ROUTING AND TRANSMITTAL SLIP Date

TO: (Name, office symbol, room number, building, Agency/Post)	Initials	Date
1. EO/DDA		28 JAN 1983
2. DDA		
3. A/DDA		31 JAN 1983
4. [redacted]		24AUG 83
5. Registry		

Action		File		Note and Return	
Approval		For Clearance		Per Conversation	
As Requested		For Correction		Prepare Reply	
Circulate		For Your Information		See Me	
Comment		Investigate		Signature	
Coordination		Justify			

REMARKS

1-2/3: Note that D/ODP has action on this.

[redacted] STAT

[redacted] STAT

Maybe I didn't want D/ODP to have action. They should let us task our offices as we see fit.

[redacted] STAT

DO NOT use this form as a RECORD of approvals, concurrences, disposals, clearances, and similar actions

FROM: (Name, org. symb[redacted] STAT

Room No.—Bldg.

Phone No.

5041-102

FORM 41 (Rev. 7-76)

by GSA

FPMR (41 CFR) 101-11.206

☆ GPO : 1981 O - 361-529 (148)

EXECUTIVE SECRETARIAT

Routing Slip

TO:			ACTION	INFO	DATE	INITIAL
	1	DCI				
	2	DDCI				
	3	EXDIR		X		
	4	D/ICS				
	5	DDI		X		
	6	DDA		X		
	7	DDO		X		
	8	DDS&T		X		
	9	Chm/NIC				
	10	GC				
	11	IG				
	12	Compt				
	13	D/EEO				
	14	D/Pers				
	15	D/OEA				
	16	C/PAD/OEA				
	17	SA/IA				
	18	AO/DCI				
	19	C/IPD/OIS				
	20	D/ODP	X			
	21					
	22					
		SUSPENSE	4 Feb			
			Date			

Remarks:

Please coordinate with all Directorates and prepare a response for EXDIR's signature.

Executive Secretary

28 January 1983

Date

3637 (10-81)

The Director of Central Intelligence

Washington, D.C. 20505

Intelligence Community Staff

DCI/ICS 83-4224
26 January 1983

MEMORANDUM FOR: Director, Defense Intelligence Agency
Director, National Security Agency
Executive Director, Central Intelligence Agency

VIA: Acting Director, Intelligence Community Staff

FROM: [redacted] STAT
Chief, Policy & Planning Staff

SUBJECT: Supercomputers

1. The ad hoc committee on Supercomputers convened by the Office of Science & Technology Policy (O/S&TP) met on 24 January 1983 to review the many issues on this subject. The opinions and proposals presented differed dramatically; consequently, no consensus could be developed. [redacted] STAT Assistant Director, O/S&TP, tasked the members to respond to the following questions by Monday, 7 February 1983.

A. Do you currently own and operate or time share a supercomputer? How many or how much usage?

B. Do you have firm plans to acquire the next generation supercomputer? What specs? When? How many? Approximate dollar funds per supercomputer?

C. Is there a difference in your requirement between a "big number cruncher" and an even bigger and more complex AI-based machine?

D. Have you identified a US source or sources?

E. What impact would a successful Japanese fifth generation and supercomputer with the approximate performance characteristics have on your agency? (See attachment)

F. Is there a role for the federal government in stimulating, partially funding, or actually developing the fifth generation supercomputer. One body of opinion asserts the US Government should only indicate the range of performance characteristic desired, the best estimate on quantity required and probable time frame for delivery with a tolerable price range.

G. Do you have an opinion on the probable success or range of performance the Japanese are likely to achieve? Basis for opinion?

UNCLASSIFIED

2. My assessment is that there is not now a strong commitment for US Government involvement in any aspect of the next supercomputer, nor to any concentrated reaction to the potential Japanese computer project.

3. Please provide me your comments (which may be classified if appropriate) by noon, Monday, 7 February. I will provide them to [redacted] office and will obtain and circulate all members' comments for your individual review and comment prior to developing an Intelligence Community position.

STAT

STAT

Attachment:
Japanese Computer Specifications
(20 Charts)

UNCLASSIFIED

SUBJECT: Supercomputers

Distribution: (DCI/ICS 83-4224)
1 - each addressee w/att
1 - ER w/att
1 - A-D/ICS w/o att
1 - ICS Registry w/att
1 - ICS/Info Handling Committee Staff [redacted] w/att STAT
1 - ICS/PPS Subject (Supercomputers) w/att
1 - ICS/PPS Chrono w/o att

DCI/ICS/PPS [redacted] (26 Jan 83) STAT

JAPANESE GOALS

JAPANESE GOVERNMENT (MITI) AND COMPUTER INDUSTRY WANT TO BE LEADERS IN SUPER COMPUTING

THREE NATIONAL PROJECTS
- COMPONENTS
- HIGH-SPEED COMPUTER
- FIFTH GENERATION COMPUTER

NUMEROUS INDIVIDUAL COMPANY PROJECTS

JAPANESE NATIONAL SUPER-SPEED COMPUTER PROJECT

DURATION: 1982-89

FUNDING: $200M

OBJECTIVES: 10 GIGAFLOPS
1 GIGABYTE OF MEMORY WITH 1.5 GIGABYTE BANDWIDTH
100 MEGAFLOPS IN DISTRIBUTED PROCESSING

PARTICIPANTS:
ETL
FUJITSU
HITACHI
NEC
MITSUBISHI
OKI
TOSHIBA

COMPUTING

Los Alamos

FIFTH GENERATION COMPUTER

STARTS APRIL 1982

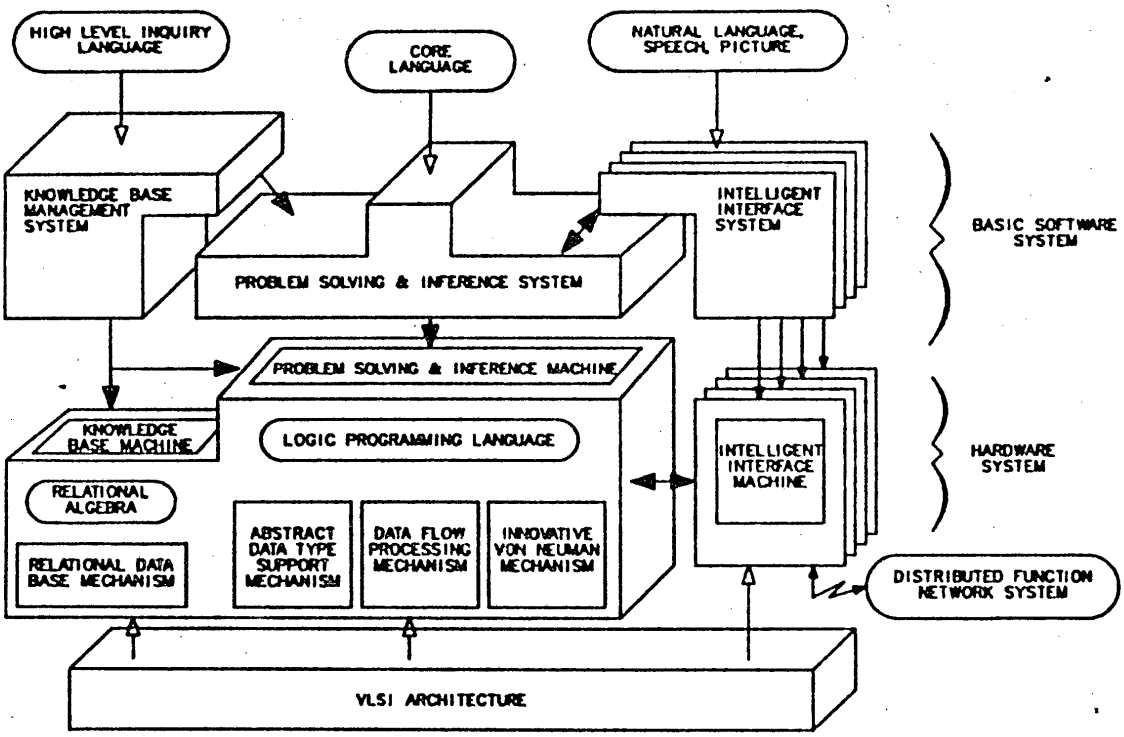
OBJECTIVE: A LARGE, INTELLIGENT COMPUTER SYSTEM FOR
- LANGUAGE PROCESSING
- SPEECH AND IMAGE PROCESSING
- EXPERT SYSTEMS

THREE PHASES
- 1ST - 3 YEARS - FUNCTIONAL MODULES
- 2ND - 4 YEARS - BUILD A PROTOTYPE
- 3RD - 3 YEARS - COMPLETE THE SYSTEM AND SOFTWARE

$45M OF GOVERNMENT FUNDS FOR FIRST PHASE

COMPUTING

Los Alamos



BASIC CONFIGURATION IMAGE OF THE FIFTH GENERATION COMPUTER SYSTEM (JAPANESE)

5TH GENERATION COMPUTER: SPECIFICATIONS

- HIGHER PERFORMANCE LEVEL AT A LOWER COST
- "TRIPARTITE BRAIN"
    1) INTELLIGENT INTERFACE SYSTEM
        - ACCESS THROUGH NATURAL LANGUAGE AND PICTURES
    2) PROBLEM-SOLVING AND INFERENCE SYSTEM
        - HANDLE MANY MORE GENERAL PROBLEM-SOLVING TASKS THAN TODAY'S MACHINES
        - BE ABLE TO LEARN, ASSOCIATE, AND INFER
    3) KNOWLEDGE-BASED MANAGEMENT SYSTEM
        - BE ABLE TO UNDERSTAND AND USE STORED INFORMATION
        - "KNOWLEDGE BASES" RATHER THAN "DATABASES"
- EACH OF THE THREE SYSTEMS HAS OWN SPECIALIZED MACHINE WITH VLSI ARCHITECTURE
- COMPUTER SIZES TO RANGE FROM MICRO'S TO MAINFRAMES

SOURCE: TOM MANUEL, BYTE, 5/82

5TH GENERATION COMPUTER: EXAMPLE: PROJECTS AND SPECIFICATIONS

- PERSONAL WORK STATION
  - PERFORM 2 MIPS
  - HAVE .5 TO 5 MEGABYTES OF MEMORY
  - HAVE 100 MEGABYTES OF DISK STORAGE, WITH AN AVERAGE ACCESS OF 1 MILLISECOND
- "SUPER HIGH-SPEED PROCESSOR"
  - PERFORM 1 TO 100 BILLION FLOATING POINT OPERATIONS PER SECOND (FLOPS)
  - HAVE 8 TO 160 MEGABYTES OF MEMORY
- PROBLEM — SOLVING AND INFERENCE FUNCTION
  - PERFORM 100 MILLION TO 1 BILLION LOGICAL-INFERENCE OPERATIONS PER SECOND

    (1 LOGICAL INFERENCE = 100 TO 1000 INSTRUCTIONS)
- NATURAL LANGUAGE PROCESSING SYSTEM
- KNOWLEDGE-BASED MANAGEMENT FUNCTION
  - RETRIEVE 1 UNIT OF KNOWLEDGE IN SEVERAL SECONDS FROM A BASE OF 100 TO 1000 GIGABYTES

SOURCE: MANUEL, BYTE, 5/82

5TH GENERATION COMPUTER: EXAMPLE PROJECTS AND SPECIFICATIONS

- VERY-LARGE-SCALE INTEGRATION TECHNOLOGY
  - AT FIRST, HAVE 1 MILLION TRANSISTORS PER CHIP
  - EVENTUALLY HAVE 10 MILLION TRANSISTORS PER CHIP

SOURCE: MANUEL, BYTE, 5/82

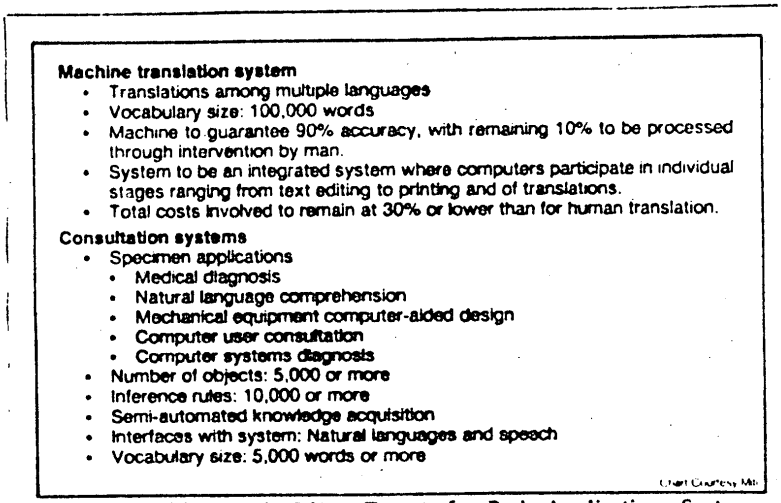


Figure 1. Subjects and 10-Year Targets for Basic Applications Systems

SOURCE: REX MALIK, COMPUTERWORLD/EXTRA 11/17/82, P. 25

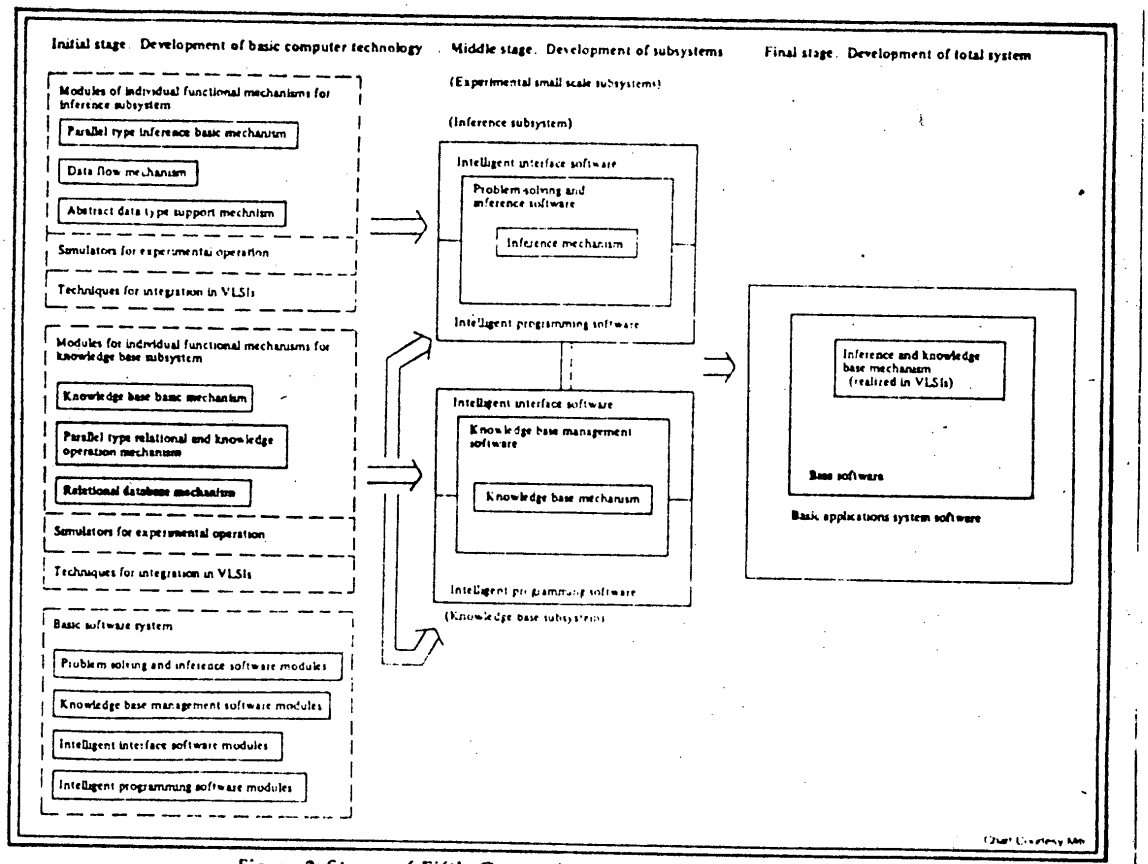


Figure 2. Stages of Fifth-Generation Research and Development

SOURCE: REX MALIK, COMPUTERWORLD/EXTRA 11/17/82, P. 25

5TH GENERATION COMPUTER: NEW TECHNOLOGIES

- NEW TECHNIQUES TO BE USED
  - NEW ARCHITECTURES LIKE DATA-FLOW MACHINES
  - ARTIFICIAL-INTELLIGENCE CONCEPTS
  - LANGUAGES SUCH AS LISP AND PROLOG WITH MACHINES OPTIMIZED FOR THEM
- TECHNOLOGIES CURRENTLY EXCLUDED FROM PROGRAM
  - EXAMPLES
    - GALLIUM ARSENIDE
    - JOSEPHSON JUNCTIONS
  - RESEARCHERS FELT THESE TECHNOLOGIES WOULD NOT BE SUFFICIENTLY DEVELOPED FOR GENERAL USE BY 1990
    - THEY WILL BE INCLUDED AT SOME INTERMEDIATE STAGE IF OUTSIDE RESEARCH GAINS OCCUR

SOURCE: MANUEL, BYTE, 5/82

5TH GENERATION COMPUTER: DESIGN AUTOMATION SYSTEM (PAGE 1)

- CONSISTS OF THREE PARTS
  1) SOFTWARE FOR AUTOMATED DESIGN OF VLSI
     - PLAN TO INITIALLY IMPLEMENT HSL (HIERARCHICAL SPECIFICATION LANGUAGE)
       - HSL CONTAINS SEVERAL MODULES INTEGRATED INTO A TOTAL DESIGN SYSTEM
       - CURRENTLY BEING USED AT THE MUSASHINO ELECTRICAL COMMUNICATION LABORATORY OF NIPPON TELEGRAPH AND TELEPHONE PUBLIC CORPORATION
  2) SYSTEM 5G - THE COMPUTER SYSTEM TO RUN IT
     - PLAN TO USE CONVENTIONAL 40 MIPS GENERAL-PURPOSE COMPUTER UNTIL FIRST 5TH GENERATION COMPUTERS ARE AVAILABLE

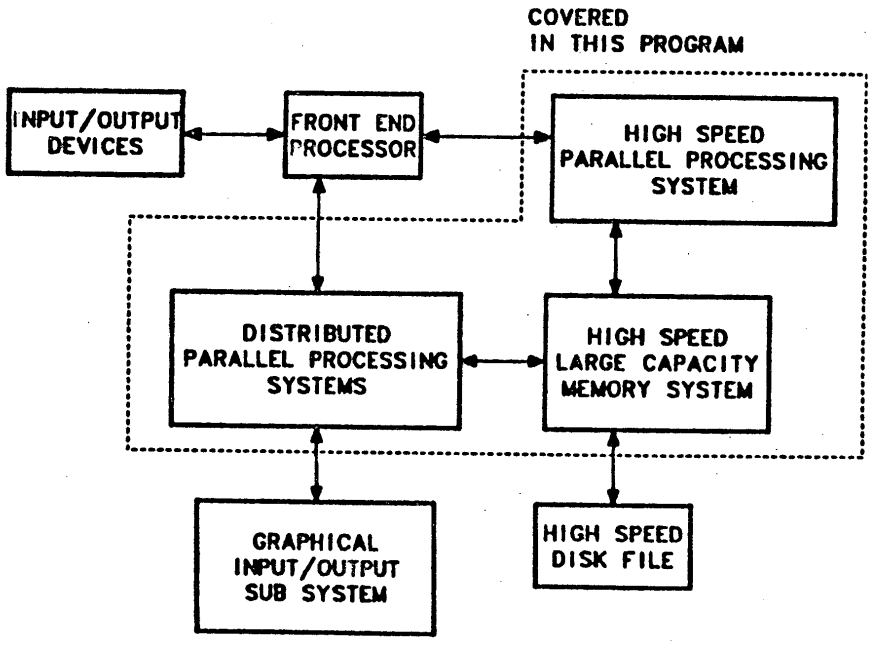
SOURCE: MANUEL, BYTE, 5/82

5TH GENERATION COMPUTER: DESIGN AUTOMATION SYSTEM (PAGE 2)

3) 5G PERSONAL COMPUTER - LOGIC-PROGRAMMING WORK STATION FOR DESIGNERS
   - REQUIRES HIGH-SPEED PROCESSING OF VOICE, GRAPHIC, AND DIGITIZED IMAGE INPUT AS WELL AS PERFORMANCE AS A PERSONAL-INTERFACE MACHINE
   - NO EXISTING PERSONAL COMPUTER MEETS THESE SPECIFICATIONS

SOURCE: MANUEL, BYTE, 5/82

JAPANESE
ULTRA–HIGH–SPEED COMPUTING FACILITY



COMPUTING **Los Alamos**

Approved For Release 2008/06/27 : CIA-RDP85B01152R000700910068-9

ADVANCES ARE REQUIRED IN

COMPONENTS

ARCHITECTURE

ALGORITHMS AND LANGUAGES

COMPUTING

Los Alamos

Approved For Release 2008/06/27 : CIA-RDP85B01152R000700910068-9

COMPONENT OBJECTIVES

LOGIC: 3k GATES, 10 ps DELAY (JJ,HEMT)
3k GATES, 30 ps DELAY (GaAs)

MEMORY: 16k bits, 10 ns ACCESS

SUMMARY

JAPAN HAS LAUNCHED A NATIONAL PROGRAM TO BECOME A WORLD LEADER IN SUPERCOMPUTERS.

ALL SIX MAJOR JAPANESE VENDORS ARE PARTICIPATING.

THE PROJECT IS LIKELY TO PRODUCE A COMPUTER AND EVEN PARTIAL SUCCESS COULD HAVE FAR REACHING CONSEQUENCES.

5TH GENERATION COMPUTER: SOME JAPANESE EXPECTATIONS

- BENEFITS TO BE GAINED
  - RAISING PRODUCTIVITY IN LOW-PRODUCTIVITY FIELDS
  - PRESERVATION OF INTERNATIONAL COMPETITIVE CAPABILITY BY DEVELOPMENT OF NEW TECHNOLOGY
  - CONSERVATION OF ENERGY AND RESOURCES
  - PROMOTE UTILIZATION OF CAPACITY OF AGING CITIZENS
  - INFORMATIONALIZATION OF SOCIETY

SOURCES: SID FERNBACH, BRIEF ON THE JAPANESE COMPUTER INDUSTRY, MAY, 1981

ZEN YAMADA, MEMORANDUM ON RECENT PUBLISHED INFORMATION, MAY 13, 1981

5TH GENERATION COMPUTER: SOME JAPANESE EXPECTATIONS

- FEATURES OF 5TH GENERATION COMPUTER
  - CONSIDERABLE DIVERSITY
  - EMPHASIS ON SPECIALIZATION
  - NON-VON NEUMANN ARCHITECTURE
  - COMPOSITE MICRO-ARCHITECTURE
  - INPUT/OUTPUT OF DAILY LANGUAGES, CHARACTERS, GRAPHS WITH NO MODIFICATION
  - SELF-RECOVERING FUNCTION (AUTOMATIC RECOVERY)
  - SELF-PROGRAMMABLE WITH SIMPLE INSTRUCTIONS (NO REQUIREMENT FOR HUGE PROGRAMS)
  - FUTURE PROBLEM SOLVING BASED ON RECORDED DATA

SOURCES: SID FERNBACH, BRIEF ON THE JAPANESE COMPUTER INDUSTRY, MAY, 1981

ZEN YAMADA, MEMORANDUM ON RECENT PUBLISHED INFORMATION, MAY 13, 1981

5TH GENERATION COMPUTER: SOME JAPANESE EXPECTATIONS

- MAJOR R&D THEMES
  - DEVICE TECHNOLOGY
  - ARCHITECTURE AND HIGH PERFORMANCE PROCESSES
  - DISTRIBUTED FUNCTIONAL SYSTEMS
  - SOFTWARE ENGINEERING
  - INTELLIGENT ROBOTS
  - HIGH RELIABILITY, SECRECY PROTECTION FUNCTION

SOURCES: SID FERNBACH, BRIEF ON THE JAPANESE COMPUTER INDUSTRY, MAY, 1981

ZEN YAMADA, MEMORANDUM ON RECENT PUBLISHED INFORMATION, MAY 13, 1981

JAPANESE COMPUTER RESEARCH: SOFTWARE DEVELOPMENT

- "THE ELECTRONIC COMPUTER BASIC TECHNOLOGY DEVELOPMENT ASSOCIATION"
  - COOPERATIVE ASSOCIATION TO DEVELOP SOFTWARE
  - MEMBERS
    - HITACHI
    - TOSHIBA
    - FUJITSU
    - NEC
    - MITSUBISHI
    - OKI
    - MATSUSHITA
    - SHARP
    - NEC - TOSHIBA INFORMATION SYSTEMS
    - COMPUTER DEVELOPMENT LABORATORY
- WILL SPEND $56 M (1981-1986)
    - MITI WILL PROVIDE HALF THE FUNDS

SOURCE: SID FERNBACH, BRIEF REPORT ON THE JAPANESE COMPUTER INDUSTRY, MAY, 1981