCITT V.28	CCITT V.24	ISO IS2110 (25-pin connector)
	4.8kbps							
	9.6kbps							
High-speed data transmission circuits	56kbps	64kbps high-speed digital service				CCITT V.35 or V10/11	CCITT V.24	ISO IS2593 (34-pin connector) or IS4902 (37-pin connector)
	64kbps							
	128kbps	192kbps high-speed digital service		Fiber-optic	Digital microwave	CCITT V.10/11 or G.703	CCITT V.24 or G.704	ISO IS4902 (37-pin connector) or IS4903 (15-pin connector)
	192kbps							
	256kbps	384kbps high-speed digital service						
	384kbps							
	512kbps	768kbps high-speed digital service						
	768kbps							
	1.5Mbps	1.5Mbps high-speed digital service						
	2Mbps	3Mbps high-speed digital service						

多彩な付加サービス

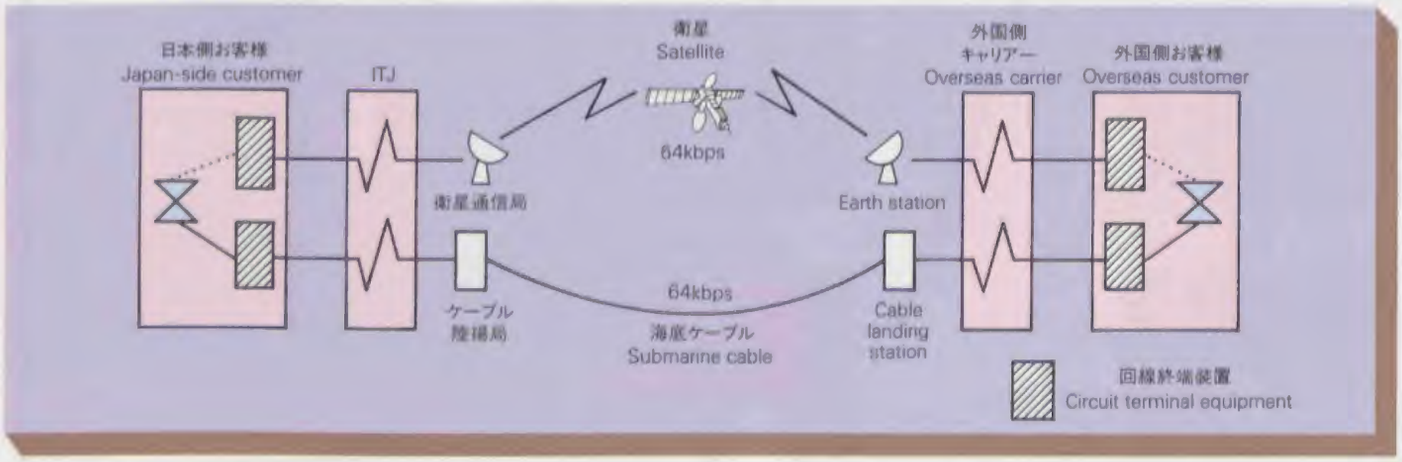
WIDE RANGE OF VALUE-ADDED SERVICES OFFERABLE

1. 異経路による国際専用回線サービス

- 国際専用回線の障害による通信の途絶を予め回避することにより、安定した通信回線を確保出来ます。
- 本回線は相互に補完関係を保ちながらそれぞれ常時ご使用いただけます。

1. Concurrent Diverse Routing Service

- A stable communication circuit can be maintained by this diverse routing system which serves as a preventative safeguard against disruptions in communications from possible malfunctions in the private leased circuits (PLC).
- Each of these circuits, while maintaining a mutually complementary relationship, are usable at all times.

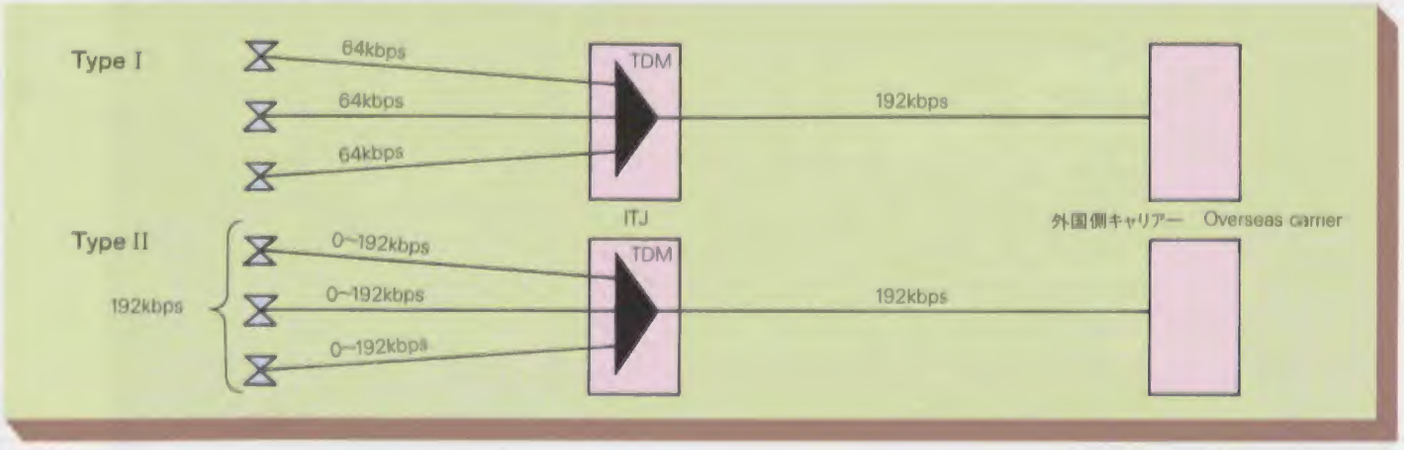


2. 回線分岐サービス

- 1本の国際専用回線をITJの多重化装置により分割し、複数の回線に分岐いたします。
- これによって、Type Iの例では192kbps回線を1本引くことにより、64kbps回線を3本引くよりも月々の回線使用料を大幅に削減することが可能となります。

2. Circuit Branching Service

- A single international private leased circuit (PLC) can be branched off into multiple circuits with ITJ's multiplexer.
- Hence in the case of Type I, for example, it is possible to drastically reduce monthly circuit charges by installing a single 192kbps circuit instead of installing three 64kbps circuits.

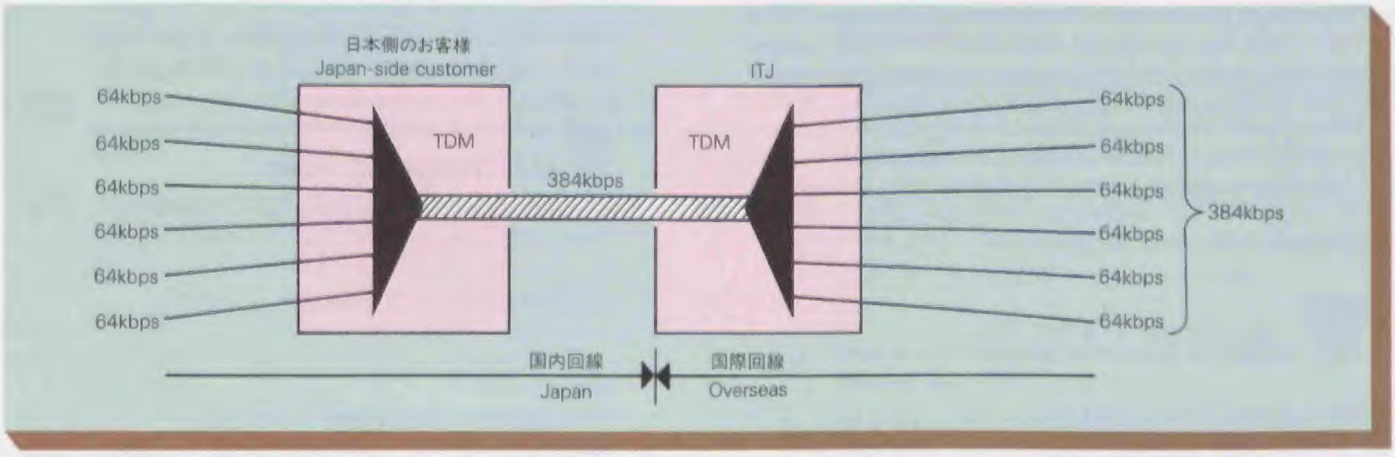


3. 国内回線多重化サービス

● 複数の国際回線をお持ちの場合、それぞれの国際回線に接続される国内回線を、ITJが設置する多重化装置により多重化して1本の国内回線に集約いたします。
これによって、国内回線使用料の節減が可能となります。

3. Domestic Multiplex Service

● If multiple international circuits are already possessed, the domestic circuits which are connected to each of them can be multiplexed into a single domestic circuit by a multiplexer installed by ITJ. By means of this multiplexer it is possible to reduce domestic circuit charges.

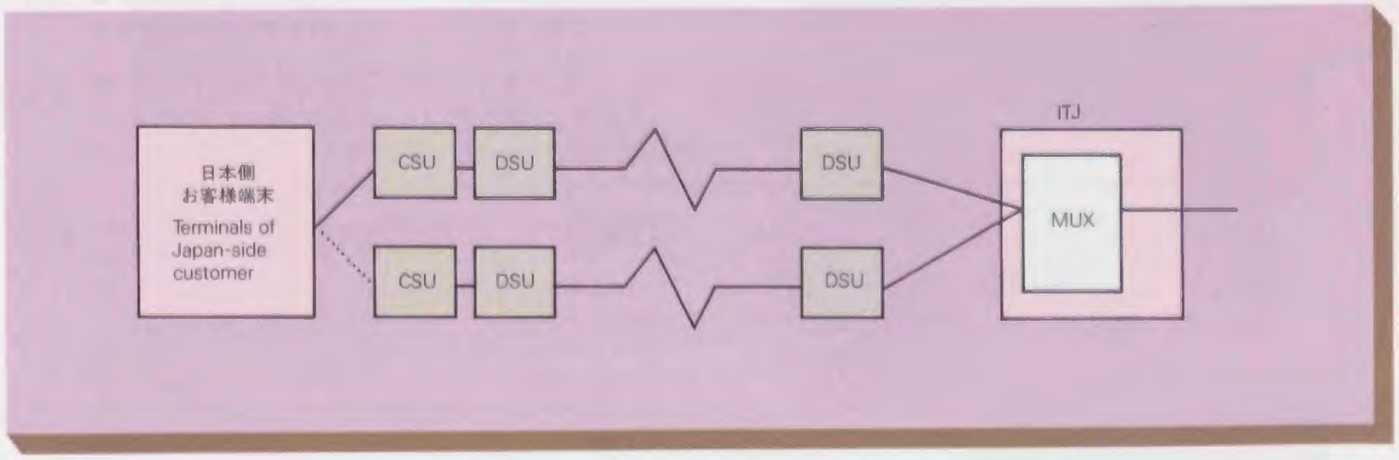


4. 国内回線のバックアップサービス

● 国内回線部分に障害が発生した場合に、あらかじめ設置した予備の国内回線に切り換えることにより通信の途絶を防げます。

4. Domestic Circuit Back-up Service

● In the event a malfunction occurs in the domestic section of the circuit, a switch-over to a preliminarily established standby circuit prevents the disruption of the communication link and assures its integrity.



国際専用回線の料金構成とITJ料金

Tariff Structure for Charges and Fees

料金構成

国際専用回線の料金は、下図のように日本側と外国側とに分かれています。このうちITJにお支払いいただく日本側料金は下記の通りですが、外国側でも同様に、外国側通信事業者が定める料金をお支払いいただくことになります。
なお、ITJではお客さまのご希望により、日本側または外国側いずれか一方での一括お支払いのサービスも取扱っております。

Tariff Structure

The charges applicable for ITJ international private leased circuit (PLC) service for international telecommunications are independently calculated for Japan and overseas, as illustrated in the accompanying diagram. The Japan-side charges, to be paid to ITJ, are explained below; the overseas charges are to be paid to the respective overseas telecommunications carriers at rates determined by them.

ITJ, however, accepts to enable both Japan-side and overseas-side charges to be paid together as a single sum, either in Japan or overseas, if desired so by the customer.

お支払い方法

国際専用回線の料金は月毎にお支払いいただきます。月の中途での開設、変更、廃止等については日割りで計算いたします。

Method of Payment

Charges for use of ITJ international PLC service are to be paid each month. In the case of installation, alterations to, or terminations of service in the middle of a month, the charges for that month are calculated on a daily basis.

ITJ料金

①国際回線料金(月額)

対地によって異なりますが、いずれもKDDより割安の料金で提供致します。詳細は料金表をご参照下さい。

②国内回線料金(月額)

NTTもしくはNCCが定める回線使用料をお支払いいただきます。なお、支払い条件他はNTT、NCCの契約約款に準じます。

③工事費(一時金)

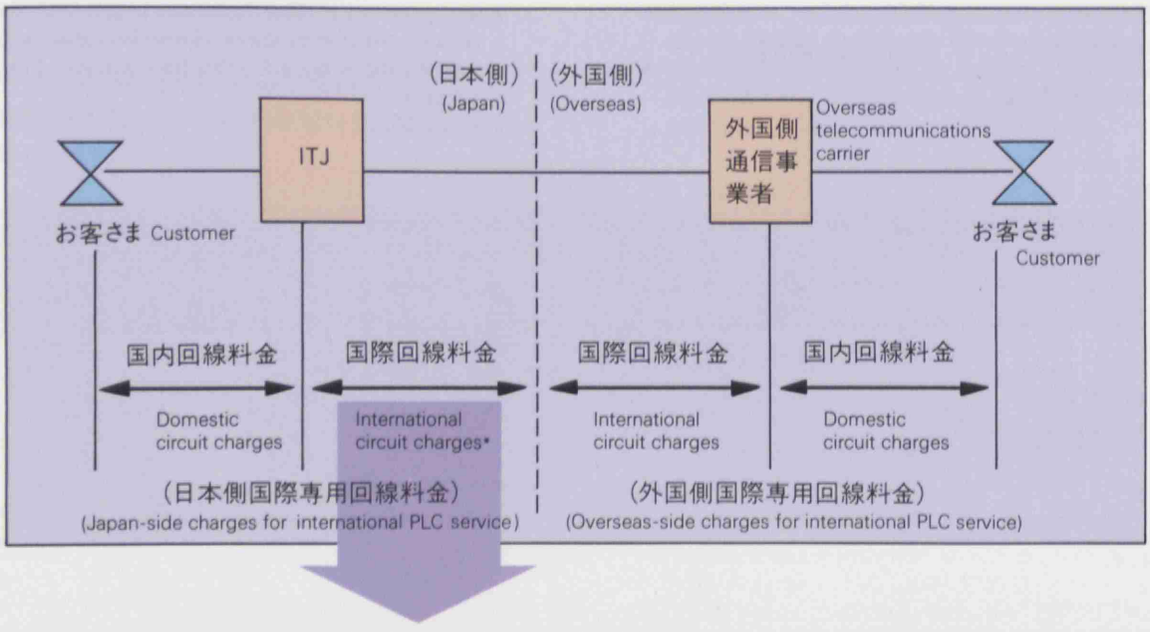
回線開設時などに工事負担金をお支払いいただきます。
〔参考：4線式102,000円 その他附帯工事費は実費〕

ITJ Charges & Fees

① International circuit charges (monthly)
These vary depending on the countries involved, but they are generally less than KDD's charges. (Please refer to ITJ's tariff table for details)

② Domestic circuit charges (monthly)
These charges established by NTT and NCC will be applicable, and terms and conditions will be in accordance with the contracts offered by NTT and NCC.

③ Installation fees (one time only)
Installation fees will be payable when the circuit is installed. (For example, a 4 wire type ¥102,000 plus actual expenses)



この部分がKDD料金より、割安となります。

*ITJ offers this portion at lower charges than KDD

「どれくらいの通信量があれば、有利?」ITJ国際専用回線へのご質問にお答えします。

"At What Level Does This Service Become Advantageous?" Answers to Questions Concerning International PLC Service

Q 一日にどれくらいの通信量があれば、専用回線にした方が有利なのでしょうか?

A 外国側の料金が国によって異なりますので、損益分岐点は対地によって違ってきます。また、専用回線のご利用方法によっても大きく違います。大ざっぱな目安としては、日米間の64kbps回線を音声・ファクミリのみに利用する場合、日本発着通信量が一日あたり3.5時間を超えるあたりでしょう。

Q **At what level of daily telecommunications traffic does it become financially advantageous to use the PLC service?**

A Because the overseas charges involved in such opperations vary depending on the country, the break-even point also varies with country. Another important factor is the way in which the PLC service is used. However, in the case of a 64kbps circuit between Japan and the USA used for voice and fax communications only, ITJ PLC service would represent a saving if communications traffic (to & from Japan) exceeded about 3.5 hours per day.

Q 国際専用回線を新設する場合、端末機はだれが手配するのですか?

A お客さまに手配していただきますが、機種選定などのご相談には応じさせていただきます。

Q **When installing the international PLC service, who is responsible for the terminals?**

A The customer must make arrangements for the terminal equipment, however, we will gladly provide advice regarding the choice of such devices.

Q 国際専用回線の利用に際し、モデムや通信機器は自社で用意したものを利用できますか?

A 基本的にはCCITT勧告(国際規格)に準拠した機器であれば、ご利用になれます。なお、当社の技術的条件を別途定めますのでこれを満たしていることが必要です。

Q **Is it possible to use modems and other communications hardware already in the customer's possession?**

A Generally speaking, a customer may use any equipment that accords with the recommendations of the international committee known as CCITT. Please note, however, that there are certain additional, technical conditions laid down by ITJ that must be fulfilled.

Q ITJの国際専用回線を利用する場合、衛星でなく海底ケーブルを指定できますか?

A 海底ケーブル利用可能対地については、ご指定頂けます。

Q **As a user of ITJ international PLC service, is it possible to stipulate that submarine cable routes be used rather than satellites?**

A It can be stipulated, provided that submarine cable routes are available between the country in question.

Q ITJは、なぜKDDより安い料金を提供できるのですか?

A 効率を重視した経営と企業努力、そして最新設備を利用することにより、割安な料金を提供できるのです。

Q **How is it that ITJ can offer such services at lower charges than KDD?**

A ITJ is able to accomplish this thanks to a philosophy that emphasizes as well as rewards maximum effort and efficiency throughout our corporate ranks. We are also able to offer high-quality service for significantly lower rates thanks to savings derived from the use of advanced technology.

国際専用回線サービスについてのご質問、ご相談はお気軽に。
お問い合せ先

日本国際通信株式会社

営業本部

☎03-5565-0178~0179
FAX 03-5565-0007
〒104 東京都中央区築地4丁目7番5号 築地KYビル

関西支社

☎06-538-0111
FAX 06-536-0007
〒550 大阪市西区新町2丁目7番5号 新町ビル

ニューヨーク駐在員事務所

☎1-212-319-2531
FAX 1-212-319-2535
12 East 49th Street, 21st Floor, New York, N.Y. 10017

All inquiries concerning ITJ international PLC service should be directed to the following:

International Telecom Japan Inc.

Marketing Dept.

☎03-5565-0178~0179
FAX 03-5565-0007
Tsukiji KY Bldg., 7-5, Tsukiji 4-chome, Chuo-ku, Tokyo 104

Kansai Branch

☎06-538-0111
FAX 06-536-0007
Shinmachi Bldg., 7-5, Shinmachi 2-chome, Nishi-ku, Osaka 550

New York Liaison Office

☎1-212-319-2531
FAX 1-212-319-2535
12 East 49th Street, 21st Floor, New York, N.Y. 10017

お申し込みから開通まで
From Application to Service Commencement

お申込書の記入
Completion of the ITJ application form

ITJ所定の申込書に必要事項をご記入の上、ITJへ。契約は原則として日本側、外国側でそれぞれ別個に結んでいただきますが、ご要望があれば、日本側或は外国側で一括してお申し込みになることも可能です。国内回線の手配・設定はITJが行ないます。

Please complete the standard ITJ application form, supplying all relevant information, and submit it to our offices. In principle separate contracts must be signed respectively by both the Japan and overseas sides, but if desired it is possible to make a one-package application either the Japan side or overseas side. ITJ will also make necessary arrangements for the installation of domestic circuits.

お申込受付
Receipt of the application

回線設定日ご連絡
Notification of scheduled installation date

お客さまからお申し込みを受けますと、ITJは外国側通信事業者と打合せの上、国際回線、国内回線の設定日などのスケジュールをお客さまにご連絡いたします。

Upon receipt of your application, we will enter into negotiations with the relevant overseas telecommunications carrier(s). You will then be notified of the date on which the international and domestic circuits will be installed.

開　通　試　験
Circuit tests

回線設定後、お客さまに回線をお引き渡しして、端末間で開通試験をしていただき、問題がなければ開通の運びとなります。

Following installation, tests will be conducted to ensure integrity at both ends by communicating between terminals connected to the circuit(s). If no malfunctions are detected, regular service will begin.

開　通
Service commencement

日本国際通信株式会社

本社：〒104 東京都中央区築地4丁目7番5号 築地KYビル TEL.(03)5565-0111(代表) FAX(03)5565-0007 TLX.J28169ITJ
関西支社：〒550 大阪市西区新町2丁目7番5号 新町ビルディング TEL.(06)538-0111(代表) FAX(06)536-0007
ニューヨーク事務所：12 East 49th Street. 21st Floor New York. N.Y. 10017 TEL 1(212)319-2531 FAX 1(212)319-2535 TLX.6790620 ITJUW

INTERNATIONAL TELECOM JAPAN INC.

[Head Office] Tsukiji KY Bldg., 7-5, Tsukiji 4-Chome, Chuo-ku, Tokyo, 104 Japan Tel: 03-5565-0111 FAX: 03-5565-0007 TLX: J28169ITJ
[Kansai Branch] Shinmachi Bldg., 7-5, Shinmachi 2-Chome, Nishi-ku, Osaka, 550 Japan Tel: 06-538-0111 FAX: 06-536-0007
[New York Liaison Office] 12 East 49th Street, 21st Floor, New York, N.Y. 10017 Tel: 1-212-319-2531 FAX: 1-212-319-2535 TLX: 6790620 ITJUW

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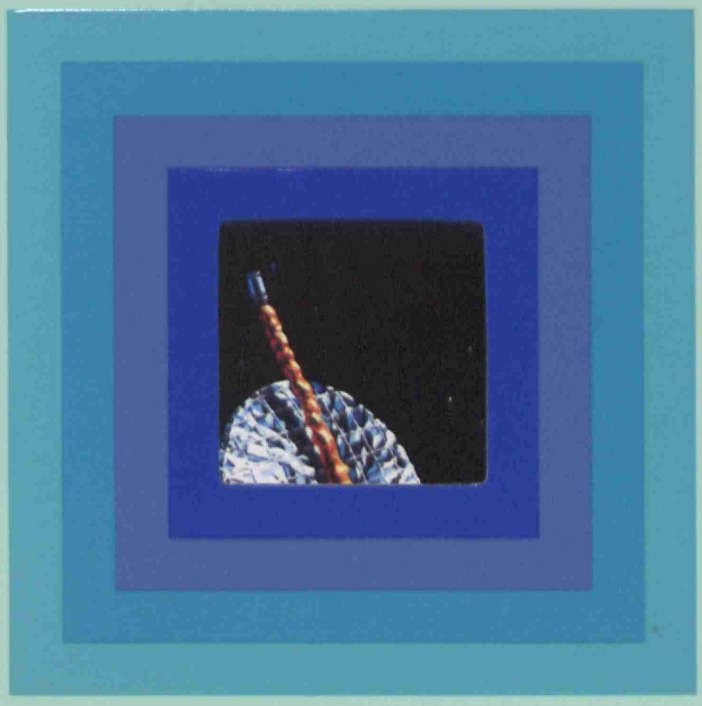
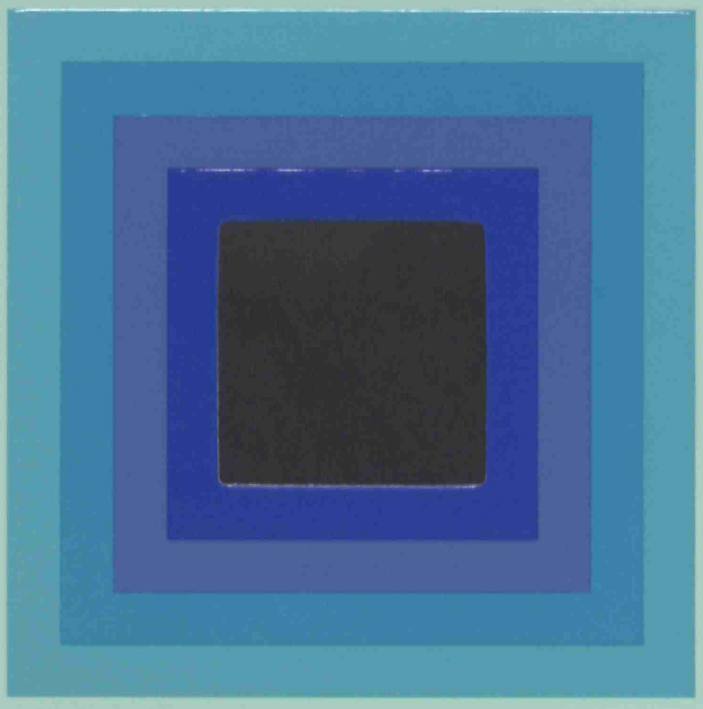


JC:SAT

Japan Communications
Satellite Company, Inc.



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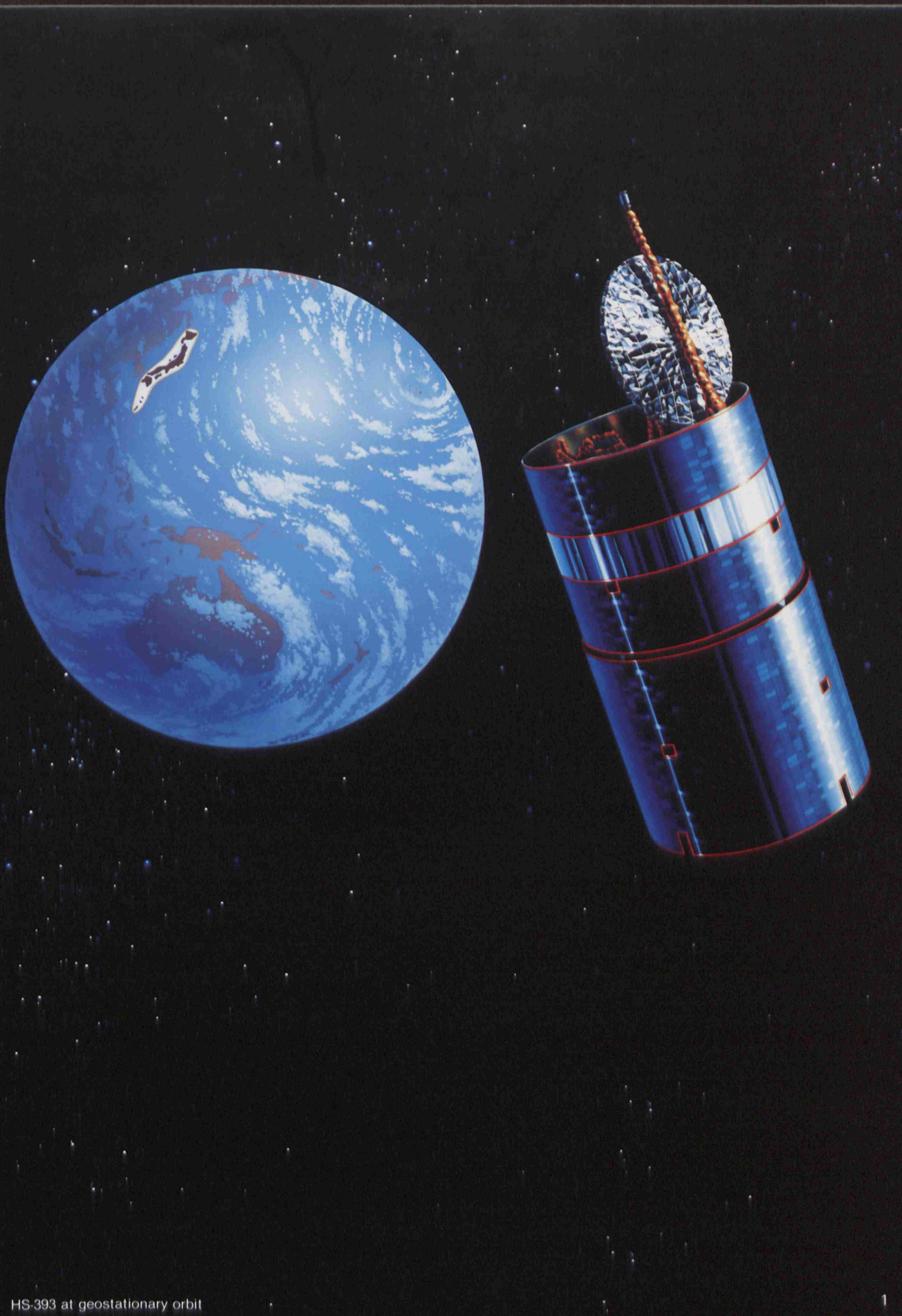


HS-393 at geostationary orbit

The advancement of telecommunications technology during recent years has been spectacular. Satellite communications technology, in particular, has evolved dramatically since the launching of the first geosynchronous satellite, Intelsat I (Early Bird), in 1965.

In the United States, there are currently over 21 privately-owned satellites providing transmission services to a wide variety of domestic users. This extensive satellite capacity, which is used for the transmission of telephony, video, and data, has become an indispensable and growing component of the U.S. national communications infrastructure.

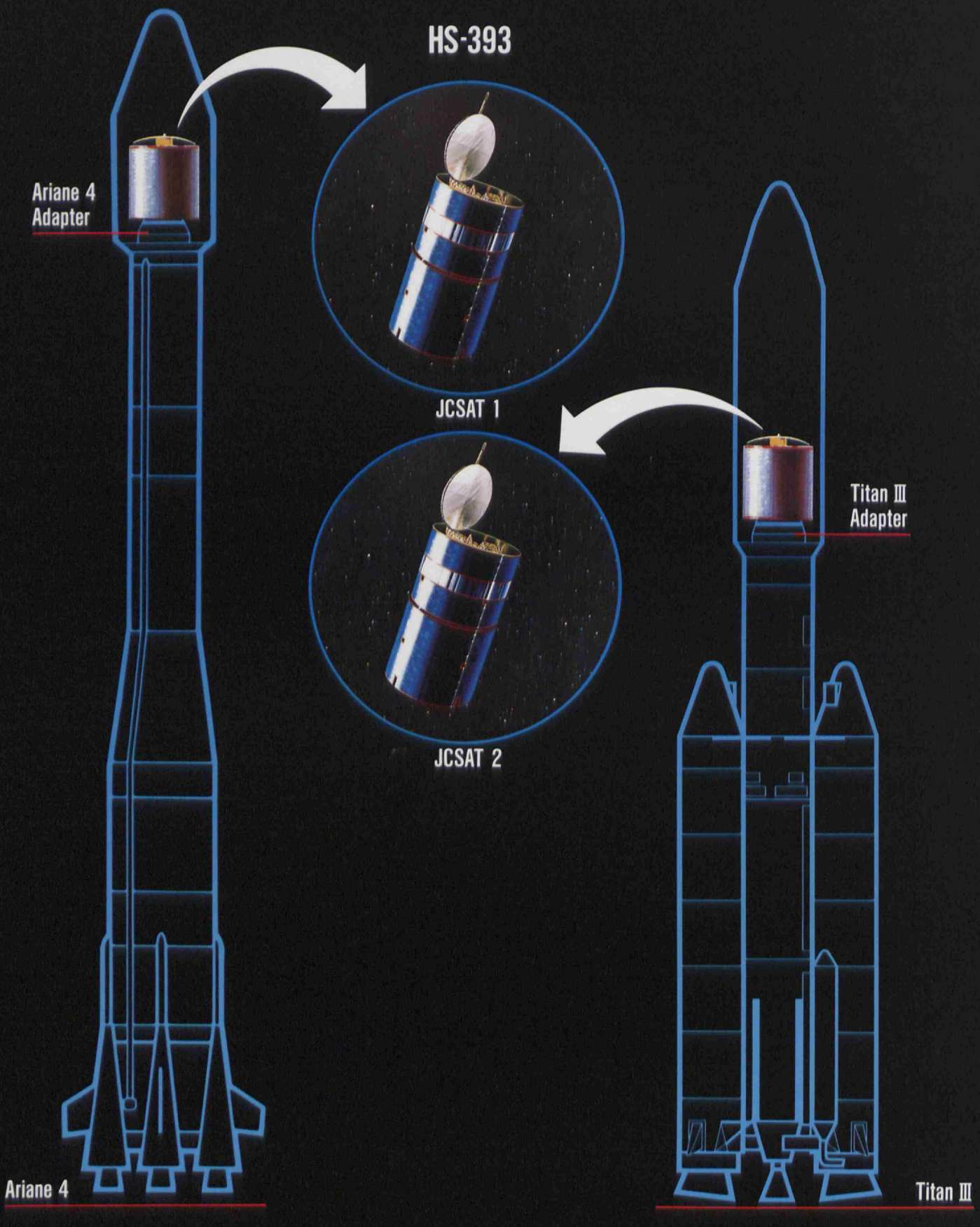
As Japan develops into a highly advanced, information oriented society, its needs for advanced communications capabilities such as those provided by satellites have increased rapidly. Responding to these needs, in April 1985 the Japanese government enacted the Telecommunications Enterprise Law. This law provided new and important opportunities for private Japanese businesses to participate in the provision of communication services, including satellite communications. Japan Communications Satellite Company, Inc. one of the first private companies to apply for a business license under the new law, was awarded a Type 1 Telecommunications permit from the Japanese Ministry of Posts and Telecommunications on June 21, 1985.

As the first company planning to bring domestic commercial satellite services to Japan, JCSAT is deeply committed to not only serving the needs of Japanese industry, but in providing new and innovative communications services to the Japanese public as a whole. By combining the broad knowledge of the Japanese market of C. Itoh and Mitsui, with the technical experience of our U.S. partner Hughes Communications, Inc., we believe that the services we shall offer shall be of the highest possible quality.

We are anxious to become part of your future communications plans and look forward to discussing your communication needs with you.

July, 1985

President Hiroshi Kamiya


HS-393
Ariane 4
Adapter
JCSAT 1
JCSAT 2
Titan III
Adapter
Ariane 4
Titan III

A Summary of the JCSAT Business Plan

On April 1, 1985, C. Itoh & Co., Ltd., Mitsui & Co., Ltd., and Hughes Communications, Inc. established a joint venture company, Japan Communications Satellite Company, Inc. (JCSAT), for the purpose of providing satellite communications services to Japanese industry. The business plan of JCSAT is to procure and operate two communications satellites and to offer dedicated transponder services using these satellites to various users. Transponders are the devices on the satellite which receive, amplify, and retransmit incoming signals.

The JCSAT satellites will be members of the next-generation HS-393 satellite series built by Hughes Aircraft Co.. After launching by Ariane 4 and Titan III, the JCSAT satellites will be monitored and controlled through two (primary and backup) telemetry, tracking and control (TT & C) stations located in Yokohama and Gunma.

The first JCSAT satellite, will be launched in February, 1989 and shall become operational in May, 1989. The second JCSAT satellite, will be launched in July, 1989 and shall be ready for service in October, 1989.

Each satellite shall contain 32 transponders each consisting of an input filter, a 20 watt Traveling Wave Tube Amplifier (TWTA), and an output filter. In addition to the 32 primary TWTA's, each satellite will contain 8 spare TWTA's. The satellite operating frequencies will be in the Ku band (14.0 to 14.5 GHz uplink, 12.25 to 12.75 GHz downlink). In comparison to higher frequencies, the Ku band is less affected by rainfall and will enable users to develop highly reliable satellite networks utilizing small antenna earth stations.

Among the types of services to be offered using JCSAT transponders are:

- Video program distribution to CATV and network television stations
- Telephone services
- Data transmission/broadcast services
- Specialized services such as video conferencing, remote printing, high-speed facsimile transmission, satellite news gathering

OUTLINE OF JCSAT

● Name of Company

JAPAN COMMUNICATIONS SATELLITE COMPANY, INC.

JC·SAT

● Address

Headquarters 7th Fl., No.40 Mori Bldg., 5-13-1, Toranomon, Minato-ku, Tokyo 105
Phone 03(432)5661
03(437)3951 (Marketing Dept.)
03(432)6962 (Corporate Planning Dept.)
03(432)5630 (System Engineering Dept.)
03(432)0185 (Customer Service Dept.)

Yokohama Satellite Control Center
229-1 Miho-cho, Midori-ku, Yokohama-shi, Kanagawa 226
Phone 045(922)7111 (Satellite Operations Dept.)

● Capital

Paid capital: ¥24 billion (as of end Aug. 1988)
(Authorized capital: ¥30 billion)

● Date of Establishment

February 18, 1985

● Shareholders

C. Itoh & Co., Ltd.	40%
Mitsui & Co., Ltd.	30%
Hughes Communications, Inc.	30%

● Directors

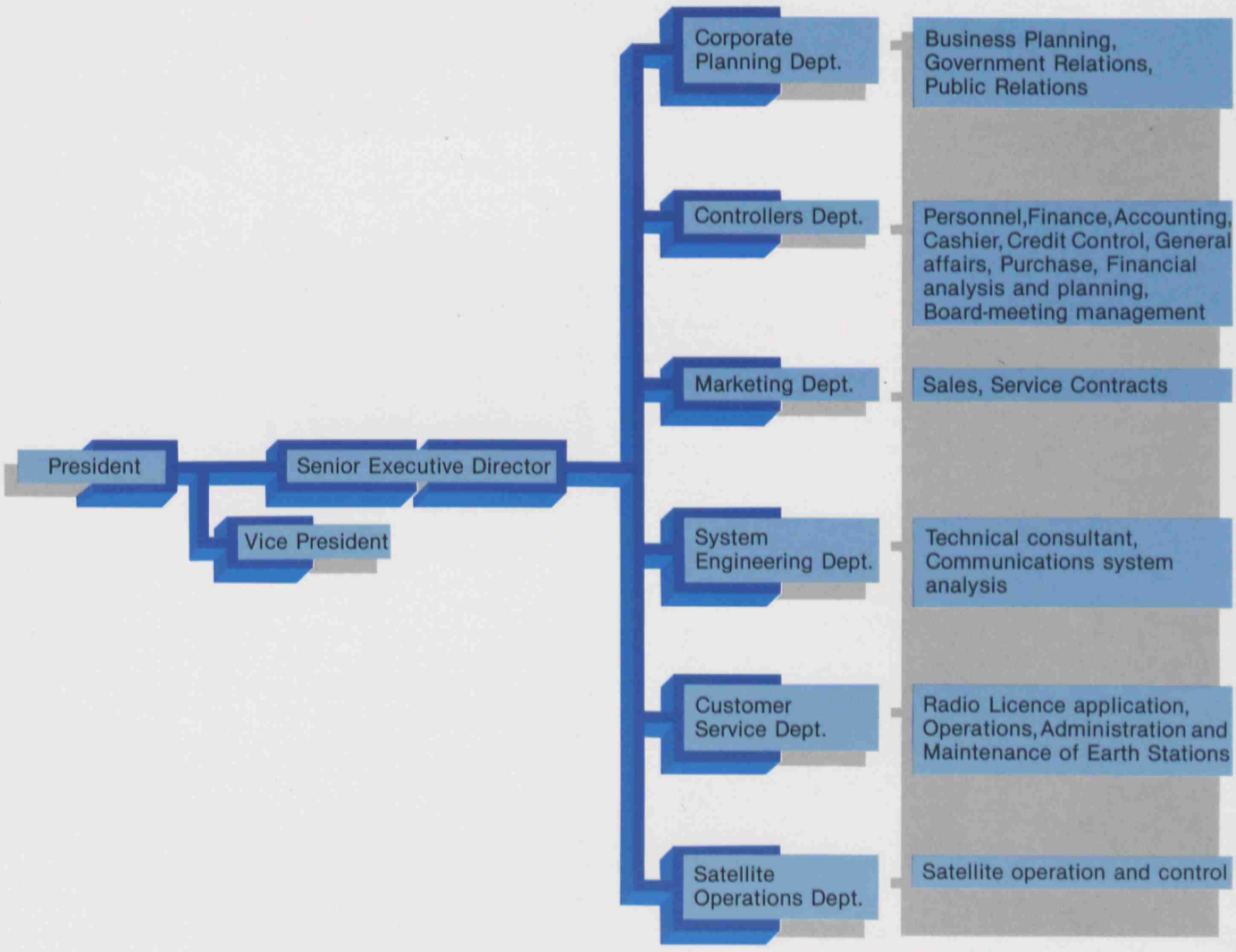
President	Hiroshi Kamiya
Vice President	Yoshihiko Itami
Senior Executive Director	Fred L. Judge
Executive Directors	Shigeru Miyakawa
	Masayoshi Marumo
Directors	Taketo Furuhata
	Shigeru Goto
	Akihito Mori
	Akira Mizukami
	Masashi Ikegai
	Steve D. Dorfman
	John E. Koehler
	Stephen J. Petrucci
Auditors	Ryohei Kikuno
	Taiji Hirata
	Margaret L. Howe


JC·SAT

▲ *Ariane*

▼ *Titan III*

ORGANIZATION CHART



Key Features of a Satellite Communications Network

● Easy and Flexible Network Construction

In contrast to the long delays often encountered when constructing a terrestrial communications networks, a satellite earth station can be rapidly installed at a location of the user's choosing. In this same manner, satellite earth station networks can be quickly reconfigured and expanded.

● Protection Against Outages Due to Natural Disasters

Satellites offer important alternative communications links during times when natural disasters have destroyed or degraded terrestrial communication capabilities. The mobility and flexibility of satellite earth stations can quickly reestablish communications connectivity in the disaster stricken areas. A satellite network thus offers protection by ensuring that alternate channels of communication are available and will remain functional during emergency situations.

● Broadcast Capabilities

Satellites are the optimal means of transmission for point-to-multipoint applications. Signals such as video or data may be transmitted from a single uplink site and received simultaneoustly by thousands of users. Conversely, for applications such as remote sensing, large numbers of isolated transmit sites may be simultaneously received by a single data-collection location.

● Multi-Accessing Capabilities

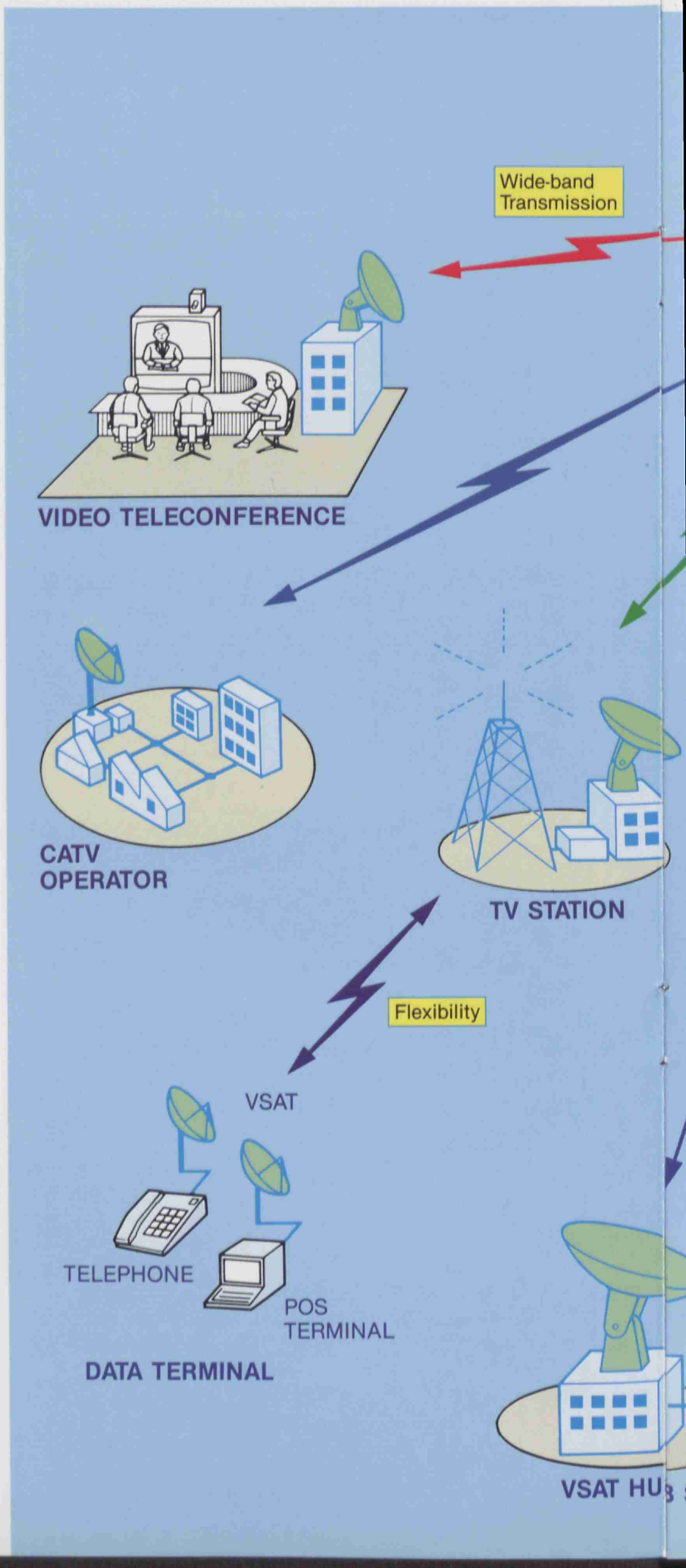
By using frequency division, time division or similar multi-access technique, many transmit/receive stations distributed over a diverse geographical area may efficiently utilize a single transponder.

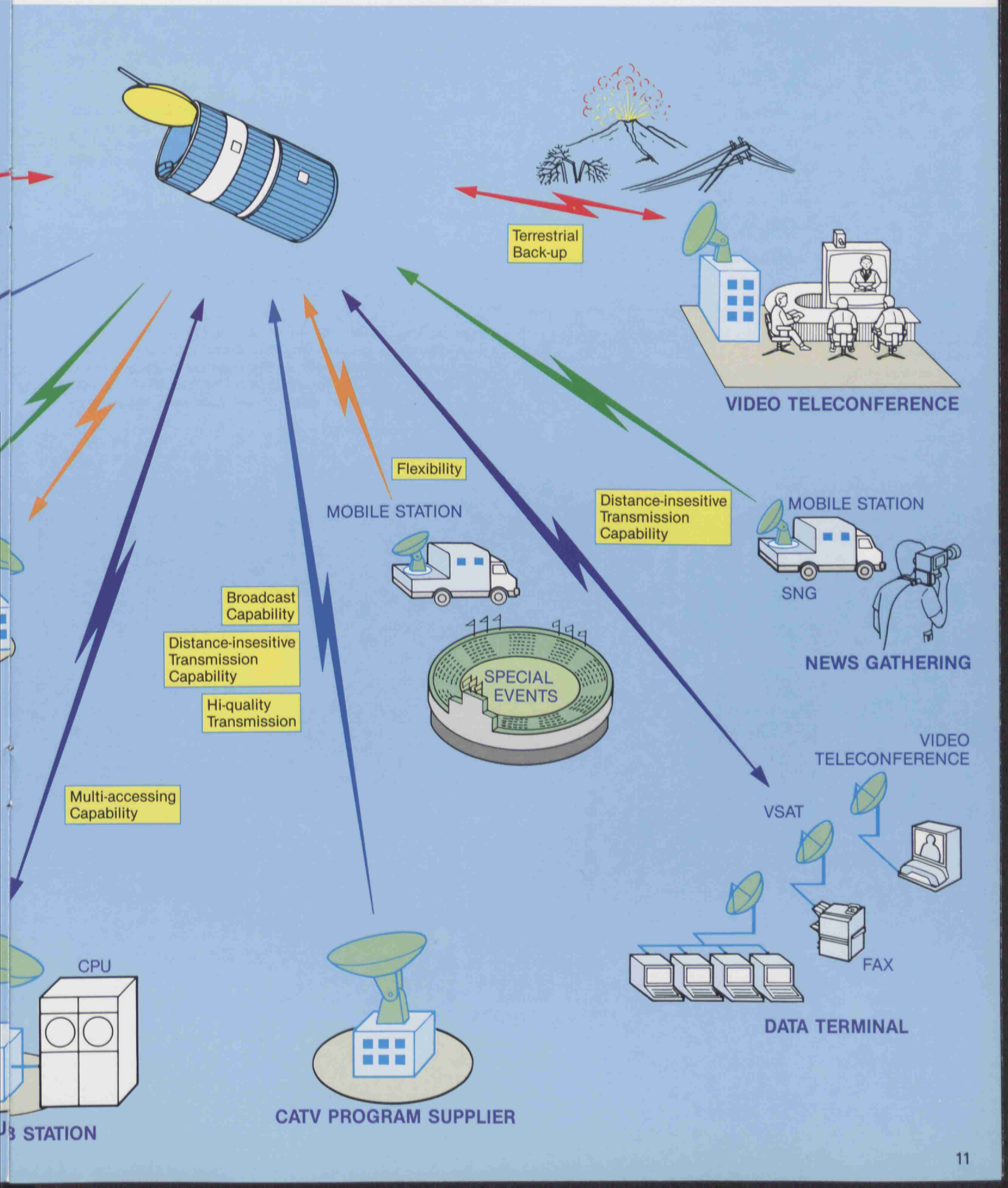
● Wide-band Transmission Capabilities

The use of Ku band as an operating frequency permits high quality transmission of high-speed, large-capacity services such as television, telephony, and computer communications.

● Distance-insensitive Transmission Capabilities

Since a satellite's coverage area can extend over an entire country, the installation and operational costs associated with the connection of any two earth stations is insensitive to the terrestrial distance between the earth stations.



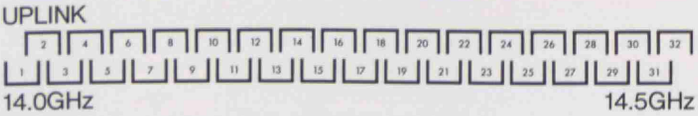

Terrestrial
Back-up
VIDEO TELECONFERENCE
Flexibility
MOBILE STATION
Distance-insesitive
Transmission
Capability
MOBILE STATION
SNG
NEWS GATHERING
Broadcast
Capability
Distance-insesitive
Transmission
Capability
Hi-quality
Transmission
SPECIAL
EVENTS
VIDEO
TELECONFERENCE
VSAT
Multi-accessing
Capability
CPU
FAX
DATA TERMINAL
CATV PROGRAM SUPPLIER
STATION

HS-393 Satellite

The HS-393 satellite represents a state-of-the-art satellite design and has been designated Hughes Aircraft's next-generation satellite series.

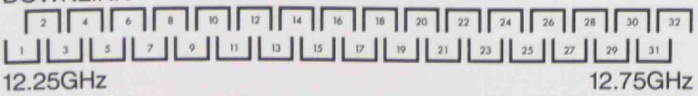
Height	10 m	Antenna directional accuracy (Beacon tracking)	0.06°
Diameter	3.66 m	Design life	10 years
Weight at geostationary orbit	1.37 tons	No. of Transponders/ Transponder Power	32/20 watts
Solar panel power output	2.2 KW	Available Transponder bandwidth	27 MHz
Antenna Diameter	2.4 m		

UPLINK



14.0GHz 14.5GHz

DOWNLINK



12.25GHz 12.75GHz

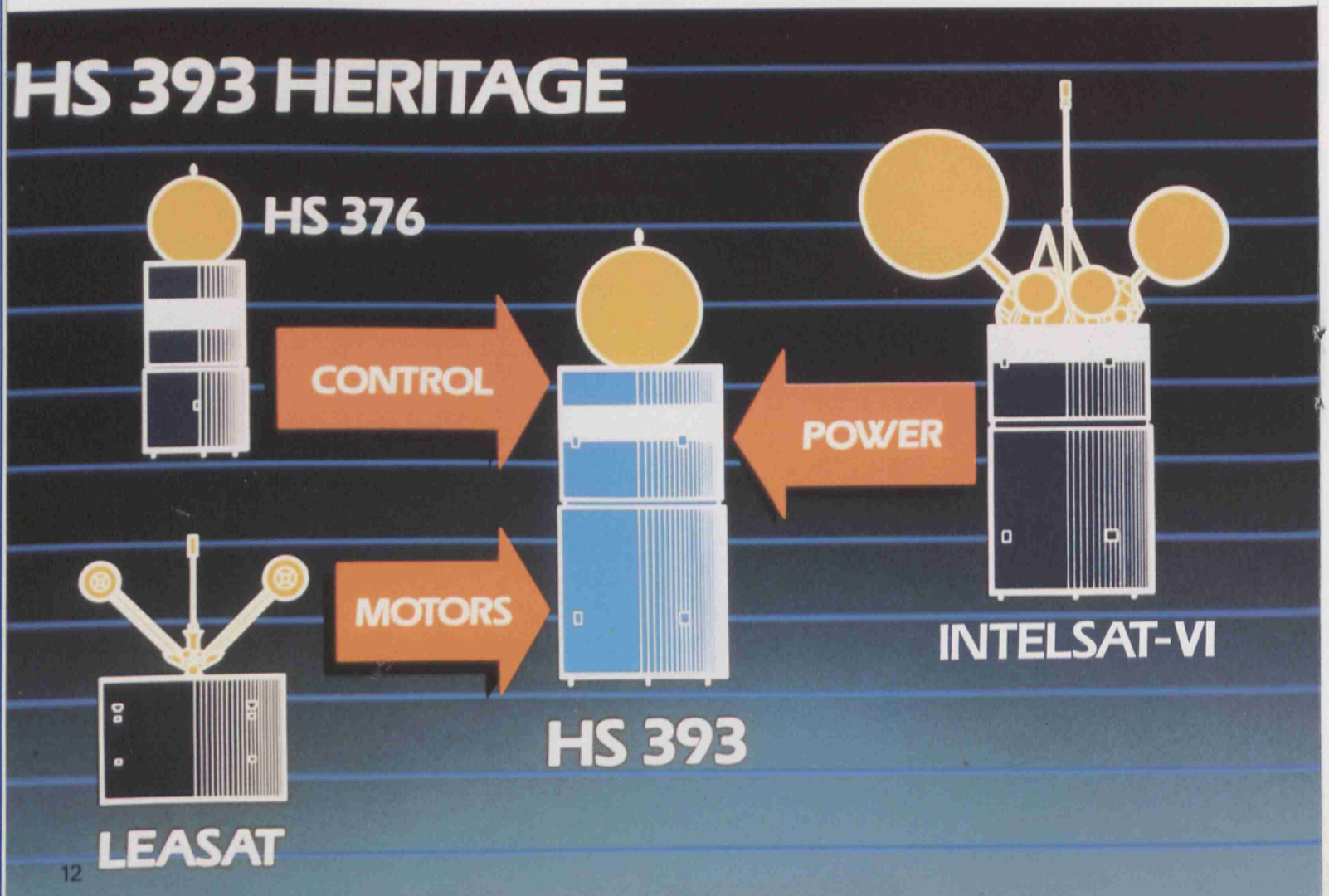
Through the use of horizontal and vertical polarization, the satellite's 500 MHz operating bandwidth may be divided into 32 channels of 27 MHz each.

The JCSAT spacecraft design is built upon an unequaled heritage of Hughes-built satellites. Among the areas in which the JCSAT satellite incorporates proven technology from other flight-tested Hughes spacecraft are:

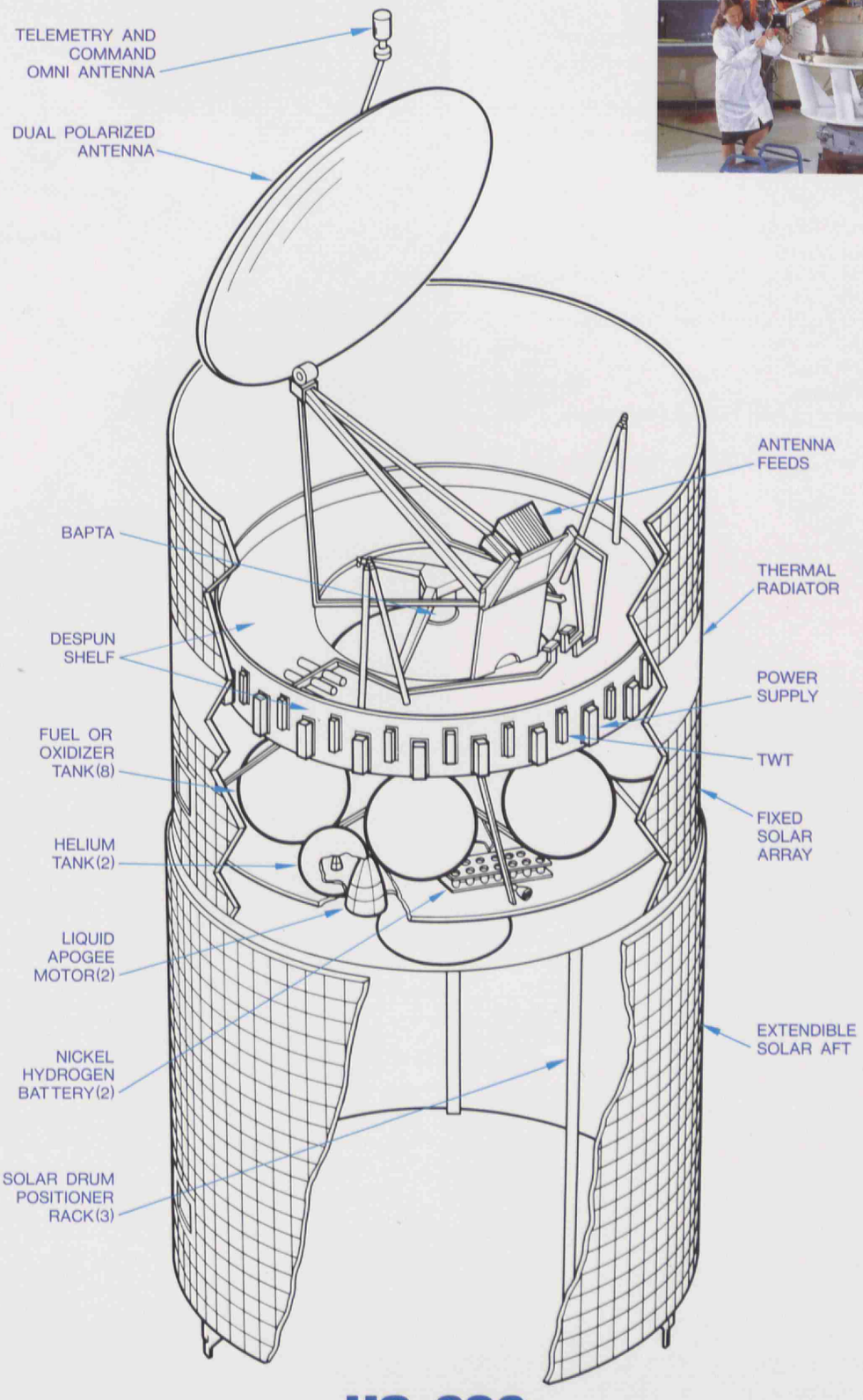
Control The HS-393 control system is based upon that used in the HS-376 series, Hughes Aircraft's best-selling satellite series. With over 34 HS-376 satellites sold as of April, 1985, the reliability of the HS-376 control system has been shown to be superb.

Motors The solid-fuel perigee kick motor (PKM) to be used by the HS-393 for Titan III launches was first used by the Leasat satellite, Hughes' UHF-band military communications spacecraft. Four out of four successful firings of this motor have demonstrated its high degree of reliability.

Power The power subsystem of the HS-393 is a similar design to that used in the Intelsat VI satellite, a spacecraft with approximately the same power requirements as the HS-393. By the time of the first JCSAT launch, over 3 Intelsat VI satellites will have been launched.



Internal View of JCSAT-1



HS-393

TT & C

Although a geosynchronous satellite appears to be motionless when viewed from a point on the earth, it is in fact orbiting the earth at a height of 36,000km above the equator at a speed of 11,000km per hour. Because of the gravitational effects of the earth, moon, and sun, periodic micro-adjustments must be made to the satellite's orbit in order to keep the satellite at its correct orbital position. This function will be performed by personnel at JCSAT's Tracking, Telemetry and Control (TT & C) station. Two TT & C stations, one primary and the other back-up, have been constructed in Yokohama and Gunma.

In addition to tracking the satellites and relaying commands to control its position, the TT & C stations will be used to continuously monitor the general health and performance of the JCSAT spacecraft.

● Primary Station/Monitoring Station
Yokohama Satellite Control Center
Address: 229-1 Miho-cho Midori-ku, Yokohama-shi, Kanagawa
Antenna Diameter: One 11m Full Motion Antenna,
Two 5.5m Limited Motion Antennas
Uplink Power: 2kW, 400W

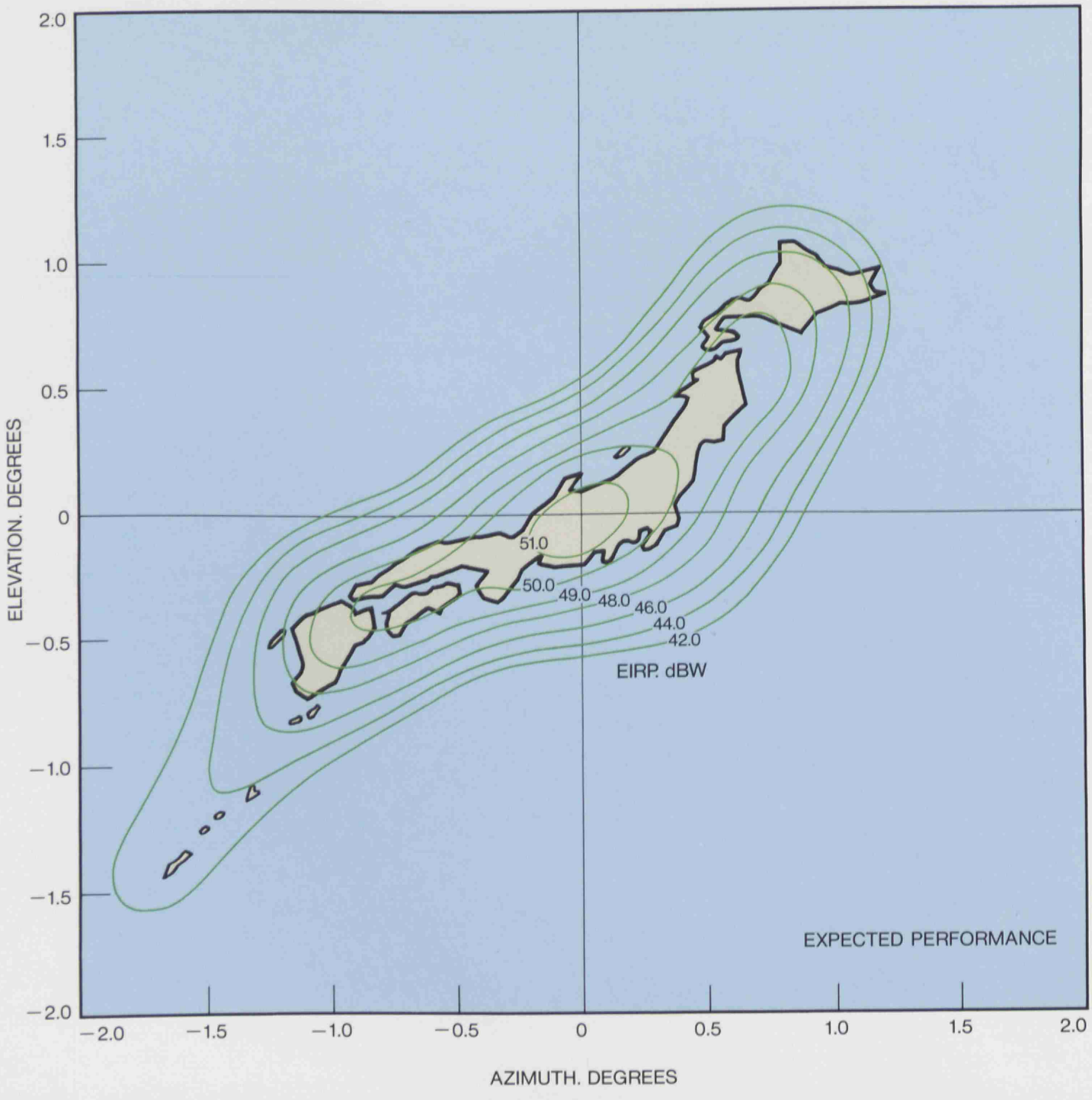
● Back-up Station
Gunma Satellite Control Station
Address: 3590-1 Momoizumi Aza Arai Oh-aza Sinto-mura
Kita-Gunma-gun Gunma
Antenna Diameter: Two 5.5m Limited Motion Antennas
Uplink Power: 400W

Gunma Satellite Control Station

Yokohama Satellite Control Center

EIRP

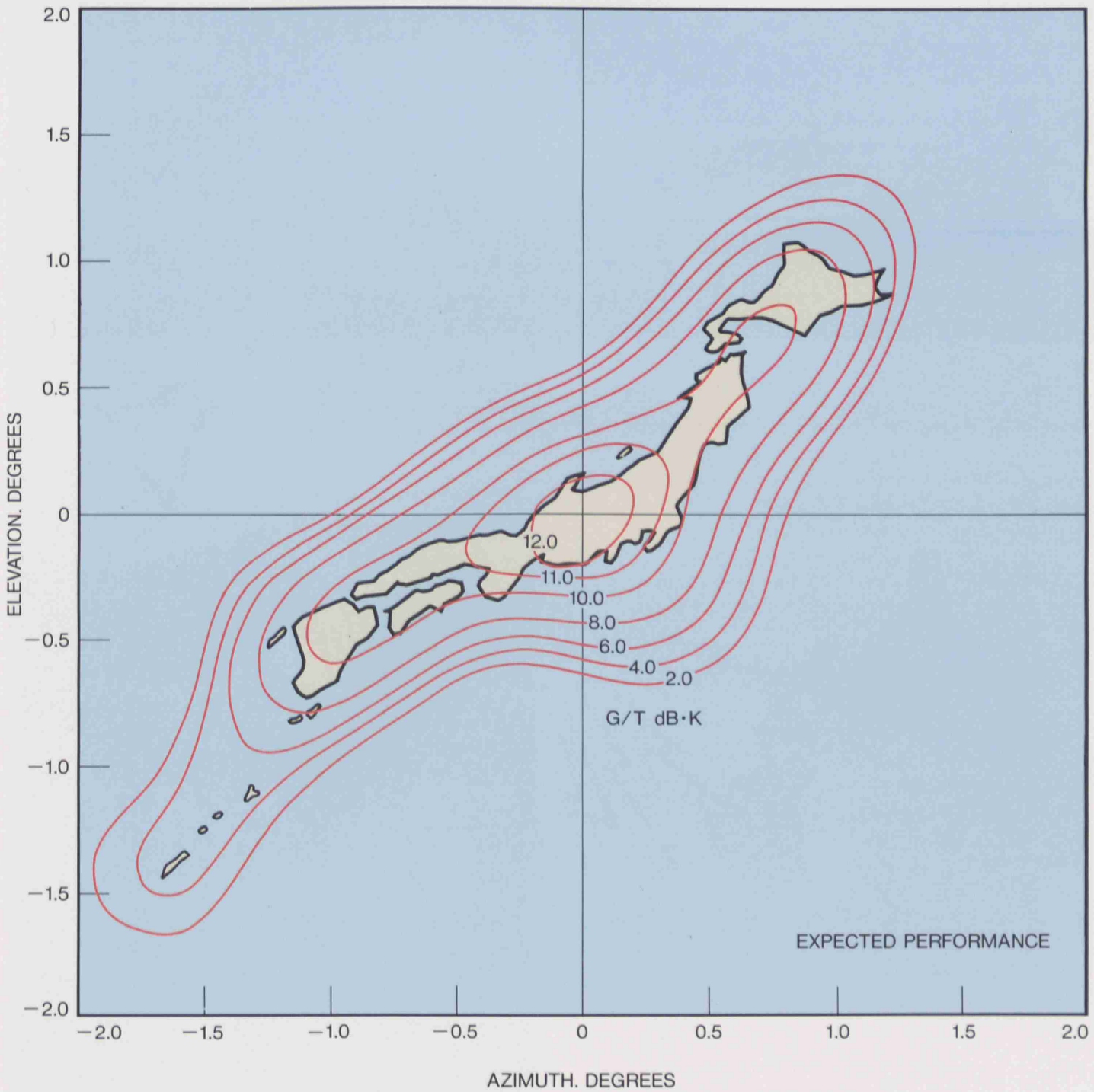
EIRP (Equivalent Isotropic Radiated Power) is a transmit power value expressed by the product of the transponder output power and the gain of the satellite transmit antenna. EIRP is expressed in units of dBW. Since the entire Japanese mainland may be covered by a single, high-gain spot beam, the EIRP performance of the JCSAT's will be comparable to the EIRP of broadcast satellites planned for some countries. The high EIRP value will allow for the efficient use of small antennas in satellite earth stations.



G/T

G/T (Gain Over Temperature) is a recieve gain value expressed by the ratio of the gain of the satellite receive antenna and the transponder input noise temperature. G/T is expressed in units of dB•K.

Since the entire Japanese Mainland may be covered by a single spot beam, and the size of satellite on-board antenna is large, the G/T performance of JCSAT is very good. The high G/T value will allow transmitting earth stations to have smaller antennas and less uplink power.

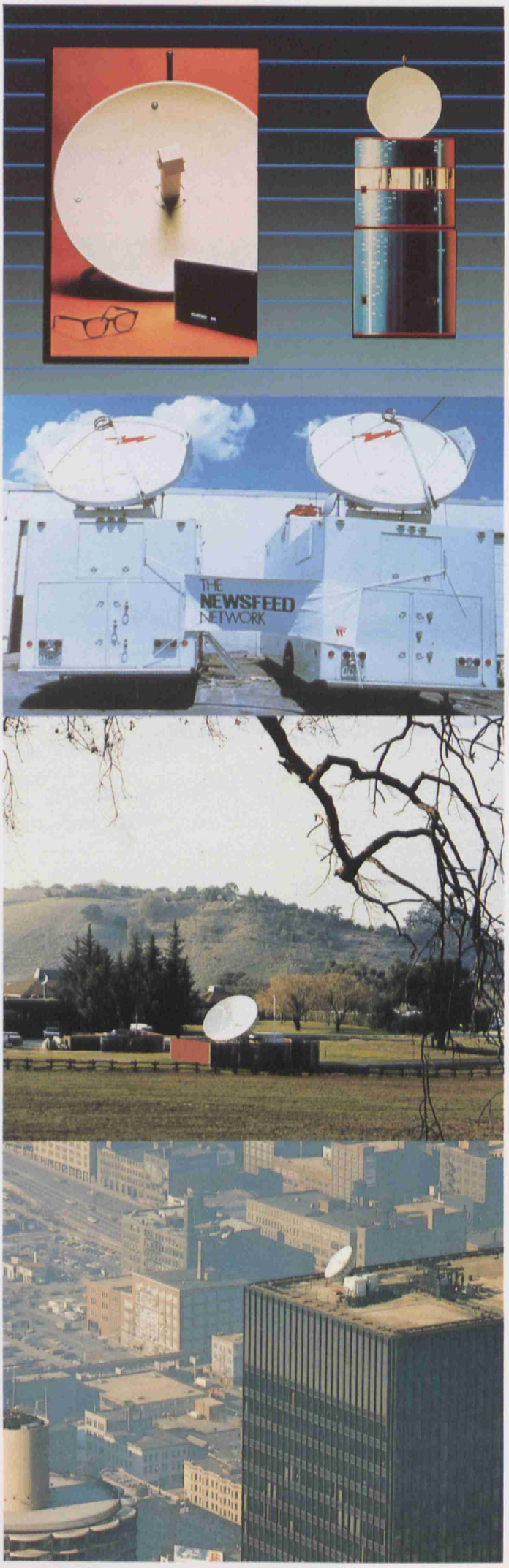


EXAMPLES OF PREDICTED UTILIZATION MODES

Purpose	Circuits per transponder		Size of antenna of earth station (m)	
			Transmission	Receive
FM-TV (TV redistribution)	1		6	4.5
FM-TV (CATV distribution)	1		6	1.5
FDM-FM (Telephone)	1	*1	6	6
QPSK (Digital transmission at 45 MBPS)	1	*2	4.3	4.3
QPSK (Digital transmission at 1.544 MBPS)	20		2.3	2.3
CSSBAM (Telephone)	1	*3	3.0	3.0

(*1) Equivalent to 1,860 one way telephone lines
(*2) When 32 KBPS Digital Speech Interpolation is used, equivalent to 2,100 one way telephone lines
(*3) No. of 5,750 one way telephone lines

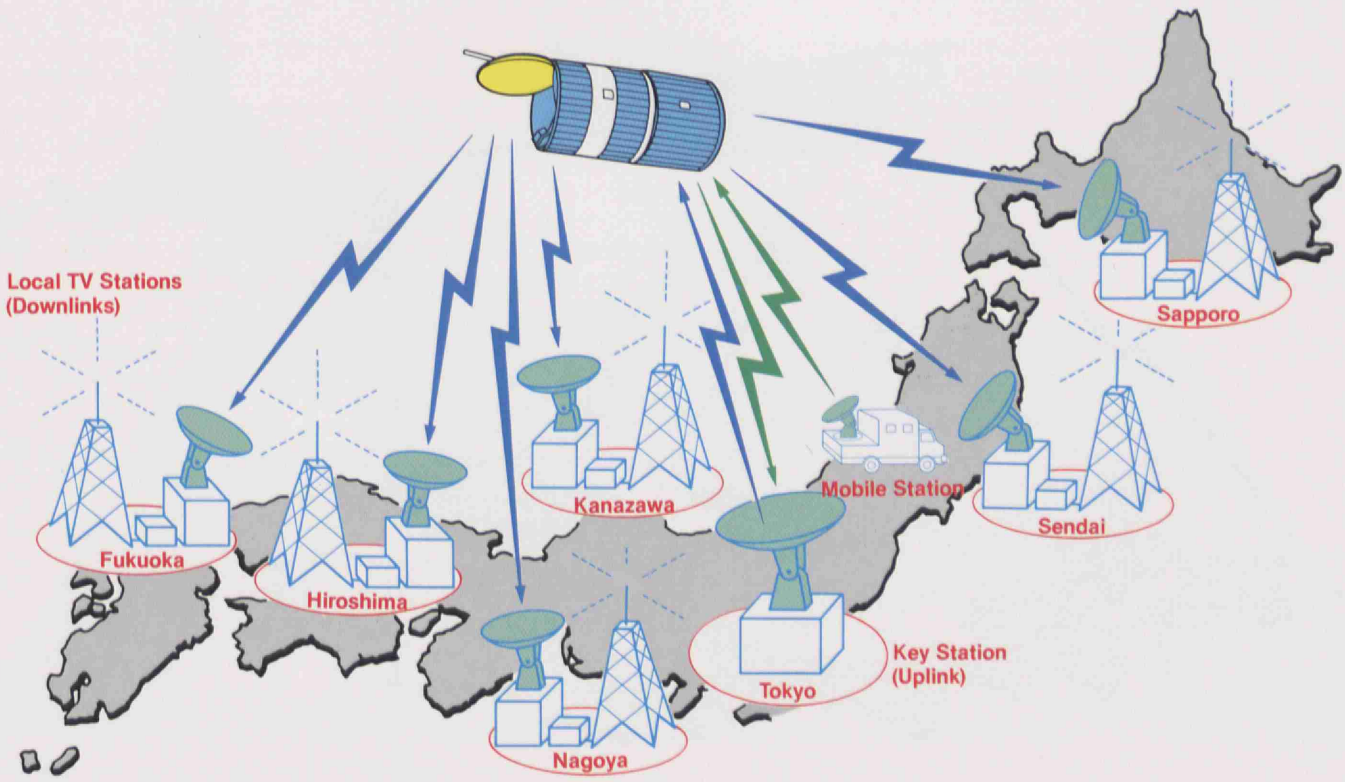
Further, the antenna diameter and the number of circuits per transponder vary with the availability and system performance.



TV Redistribution

- When the satellite is used for distribution and relaying of programs between television stations, a single transponder can transmit one channel of color full-motion television pictures.
- Typical Ground Station Parameters

Antenna Size: Uplink ····· 6m
Downlink ····· 5m (depends upon rain zone)
Uplink Power: 80—250W

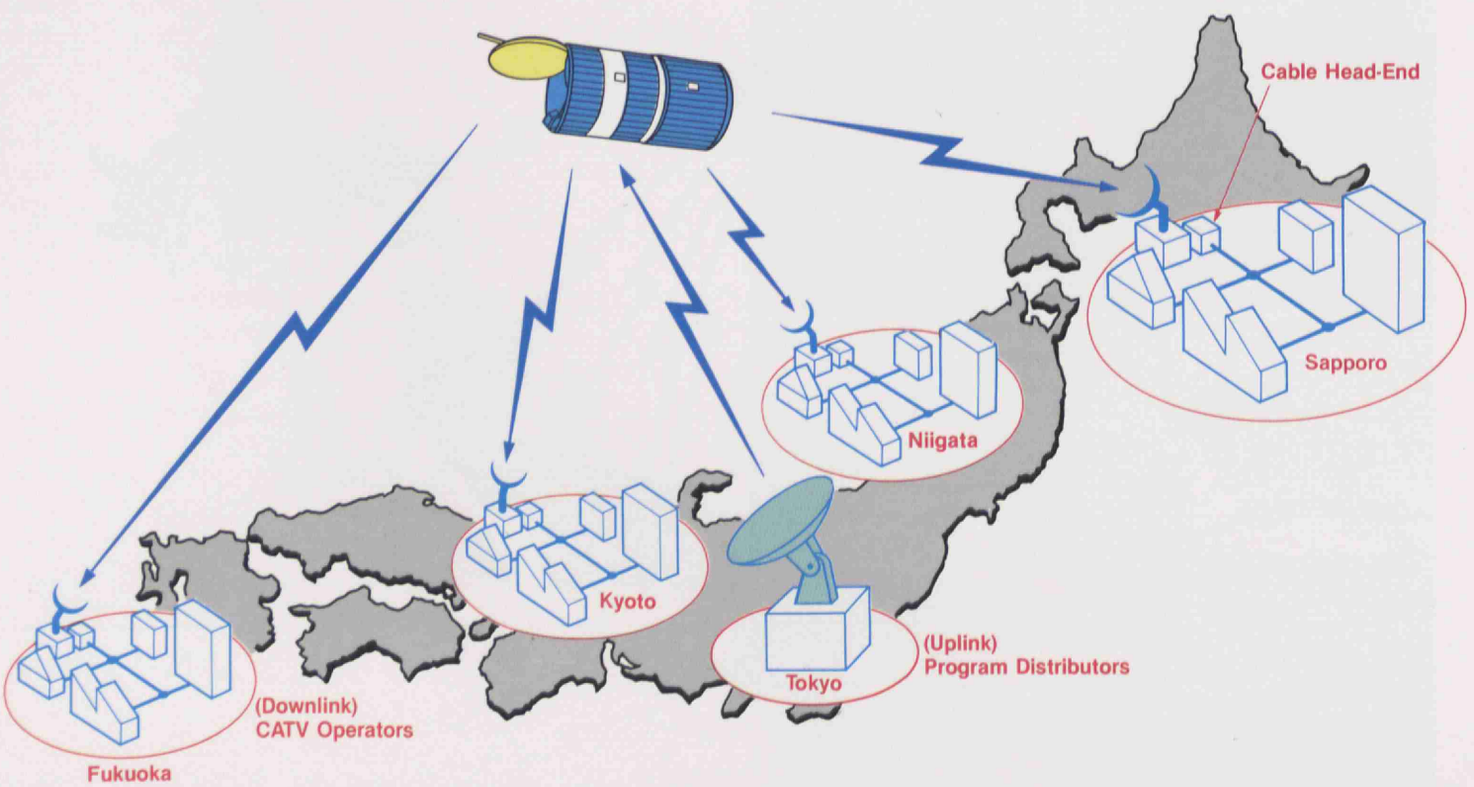


CABLE TV DISTRIBUTION

- When the satellite is used for distributing programs to CATV stations, a single transponder can transmit one channel of color full-motion television pictures.
- Typical Ground Stations Parameters

Antenna Size: Uplink 6m
Downlink ..... 1.3m (Sapporo)
..... 1.5m (Tokyo)
..... 1.7m (Fukuoka)

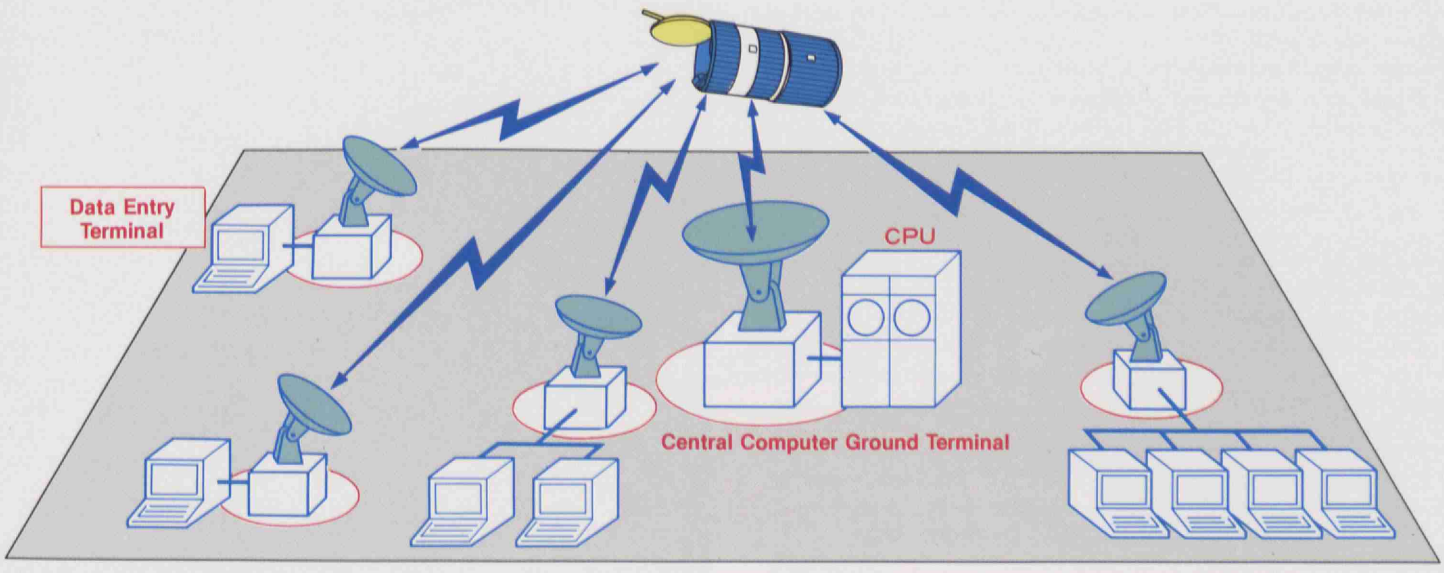
Uplink Power: 65W



DATA TRANSMISSION

- It is possible to transmit data by using small portion of a single transponder.
- Typical Service: Remote Data Entry Systems
- Typical Ground Station Parameters

Antenna Size ..... 0.6—2.5 m (variable with transmitting volume)
Uplink Power ..... 1—3W



Private Customer Premise Networks

Because of the high transmit power of the JCSAT satellites, customer premise "rooftop to rooftop" communications are possible using relatively small earth station antennas. These customer premise networks may be implemented throughout Japan, including Okinawa.

As an example, for a multi-purpose network used for the transmission/reception of data, video-conferences, voice, etc., the required antenna diameter would typically be 2 to 3 meters. For a station to be used for reception purposes only, the required antenna diameter would be less than 2 meters.

Through the use of customer-premise earth stations, corporations, banks, and other business users can quickly establish efficient and flexible private communication networks between their offices in a very cost-effective manner. Similarly, hotels and multi-tenant office building developers have the opportunity of providing their customers with advanced communications capabilities, thus increasing the value of their service and property offerings.

Among the types of services which a customer-premise network can support are:

- **Data Transmission**

Utilizing an antenna of approximately 2 meters in diameter, up to 10 bidirectional data streams of 1,544 Mbps (T-1 rate) each can be transmitted. Through the use of advanced coding techniques, data singals may be received utilizing an antenna less than 60cm in diameter pointed through an office window.

- **Video Teleconferencing**

In order to reduce the time and expense associated with business meetings, an increasing number of businesses are expected to implement video-conference facilities. Since a video-conference signal may be transmitting at a data rate of 1,544 Mbps or less, multiple video-conferencing signals may be transmitted simultaneously over a single satellite transponder.

- **Remote Newspaper Printing**

By using a satellite to transmit newspaper text to local printing facilities, a newspaper may be printed simultaneously throughout the country. U.S. newspapers such as U.S.A. Today, the Wall Street Journal, and the New York Times use satellites to remotely publish their newspapers for distribution across the United States.

- **High-speed Facsimile (FAX) Transmission**

Satellites may be used to transmit documents via facsimile at data rates of 56 Kbps and higher. FAX copies comparable in quality to those produced using PPC can be obtained.

- **PCM Music Distribution**

High quality music programs can be transmitted by communications satellites. Number of channels which can be transmitted by one transponder simultaneously will change due to the antenna size and the quality of the music.

- **VSAT (Very Small Aperture Terminal)**

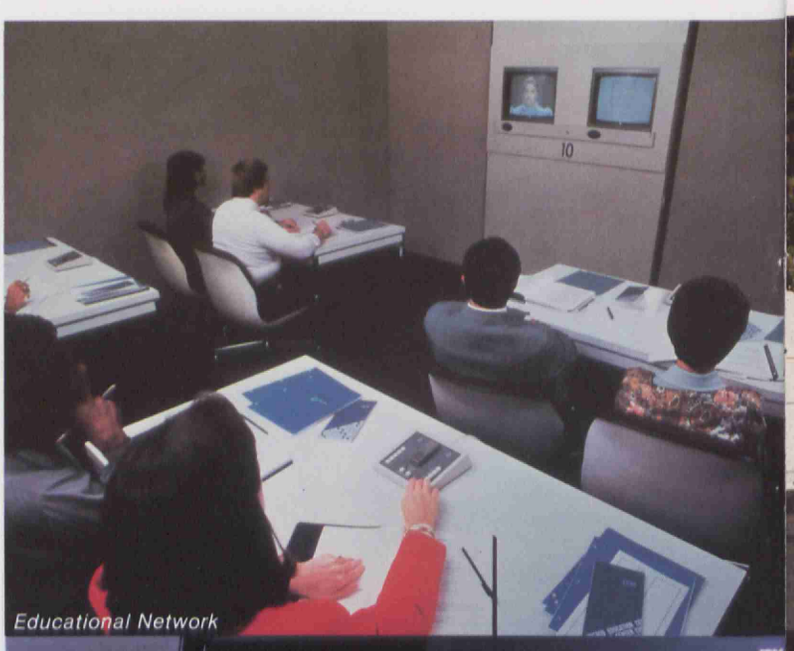
Using antennas smaller than 2m dia., it is possible to transmit up to 64kbps, including data, voice, facsimile and video conferencing.

- **SNG (Satellite News Gathering)**

Mobile uplink stations with aprx. 2m dia. antenna can easily and quickly send live news pictures to the TV stations. Today, all three major TV networks and most of the local TV stations in the U.S. are using SNG to keep their competitive edge.

- **Educational Network**

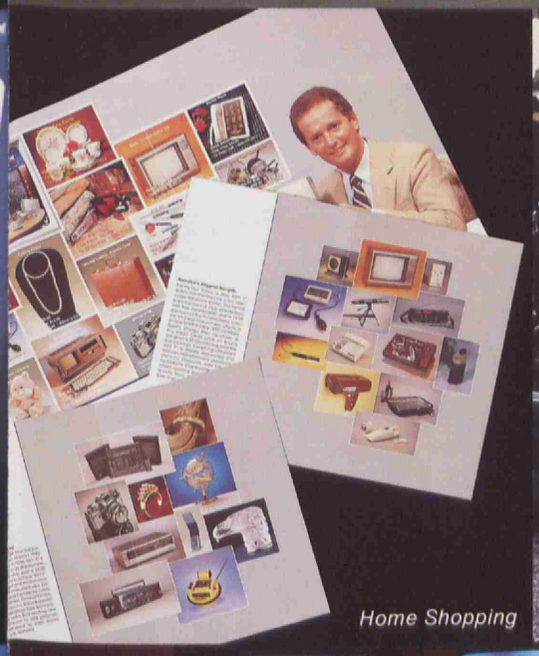
One teacher at an educational broadcast center can teach thousands of students simultaneously, receiving questions from the students at remote areas.



Educational Network

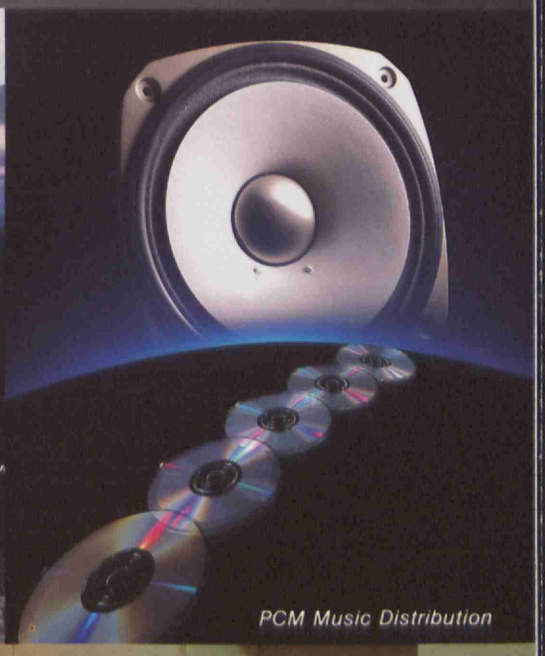
Data Transmission

Remote Newspaper Printing



Home Shopping

VSAT



PCM Music Distribution

Video Teleconferencing

The following will be considered as a possible future step for providing multi-area services, utilizing communication satellites.

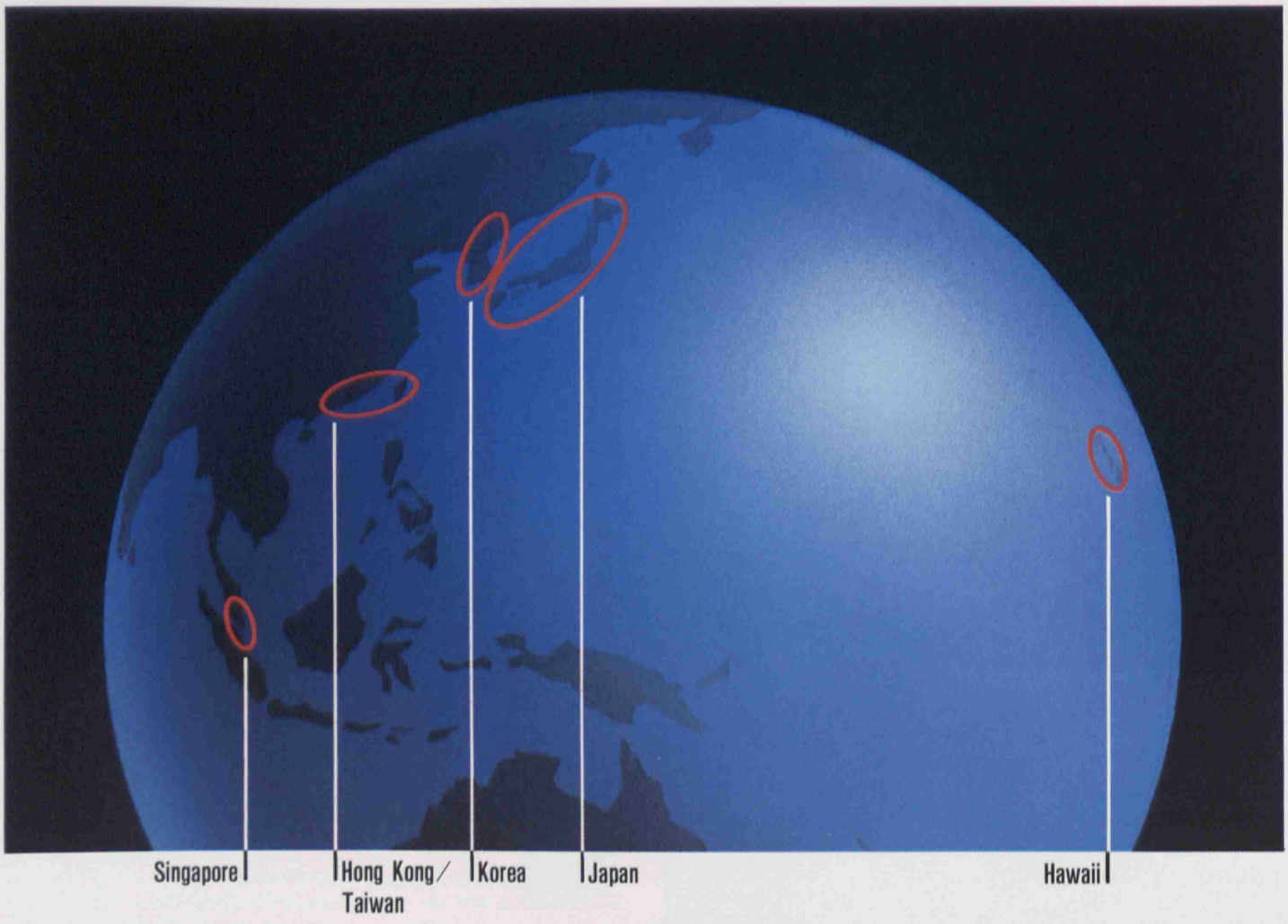
Multinational (Regional) Satellite Communications Services

Domestic communications satellites offer possibilities for sharing regional and international communications. EUTELSAT now provides such service to its 20 members in Europe using Ku band satellites. The Arab Satellite Communications Organization (ARABSAT) will provide interconnection among its 22 member countries as well as dedicated transponders for domestic services.

The Indonesian system-Palapa-provides dedicated transponders to neighboring countries in Southeast Asia—Thailand, Malaysia, and the Philippines—in addition to a small amount of interconnection. In 1983 the Federal Communications Commission authorized 24 transborder satellite services from the U.S. to other parts of the Western Hemisphere where they would not inflict economic harm on Intelsat. Sixty additional applications for transborder services are pending.

A domestic satellite system for Japan could be configured to provide regional communications service. Such a regional system might create a communications network between Japan and major urban business centers on the Asian mainland by using spot beams directed at Seoul, Taiwan, Hong Kong, and Singapore.

Regional Communications Satellite Services

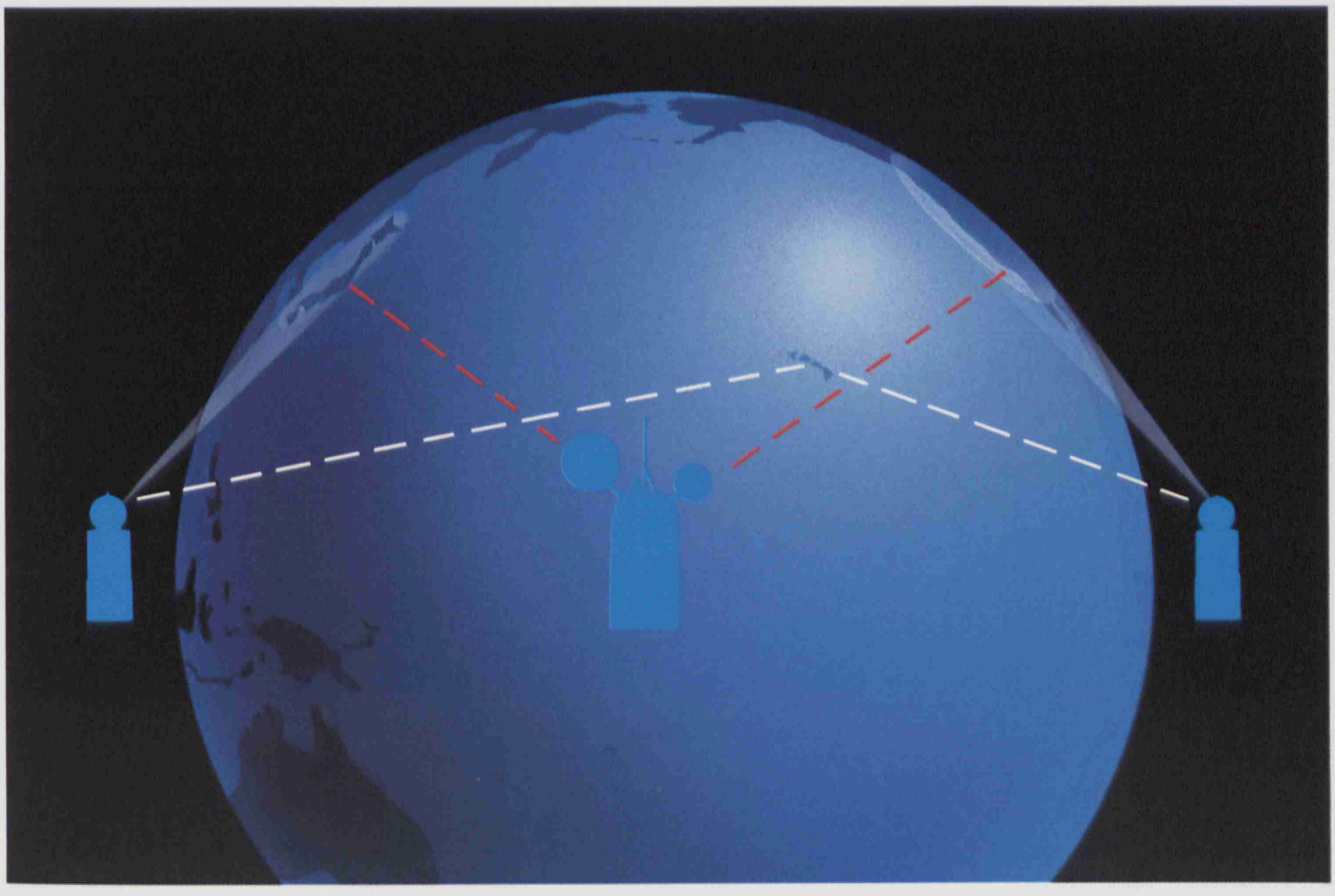


International Communications

The communications satellite network can be tied into the Pacific region Intelsat system through the Intelsat Business Service (IBS) to be provided by Intelsat spacecraft stationed over the Pacific. Access to the continental U.S. using other private satellite systems may be possible under certain international regulatory conditions. For instance, a link through a "double hop" from Tokyo to Hawaii to one of the U.S. domestic satellites, such as Galaxy, would provide data communications, video-conferencing, and voice circuits between the Pacific Basin and North America.

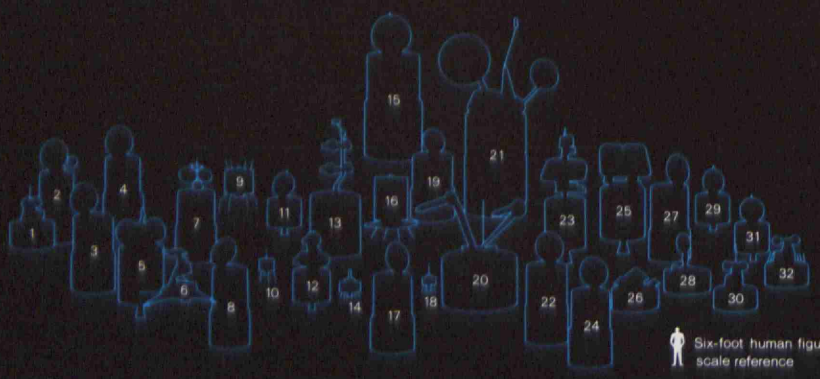
Satellite communications can serve as a backbone for an integrated domestic and international communications network linking dispersed foreign business sites to home offices and connecting the economic centers of nations in a time- and cost-efficient way.

International Communications

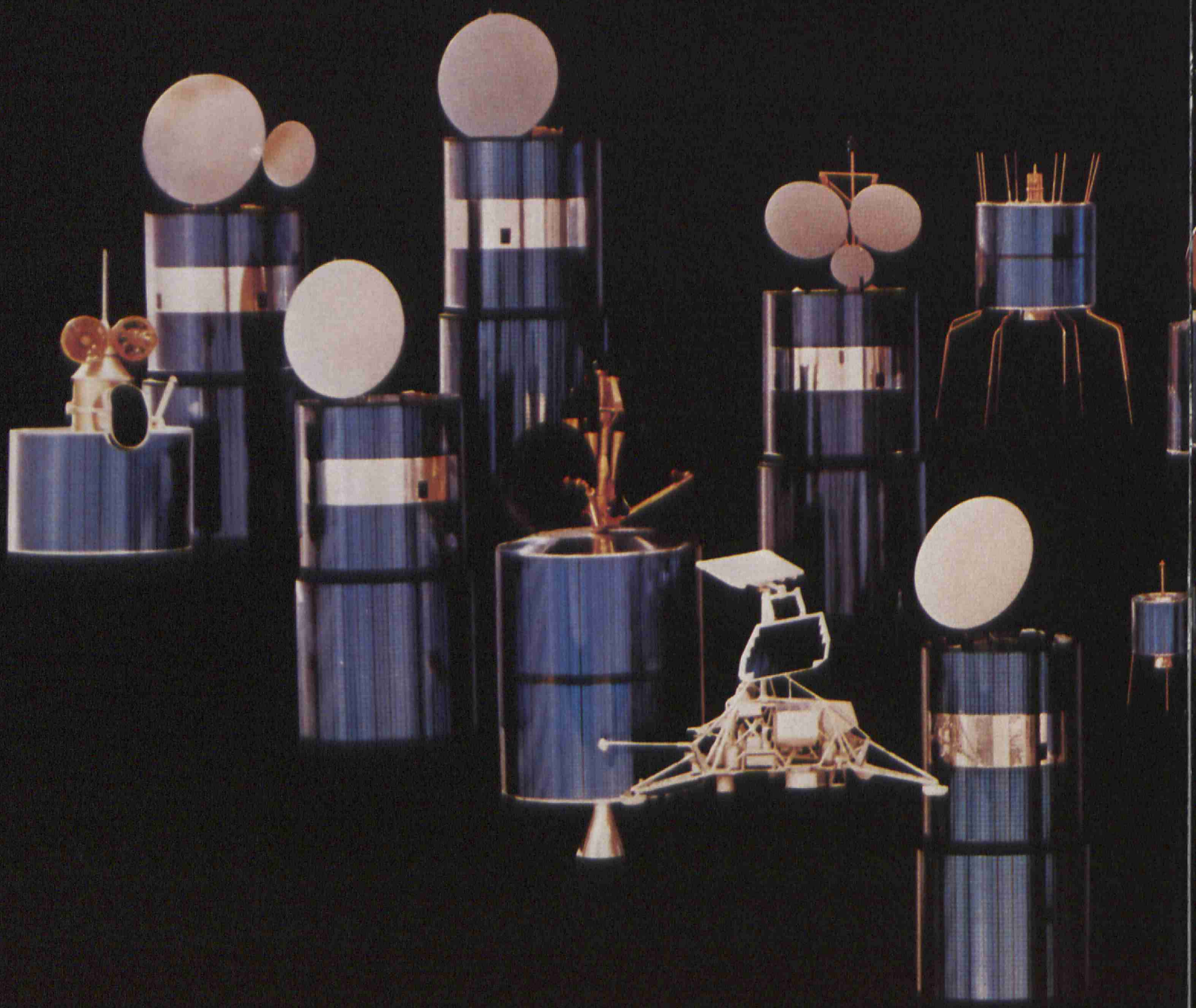


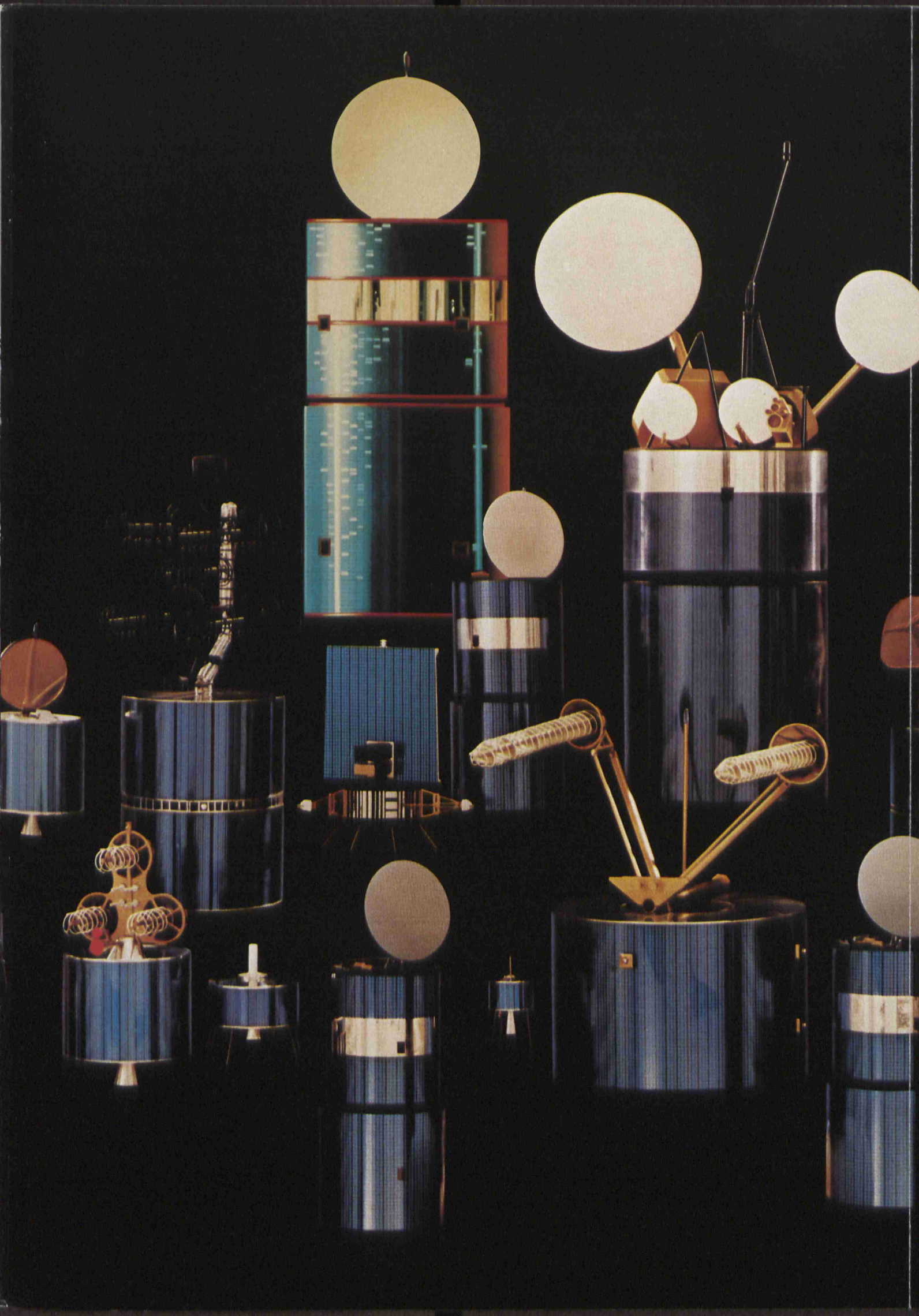
Hughes Family of Spacecraft

1 GOES D, E, F, G, H(USA)
2 SCT (MEXICO)
3 SBTS(BRAZIL)
4 GALAXY(USA)
5 INTELSAT IV
6 SURVEYOR(USA)
7 AUSSAT(AUSTRALIA)
8 SBS(USA)
9 ATS(USA)
10 INTELSAT I
11 ANIK A(CANADA)
12 MARISAT(USA)
13 TACSAT(USA)
14 INTELSAT II
15 HS 393*
16 OSO-8(USA)
17 ANIK D(CANADA)
18 SYNCOM(USA)
19 ANIK C(CANADA)
20 LEASAT(USA)
21 INTELSAT VI
22 TELSTAR 3(USA)
23 INTELSAT IV A
24 PALAPA-B(INDONESIA)
25 COMSTAR(USA)
26 PIONEER VENUS MULTIPROBE (USA)
27 WESTAR IV, V, VI, VII(USA)
28 PIONEER VENUS ORBITER(USA)
29 WESTAR I, II, III(USA)
30 GMS-2,3(JAPAN)
31 PALAPA-A(INDONESIA)
32 GMS-1(JAPAN)
INTELSAT ORGANIZATION



Six-foot human figure provides scale reference





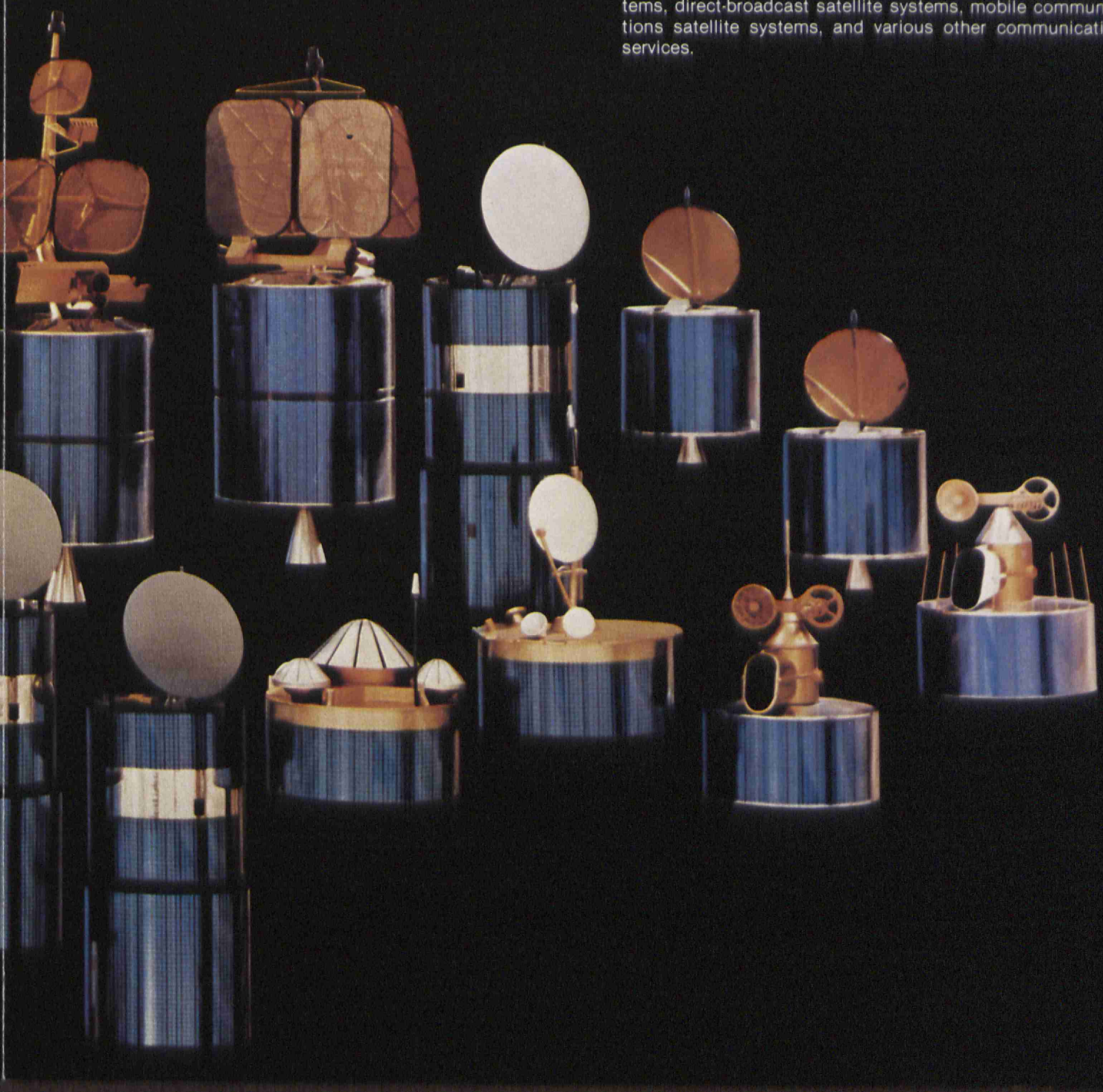
Hughes Aircraft Company

Hughes Aircraft Company is a leading aerospace electronics manufacturer with over 70,000 employees and annual sales of approximately US$ 5 billion (1984). Its Space and Communications Group, the division responsible for Hughes' commercial satellite programs, employs over 8,000 persons and has annual sales of approximately US$ 1 billion.

Since the launching of the world's first geosynchronous communications satellite, SYNCOM, in 1965, Hughes has manufactured approximately 60 commercial satellites. It has captured more than 50% of the world commercial communication satellite market.

Customers for Hughes built satellites include not only U.S. firms such as ATT, COMSAT General, Western Union and SBS, but also INTELSAT and the governments of Indonesia, Australia, Canada, and Mexico.

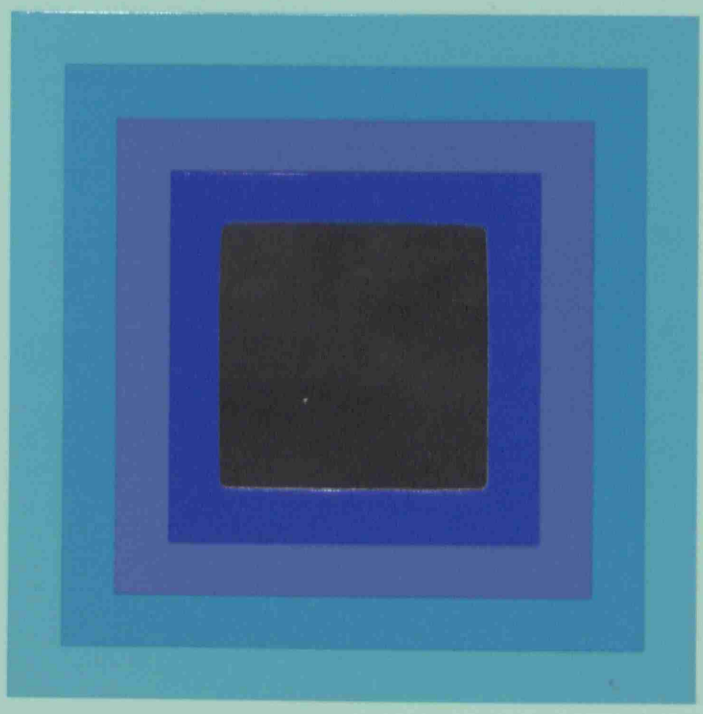
In 1980, Hughes Aircraft expanded from a satellite manufacturer to a satellite operating company through the creation of Hughes Communications, Inc., a wholly owned subsidiary. Hughes Communications owns and operates the C-band Galaxy satellite system and the military communications LEASAT satellite system. Hughes Communications is also actively involved in the development of Ku band satellite systems, direct-broadcast satellite systems, mobile communications satellite systems, and various other communications services.



Japan Communications Satellite Company, Inc.
7th Fl., No.40 Mori Bldg., 5-13-1, Toranomon, Minato-ku, Tokyo 105 Phone 03(432)5661

JC:SAT

Japan Communications
Satellite Company, Inc.



JC:SAT

Japan Communications
Satellite Company, Inc.

January 7, 1991

Japan Communications Satellite Company, Inc.
- Profile -

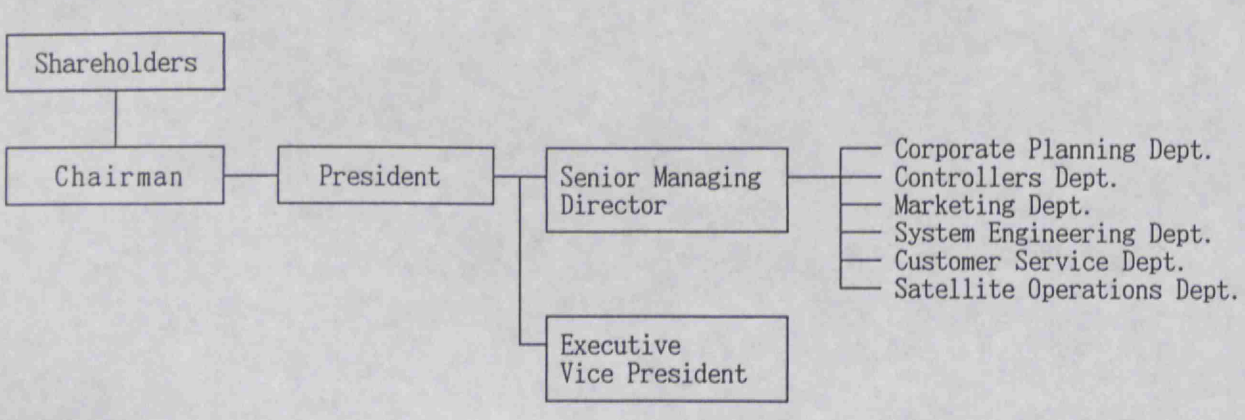
SATELLITE - HS-393 series built by Hughes Aircraft Company

	Launch	Operation Start	Location
JCSAT-1	Mar. 7, 1989	Apr. 16, 1989	150°E
JCSAT-2 (Video Bird)	Jan. 1, 1990	Feb. 10, 1990	154°E

DIRECTORS

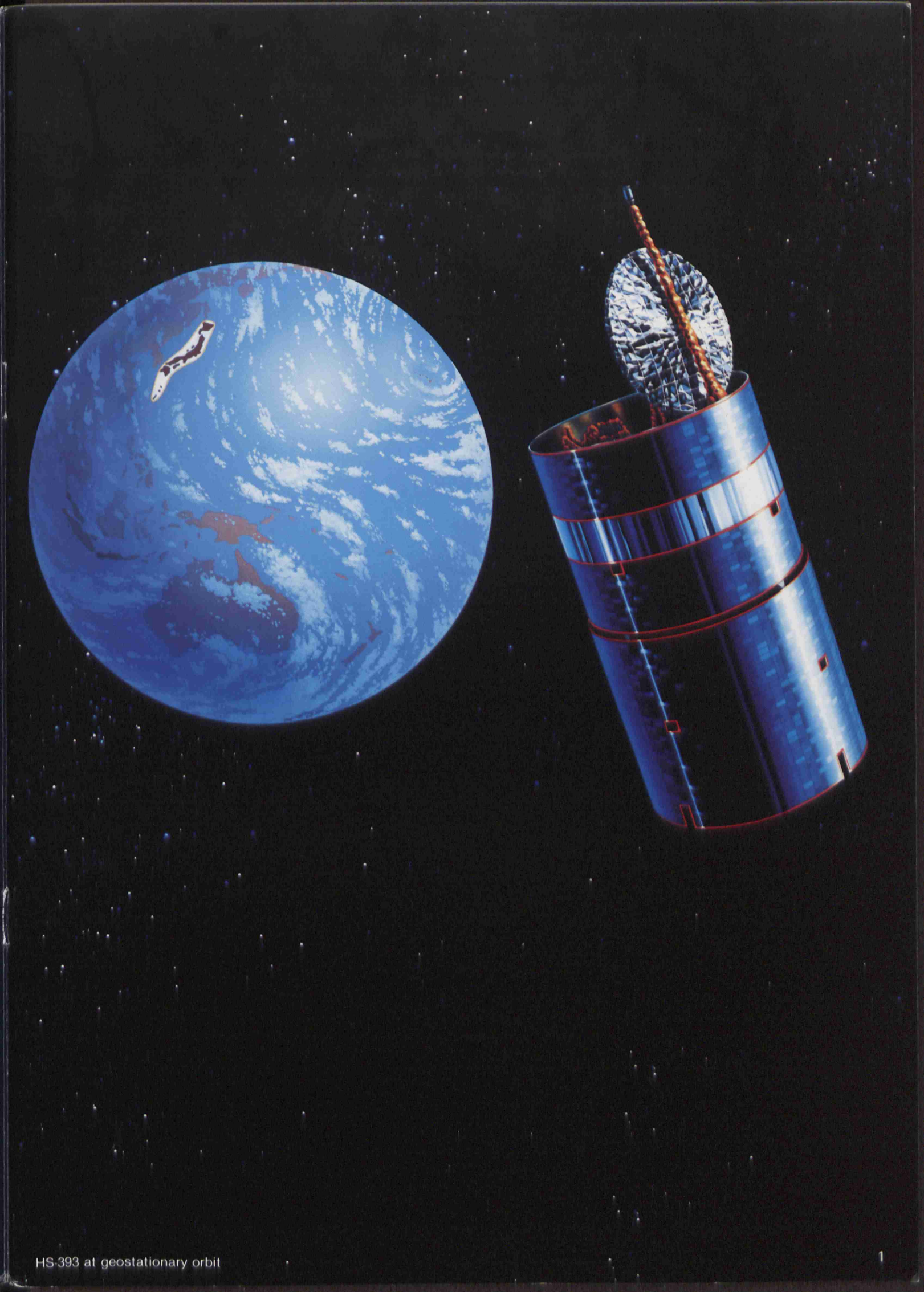
Chairman:	Hiroshi Kamiya
President:	Yoshihide Nakayama
Executive Vice President:	Yoshihiko Itami
Senior Managing Director:	Floyd R. Stuart
	Yasuharu Iwashima
Director:	Nobuo Hasegawa
	Yoichi Kamada
	Koya Mita
	Akihito Mori
	Kazutami Ishiguri
	Masashi Ikegai
	John E. Koehler
	Stephen J. Petrucci
	Fred L. Judge
Auditor:	Shigehiko Itoh
	Tadashi Yoshihara
	Margaret L. Howe

ORGANIZATION



JC:SAT

Japan Communications
Satellite Company, Inc.



HS-393 at geostationary orbit

A message from the President

The advancement of telecommunications technology during recent years has been spectacular. Satellite communications technology, in particular, has evolved dramatically since the launching of the first geosynchronous satellite, Intelsat I (Early Bird), in 1965.

In the United States, there are currently over 21 privately-owned satellites providing transmission services to a wide variety of domestic users. This extensive satellite capacity, which is used for the transmission of telephony, video, and data, has become an indispensable and growing component of the U.S. national communications infrastructure.

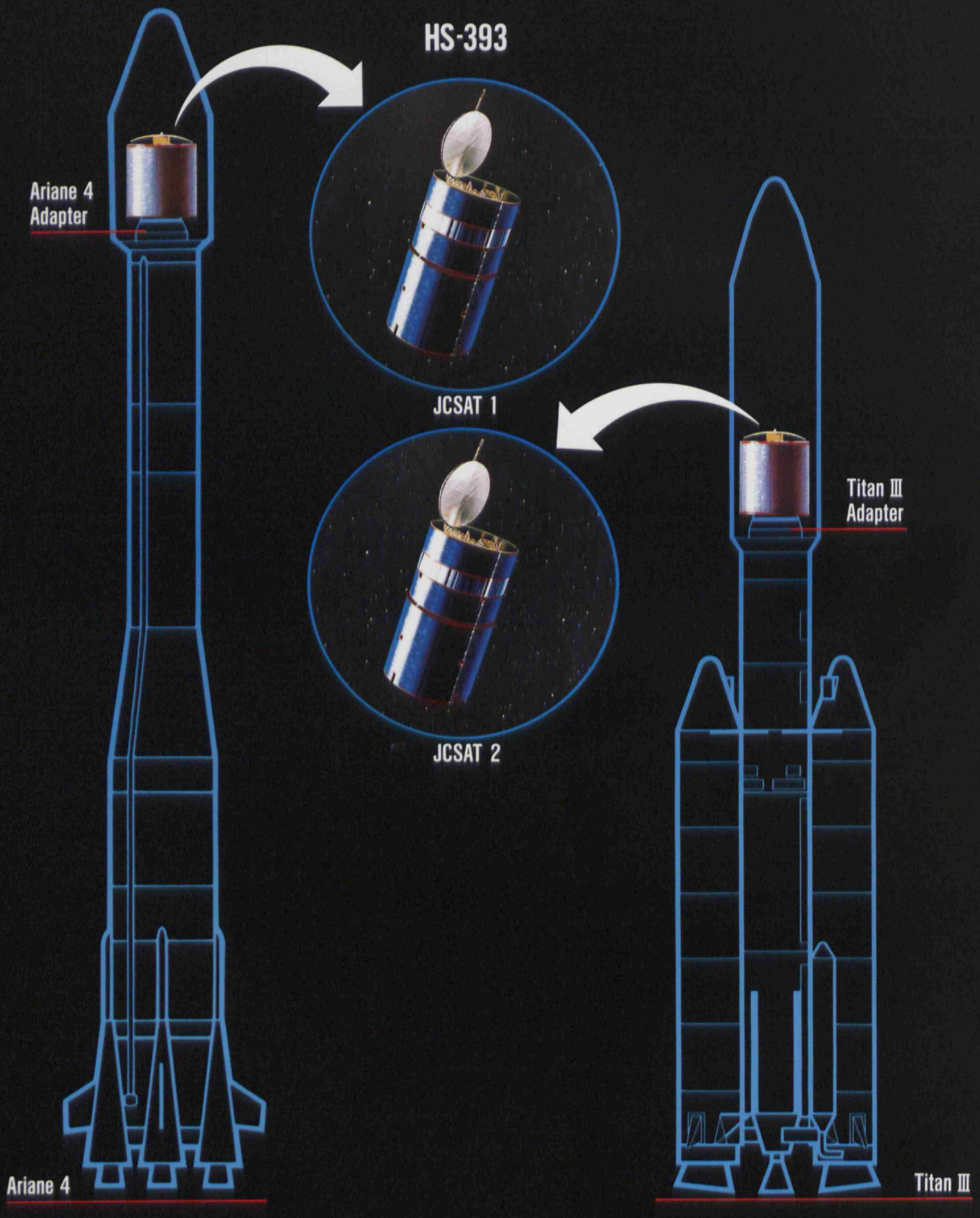
As Japan develops into a highly advanced, information oriented society, its needs for advanced communications capabilities such as those provided by satellites have increased rapidly. Responding to these needs, in April 1985 the Japanese government enacted the Telecommunications Enterprise Law. This law provided new and important opportunities for private Japanese businesses to participate in the provision of communication services, including satellite communications. Japan Communications Satellite Company, Inc. one of the first private companies to apply for a business license under the new law, was awarded a Type 1 Telecommunications permit from the Japanese Ministry of Posts and Telecommunications on June 21, 1985.

As the first company planning to bring domestic commercial satellite services to Japan, JCSAT is deeply committed to not only serving the needs of Japanese industry, but in providing new and innovative communications services to the Japanese public as a whole. By combining the broad knowledge of the Japanese market of C. Itoh and Mitsui, with the technical experience of our U.S. partner Hughes Communications, Inc., we believe that the services we shall offer shall be of the highest possible quality.

We are anxious to become part of your future communications plans and look forward to discussing your communication needs with you.

July, 1985

President Hiroshi Kamiya


HS-393
Ariane 4
Adapter
JCSAT 1
JCSAT 2
Titan III
Adapter
Ariane 4
Titan III

A Summary of the JCSAT Business Plan

On April 1, 1985, C. Itoh & Co., Ltd., Mitsui & Co., Ltd., and Hughes Communications, Inc. established a joint venture company, Japan Communications Satellite Company, Inc. (JCSAT), for the purpose of providing satellite communications services to Japanese industry. The business plan of JCSAT is to procure and operate two communications satellites and to offer dedicated transponder services using these satellites to various users. Transponders are the devices on the satellite which receive, amplify, and retransmit incoming signals.

The JCSAT satellites will be members of the next-generation HS-393 satellite series built by Hughes Aircraft Co.. After launching by Ariane 4 and Titan III, the JCSAT satellites will be monitored and controlled through two (primary and backup) telemetry, tracking and control (TT & C) stations located in Yokohama and Gunma.

The first JCSAT satellite, will be launched in February, 1989 and shall become operational in May, 1989. The second JCSAT satellite, will be launched in July, 1989 and shall be ready for service in October, 1989.

Each satellite shall contain 32 transponders each consisting of an input filter, a 20 watt Traveling Wave Tube Amplifier (TWTA), and an output filter. In addition to the 32 primary TWTA's, each satellite will contain 8 spare TWTA's. The satellite operating frequencies will be in the Ku band (14.0 to 14.5 GHz uplink, 12.25 to 12.75 GHz downlink). In comparison to higher frequencies, the Ku band is less affected by rainfall and will enable users to develop highly reliable satellite networks utilizing small antenna earth stations.

Among the types of services to be offered using JCSAT transponders are:

- Video program distribution to CATV and network television stations
- Telephone services
- Data transmission/broadcast services
- Specialized services such as video conferencing, remote printing, high-speed facsimile transmission, satellite news gathering

OUTLINE OF JCSAT

● Name of Company

JAPAN COMMUNICATIONS SATELLITE COMPANY, INC.

JC·SAT

● Address

Headquarters 7th Fl., No.40 Mori Bldg., 5-13-1, Toranomon, Minato-ku, Tokyo 105
Phone 03(432)5661
03(437)3951 (Marketing Dept.)
03(432)6962 (Corporate Planning Dept.)
03(432)5630 (System Engineering Dept.)
03(432)0185 (Customer Service Dept.)

Yokohama Satellite Control Center
229-1 Miho-cho, Midori-ku, Yokohama-shi, Kanagawa 226
Phone 045(922)7111 (Satellite Operations Dept.)

● Capital

Paid capital: ¥24 billion (as of end Aug. 1988)
(Authorized capital: ¥30 billion)

● Date of Establishment

February 18, 1985

● Shareholders

C. Itoh & Co., Ltd.	40%
Mitsui & Co., Ltd.	30%
Hughes Communications, Inc.	30%

● Directors

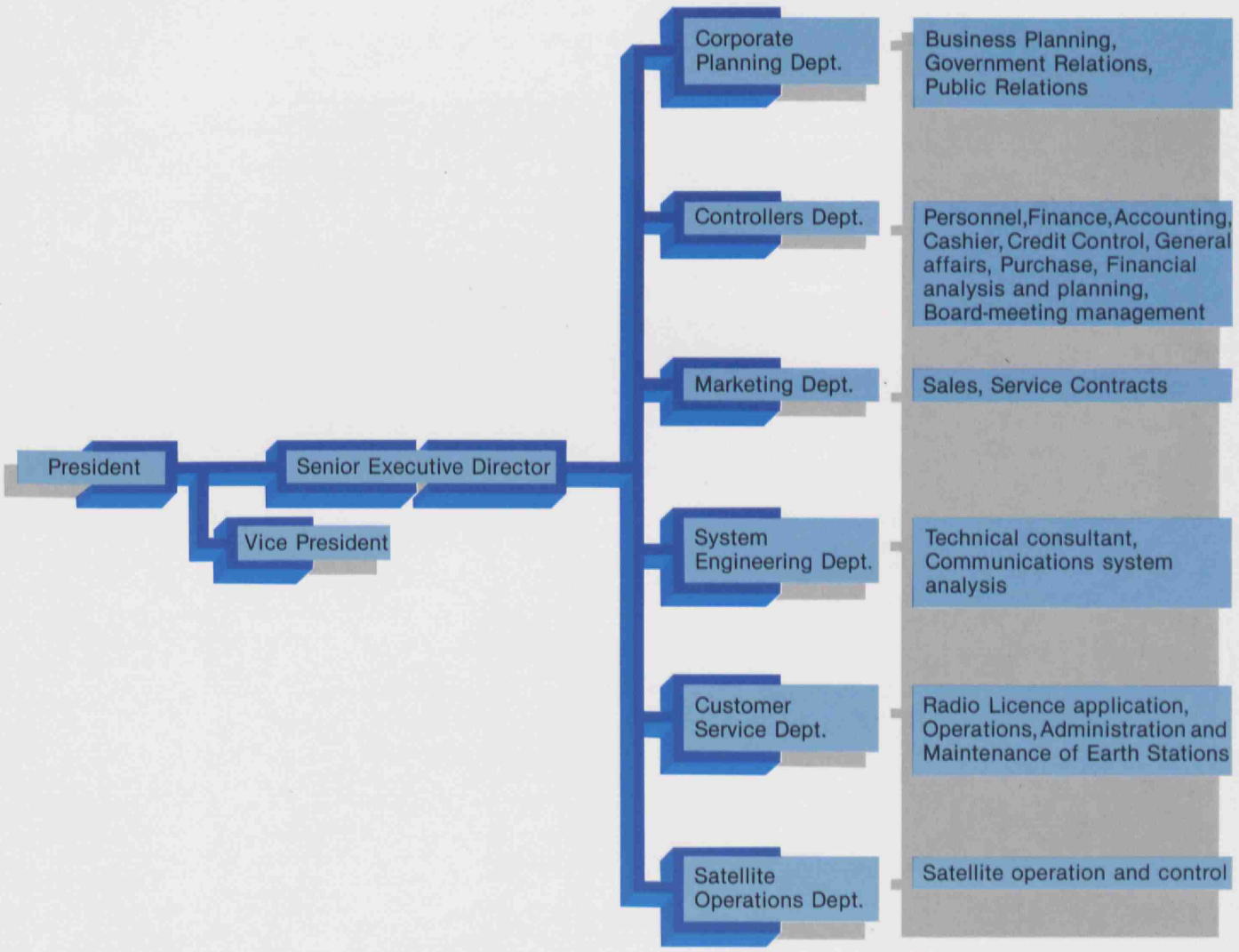
President	Hiroshi Kamiya
Vice President	Yoshihiko Itami
Senior Executive Director	Fred L. Judge
Executive Directors	Shigeru Miyakawa
	Masayoshi Marumo
Directors	Taketo Furuhata
	Shigeru Goto
	Akihito Mori
	Akira Mizukami
	Masashi Ikegai
	Steve D. Dorfman
	John E. Koehler
	Stephen J. Petrucci
Auditors	Ryohei Kikuno
	Taiji Hirata
	Margaret L. Howe


JC·SAT

▲ *Ariane*

▼ *Titan III*

ORGANIZATION CHART



Key Features of a Satellite Communications Network

● Easy and Flexible Network Construction

In contrast to the long delays often encountered when constructing a terrestrial communications networks, a satellite earth station can be rapidly installed at a location of the user's choosing. In this same manner, satellite earth station networks can be quickly reconfigured and expanded.

● Protection Against Outages Due to Natural Disasters

Satellites offer important alternative communications links during times when natural disasters have destroyed or degraded terrestrial communication capabilities. The mobility and flexibility of satellite earth stations can quickly reestablish communications connectivity in the disaster stricken areas. A satellite network thus offers protection by ensuring that alternate channels of communication are available and will remain functional during emergency situations.

● Broadcast Capabilities

Satellites are the optimal means of transmission for point-to-multipoint applications. Signals such as video or data may be transmitted from a single uplink site and received simultaneouslly by thousands of users. Conversely, for applications such as remote sensing, large numbers of isolated transmit sites may be simultaneously received by a single data-collection location.

● Multi-Accessing Capabilities

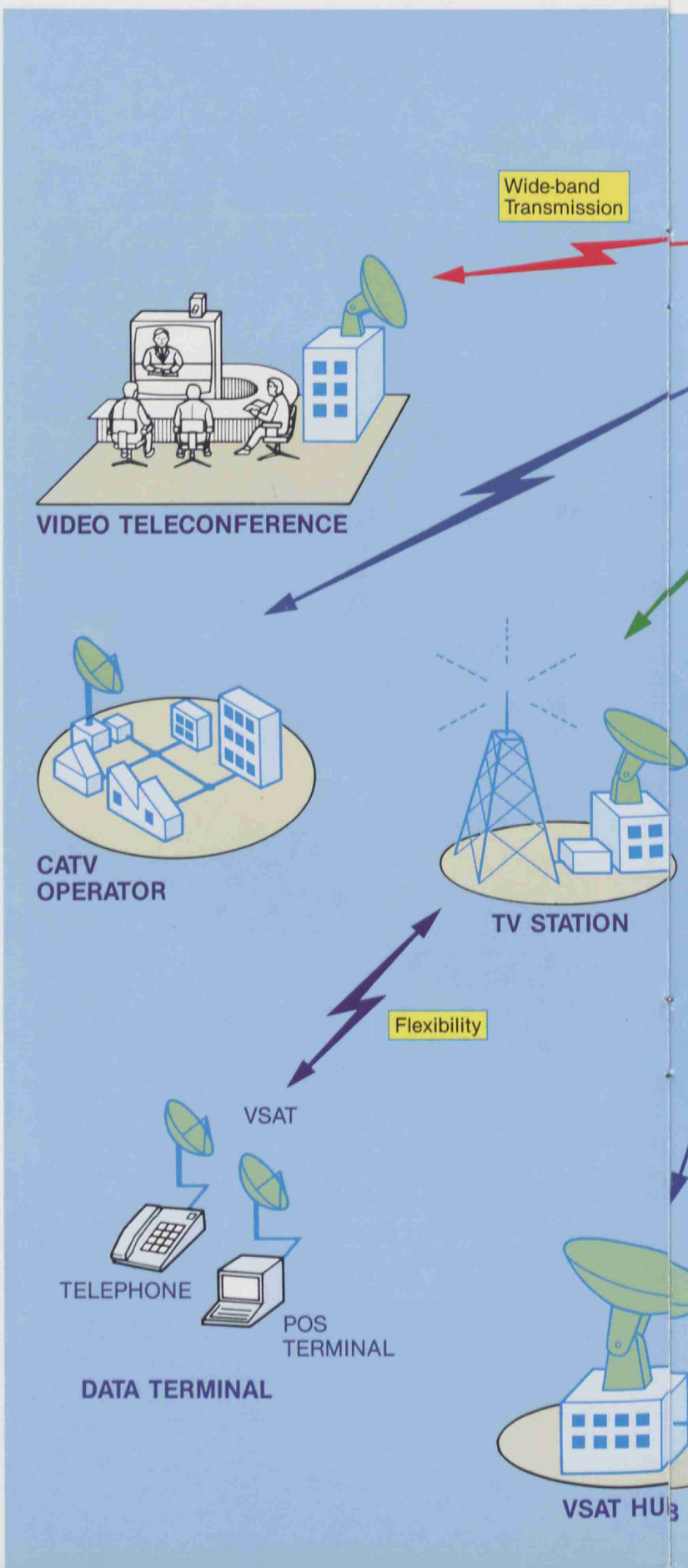
By using frequency division, time division or similar multi-access technique, many transmit/receive stations distributed over a diverse geographical area may efficiently utilize a single transponder.

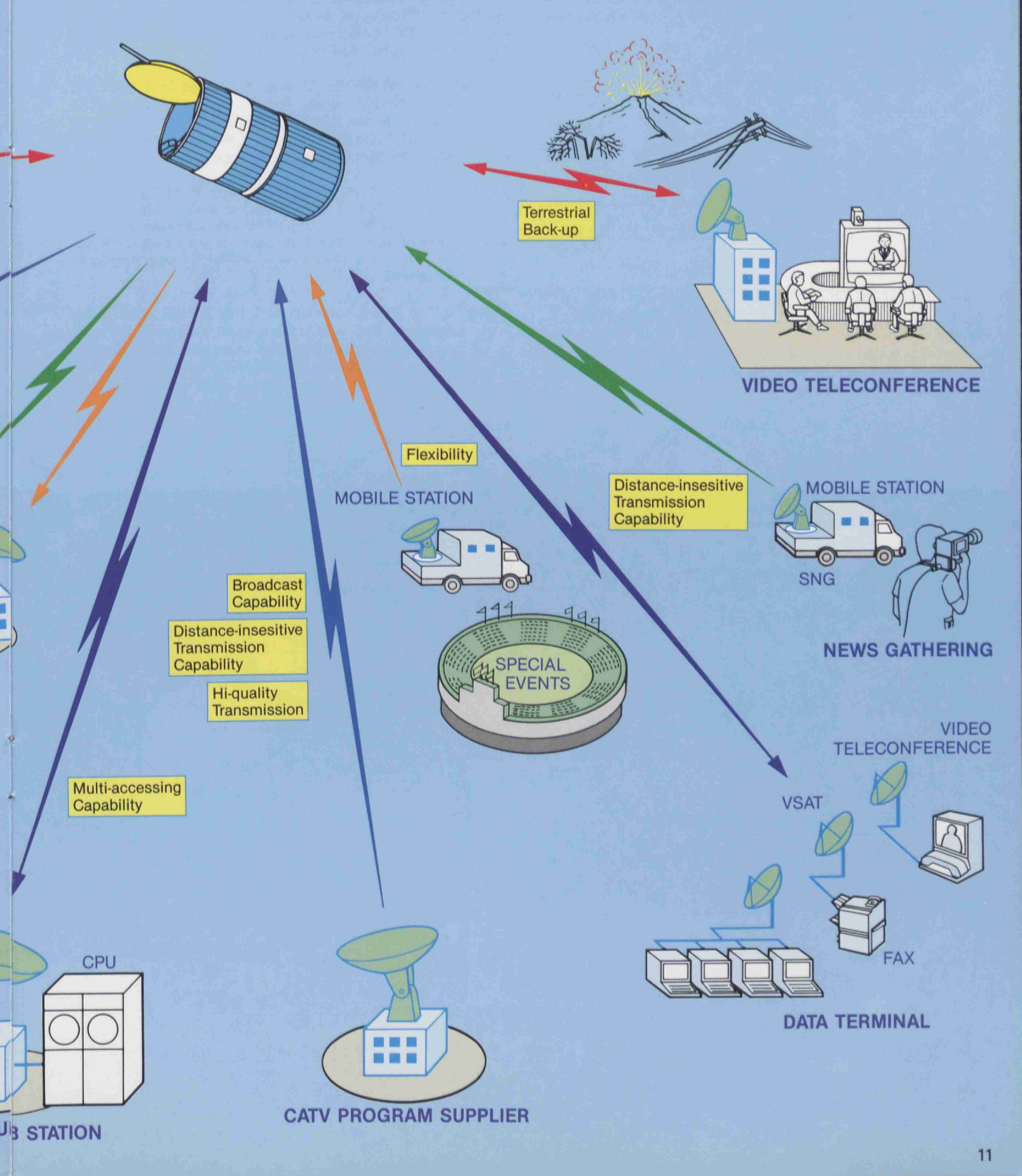
● Wide-band Transmission Capabilities

The use of Ku band as an operating frequency permits high quality transmission of high-speed, large-capacity services such as television, telephony, and computer communications.

● Distance-insensitive Transmission Capabilities

Since a satellite's coverage area can extend over an entire country, the installation and operational costs associated with the connection of any two earth stations is insensitive to the terrestrial distance between the earth stations.



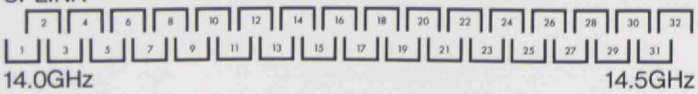

Terrestrial
Back-up
VIDEO TELECONFERENCE
Flexibility
MOBILE STATION
Distance-insesitive
Transmission
Capability
MOBILE STATION
SNG
NEWS GATHERING
Broadcast
Capability
Distance-insesitive
Transmission
Capability
Hi-quality
Transmission
SPECIAL
EVENTS
VIDEO
TELECONFERENCE
VSAT
Multi-accessing
Capability
CPU
FAX
DATA TERMINAL
CATV PROGRAM SUPPLIER
STATION

HS-393 Satellite

The HS-393 satellite represents a state-of-the-art satellite design and has been designated Hughes Aircraft's next-generation satellite series.

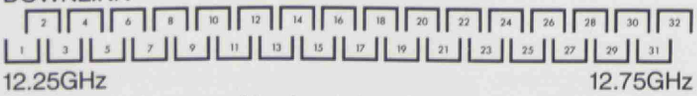
Height	10 m	Antenna directional accuracy (Beacon tracking)	0.06°
Diameter	3.66 m	Design life	10 years
Weight at geostationary orbit	1.37 tons	No. of Transponders/ Transponder Power	32/20 watts
Solar panel power output	2.2 KW	Available Transponder bandwidth	27 MHz
Antenna Diameter	2.4 m		

UPLINK



14.0GHz 14.5GHz

DOWNLINK



12.25GHz 12.75GHz

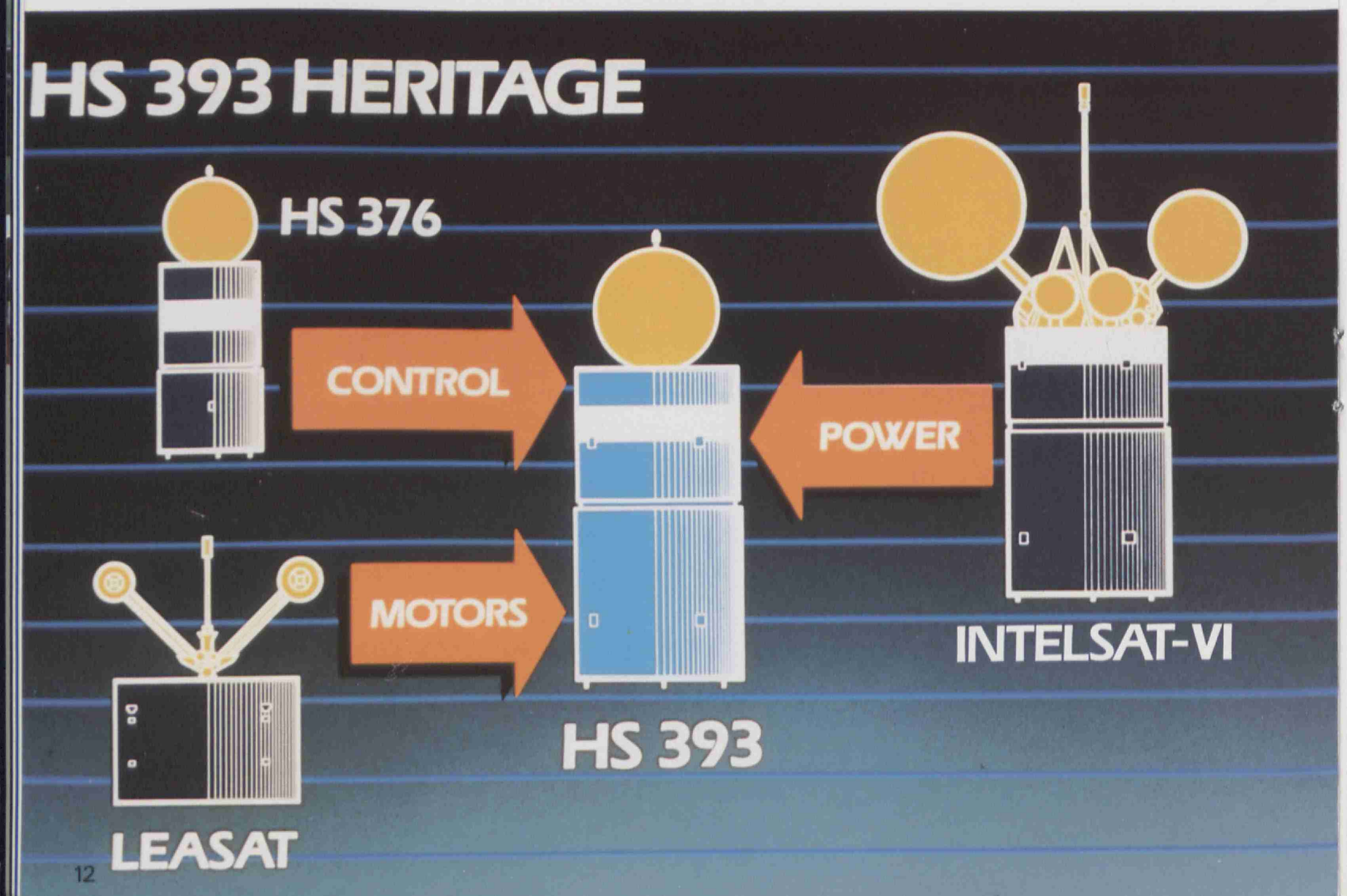
Through the use of horizontal and vertical polarization, the satellite's 500 MHz operating bandwidth may be divided into 32 channels of 27 MHz each.

The JCSAT spacecraft design is built upon an unequaled heritage of Hughes-built satellites. Among the areas in which the JCSAT satellite incorporates proven technology from other flight-tested Hughes spacecraft are:

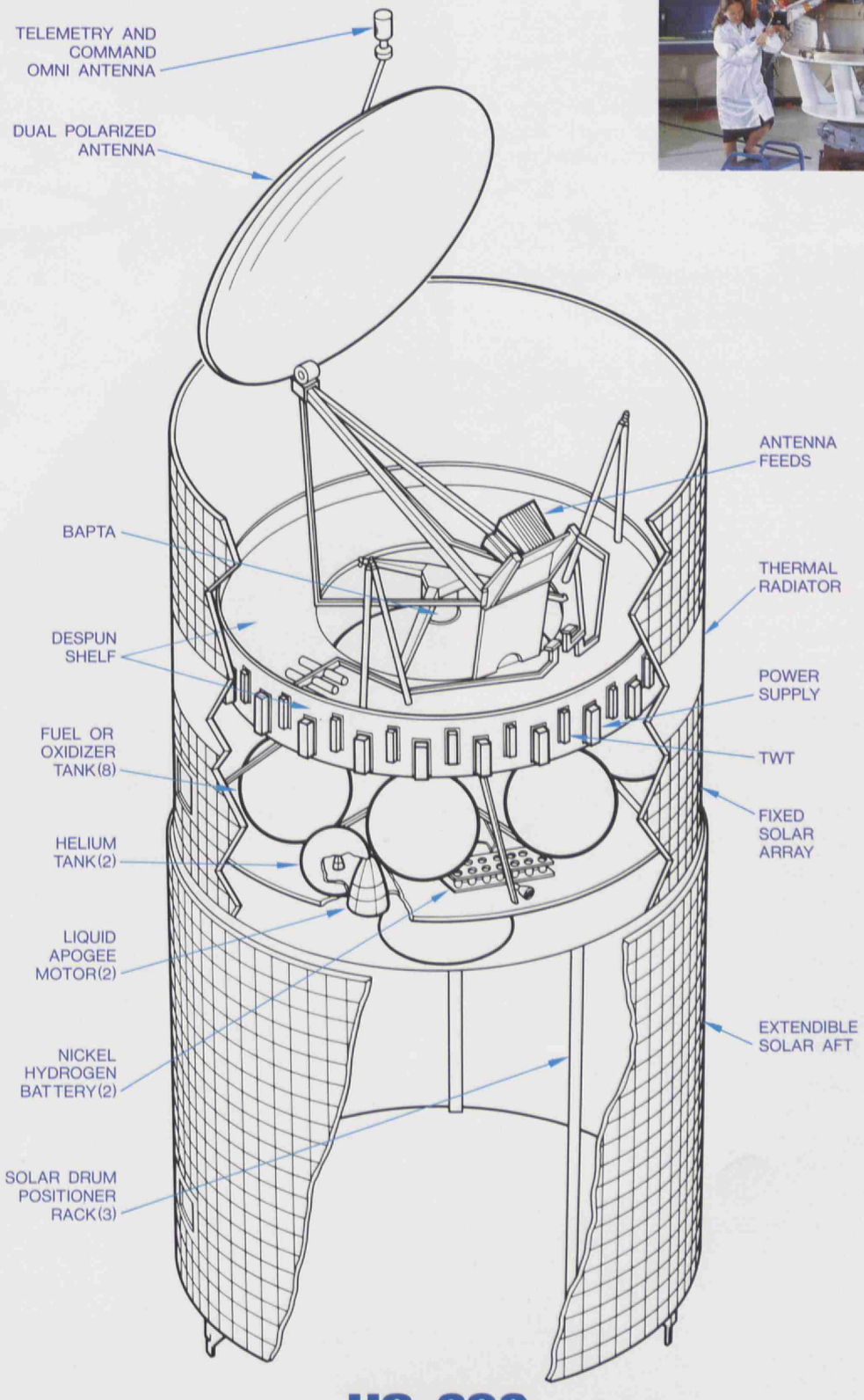
Control The HS-393 control system is based upon that used in the HS-376 series, Hughes Aircraft's best-selling satellite series. With over 34 HS-376 satellites sold as of April, 1985, the reliability of the HS-376 control system has been shown to be superb.

Motors The solid-fuel perigee kick motor (PKM) to be used by the HS-393 for Titan III launches was first used by the Leasat satellite, Hughes' UHF-band military communications spacecraft. Four out of four successful firings of this motor have demonstrated its high degree of reliability.

Power The power subsystem of the HS-393 is a similar design to that used in the Intelsat VI satellite, a spacecraft with approximately the same power requirements as the HS-393. By the time of the first JCSAT launch, over 3 Intelsat VI satellites will have been launched.



Internal View of JCSAT-1



HS-393

TT & C

Although a geosynchronous satellite appears to be motionless when viewed from a point on the earth, it is in fact orbiting the earth at a height of 36,000km above the equator at a speed of 11,000km per hour. Because of the gravitational effects of the earth, moon, and sun, periodic micro-adjustments must be made to the satellite's orbit in order to keep the satellite at its correct orbital position. This function will be performed by personnel at JCSAT's Tracking, Telemetry and Control (TT & C) station. Two TT & C stations, one primary and the other back-up, have been constructed in Yokohama and Gunma.

In addition to tracking the satellites and relaying commands to control its position, the TT & C stations will be used to continuously monitor the general health and performance of the JCSAT spacecraft.

- Primary Station/Monitoring Station

Yokohama Satellite Control Center
Address: 229-1 Miho-cho Midori-ku, Yokohama-shi, Kanagawa
Antenna Diameter: One 11m Full Motion Antenna,
Two 5.5m Limited Motion Antennas
Uplink Power: 2kW, 400W

- Back-up Station

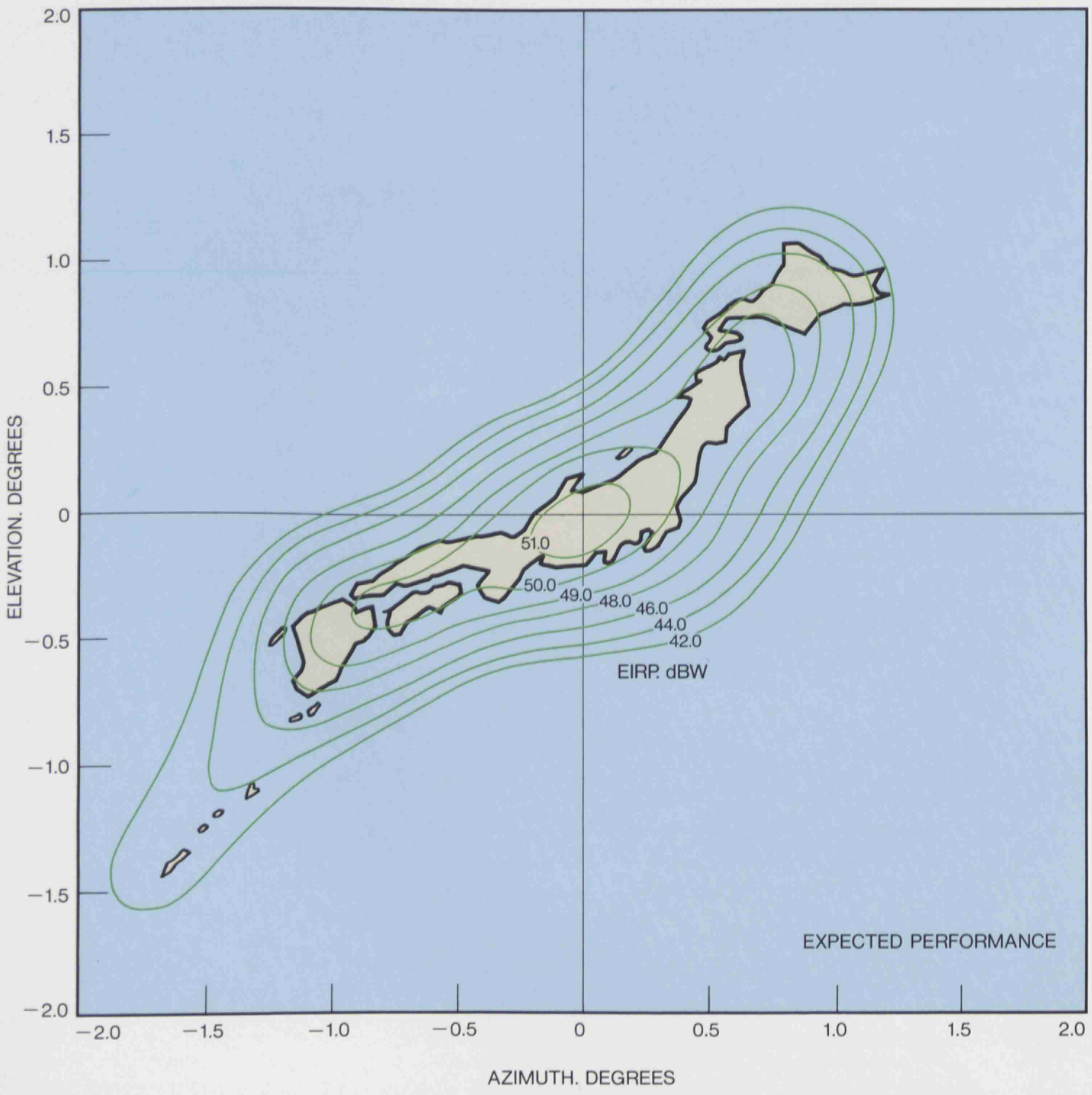
Gunma Satellite Control Station
Address: 3590-1 Momoizumi Aza Arai Oh-aza Sinto-mura
Kita-Gunma-gun Gunma
Antenna Diameter: Two 5.5m Limited Motion Antennas
Uplink Power: 400W

Gunma Satellite Control Station

Yokohama Satellite Control Center

EIRP

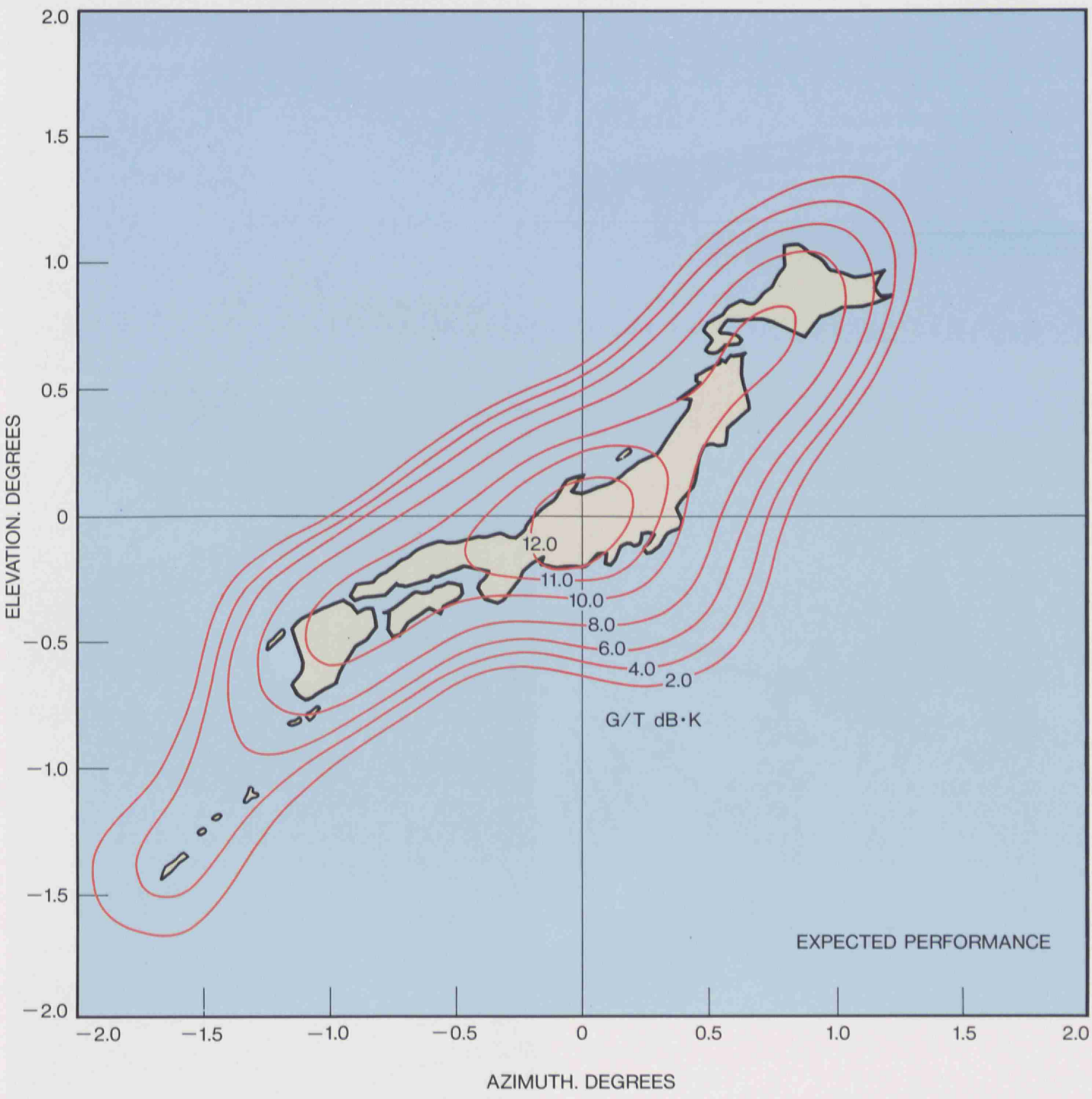
EIRP (Equivalent Isotropic Radiated Power) is a transmit power value expressed by the product of the transponder output power and the gain of the satellite transmit antenna. EIRP is expressed in units of dBW. Since the entire Japanese mainland may be covered by a single, high-gain spot beam, the EIRP performance of the JCSAT's will be comparable to the EIRP of broadcast satellites planned for some countries. The high EIRP value will allow for the efficient use of small antennas in satellite earth stations.



G/T

G/T (Gain Over Temperature) is a recieve gain value expressed by the ratio of the gain of the satellite receive antenna and the transponder input noise temperature. G/T is expressed in units of dB•K.

Since the entire Japanese Mainland may be covered by a single spot beam, and the size of satellite on-board antenna is large, the G/T performance of JCSAT is very good. The high G/T value will allow transmitting earth stations to have smaller antennas and less uplink power.

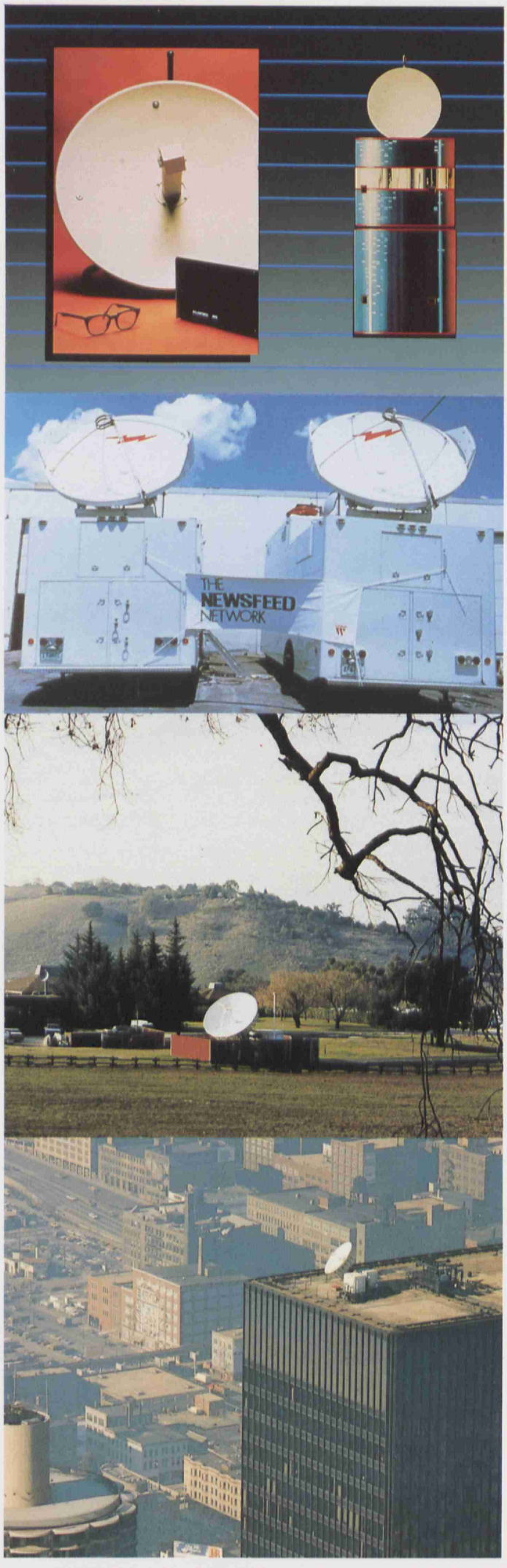


EXAMPLES OF PREDICTED UTILIZATION MODES

Purpose	Circuits per transponder	Size of antenna of earth station (m)	
		Transmission	Receive
FM-TV (TV redistribution)	1	6	4.5
FM-TV (CATV distribution)	1	6	1.5
FDM-FM (Telephone)	1 *1	6	6
QPSK (Digital transmission at 45 MBPS)	1 *2	4.3	4.3
QPSK (Digital transmission at 1.544 MBPS)	20	2.3	2.3
CSSBAM (Telephone)	1 *3	3.0	3.0

(*1) Equivalent to 1,860 one way telephone lines
(*2) When 32 KBPS Digital Speech Interpolation is used, equivalent to 2,100 one way telephone lines
(*3) No. of 5,750 one way telephone lines

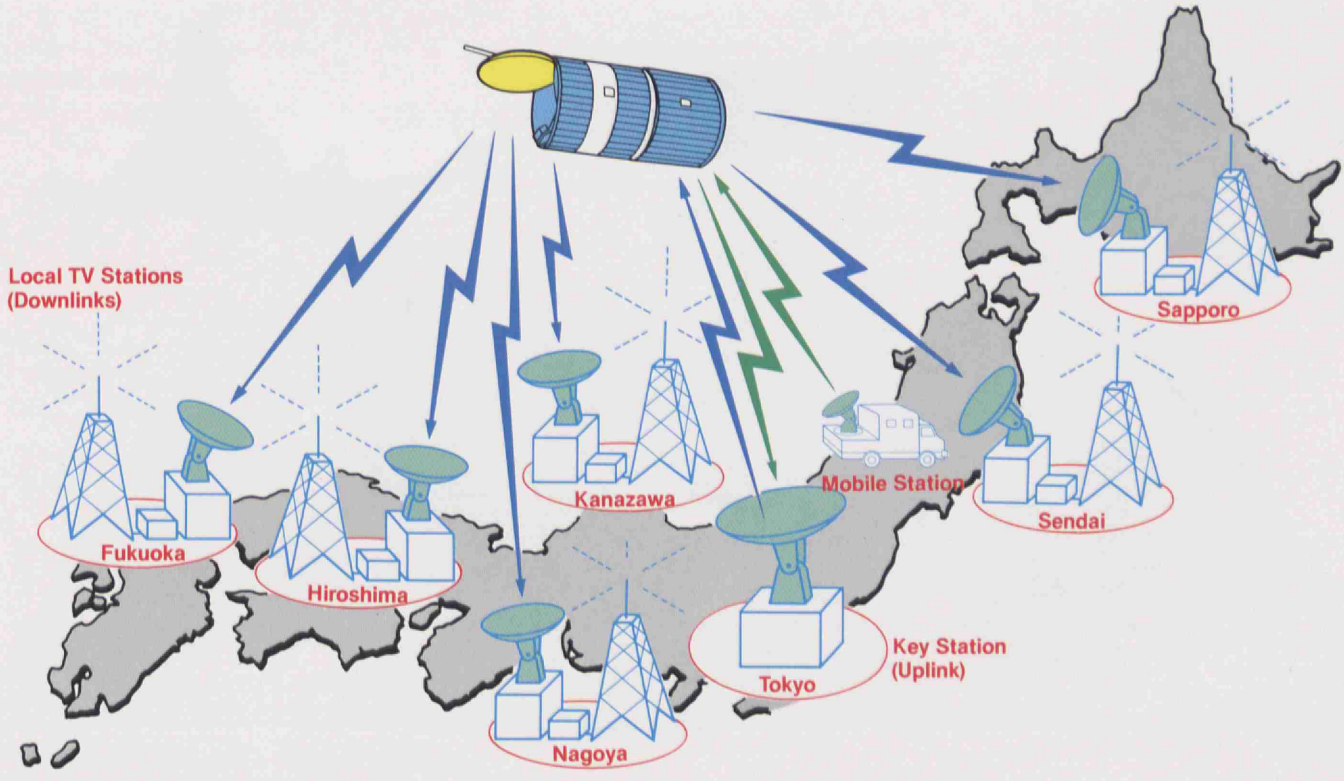
Further, the antenna diameter and the number of circuits per transponder vary with the availability and system performance.



TV Redistribution

- When the satellite is used for distribution and relaying of programs between television stations, a single transponder can transmit one channel of color full-motion television pictures.
- Typical Ground Station Parameters

Antenna Size: Uplink ····· 6m
Downlink ····· 5m (depends upon rain zone)
Uplink Power: 80—250W

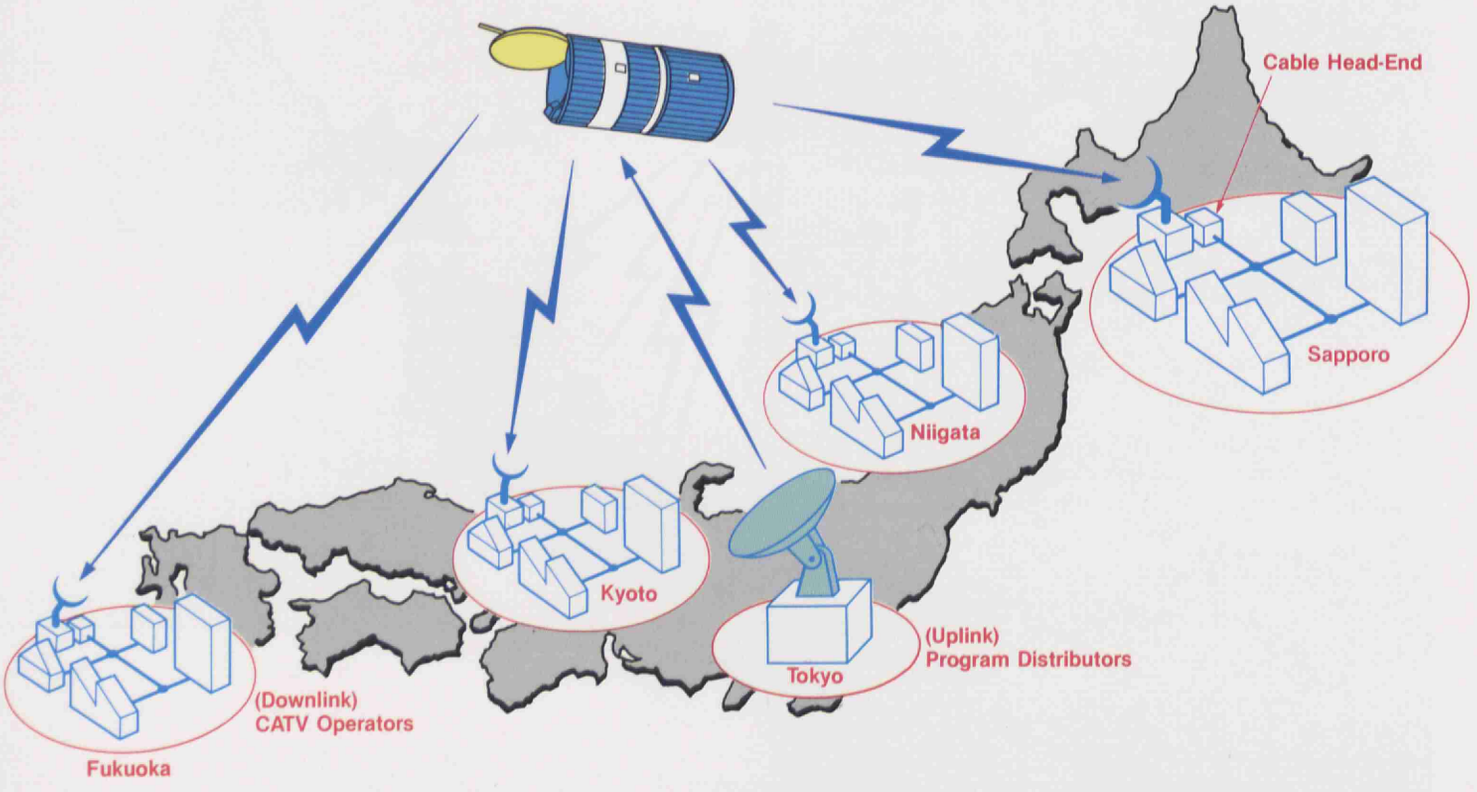


CABLE TV DISTRIBUTION

- When the satellite is used for distributing programs to CATV stations, a single transponder can transmit one channel of color full-motion television pictures.
- Typical Ground Stations Parameters

Antenna Size: Uplink 6m
Downlink ..... 1.3m (Sapporo)
..... 1.5m (Tokyo)
..... 1.7m (Fukuoka)

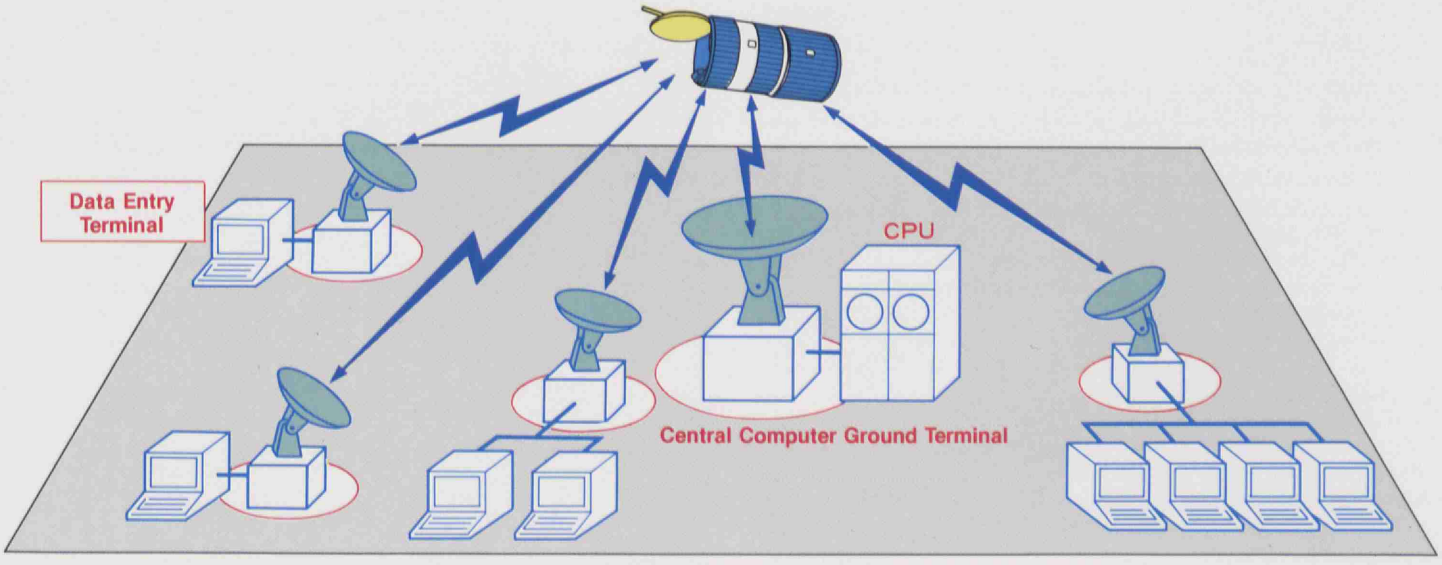
Uplink Power: 65W



DATA TRANSMISSION

- It is possible to transmit data by using small portion of a single transponder.
- Typical Service: Remote Data Entry Systems
- Typical Ground Station Parameters

Antenna Size ..... 0.6—2.5m (variable with transmitting volume)
Uplink Power ..... 1—3W



Private Customer Premise Networks

Because of the high transmit power of the JCSAT satellites, customer premise "rooftop to rooftop" communications are possible using relatively small earth station antennas. These customer premise networks may be implemented throughout Japan, including Okinawa.

As an example, for a multi-purpose network used for the transmission/reception of data, video-conferences, voice, etc., the required antenna diameter would typically be 2 to 3 meters. For a station to be used for reception purposes only, the required antenna diameter would be less than 2 meters.

Through the use of customer-premise earth stations, corporations, banks, and other business users can quickly establish efficient and flexible private communication networks between their offices in a very cost-effective manner. Similarly, hotels and multi-tenant office building developers have the opportunity of providing their customers with advanced communications capabilities, thus increasing the value of their service and property offerings.

Among the types of services which a customer-premise network can support are:

- **Data Transmission**

Utilizing an antenna of approximately 2 meters in diameter, up to 10 bidirectional data streams of 1,544 Mbps (T-1 rate) each can be transmitted. Through the use of advanced coding techniques, data singals may be received utilizing an antenna less than 60cm in diameter pointed through an office window.

- **Video Teleconferencing**

In order to reduce the time and expense associated with business meetings, an increasing number of businesses are expected to implement video-conference facilities. Since a video-conference signal may be transmitting at a data rate of 1,544 Mbps or less, multiple video-conferencing signals may be transmitted simultaneously over a single satellite transponder.

- **Remote Newspaper Printing**

By using a satellite to transmit newspaper text to local printing facilities, a newspaper may be printed simultaneously throughout the country. U.S. newspapers such as U.S.A. Today, the Wall Street Journal, and the New York Times use satellites to remotely publish their newspapers for distribution across the United States.

- **High-speed Facsimile (FAX) Transmission**

Satellites may be used to transmit documents via facsimile at data rates of 56 Kbps and higher. FAX copies comparable in quality to those produced using PPC can be obtained.

- **PCM Music Distribution**

High quality music programs can be transmitted by communications satellites. Number of channels which can be transmitted by one transponder simultaneously will change due to the antenna size and the quality of the music.

- **VSAT (Very Small Aperture Terminal)**

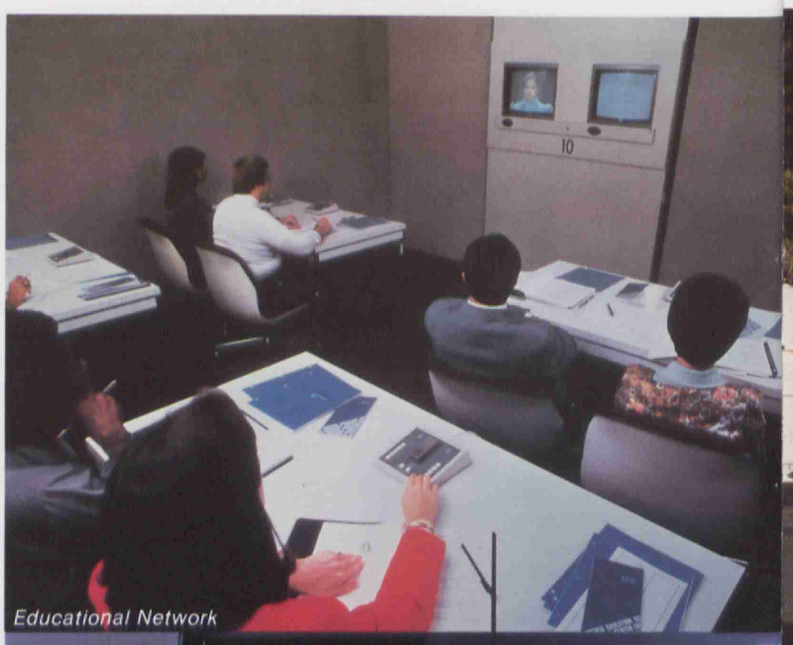
Using antennas smaller than 2m dia., it is possible to transmit up to 64kbps, including data, voice, facsimile and video conferencing.

- **SNG (Satellite News Gathering)**

Mobile uplink stations with aprx. 2m dia. antenna can easily and quickly send live news pictures to the TV stations. Today, all three major TV networks and most of the local TV stations in the U.S. are using SNG to keep their competitive edge.

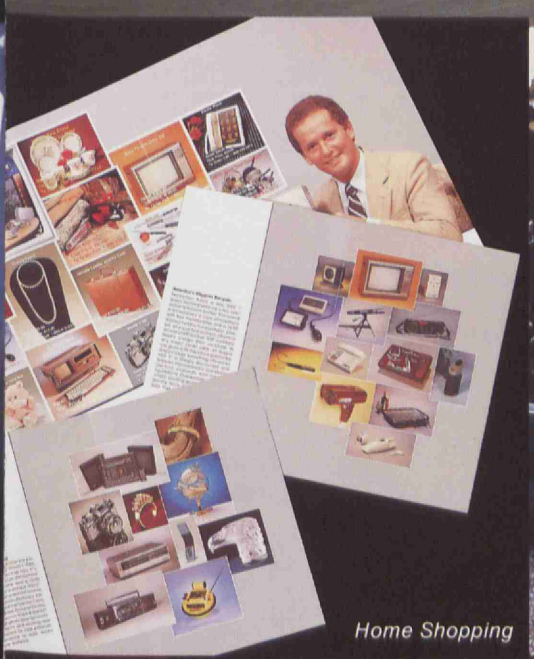
- **Educational Network**

One teacher at an educational broadcast center can teach thousands of students simultaneously, receiving questions from the students at remote areas.


Educational Network

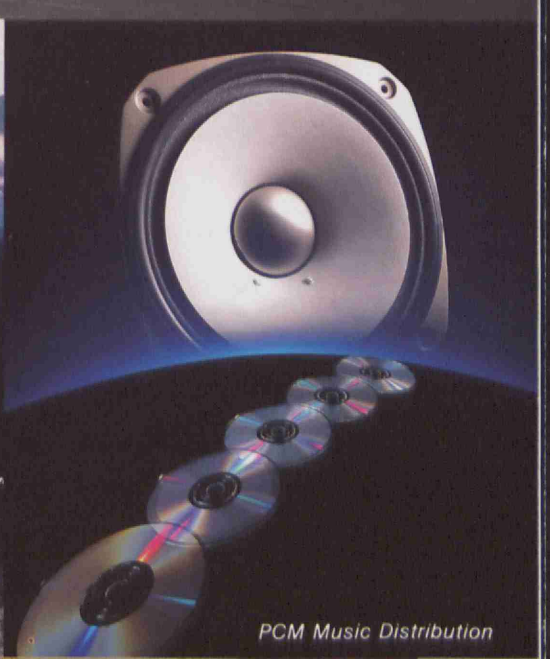
Data Transmission

Remote Newspaper Printing

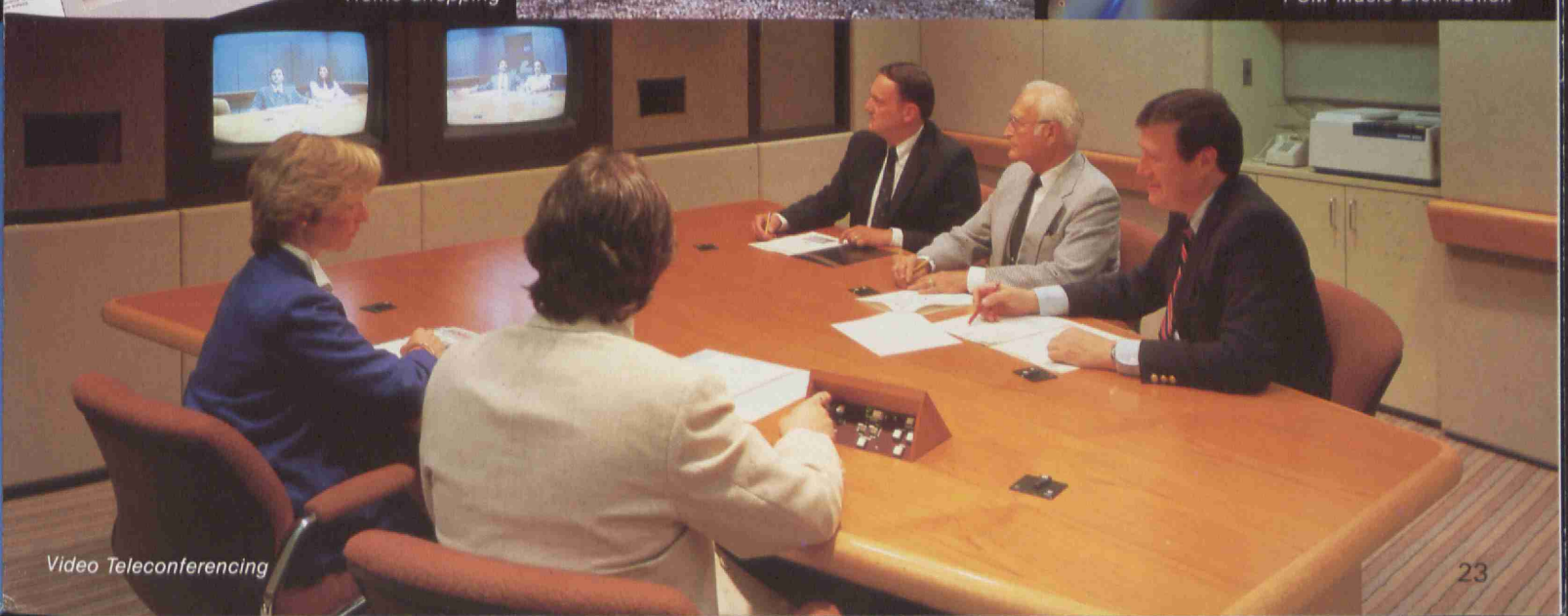


Home Shopping

VSAT



PCM Music Distribution



Video Teleconferencing

The following will be considered as a possible future step for providing multi-area services, utilizing communication satellites.

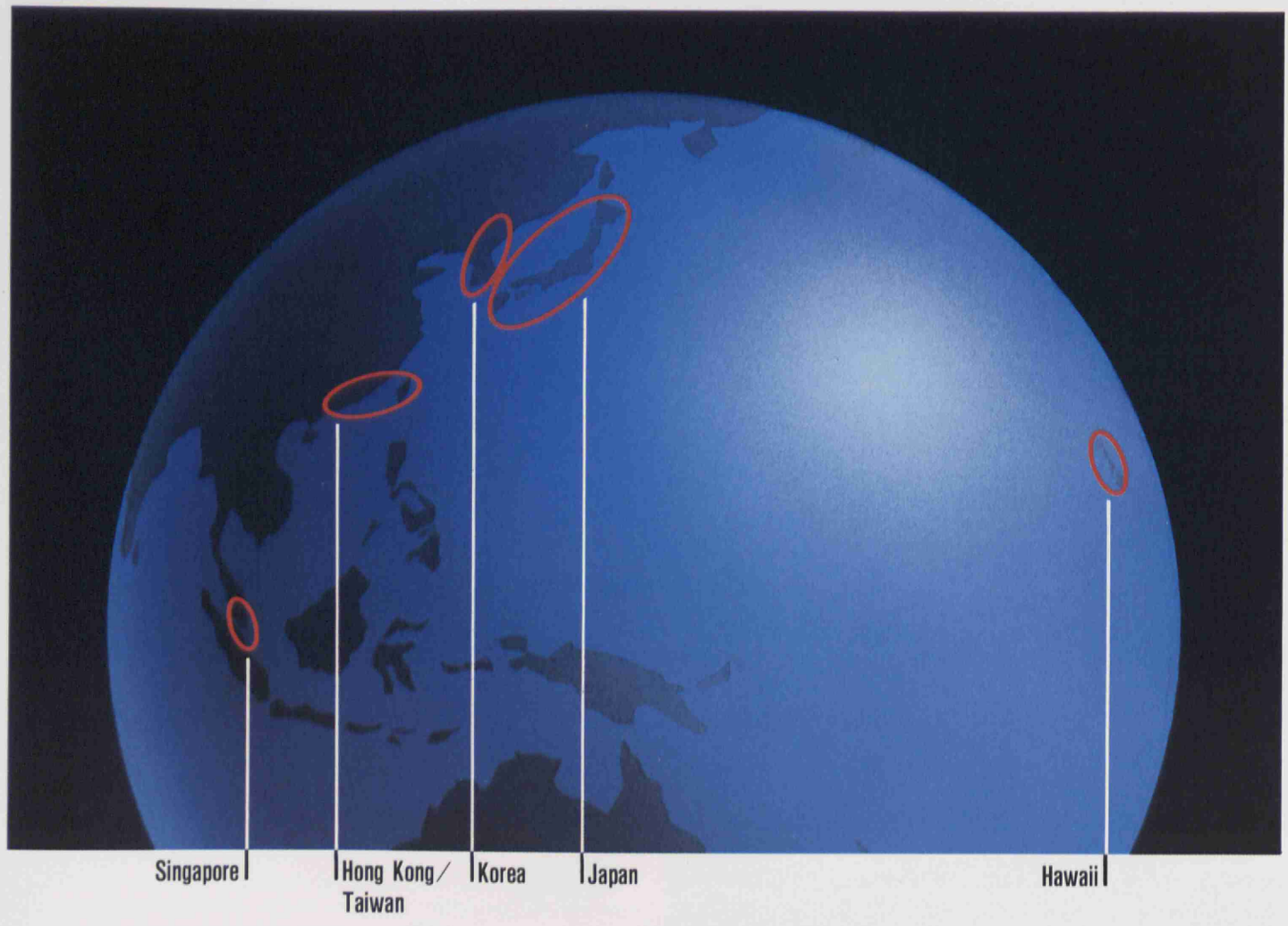
Multinational (Regional) Satellite Communications Services

Domestic communications satellites offer possibilities for sharing regional and international communications. EUTELSAT now provides such service to its 20 members in Europe using Ku band satellites. The Arab Satellite Communications Organization (ARABSAT) will provide interconnection among its 22 member countries as well as dedicated transponders for domestic services.

The Indonesian system-Palapa-provides dedicated transponders to neighboring countries in Southeast Asia—Thailand, Malaysia, and the Philippines—in addition to a small amount of interconnection. In 1983 the Federal Communications Commission authorized 24 transborder satellite services from the U.S. to other parts of the Western Hemisphere where they would not inflict economic harm on Intelsat. Sixty additional applications for transborder services are pending.

A domestic satellite system for Japan could be configured to provide regional communications service. Such a regional system might create a communications network between Japan and major urban business centers on the Asian mainland by using spot beams directed at Seoul, Taiwan, Hong Kong, and Singapore.

Regional Communications Satellite Services

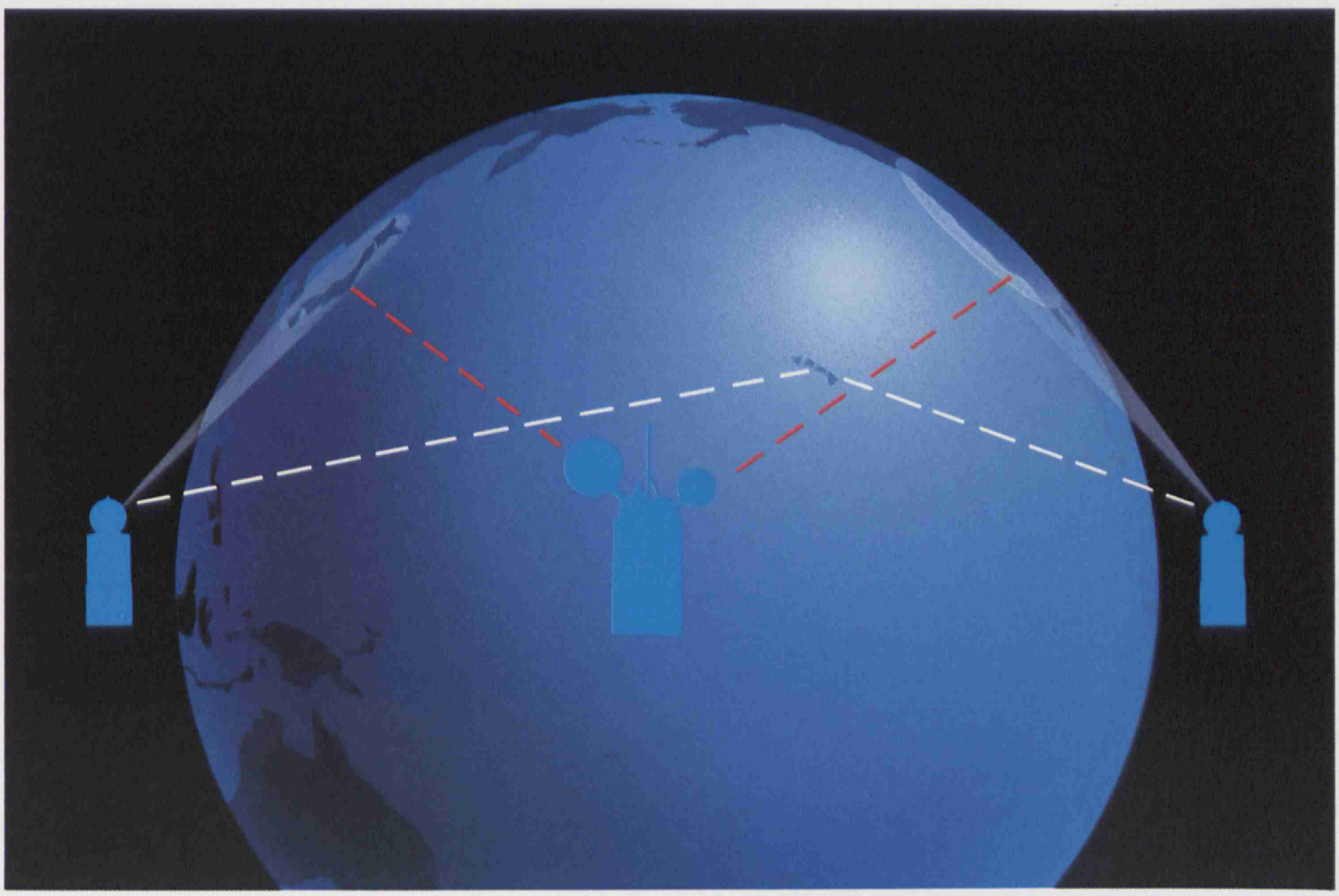


International Communications

The communications satellite network can be tied into the Pacific region Intelsat system through the Intelsat Business Service (IBS) to be provided by Intelsat spacecraft stationed over the Pacific. Access to the continental U.S. using other private satellite systems may be possible under certain international regulatory conditions. For instance, a link through a "double hop" from Tokyo to Hawaii to one of the U.S. domestic satellites, such as Galaxy, would provide data communications, video-conferencing, and voice circuits between the Pacific Basin and North America.

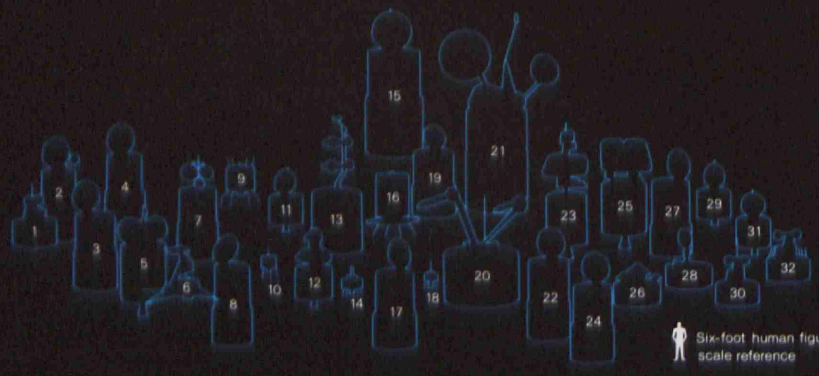
Satellite communications can serve as a backbone for an integrated domestic and international communications network linking dispersed foreign business sites to home offices and connecting the economic centers of nations in a time- and cost-efficient way.

International Communications

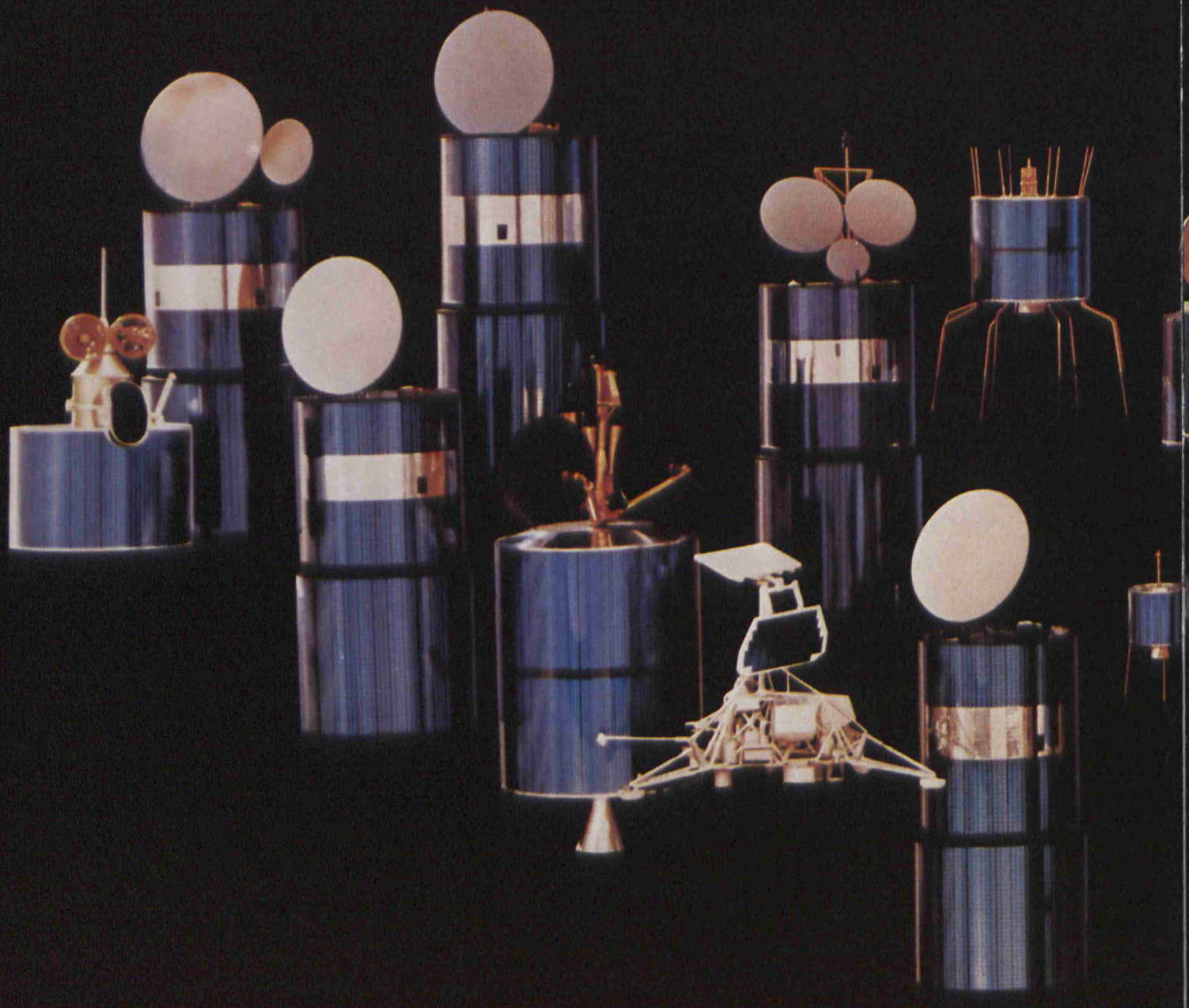


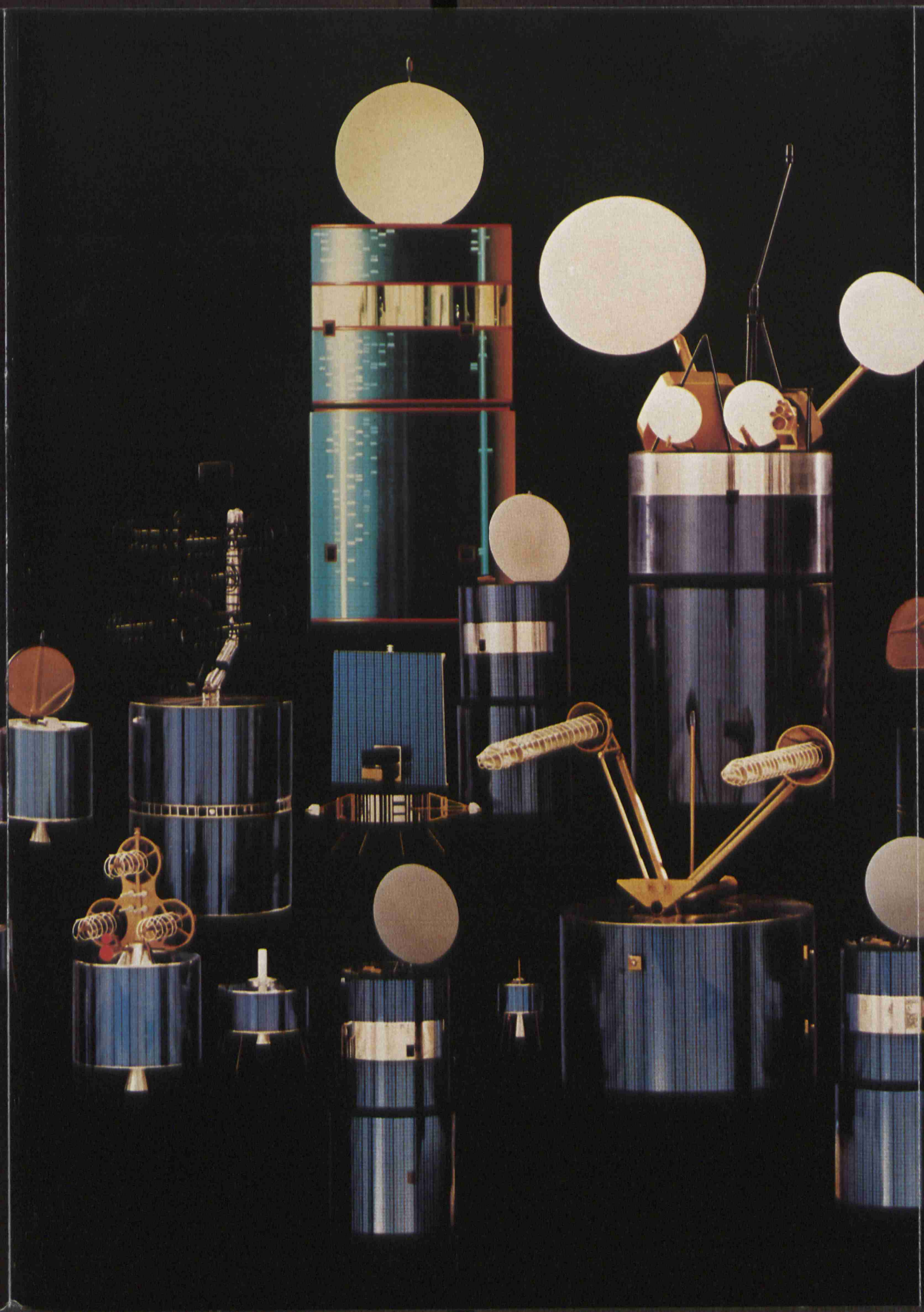
Hughes Family of Spacecraft

1 GOES D, E, F, G, H(USA)
2 SCT (MEXICO)
3 SBTS(BRAZIL)
4 GALAXY(USA)
5 INTELSAT IV
6 SURVEYOR(USA)
7 AUSSAT(AUSTRALIA)
8 SBS(USA)
9 ATS(USA)
10 INTELSAT I
11 ANIK A(CANADA)
12 MARISAT(USA)
13 TACSAT(USA)
14 INTELSAT II
15 HS 393*
16 OSO-8(USA)
17 ANIK D(CANADA)
18 SYNCOM(USA)
19 ANIK C(CANADA)
20 LEASAT(USA)
21 INTELSAT VI
22 TELSTAR 3(USA)
23 INTELSAT IV A
24 PALAPA-B(INDONESIA)
25 COMSTAR(USA)
26 PIONEER VENUS MULTIPROBE (USA)
27 WESTAR IV, V, VI, VII(USA)
28 PIONEER VENUS ORBITER(USA)
29 WESTAR I, II, III(USA)
30 GMS-2,3(JAPAN)
31 PALAPA-A(INDONESIA)
32 GMS-1(JAPAN)
INTELSAT ORGANIZATION



Six-foot human figure provides scale reference





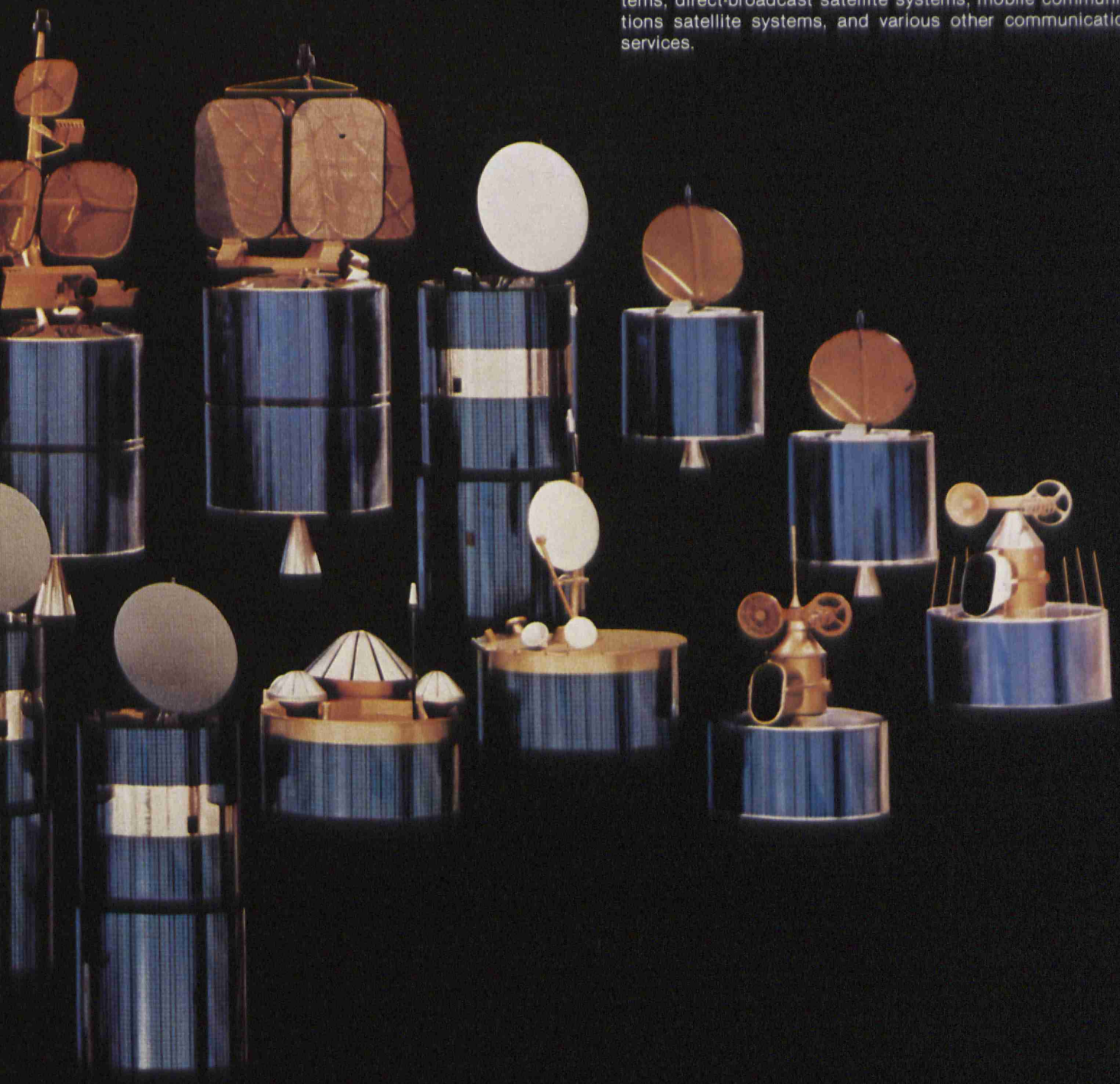
Hughes Aircraft Company

Hughes Aircraft Company is a leading aerospace electronics manufacturer with over 70,000 employees and annual sales of approximately US$ 5 billion (1984). Its Space and Communications Group, the division responsible for Hughes' commercial satellite programs, employs over 8,000 persons and has annual sales of approximately US$ 1 billion.

Since the launching of the world's first geosynchronous communications satellite, SYNCOM, in 1965, Hughes has manufactured approximately 60 commercial satellites. It has captured more than 50% of the world commercial communication satellite market.

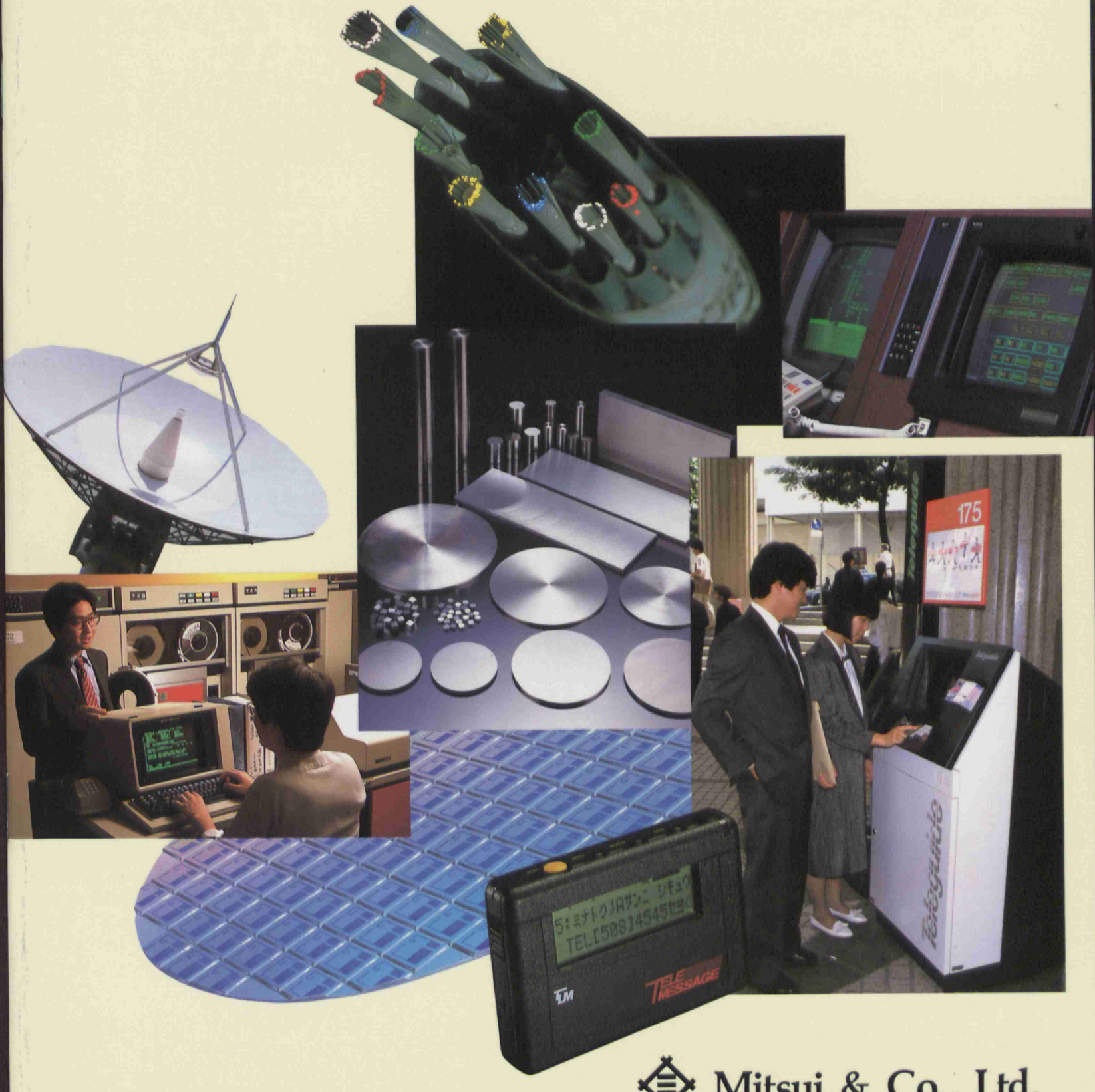
Customers for Hughes built satellites include not only U.S. firms such as ATT, COMSAT General, Western Union and SBS, but also INTELSAT and the governments of Indonesia, Australia, Canada, and Mexico.

In 1980, Hughes Aircraft expanded from a satellite manufacturer to a satellite operating company through the creation of Hughes Communications, Inc., a wholly owned subsidiary. Hughes Communications owns and operates the C-band Galaxy satellite system and the military communications LEASAT satellite system. Hughes Communications is also actively involved in the development of Ku band satellite systems, direct-broadcast satellite systems, mobile communications satellite systems, and various other communications services.



Japan Communications Satellite Company, Inc.
7th Fl., No.40 Mori Bldg., 5-13-1, Toranomon, Minato-ku, Tokyo 105 Phone 03(432)5661

Mitsui: Capabilities and Organization of the Information Business and Electronics Group



Mitsui & Co., Ltd.

Contents

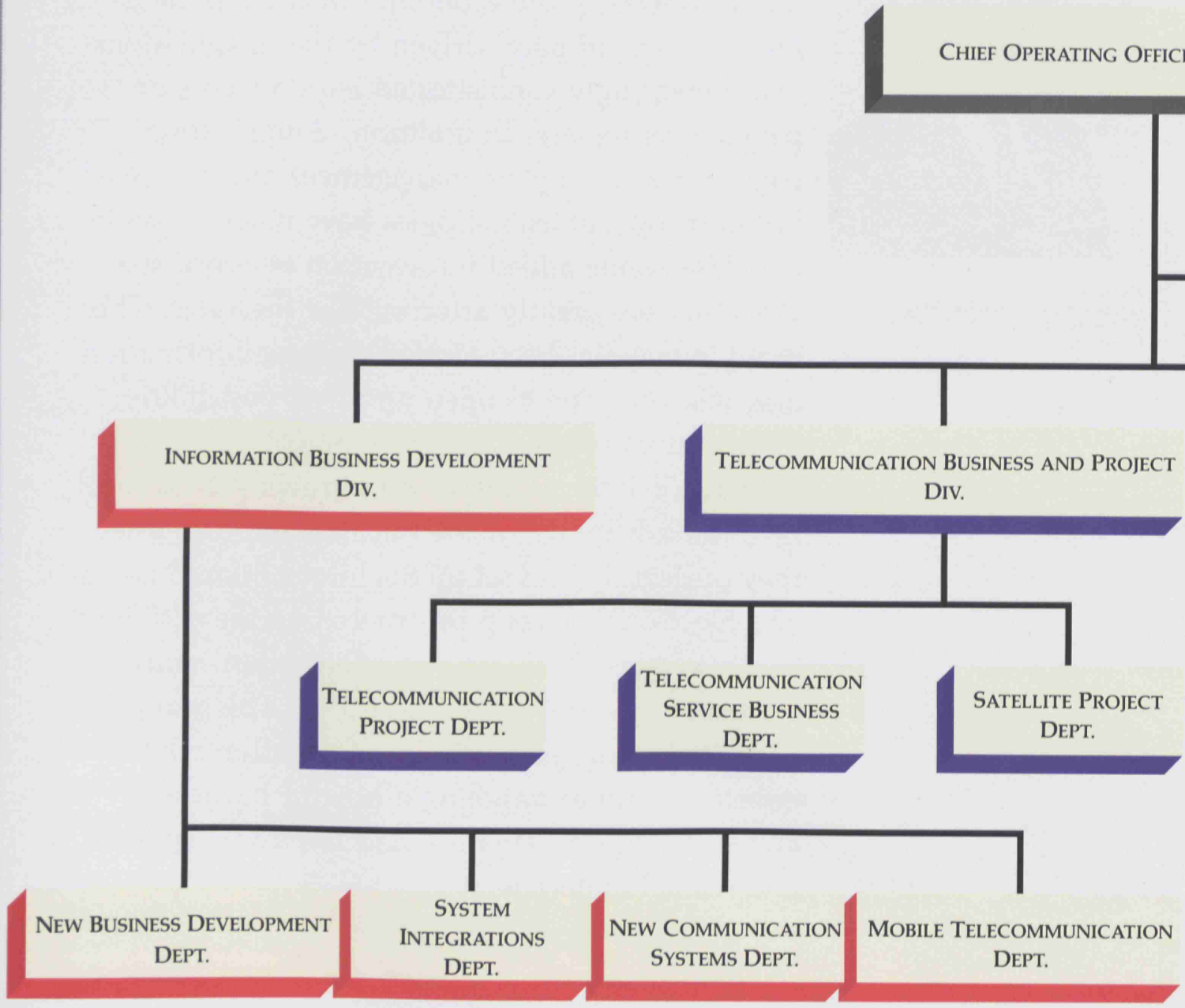
MESSAGE FROM MANAGEMENT

Kazuo Sato,
Director; Chief Operating Officer,
Information Business and Electronics Group

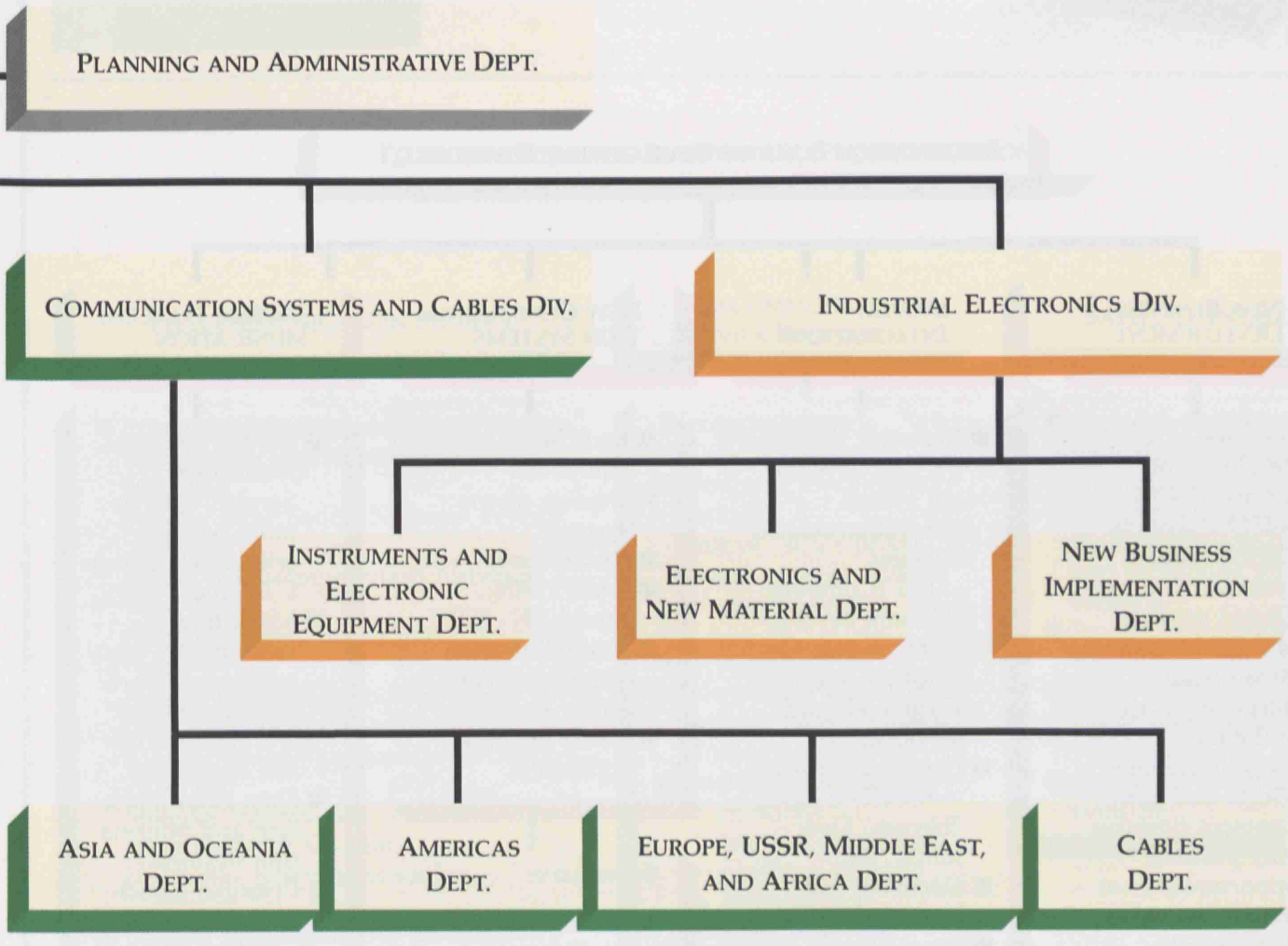
Created out of human need, the information industry worldwide—which exerts enormous impact on all aspects of the economy—will continue to grow at a rapid pace, driven by the imaginations and increasingly sophisticated requirements of people everywhere. In addition, digitalization, computerized network management and the evolution of optical technologies have made possible new high-value-added information network services that are greatly affecting our lifestyles. This trend, which has been termed the new information age, will continue to open up novel possibilities in all sectors of the world economy.

In April 1986, to respond to growing needs and take full advantage of the business opportunities they present, Mitsui set up the Information Business and Electronics Group by combining the activities and resources of its various information- and electronic systems-related divisions. The group is dedicated to participating in information-related industries and to handling a host of hardware and software, information and electronic systems, and related materials.

Organization Chart of the Information Business and Electronics Group



OF THE GROUP


PLANNING AND ADMINISTRATIVE DEPT.
COMMUNICATION SYSTEMS AND CABLES DIV.
INDUSTRIAL ELECTRONICS DIV.
INSTRUMENTS AND ELECTRONIC EQUIPMENT DEPT.
ELECTRONICS AND NEW MATERIAL DEPT.
NEW BUSINESS IMPLEMENTATION DEPT.
ASIA AND OCEANIA DEPT.
AMERICAS DEPT.
EUROPE, USSR, MIDDLE EAST, AND AFRICA DEPT.
CABLES DEPT.

Mitsui is the best partner in Japan for the marketing, sale, installation and maintenance of communication equipment. ADAM NET Ltd. is 100% owned by Mitsui and the excellent distributor of Network Equipment (including Digital PABX, MUX and Inter-LAN) in Japan.

INFORMATION BUSINESS DEVELOPMENT DIVISION

This division is engaged in system integration-related business and is promoting marketing activities for mobile telecommunications, such as radio paging and cellular telephones, and other new communication systems and equipment.

Development of new information business is one of its important targets.

INFORMATION BUSINESS DEVELOPMENT DIVISION

NEW BUSINESS DEVELOPMENT

- Business development towards ISDN, B-ISDN services
- Digital cellular systems
- Digital cordless and CT III systems
- Broad band integrated voice and data communications
- Media and entertainment business
- Any business opportunities not covered by other departments

SYSTEM INTEGRATIONS

- Planning, consulting and developing system integration-related business
  —BSI (Computer software development)
  —Tokyo Teleguide Corp. (Teleguide services), etc.
- Database services
  —KISCO (Nikkei Telecom, Dow Jones), etc.
- Electronic billboard business
- Internetwork equipment, Modem, Voice logging recorder, Message switching equipment

NEW COMMUNICATION SYSTEMS

- Switching equipment
- Dealing phone systems
- Multiplexers
- LAN/WAN, Inter-LAN, FDDI
- Communication terminals (FAX, Pager, etc.)
- Other network equipment

Subsidiary:

- **ADAM NET Ltd.**

Located in Tokyo, Osaka and Fukuoka

Marketing, selling, installing, servicing and systems engineering of communications and network equipment

MOBILE TELECOMMUNICATION

- Mobile Telecommunication Service, such as radio paging, cellular telephones, CT-2 and PCN
- Marketing of radio pagers, car telephones, portable telephones and digital cordless telephones
- Data communication and information business
- Principal associated companies:
  Tokyo Telemessage Inc.
  Nippon Idou Tsushin Corp.

The Telecommunication Business and Project Division played a vital role in establishing Tokyo Telecommunication Network Co., Inc. (TTNet), in March 1986, with Tokyo Electric Power Co. and Mitsubishi Corporation. TTNet serves a large area in and around Tokyo and employs such sophisticated technology as this computerized automatic maintenance control system equipped with a digital switching center.

TELECOMMUNICATION BUSINESS AND PROJECT DIVISION

Investment and promotional activities in the telecommunications field, including domestic and international telecommunications and cable television, are the focus of this division.

It is also engaged in such new business fields as telemarketing, planning events and other creative business activities that are expected to enrich the quality of life in a highly developed communications-based society.

Satellite communications are vital to the future development of Japan's telecommunications industry.

TELECOMMUNICATION BUSINESS AND PROJECT DIVISION

TELECOMMUNICATION PROJECT

- Promoting telecommunications projects with Japan's electric power companies, including:
  - Tohoku Information Network Service Co., Inc.
  - Tokyo Telecommunication Network Co., Inc.
  - Chubu Telecommunications Company, Inc.
  - Kansai Telecom Technology Corp.
  - Osaka Media Port Corp.
  - Kyushu Telecommunication Network Co., Inc.
  - Shikoku Information Telecommunication Network Co., Inc.
  - Hokkaido Telecommunication Network Co., Inc.
- Sales of equipment and materials related to telecommunications services to electric power companies and to joint venture companies
- Sales of services to electric power companies, joint ventures and others
- Development of new business related to information and communication
- Assisting in the establishment and development of new business by the companies mentioned above

TELECOMMUNICATION SERVICE BUSINESS

Telecommunication Service Business

- Domestic telecommunications
  - Sale of NCC's private circuit services and telephone services
- CATV and events
- Development of telemarketing projects through Moshi Moshi Hotline Inc.
- International telecommunications
  - Promotion of telecommunications projects by International Telecom Japan Inc.
  - Promotion of enhanced-data telecommunications services

SATELLITE PROJECT

- Planning and developing various businesses and projects utilizing transponders of communications satellites and promoting related business
- Japan Communications Satellite Co., Inc.
- Japan Satellite Communications Network Corp.
- Skynet Communications Inc.

Mitsui's Communication Systems and Cables Division and NEC worked together on a large-scale microwave network project in Thailand, of which the TOT Ayutthaya microwave station tower is a part. This project was completed in September 1987.

COMMUNICATION SYSTEMS AND CABLES DIVISION

The main business of this division is the export and import of telecommunications equipment and systems, technology transfers and joint venture projects in various telecommunications fields, including power and communication cables and related products. It deals with the equipment and systems listed below.

The Communication Systems and Cables Division has two joint venture companies; Furukawa Industrial S.A. Produtos Eletricos, in Brazil, and Furukawa Electric Cables (Malaysia) Sdn., Bhd., both leading electric cables manufacturers in their respective countries. It also participates in NTT International Corp., a joint engineering venture established by NTT and other leading Japanese companies.

COMMUNICATION SYSTEMS AND CABLES DIVISION

EXPORT OF COMMUNICATIONS SYSTEMS AND EQUIPMENT

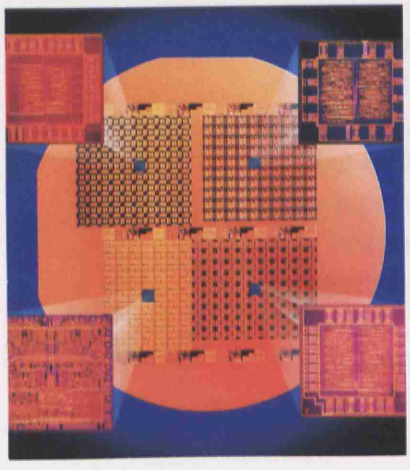
- Switching equipment
  Central office exchanges
  Private branch exchanges (PBXs)
  Key telephones
- Microwave link systems
- Satellite earth station systems
- Public telephones
- Optical fiber transmission systems
- TV and radio broadcasting systems
- Cellular phones/pagers
- Land mobile radios
- Facsimile machines
- Computerized integrated service network systems
- Radar systems
- Space satellite equipment

DOMESTIC, IMPORT/EXPORT AND OVERSEAS SALES OF CABLES AND RELATED PRODUCTS

- Aluminum conductor steel reinforced
- Insulated power cables
- Telephone cables
- Coaxial cables and connectors for CATV
- Optical fiber and optical fiber cables
- Optical ground wires
- Submarine cables

INDUSTRIAL ELECTRONICS DIVISION

Through a technical tie-up between Mitsui and European Silicon Structures (ES2), Bussan Electronic Systems Technology, Inc., is actively marketing ES2's Custom LSIs and automated IC design systems.



This division was set up to develop and expand sales of industrial electronics equipment and materials, both hardware and software.

These include measuring instruments; semiconductor design, testing and manufacturing equipment; graphics computers and peripherals; and silicon wafers, III-V compound wafers and other metal-based new materials.

Business is composed primarily of domestic sales, but also includes exports and imports as well as a continuous search for and development of new business. The division also carries out equity investments to enhance its ability to grasp larger business opportunities.

INDUSTRIAL ELECTRONICS DIVISION

INSTRUMENTS AND ELECTRONIC EQUIPMENT

- Measuring instruments and other electronics equipment
- Design, manufacturing and testing of equipment and instruments for semiconductors and other electronics devices
- Personal computer peripherals and applications software
- Laser-based equipment

ELECTRONICS AND NEW MATERIAL

- Silicon ingots and wafers, GaAs, InP and GaP wafers, and $LiTaO_3$ and $LiNbO_3$ wafers
- High-purity germanium oxide and metals and rare earth
- Calcia-refined sputtering targets and amorphous metals
- SiC CVD surface coating
- EMI-shielding systems and materials
- Water measuring equipment and systems
- LSI cards

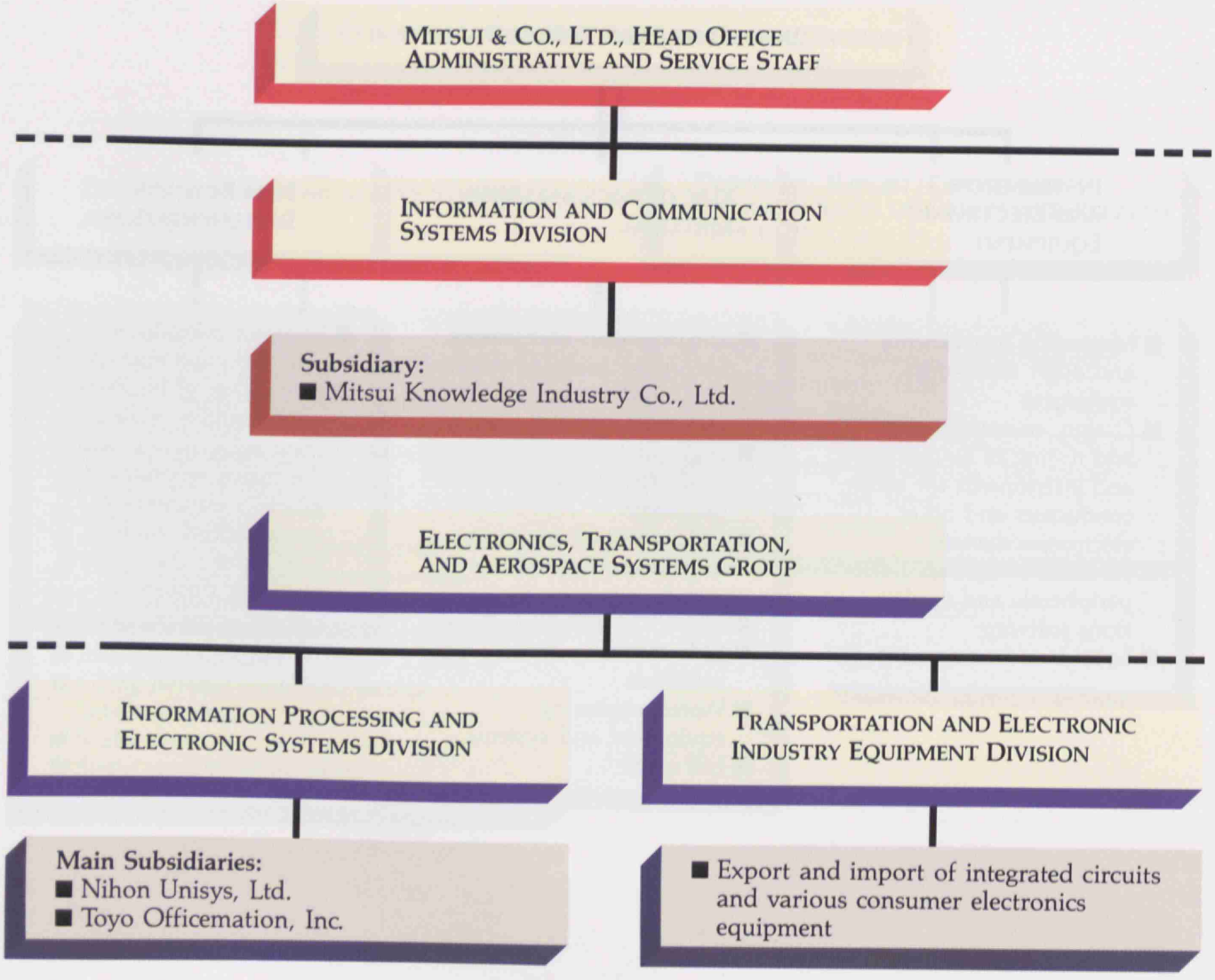
NEW BUSINESS IMPLEMENTATION

- Strategic subsidiaries' operation and management
- Promotion of business opportunities related to these subsidiaries, with the major emphasis on graphics engineering workstations, such as CAD and CAE systems and Asic business

OTHER RELATED DIVISIONS

Mitsui has other divisions related to the information and electronics businesses. The Electronics, Transportation, and Aerospace Systems Group is involved in domestic sales of UNISYS computers through Nihon Unisys, Ltd., and also handles OEM export of personal computers and the export and import of integrated circuits and consumer electronics equipment.

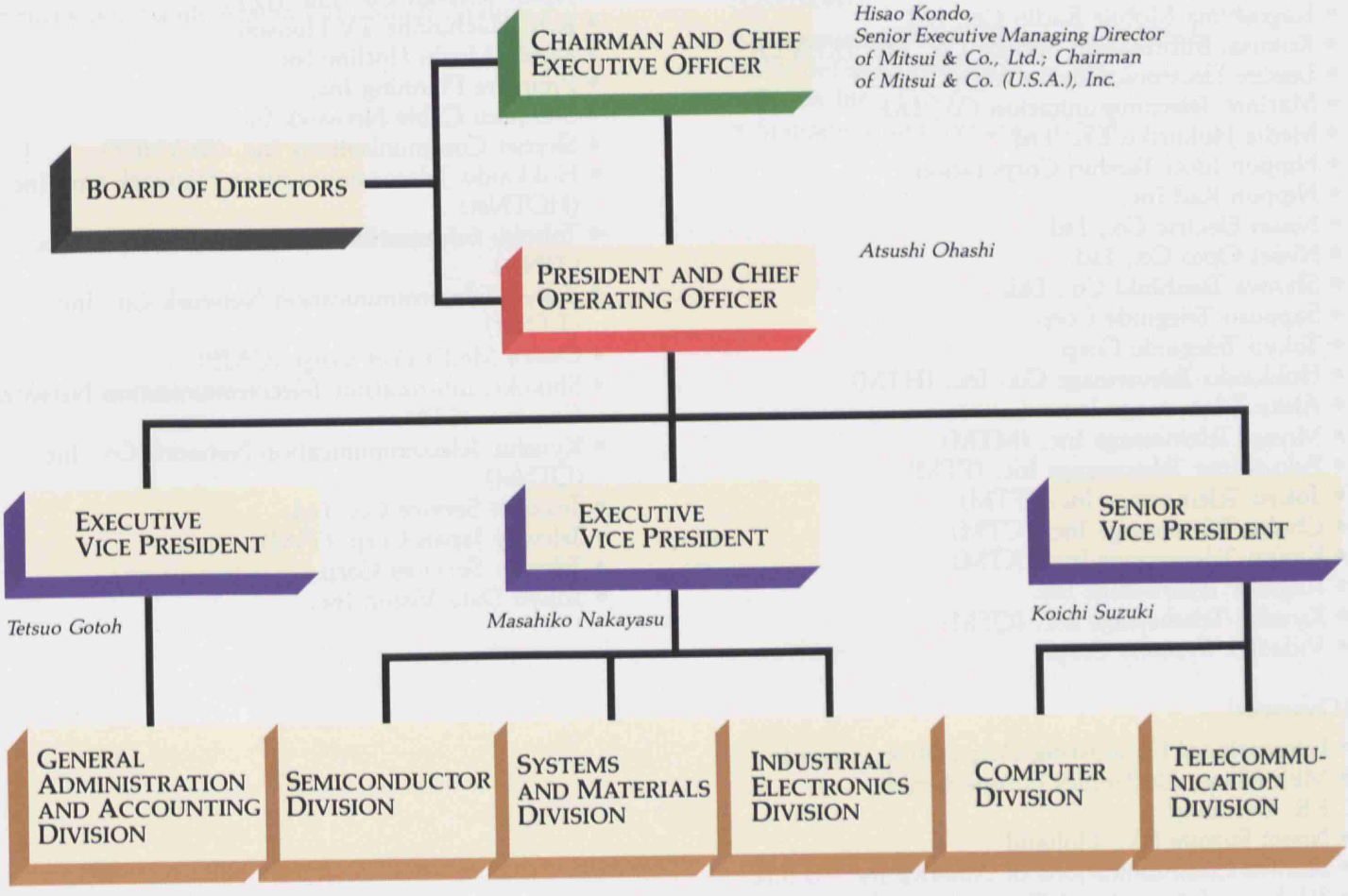
The Information and Communication Systems Division is responsible for data transmission and processing, systems development, computer systems control and maintenance, and the construction of communications networks.



MITSUI COMTEK CORP.

Mitsui Comtek Corp., headquartered in Saratoga, California, was established in August 1986 with an 80% capitalization by Mitsui & Co. (U.S.A.), Inc., and the remaining 20% by Mitsui & Co., Ltd. The Company handles electronics- and information-related business in the United States.

It has established an extensive, nationwide network supported by branch offices in New York and Chicago.



Headquarters:
12980 Saratoga Avenue, Suite B,
Saratoga, CA 95070, U.S.A.
Tel: (408) 725-8525

OUTLINE OF MITSUI'S PRINCIPAL INVESTMENTS IN THE GROUP'S FIELD

INFORMATION BUSINESS DEVELOPMENT DIVISION

[Domestic]

- ADAM NET Ltd.
- ASCII Information Systems Corp.
- AT&T Jens Corp.
- Bussan System Integration Co., Ltd. (BSI)
- Hokkaido Cellular Telephone Company
- Tohoku Cellular Telephone Company
- Hokuriku Cellular Telephone Company (HCT)
- Kansai Cellular Telephone Company (KCT)
- Chugoku Cellular Telephone Company (CCT)
- Shikoku Cellular Telephone Company (SCT)
- Kyushu Cellular Telephone Company (QCT)
- Japan Citymedia Inc.
- Kagoshima Mobile Radio Co., Ltd.
- Kokusai Information Service Co., Ltd. (KISCO)
- Leisure Electronics Technology Co., Ltd.
- Marinet Telecommunication Co., Ltd.
- Media Hokuriku Co., Ltd.
- Nippon Idou Tsushin Corporation
- Nippon Rad Inc.
- Nissei Electric Co., Ltd.
- Nissei Opto Co., Ltd.
- Shinwa Tsushinki Co., Ltd.
- Sapporo Teleguide Corp.
- Tokyo Teleguide Corp.
- Hokkaido Telemessage Co., Inc. (HTM)
- Akita Telemessage Inc.
- Miyagi Telemessage Inc. (MTM)
- Fukushima Telemessage Inc. (FTM)
- Tokyo Telemessage Inc. (TTM)
- Chubu Telemessage Inc. (CTM)
- Kansai Telemessage Inc. (KTM)
- Kagawa Telemessage Inc.
- Kyushu Telemessage Inc. (QTM)
- Videotex Systems Corp.

[Overseas]

- International Datacasting Corporation, Canada
- MEE Mitsui Electronics Europe Gmbh, F.R. Germany
- Nissei Europe B.V., Holland
- Shinwa Communications of America Inc., U.S.A.
- Telehouse International Corporation of America (Telehouse America), U.S.A.
- Uniden Canada Inc. (UCI), Canada

TELECOMMUNICATION BUSINESS AND PROJECT DIVISION

[Domestic]

- Chubu Telecommunications Company, Inc. (CTC)
- Computer Technology Integrator Co., Ltd. (CTI)
- Daini Denden Inc. (DDI)
- Global VAN Japan Inc.
- Kansai Telecom Technology Corp. (KTT)
- International Cable Network Corp. (ICN)
- International Telecom Japan Inc. (ITJ)
- Japan Business Television, Inc.
- Japan Communications Satellite Co., Inc. (JCSAT)
- Japan Satellite Communications Network Corp. (JSNET)
- Japan Telecom Co., Ltd. (JT)
- K.K. Hachinohe TV Housou
- Moshi Moshi Hotline Inc.
- Premiere Planning Inc.
- Shinjuku Cable Network Inc.
- Skynet Communications Inc. (SKYNET)
- Hokkaido Telecommunication Network Co., Inc. (HOTNet)
- Tohoku Information Network Service Co., Inc. (TINet)
- Tokyo Telecommunication Network Co., Inc. (TTNet)
- Osaka Media Port Corp. (OMP)
- Shikoku Information Telecommunication Network Co., Inc. (STNet)
- Kyushu Telecommunication Network Co., Inc. (QTNet)
- Telecom Service Co., Ltd.
- Teleway Japan Corp. (TWJ)
- Teleway Services Corp.
- Tokyo Data Vision Inc.

Communication Systems and Cables Division

[Domestic]

- Bussan Electric Machinery Trading Co., Ltd.
- Central Security Patrols Co., Ltd.
- K.K. Fujiden
- NTT International Corp.
- Sanyo Co., Ltd.

[Overseas]

- Furukawa Electric Cables (Malaysia) Sdn., Bhd., Malaysia
- Furukawa Industrial S.A. Produtos Eletricos, Brazil
- Furukawa Saudi Arabia Ltd., Saudi Arabia

Industrial Electronics Division

[Domestic]

- Admon Science Inc.
- Bussan Advanced Systems Inc.
- Bussan Electronic Systems Technology, Inc.
- Denkoh Co., Ltd.
- Denko Systems Inc.
- Komatsu Electronic Metals Co., Ltd.
- MBK Asyst Inc.
- MBK Microtek Inc.
- Tokyo Denshi Yakin Laboratory Inc.
- Tokyo Hi-Tech Corp.
- Tokyo Seimitsu Co., Ltd.

[Overseas]

- Integrated CMOS Systems Inc., U.S.A.
- PrairieTek Corporation, U.S.A.
- Semia Inc., U.S.A.
- Stardent Computer Inc., U.S.A.

COMPANY INFORMATION

MITSUI & CO., LTD.

2-1, Ohtemachi 1-chome,
Chiyoda-ku, Tokyo 100, Japan
Telephone: (03) 285-1111
(Effective January 1, 1991, the new telephone number will be (03) 3285-1111)
Cable: MITSUI TOKYO
Telex: J22253
Fax: (03) 285-9800
(Effective January 1, 1991, the new fax number will be (03) 3285-9800)

DATE OF FOUNDING

July 1, 1876

DATE OF ESTABLISHMENT

July 25, 1947

PAID-IN CAPITAL

¥175,116 million (As of June 30, 1990)

NUMBER OF EMPLOYEES

11,656 (As of March 31, 1990)

STOCK EXCHANGE LISTINGS

Tokyo, Osaka, Nagoya, Kyoto, Hiroshima, Fukuoka, Niigata, Sapporo, Luxembourg, Amsterdam and Frankfurt stock exchanges. American Depositary Receipts (ADRs) are traded over the counter through the NASDAQ System.

TRANSFER AGENT OF COMMON STOCK

The Mitsui Trust and Banking Co., Ltd.
1-1, Muromachi 2-chome, Nihonbashi,
Chuo-ku, Tokyo 103, Japan

DOMESTIC OFFICES

57 offices

OVERSEAS OFFICES AND OVERSEAS SUBSIDIARIES

80 overseas offices and 37 overseas subsidiaries with 84 offices. A total of 164 offices in 87 countries

OVERSEAS OFFICES

Beijing Office, Seoul Branch, Manila Branch, Singapore Branch, Representative Office in Indonesia (Jakarta) and 75 other offices

OVERSEAS SUBSIDIARIES

Mitsui & Co. (U.S.A.), Inc.,
Mitsui Brasileira Importação e Exportação Ltda.,
Mitsui & Co. Europe Ltd.,
Mitsui & Co. UK PLC,
Mitsui & Co. Deutschland GmbH,
Mitsui & Co. (Australia) Ltd.,
Mitsui & Co. (Canada) Ltd.,
Mitsui & Co. (Middle East) E.C.,
Mitsui & Co. (Hong Kong), Ltd.,
Mitsui & Co. (Taiwan) Ltd.,
Mitsui & Co. (Thailand) Ltd.
and 26 other subsidiaries

For further information, contact the
Planning and Administrative Department of
the Information Business and Electronics Group,
Mitsui & Co., Ltd.
2-1, Ohtemachi 1-chome,
Chiyoda-ku, Tokyo 100, Japan
Telephone: (03) 285-4630
(Effective January 1, 1991, the new telephone number will be (03) 3285-4630)
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Telex: J22253
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(Effective January 1, 1991, the new fax number will be (03) 3285-9925)

October 1990

MITSUI & CO., LTD.
2-1, OHTEMACHI 1-CHOME, CHIYODA-KU, TOKYO 100, JAPAN

Printed in Japan


SKYNET
COMMUNICATIONS

JCSAT (VIDEO BIRD)
HS-393
Height 10m Diameter 3.66m
Antenna Diameter 2.4m
Solar panel power output 2.2kw
Weight at geostaitonary orbit 1.37tons
No. of Transponders/Transponder Power 32/20watts
Available Transponder bandwidth 27MHz

P R I V A T E

&

R E A L T I M E

S A T E L L I T E

N E T W O R K

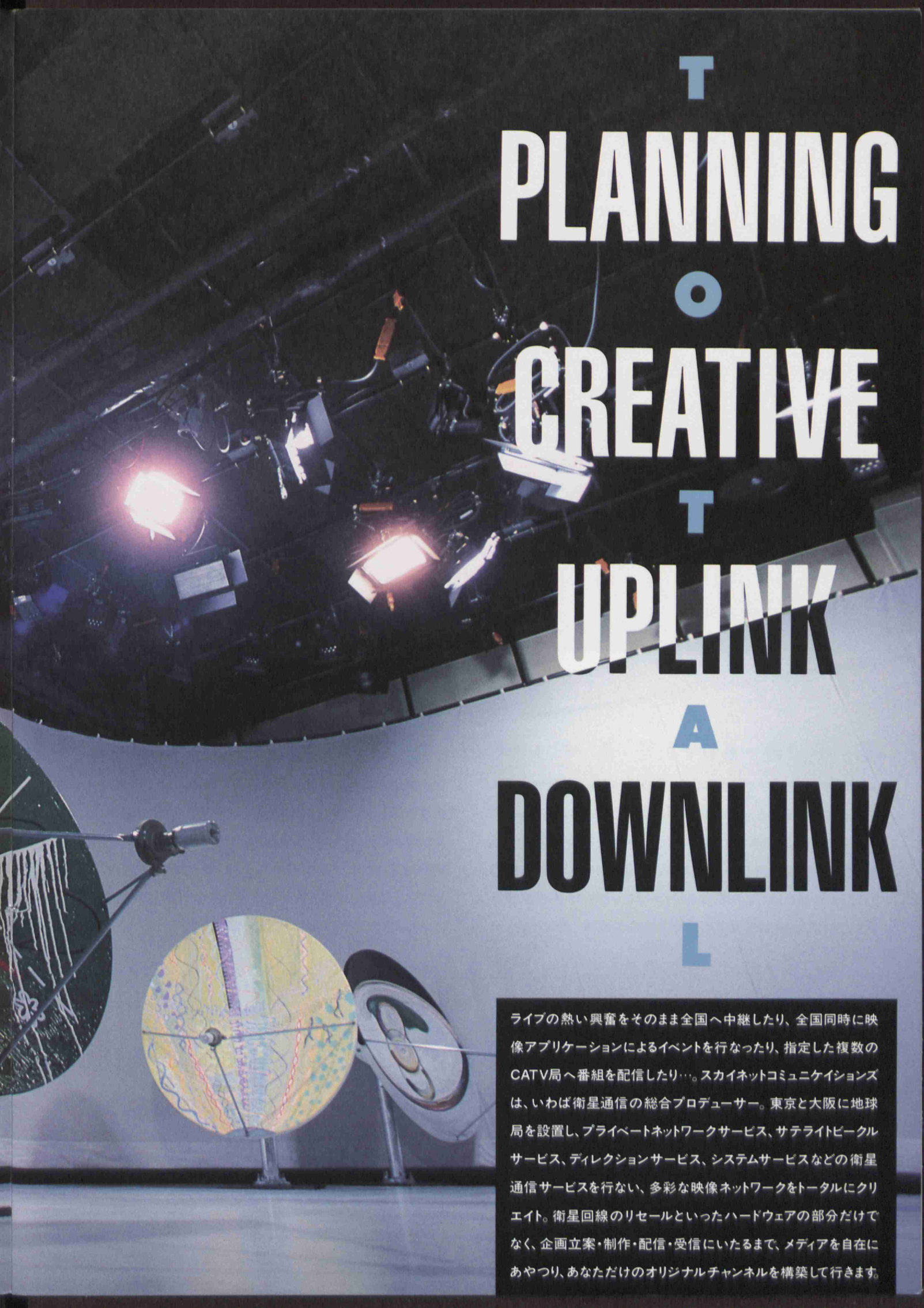
MESSAGE FROM THE C.E.O.

21世紀に向けての残された時間より早く、情報化時代の新世紀は始まろうとしています。ニューメディアをリニューアルする新しいメディア「衛星通信」。情報の伝達経路は地上から、赤道上空遥か3万6,000kmの大空へ……。

皆様ご承知の通り、1989年3月、日本初の民間通信衛星JCSAT-1が打ち上げられサービスが開始されました。ISDN(総合デジタル通信網)、VAN、パソコン通信などの地上系通信の発達と同時に、わが国は、衛星通信による空陸複合ネットワークの時代へと確実に動き始めています。この、さらに高度化して行く情報化社会のなかで、「同報性」「広域性」「大容量」を最大のメリットとする衛星通信による映像ネットワークは、私たちの生活に不可欠なコミュニケーションツールとなることでしょう。活字メディアだけでは伝えきれない膨大な情報を、的確に処理し、ビジネス戦略へと展開できるのは、映像によるイメージの力。そしてネットワーク化により、「距離」を失くした緊密なコミュニケーションの力だと言えるでしょう。新世紀のビジネスは、もう衛星通信抜きには語れないと言っても過言ではありません。私たちスカイネットコミュニケイションズでは、この貴重なメディアを身近にお使いいただけるよう、リアルタイムの映像ネットワークを企画段階よりフルにサポートしてまいります。そして、誰もが必要なとき必要なだけご利用になれるプライベートなネットワークを構築し、貴社だけのオリジナルチャンネルをご提供いたします。さらに、ただ単に衛星回線の供給といったハードウェアの部分にとどまらず、映像アプリケーションの企画から、実際の制作といったソフトウェアの部分も含めてトータルにお役に立ってまいります。いわば弊社は、衛星通信の総合プロデューサー。何卒あたたかいご支援ご鞭達を賜わりますよう心からお願い申し上げます。

代表取締役社長　山岡弘信

“スカイネットコミュニケイションズ”いわば衛星通信の総合プロデューサー



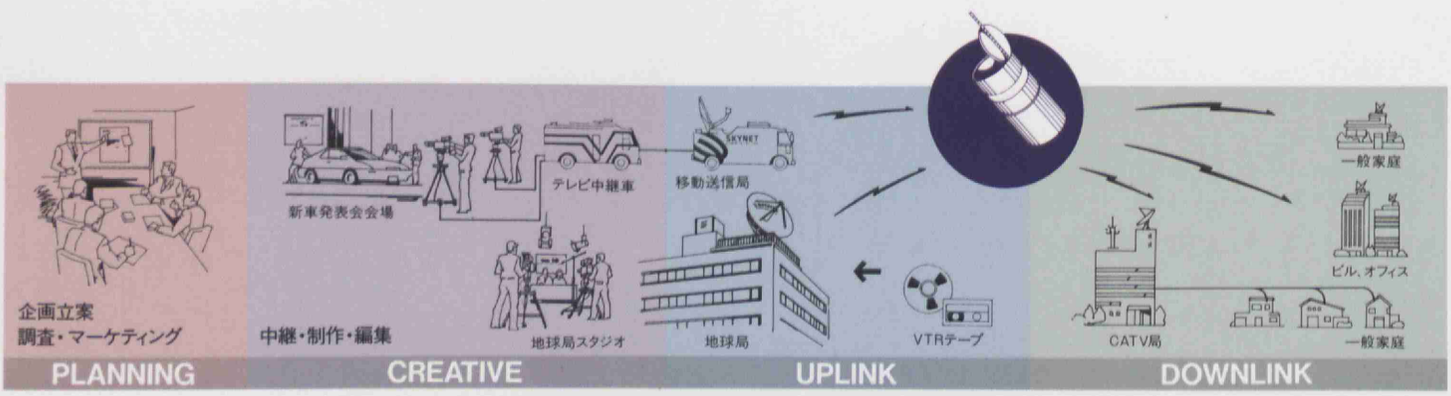
TOTAL PLANNING TO CREATIVE UPLINK AND DOWNLINK

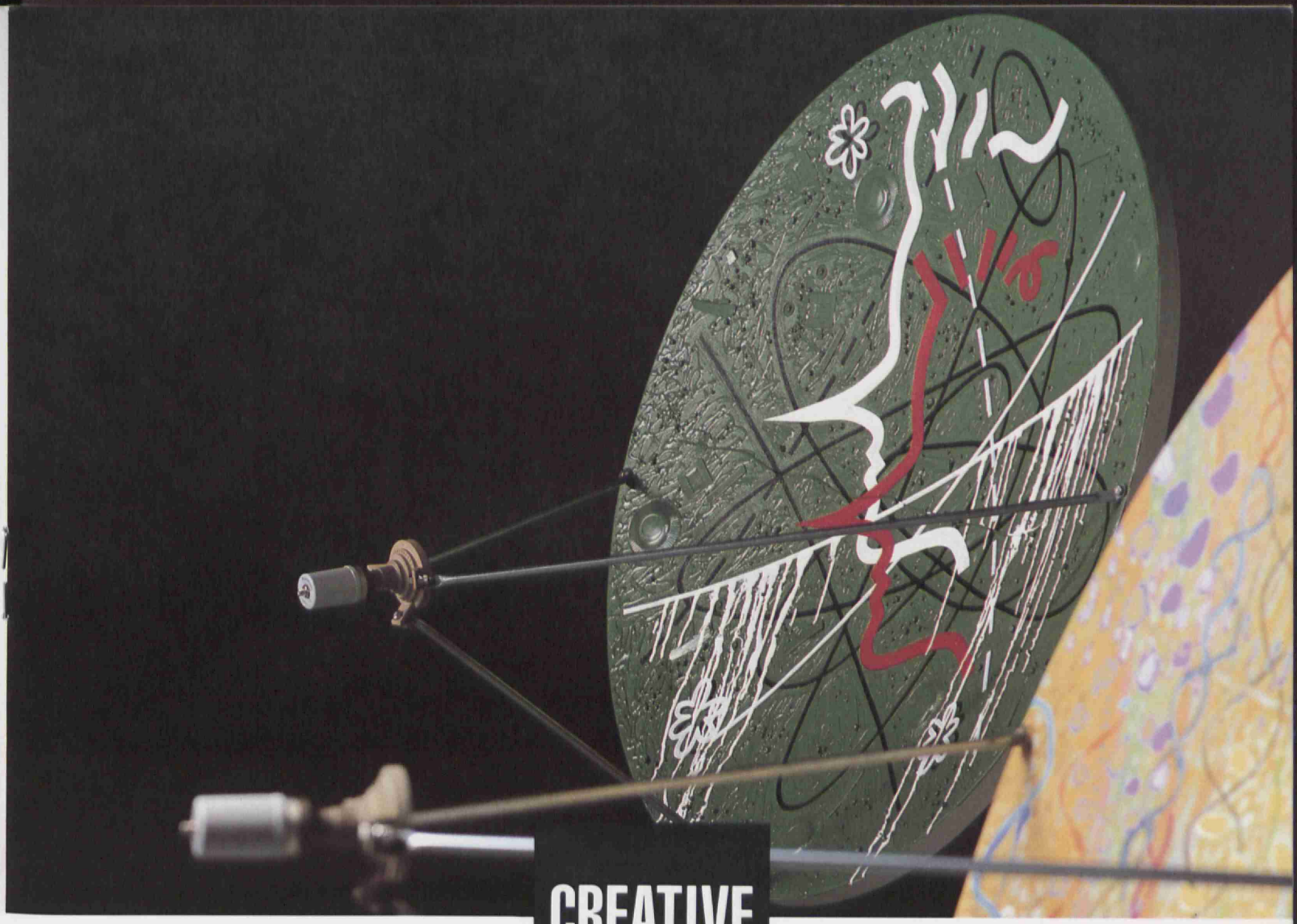
ライブの熱い興奮をそのまま全国へ中継したり、全国同時に映像アプリケーションによるイベントを行なったり、指定した複数のCATV局へ番組を配信したり…。スカイネットコミュニケイションズは、いわば衛星通信の総合プロデューサー。東京と大阪に地球局を設置し、プライベートネットワークサービス、サテライトビークルサービス、ディレクションサービス、システムサービスなどの衛星通信サービスを行ない、多彩な映像ネットワークをトータルにクリエイト。衛星回線のリセールといったハードウェアの部分だけでなく、企画立案・制作・配信・受信にいたるまで、メディアを自在にあやつり、あなただけのオリジナルチャンネルを構築して行きます。

PLANNING

生中継もVTRも、一枚のラフスケッチから。

企画段階から映像アプリケーションをフルにサポート　「どうすれば、衛星通信に最適な映像アプリケーションを制作できるのか」「高品質の画像を持つ映像を配信し、受信させるためにはどうすればよいのか」。この問いに答えるために、スカイネットコミュニケイションズでは企画セクションを設け、あなたの映像ネットワークをプランニングからフォローいたします。たとえば生中継の場合、中継の規模と現場に合わせた映像プラン、さらに受信者を開拓するための企画を立案。その内容に合わせた中継システムと受信設備の設計・施工をプランニング。VTRの場合には、視聴者層と視聴場所、そして、ネットワークの利用時間や導入計画を考慮しながら、番組内容の構想を練ってゆきます。もちろん、衛星通信の利用状況に合わせて、受信システムと機器メーカーを選択し、工事計画にいたるまで、トータルにサポートいたします。





CREATIVE

映像はソフィスティケーティッド・ドローイング。

目的に合わせたハイグレードな映像を制作　スカイネットコミュニケイションズの制作セクションは、一人ひとりがあなた専属のクリエイター。専門知識の全くない方でも、そのメリットを十分にいかした映像ソフトを制作することができます。まず、生中継の場合には、中継スタッフの人選、そして映像効果の演出にいたるまで、ハードを含む人材・機材のすべてをサポートいたします。さらに、VTRの場合、スタジオでの制作とロケーションによる制作、そのどちらにも今まで培ってきた高度なノウハウを駆使。収録システム、ロケーションシステムの全てをフォローし、最高レベルの映像づくりをめざします。収録素材は、ただちに編集され、スーパーや音楽の入った番組に加工。映像エフェクトなどによる効果的なイメージづくりも、まるでアーティストがカンヴァスに自由にドローイングするように自在にこなします。

【スタジオ】
地球局のなかにあるスタジオは、カメラ・マイク・照明設備などの機材はもちろん、通常のテレビ局と同様のゆったりしたスペースを有します。生中継、中継録画、そしてVTRの収録など、衛星通信のメリットを十分に生かす水準の高い映像アプリケーションを制作。演出などは、制作スタッフがフォローします。
［主要設備］
■面積 40坪■CCDカメラ BVP-7×2、BVP-5×1
■照明 20KVA（調光装置あり）

【サブコントロール室】
スタジオでの生中継から、収録にいたるまで制作をフルにサポートします。また、デジタルビデオエフェクター、スイッチャーなどを標準配備。その充実した高度な機能により、収録素材を自在に編集することができます。
［主要設備］
■SW'er AS-6500■DVE DVP-60
■VTR(MII) AU-660×2■FSS TKG-203CAS
■CG SMC-3000■ミキサー S200BVE
■MTR DN-86R■編集機 ESX-1000

UPLINK

電波はコミュニケーション・スペースを創造する。

あなただけのオリジナルチャンネルを構築　映像ソフトや生中継を、指定の時間に指定されたパラボラアンテナに配信する、それがスカイネットのプライベートネットワークサービスです。全国に数多くの支店、支社、営業所、工場などを持つ企業や、プライベートな映像を構築しようという方々に最適。誰もが簡単に、必要なとき、必要な時間だけ、衛星通信を利用した幅広いコミュニケーションを図ることができます。さらにスカイネットでは、全国どこからでも衛星にアクセスできる移動送信局(SNV)を保有し、そのサービス体制を強化しています。企業などの式典や社内行事、講演会、シンポジウム、そしてスポーツやコンサートなどのエンターティメントなどを、どこの会場からでもリアルタイムにネットワーク。最先端のハードウェアと高度なソフトウェア技術で、クォリティの高い映像をお届けします。

【東京地球局】

東京地球局は、アップリンクセンター。いわばスカイネットコミュニケイションズの拠点となる場所です。局内には、ビデオスタジオはもとより、制作・編集・配信に関わるあらゆる設備を備えております。また、東京地球局ではアドレス管理センターを設け、受信者の住所やネットワークの管理を行ないます。

［主要設備］

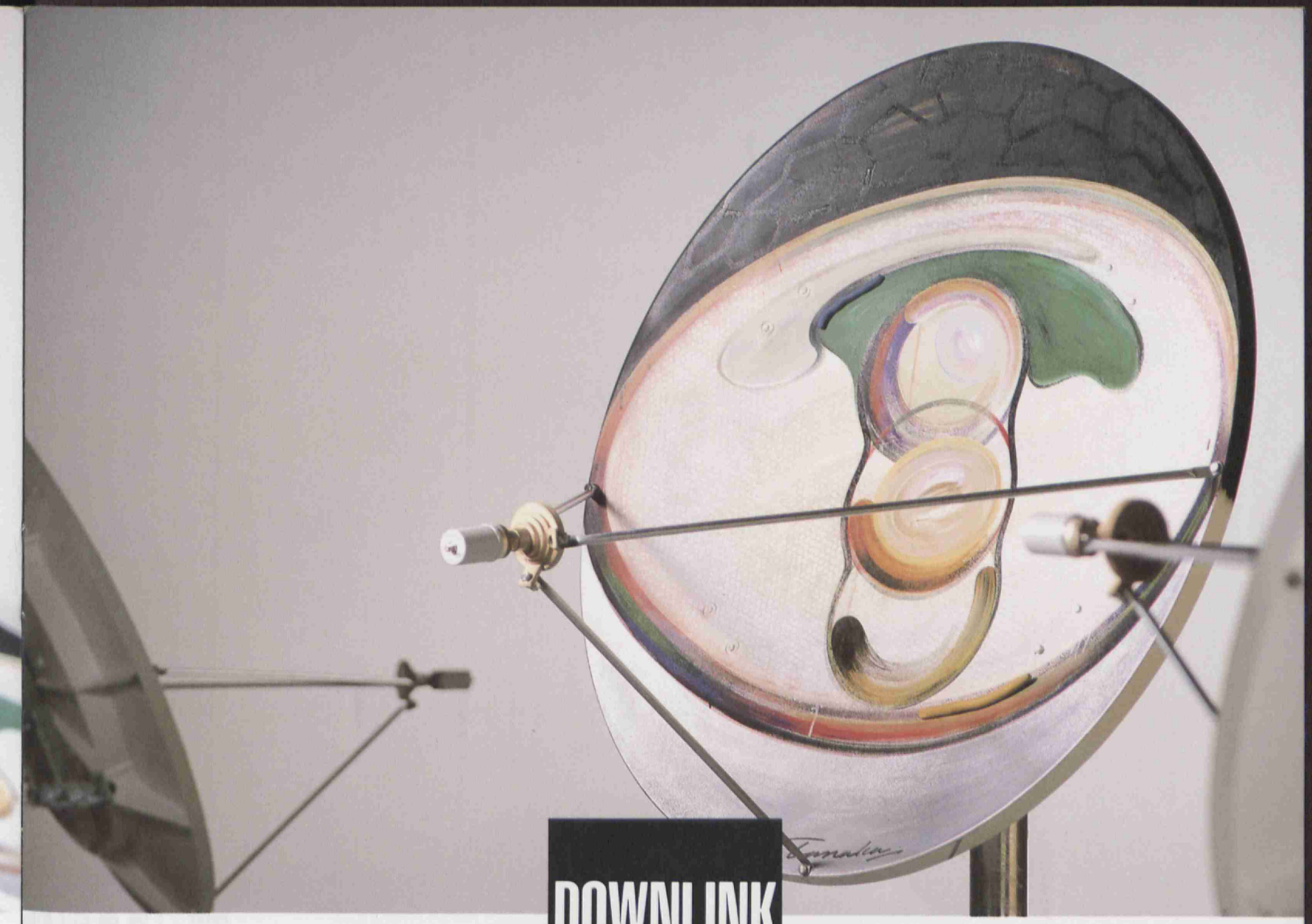
■スタジオ■サブコントロール室
■送出マスター室■EDPS室■屋上アンテナ

【移動送信局(SNV)】

機動力のある回線運営を心掛けるために、全国どこからでもリアルタイムにアクセスできる小型でハイパワーの移動送信局を3台保有。出力600wは、国内最大クラスです。大阪や東京などの大都市圏だけでなく、あらゆる場所からアップリンクを行なうことができます。

［主要設備］

■アンテナ 2.3m■送信機 600w(最大出力)
■CCDカメラ SC-821×2■SW'er BVS-1100
■ミキサー MX-P61■VTR BVW-70■スクランブルシステム



DOWNLINK

このイメージは、リアルタイムで繋がっている。

全国どこででも、同時にコミュニケーション　ソフトウェアとハードウェアを融合させ、いままででは考えられなかった映像の広がりを創造するスカイネットコミュニケイションズ。その情報伝送の可能性は無限です。たとえば、会場が遠すぎて参加することのできなかった貴重な講演会・会議・スポーツ・コンサートなどのコンベンション・イベントにも、身近な会場で参加できる「クローズドサーキット」。学会や研究発表の模様を、ホテルや企業のネットワークに供給する「クロスネットワーク」。また、CATV事業者に音楽や実況中継を提供して、みなさまに多彩なライブ感覚をお届けすることもできます。加えてスカイネットでは、使いやすい受信システムの設計・施工、機器メーカーの選択、そしてその導入スケジュールや工事計画の立案にいたるまで、受信に関しても万全なサービスを実施いたします。

【送出マスター室】

最新のシステムで、衛星回線の管理から映像・音声の品質管理、さらに移動送信局の回線設定まで衛星通信の全てをコントロールします。
[主要設備]■制御卓×4(ベースバンド/RF監視/回線設定/EDP)■交差偏波監視装置■映像/音声SW'er■ピクチャシンクロナイザ AV-7860×2■送出用VTR(MII)AU-660×2■スクランブルシステム

【EDPS室】

最先端の技術を集積させた高性能のコンピュータを導入。送信の運行状態やスクランブルなどを管理し、すべての受信端末(契約者、料金、回線)のデータまでファイルします。
[主要設備]■スーパーミニコンピュータ A-400

【受信設備】

受信設備としては左の写真の機材が必要です。スカイネットでは、使いやすいシステムの設計から、工事計画の立案までサービスします。
[主要機材]■パラボラアンテナ■デコーダー■CSチューナー■テレビ受像機

システム・トータルの運営を

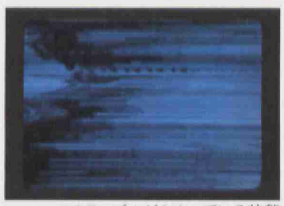
APPLICATION

フルにサポート。

スカイネットコミュニケイションズでは、様々な分野の映像アプリケーションを通して、あらゆる業種の方々のお役に立ってまいります。たとえば、企業の本社と支社間などをつなぐビジネスのネットワーク。また、ホテルに向けての多彩な番組の配信やCATV事業者へのソフトウェアを供給するエンターティメントのネットワーク。外食産業、あるいは老人ホームや福祉施設への配信も可能です。さらに、学習塾やスポーツ施設、ホテルを利用した教養講座などを結ぶカルチャーのネットワークなど、独自のネットワークづくりをお手伝いいたします。

SCRAMBLE ●スカイネットスクランブルシステム

スカイネットではSBNとSPNという2種類のネットワークで、みなさまのさまざまな映像コミュニケーションを幅広くサポートいたします。SBN(ビジネステレビジョン)は、ネットワークに登録した特定の受信者に向けて映像を送信する形態。たとえば、企業や特定の団体が、社員教育や記念行事などのイベントを中継したり、系列販売店への新製品発表や既存製品紹介を行なう際などにご利用いただけます。そしてSPN(プログラムテレビジョン)は、通常のテレビ放送に近い形態。受信者は、プログラム供給者との間で番組契約を結ぶことにより、複数のチャンネルで送られてくる番組を見ることができます。さらに全ての受信端末をアドレス管理していますので「グループ分け配信」や「受信者課金」を簡単に行なうことができ、契約者の指定口座からの定期的な受信料金の自動引き落しも可能です。またスカイネットが行なう衛星通信の電波には、全てスクランブル(暗号化装置によって画像を乱し、音声や映像などのデータを指定した相手以外には、視聴できないようにすること)がかけられています。社内情報や会議などのように情報の秘密保持が要求される場合でも、送り手が指定した相手のみが正常な状態で映像を見ることができます。



スクランブルがかかっている状態

TOTAL SUPPORT ●使いやすさをトータルにサポート

スカイネットではご利用になるユーザーのみなさまにとって、本当に使いやすく価値のあるネットワーク構築の企画立案から、受信機器の販売・リース・レンタルおよびそれらの取付工事、保守メンテナンスにいたるまでトータルにサポート。さらに、機器メーカーとのタイアップにより、どんなトラブルにもスピーディかつフレキシブルに対応いたします。実際にシステムが稼動してからの運営段階も、安心しておまかせください。

CORPORATE PROFILE

会社名

株式会社スカイネットコミュニケイションズ
SKYNET COMMUNICATIONS INC.

会社所在地

本　　社：東京都品川区上大崎4丁目5番37号
本多電機ビル 〒141
TEL03(494)7681㈹FAX03(494)7915

大阪本部：大阪市中央区難波千日前12番35号
SWINGヨシモト7F 〒542
TEL06(643)2891㈹FAX06(643)3447

設立年月日

昭和63年4月8日

資本金

払込資本金　25億円
授権資本金　90億円

株主構成

三井物産㈱	10億2千万円	(40.8%)
㈱エキスプレス	2億　円	(8.0%)
三井リース事業㈱	1億8千万円	(7.2%)
㈱千趣会	1億5千万円	(6.0%)
吉本興業㈱	1億5千万円	(6.0%)
松下電器産業㈱	1億5千万円	(6.0%)
共同石油㈱	1億5千万円	(6.0%)
㈱東芝	1億　円	(4.0%)
サッポロビール㈱	1億　円	(4.0%)
日本電気㈱	5千万円	(2.0%)
新日本証券㈱	5千万円	(2.0%)
㈱三井銀行	5千万円	(2.0%)
三井信託銀行㈱	5千万円	(2.0%)
㈱住友銀行	4千万円	(1.6%)
大正海上火災保険㈱	3千万円	(1.2%)
三井生命保険㈱	3千万円	(1.2%)

役員構成

代表取締役社長	山岡弘信
代表取締役専務取締役	深井満男
代表取締役常務取締役	田村堅三
常務取締役	中山　健
取締役	内海　昭
取締役	大富國正
取締役	淺井淳一
監査役	永島　弘
監査役	宮原　卓

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大阪本部
大阪市中央区難波千日前12番35号
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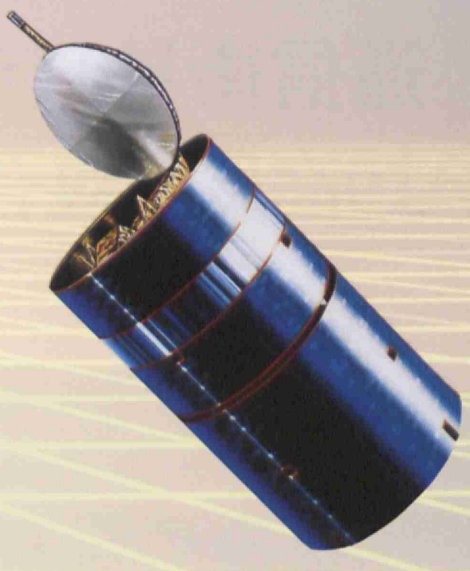
TEL06(643)2891代 FAX06(643)3447

JS-NET 日本サテライトネットワーク株式会社

高度情報社会の、企業戦略を語る日がやって来ました。

21世紀＝高度情報社会へ。数々の先進テクノロジーを基盤とした、新しいネットワークによって、いまコミュニケーションの方法や在り方が大きく変わろうとしています。

企業をとりまく環境も、経営革新の時代へと、急速な展開を見せています。変化をいち早く予測し、企業間競争のなかで、ビジネスチャンスをつかみ「競争優位」を築く時が来ました。情報システムも、これまでの合理化の道具から、攻めの武器へ。この戦略情報システムのインフラとなるのが、私たちJS・NETなのです。



ごあいさつ

21世紀へ向けて90年代は、高度情報社会が一段と花開く時代といえます。

各企業は経営戦略の重要なファクターとして、戦略情報システム(SIS)を位置づけサバイバル化を図っております。こうした情報を中心とした高度のインフラストラクチャは巨大なコンピュータシステムを中心に地上系通信ネットワークによって構築されてまいりましたが、それに加え近年無線系のインフラストラクチャとして注目をあつめていますのが衛星通信ネットワークです。私ども日本サテライトネットワーク株式会社は、民間衛星JC・SATのトランスポンダを利用してVSAT（ミニ地球局）を中心に日本全国に経済性の高い且つ信頼性の高いJS・NET複合衛星通信ネットワークを構築しています。

さらにお客様の衛星利用にたいする幅広いニーズに最適な高度のサービスの提供を心がけ、高度情報社会の一翼を担い情報通信の発展に貢献すべく全力投球する所存ですので、何卒一層のお引き立てを賜りますようお願い申し上げます。

代表取締役社長　池浜洋一

会社概要

名　　称/日本サテライトネットワーク株式会社
Japan Satellite Communications Network Corp.(略称：JS・NET)

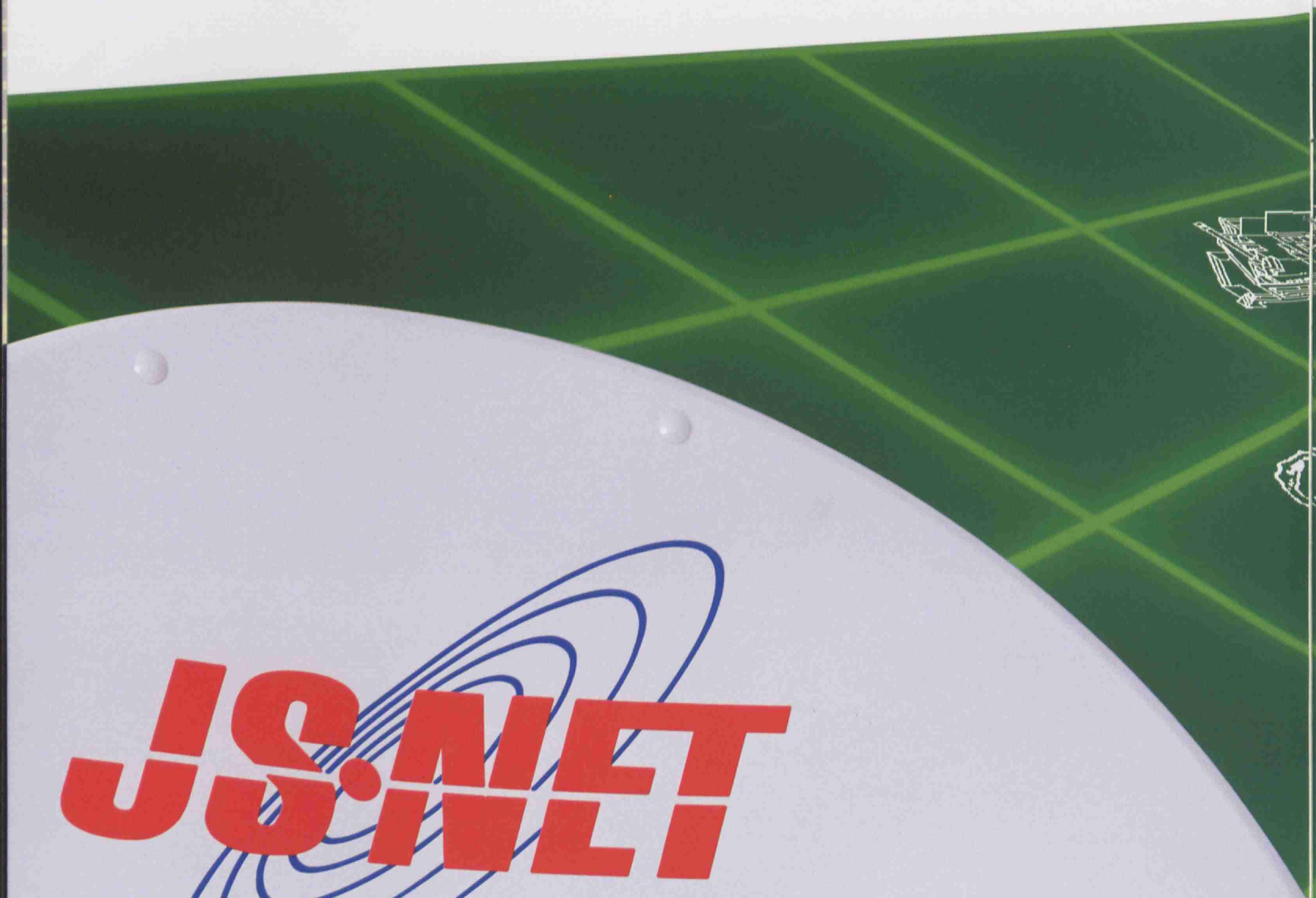
所 在 地/〒102 東京都千代田区麹町三丁目2番地
(垣見麹町ビル5階)
TEL.03-221-7511(代) FAX.03-221-7510

資 本 金/払込資本25億円(授権資本25億円)

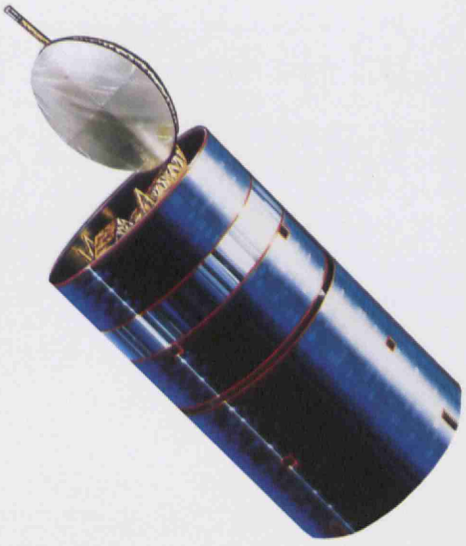
設立年月日/1987年7月7日

株主構成/伊藤忠商事株式会社
三井物産株式会社
日本電気株式会社
ヒューズ・コミュニケーションズ社
センチュリー・リーシング・システム株式会社
三井リース事業株式会社
日本電気リース株式会社
安田火災海上保険株式会社
大正海上火災保険株式会社
住友海上火災保険株式会社
株式会社第一勧業銀行
株式会社太陽神戸三井銀行
株式会社住友銀行
株式会社日本興業銀行
株式会社日本長期信用銀行
株式会社東京銀行
株式会社富士銀行
株式会社協和銀行
株式会社横浜銀行
住友信託銀行株式会社
三井信託銀行株式会社
株式会社三和銀行
日本生命保険相互会社
三井生命保険相互会社
第一生命保険相互会社
住友生命保険相互会社
千代田生命保険相互会社
朝日生命保険相互会社　　(順不同)

通信衛星が、データ、音声と画像、映像の
より高度な複合通信を可能にしました。



JS-NET



●衛星通信の優れた特性が、コミュニケーションの新たな可能性を広げます。

JS・NETのネットワークサービスは、我が国初の民間衛星JC・SATのトランスポンダを利用して、VSAT(ミニ地球局)による双方向の新しいマルチメディアデジタル通信を可能にしています。

●衛星通信の特長は、何といっても同報性と広域性にあります。

JC・SATのビームは日本全域に向けられており、日本全域がサービスエリアですので、通信料金の遠近格差なしに、一回の送信で同時に多数の拠点に情報伝達できる優れた同報性を発揮します。しかも衛星通信は、広帯域の周波数(Ku-Band)が使用できるので、高速・大容量の通信が可能となり、データ、音声、画像、映像などの各種複合通信を実現します。

●VSATを設置するだけ、ネットワークの拡大は容易です。

地上回線に関係なく、どこにでも設置できるので、ネットワーク構築は極めて容易です。また地上災害の影響を受けることがないので災害に強く、重要通信を確保できます。

企業経営のインフラ＝戦略情報システムの構築
力強くサポートする、JS・NETのD+Vネットワーク。

●JS・NETのお届けするサービスは、

①受発注などのデータを小包みに分割して経済的に送るパケット交換サービス、②大容量のコンピュータデータや画像データを必要な時間だけつないで送る回線交換サービス、③TV映像をリアルな情報として伝送するFM-TVサービスがあり、また一つのアンテナを用いるだけで、これらサービスを複合して利用できるD+V(データプラスビデオ)のネットワークがあります。

●日本全土がサービスエリア

民間衛星JC・SATは、日本全土から40～50度の高仰角に見えるので、VSATは地上やビル屋上など限られた空間にも手軽に設置できます。

●東京に東京都心局、大阪に大阪テレポート局を構築し、ユーザの共用中心局として経済性と利便性を提供致します。

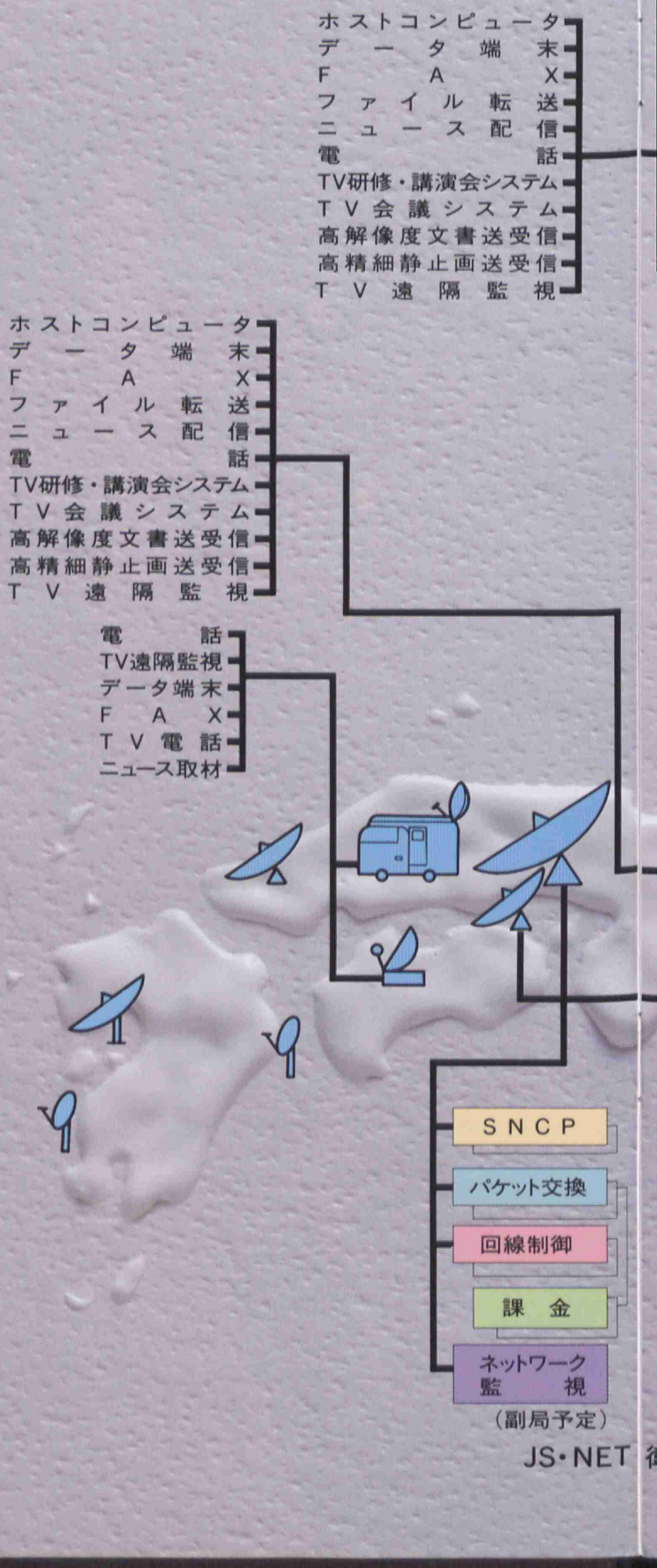
●通信センターでは、11m直径のアンテナによる高信頼度のパケット交換および回線交換を。また常時ユーザのネットワークのヘルスチェックを実施しています。

● JS・NETのサービス・メニュー

パケット交換	JS・NETの中央局利用	メッシュ型(2ホップ)
		スター型(2ホップ)
	ユーザーがハブ局を設置	専用スター型
		接続型専用スター型(1)
回線交換	低速度	9.6k, 16k, 32k, 48K, 64kビット/秒
	中高速度	192k, 384k, 768k, 1.5M, 3M, 6Mビット/秒
	複合交換	マルチメディアDAMA(2)
	アナログ交換	電話，ファクシミリの交換用
FM-TV		アナログ映像分配(予約による時間利用)
専用線		短期・長期専用

(注1) ユーザーの宅内設備とJS・NETの中央局や都心局との間を地上回線で接続して利用するシェアード・ハブ・サービス(1ホップが原則)

(注2) DAMA:Demand Assignment Multipul Access。9.6k～6Mビット／秒までの回線を、必要な時に必要な場所に設定するサービス。主として低速系は即時に、高速系は予約にて設定します。



へ。

ユーザミニ局
(1.2/1.8mφ)

ユーザ超ミニ局
(0.75mφ)

ユーザ中心局
(3.3～4.5mφ)

ユーザ小型局
(2.4～5.5mφ)

車載局
可搬局
(1.2～2.4mφ)

一般データ端末
FAX
POS端末
ビデオテックス
デジタル電話
ファイル転送
TV研修システム
TV会議システム

受信専用
FM-TV番組受信
音楽番組受信

受信専用
データ分配受信
高精細静止画分配受信

SNCP
パケット交換
回線制御
課　金
ネットワーク
監　視
(主局群馬)

FM-TV
クリア回線
クリア回線
パケット回線
パケット回線
(大阪テレポート)

FM-TV
クリア回線
クリア回線
パケット回線
パケット回線
(東京都心局)

FM-TV送受信
動画像
静止画像
音楽・音声
データ配信
ニュース配信
ファイル転送
ホストコンピュータ

T 衛星通信センター

JS・NET共用中心局

衛星通信センターを中核に、最新鋭の設備とエ
高度なシステム運営を支えています。

●トータルネットワークの制御と集中管理。
通信センターではユーザが送信したデータの交換、中継という機能をうけもつ他、ユーザのシステムの作動状況をチェックするリモート診断まで、トータルネットワークの集中管理を行い、JS・NETの高信頼性を確保しています。通信設備は二重化され、電源も瞬断のないよう万全の体制が施されています。

●将来は大型アンテナ3基まで充実。
現在は大型アンテナが1基設置されていますが、近い将来は3基となり、充実したネットワークサービスに成長します。

●世界初のメッシュ型パケット交換機能。
VSATを用いて多数のユーザ間でのパケット交換ネットワークを実現するために、電波が地上—衛星間を二度往復する2ホップ方式を採用。これにより世界初のVSAT間どうしのメッシュ型パケット網を提供しています。

●世界初のメッシュ型回線交換機能。
世界初の豪雨時2ホップ型のセンター中継機能を含む、VSAT間のDAMAシステムによるメッシュ型デジタル回線交換網を提供しています。

●エキスパート集団によるシステム管理・運営。
衛星通信のエキスパート集団が最新鋭の設備と機器、さらには長年培ってきた技術を背景にユーザが安心して使いこなせるネットワークを支えています。

キスパート集団が、

▲共用中心局はユーザの共同の送受信設備として。

都心に位置する共用中心局では、共同送受信設備として利用できるアンテナ設備利用サービスを行い、共同ハブ局として、さらにテレビ送信、機密保持のコントロールセンターとして活躍しています。

①群馬県榛東村にあるJS・NET衛星通信センター ②ネットワークを集中管理する、コントロール室 ③最新技術による、世界初のパケット交換装置 ④JS・NET東京都心局

PACKET

地上通信網に比べ、一段と優れた経済性を発揮。日本全国にデータを効率よく伝送します。

パケット交換サービス

●低コスト、高効率伝送のパケット交換。

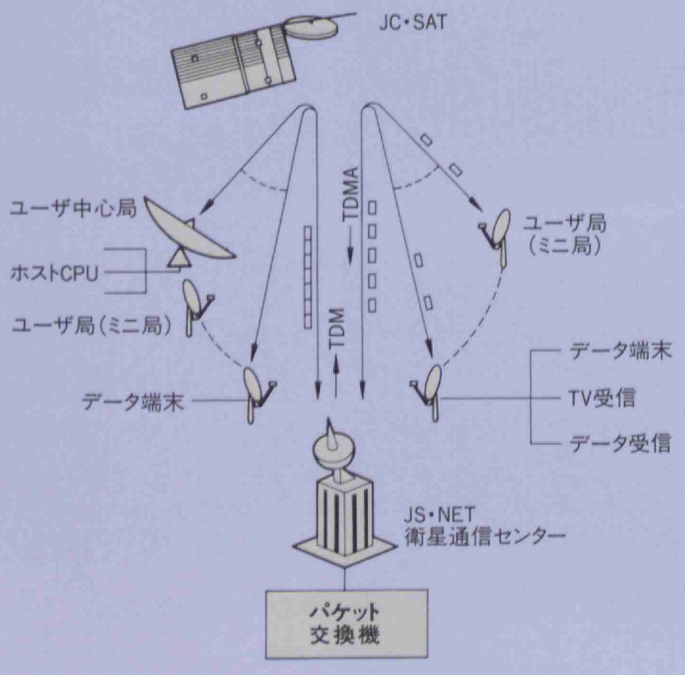
パケット交換とは、データを一定長（例えば128バイト）のパケット（小包）にして交信するサービスです。回線を占有せず、短い空き時間を使ってパケットを伝送。このため回線効率が上がり、通信コストを軽減できるというメリットがあります。

●全国に散在する支店、事務所、ディーラとの通信に最適。

パケット交換は、本社と日本全国に散在する支店、事務所、ディーラとの間を経済的に、かつ効率的に結ぶ通信で、衛星通信の広域性をもっとも生かせる分野です。JS・NETパケット交換サービスは、通信センターに設置した11m直径のアンテナを経由して、世界で最初のVSATによるメッシュ網を実現いたしました。

●主な活用用途

●データベース検索伝送●受発注データ通信●POSオンラインデータ管理●クレジットカード照合●パソコン通信●在庫、輸送等の物流管理●社内データ通信



- ●経済的な通信回線
- ●高信頼度、高品質
- ●64Kbps迄のデータ伝送
- ●メッシュ/スターネットワーク
- ●ミニ局は多目的利用可能
- ●JS・NET衛星通信センター経由により高信頼ミニ局間通信が実現
- ●データをパケット化し、衛星回線の高効率利用

注 TDM ：時分割多重
TDMA：時分割多元接続

サービス強化と、情報の戦略利用へ。

《㈱新日軽》殿

アルミ建材大手の「㈱新日軽」殿では、コンピュータセンターと全国にある約3,000社の建材問屋・販売代理店をJS・NETの衛星パケット網でオンラインネットワークを構築。受発注、在庫照会、納期回答などのデータをやりとりしています。各代理店にはVSATとオンライン用のパソコンを設置するだけで、距離や場所に無関係、コスト負担も少ないので、代理店網の拡充にも対応。さらにデータ伝送に付加して映像を応用したニュービジネス等、衛星ISDNならではのメリットを最大限に活用しています。

②
① ③ ④

①㈱新日軽殿に設置された1.2mφアンテナ設備(自立架台方式)と ②1.2mφアンテナ設備(壁面設置方式) ③パケット通信で受発注、在庫照会などを効率よく運用 ④屋内機(インドアユニット)

DIGITAL

データの種類や量にあわせて、回線の使い分けが可能。多彩な情報システムを経済的に実現します。

JS・NETの回線交換サービスは、主としてVSATを設置するだけで、日本全国どこからでも、低速から高速の各種通信が可能となります。可搬・車載局の導入で臨時回線やバックアップ構成も可能です。

回線交換サービス

●各種スピードの通信回線を、電話とおなじようにダイヤルすることで、2地点間のみならず多地点間で接続します。

●地上ISDNに優る回線サービス

DAMAシステムにより、9.6Kbps～6Mbpsのデジタル衛星回線を即時もしくは予約により、必要な場所に設定しサービスいたします。

この世界初の「DAMA回線交換装置」が、テレビ会議システムをはじめ多彩な情報システムを可能にします。

●主な活用用途

●ファイル転送●大容量データ通信●TV電話●TV会議●TV教育●静止画伝送●SNG●データベース●CAD／CAM●紙面伝送●印刷ネガ伝送●パソコン通信●バックアップ用回線

回線同報サービス

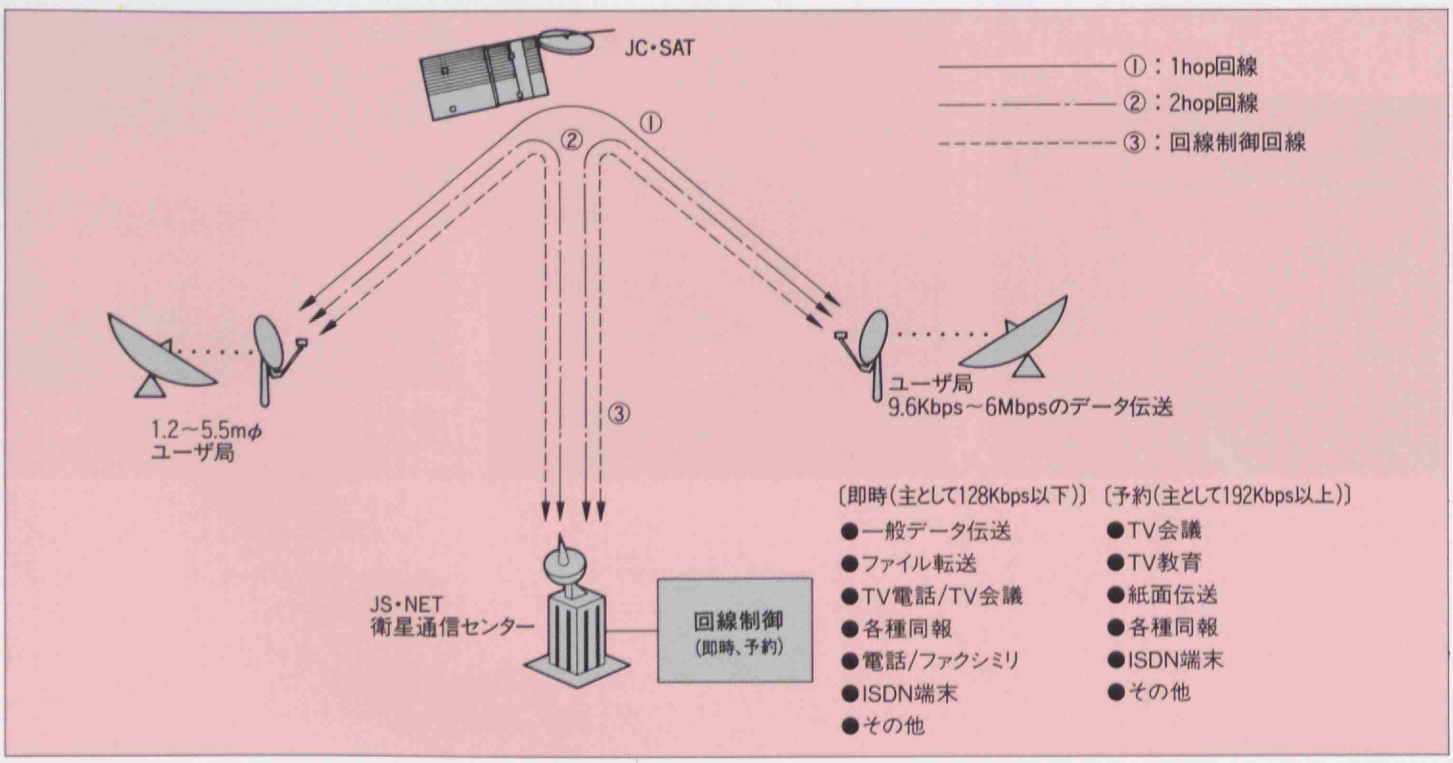
●1地点からn地点に同一情報を送信するのに、1回線、1回の送信で完了する、単方向の同報回線サービスです。

●1.2Kbps～6Mbpsまでの速度でユーザ専用の専用線モードと、DAMAコントロールによる経済的な回線交換同報モードを用意しました。

これにより日本全国への同報も、簡易な送受信設備でOK。高度な情報を手軽に分配できる新時代を築きました。

●主な活用用途

●高音質ミュージック／オーディオの配信●新聞記事等の多地点配信●同報FAX●静止画配信●社内情報の支店、営業所への配信●新製品紹介●データベースのローカル検索●データ情報サービス事業（株価情報、商品市況情報、為替情報、電光ニュース等）●在庫物流情報、購買情報等の配信



本社・工場間の距離をなくした戦略プリンティングシステム、登場。

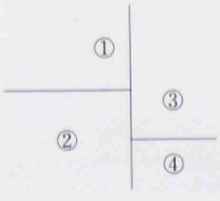
《㈱大阪ヤマトヤ商会》殿

衛星ISDNを利用すれば、全国ベースの高精細度文章等の即時分配が可能です。新聞の紙面伝送をはじめ、リモートプリンティングシステムが経済的に構築できます。
市場の問題で大都市に集中する印刷・製版・出版・新聞業界では、良質の人材と敷地の確保がますます難しくなっています。そこでJS・NETの衛星通信サービスが威力を発揮。高精細な商業用印刷カラー原版のファクシミリ伝送を可能にし、印刷工場の地方分散化を一挙に解決しました。

伊豆沖地震観測にスピーディな観測体制を実現。

《東京大学地震研究所》殿

海底噴火のおきた静岡県伊東市周辺地域での地震観測データ収集に、いちはやく対応。JS・NETの衛星回線が活躍しています。導入決定の大きな理由になったのは、衛星通信の特長である送受信の設備や設置が地上系に比べ極めて簡単であること。しかも災害に強いといった特性が評価されたもの。東大地震研究所では、宇佐美、東京にVSATを設置。宇佐美、川奈崎、初島の三箇所の高感度地震計のデータを、東京の地震研究所にまとめて送り、本部コンピュータと接続。地震活動を常時見守っています。



①㈱大阪ヤマトヤ商会殿に設置された衛星通信設備と ②2.4mφアンテナ設備 ③東京大学地震研究所殿のデータ伝送ネットワークと ④衛星よりの受信データ処理

VISUAL

衛星通信の広域・同報性をいかした、より高度なビジュアルコミュニケーションを実現。絶対優位の戦略システムを生みだします。

映像画像伝送サービス

情報量の増加とコミュニケーションの多様化が進むなか、カラー画像による高度な情報伝達が注目されています。美しい自然画像が、コトバでは伝えられない情報を伝えてくれます。そこでJS・NETの映像画像伝送サービスは、

①静止画像の伝送サービス

②デジタル動画像の伝送サービス

③FM-TVサービス

の3つのサービスを用意しました。

●デジタル動画・静止画像を高解像度で伝送。拠点間を結んだTV電話、TV会議、全国ネットのTV教育システム、さらにはテレビオークション。美麗な静止画像の分配と検索システムなど、幅広い複合コミュニケーションをお届けします。

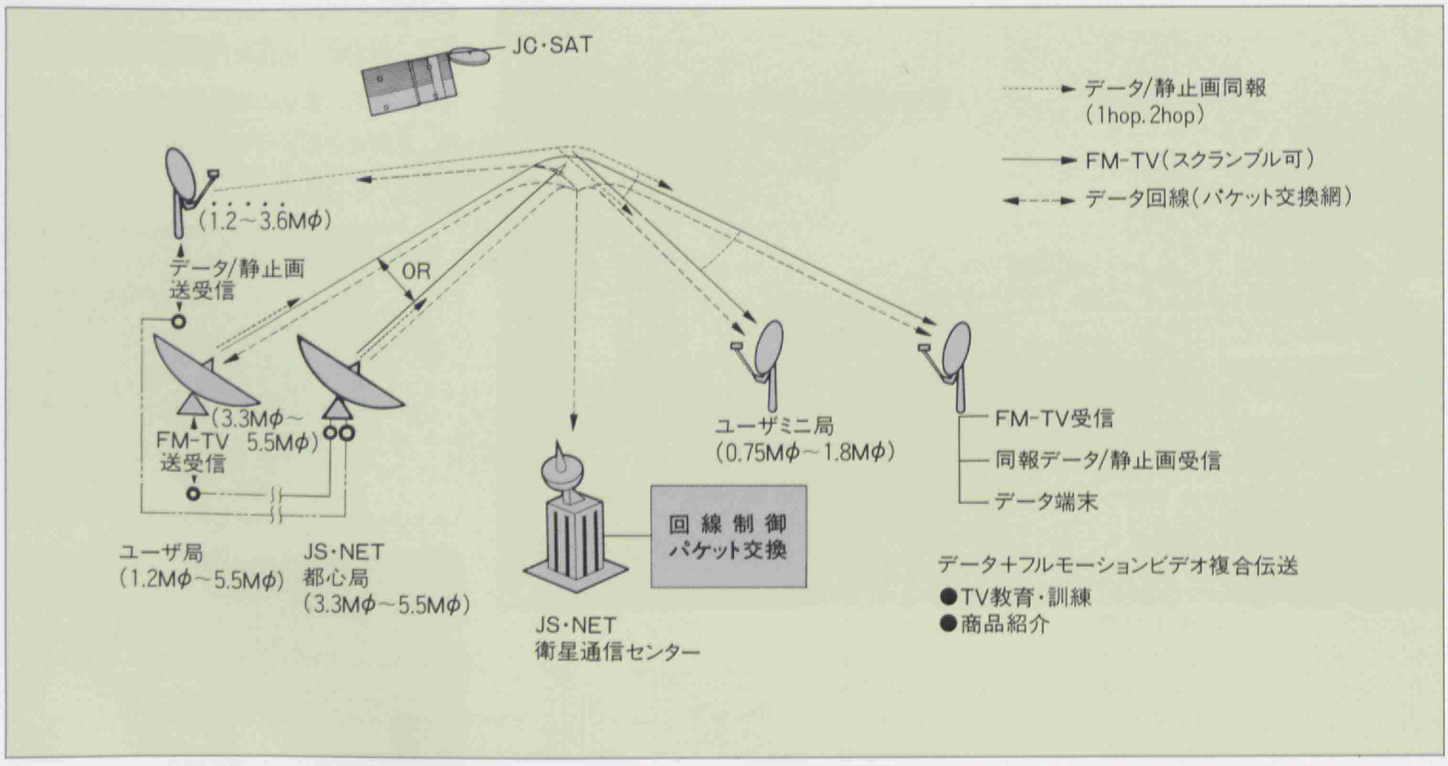
●FM—TVサービスとして、フルモーションTV送信を提供。社内教育システム、イベント中継、SNG、映像番組伝送、ニュース配信、会員制TVなどを可能にします。

●フルモーションTV・デジタル動画、静止画の送信局として、JS・NET通信センターに加えて東京都心局、大阪テレポート局を共同ハブ局として構築しています。

●イベント送信用として、車載局・可搬地球局を提供いたします。

D+V複合サービス

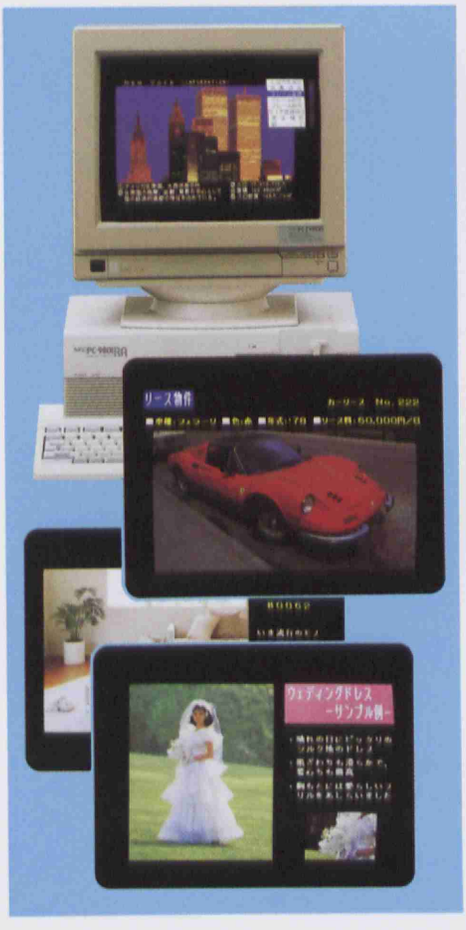
JS・NETのユニークなサービスのひとつにデータ・ネットワークにビデオを付加するD+V複合サービスがあります。使用するVSATは共通なので、二重投資が避けられ、大変経済的です。



コトバでは伝えられない高度な視覚情報が、ニュービジネスを創生。

《静止画同報検索システム》

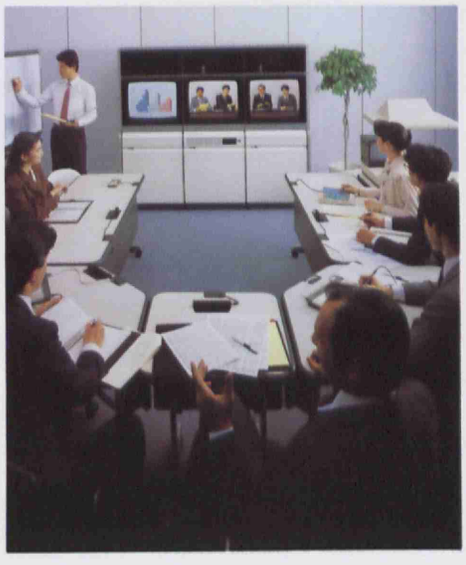
コトバ以上の説得力をもつ高精細なカラー画像を全国の営業所、販売店、研究所等へ分配、いままで実用的に困難だった高度なビジュアルコミュニケーションを確立。詳細な商品情報などが、現地に行かなくても見て確認できるカラー静止画の同報・リモート検索を可能にしました。自動車、不動産、アパレル、装飾品などの販売支援や無人店舗展開など、その活用分野は無限に広がっています。



本社・支店間の距離はゼロ。しかも通信経費は大幅コストダウン。

《テレビ会議／テレビ教育システム》

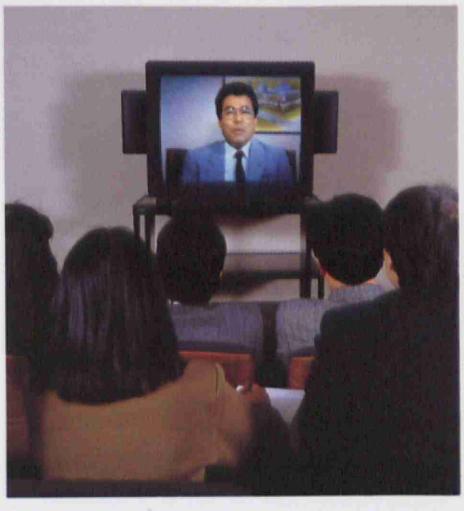
企業内コミュニケーションの効率化はいま、新しい経営戦略の柱になろうとしています。データ、画像、音声の三位一体による「テレビ会議／テレビ教育システム」が、本社／生産拠点間、本支店間の会議打合せ社員教育等を効率化し、スピーディな戦略指示を可能にするとともに、遠隔地への出張経費と時間の大幅な低減を実現。経営のパワーアップをお届けします。



企業の新しいイメージづくりと、社内頭脳の高度化のために。

《TVマネジメントシステム》

社長の経営方針の発表や訓示、さらに新製品の展示会や各種イベントなどのフルモーションビデオや同時中継画像をきめられた時間に、都心局より伝送するシステムです。企業の全国に広がる拠点ならびに販売店などへの最新情報伝達に、社員教育、ディーラーサービスなど全国同時に、スピーディに確実に行うことができ、経営面にさまざまなメリットを生みだします。もちろん機密保持の対策も万全です。



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