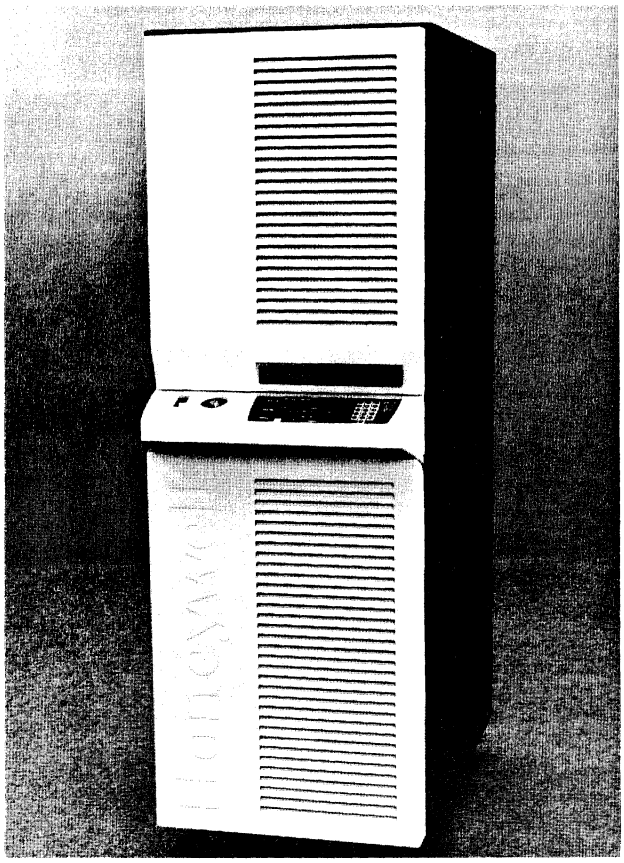
Honeywell DATANET 6661 Front-end Network Processor



Honeywell's DATANET 6661 network processor is offered as a front-end for Honeywell mainframes in pre-DSA network environments. It supports large and very large systems that run GCOS, GCOS 8, or Multics operating software.

The DATANET 6661 is a front-end network processor for Honeywell's pre-DSA, large-scale computer systems. The DATANET 6661 features up to 512K bytes of memory, a cache memory option, and support for up to 96 communications lines. The DATANET 6661 supports large and very large systems running GCOS, GCOS 8, or Multics operating software.

An entry-level DATANET 6661, including 64K bytes of memory, a heavy-duty console, one host connection, and support for up to 32 communications lines is priced at $51,569 plus $301 per month for maintenance. One-, three-, and five-year leasing plans are also available.

MANAGEMENT SUMMARY

UPDATE: *This report is being updated to reflect the changes that have occurred since the report was last updated. User ratings for the DATANET 6661, from Datapro's 1985 Network Users' Survey, are presented in this report.*

The DATANET 6661 Front-end Network Processor (FNP), introduced in March 1980, is designed to act as a dedicated communications system for Honeywell's DPS 8, DPS 88, DPS 8M, Level 66/DPS, and Level 68/DPS central systems in a pre-DSA network. The 6661 is based on Honeywell's Level 6 minicomputer technology.

The basic DATANET 6661 consists of the processor, 64K bytes of memory, a heavy-duty console, a direct interface adapter and host connection, and configurational support for up to 32 communications lines.

It can be upgraded in two series of steps: Mid-Level Performance uses 128K bytes of memory, provides support for up to 64 lines, and boosts processor power by about 47 percent; High-Level Performance adds a cache memory and ➤

CHARACTERISTICS

VENDOR: Honeywell, Incorporated, Honeywell Plaza, Minneapolis, MN 33408. Telephone (612) 870-5200.

DATE OF ANNOUNCEMENT: March 1980.

DATE OF FIRST DELIVERY: April 1980.

NUMBER DELIVERED TO DATE: Information not available.

SERVICED BY: Honeywell, Incorporated.

CONFIGURATION

The DATANET 6661 front-end processor is based on Honeywell's Level 6 minicomputer technology. The basic configuration includes: the processor; 64K bytes of main memory; a System Support Controller with control panel and system diskette drive; a Direct Interface Adapter, which provides for connection to the host; and internal support for up to 32 communications lines. An optional, heavy-duty console is required for NPS operation.

The processor operates asynchronously under firmware control and uses an internal 18-bit word structure. An I/O Multiplexer is inherent in the basic system architecture, and provides interfacing for data travelling between the I/O bus, to which the Channel Interface Bases, host connectors, and I/O device controllers are connected, and the system bus, which connects the 6661 to the host processor and main memory. Internally, the I/O Multiplexer operates asynchronously in an interrupt-driven fashion. The maximum data transfer rate is approximately 2M bytes per second.

The high-speed RAM memory subsystem performs all storage functions without restrictions on address sequences, data patterns, or repetition rates. Memory features include single- and double-word fetch, self-contained initialize and refresh logic, and standard EDAC (error detection and correction) capability.

Channel Interface Bases and Channel Interfaces can be added to the system as needed. Each Channel Interface Base provides the logical interfacing for up to eight communica- ➤

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provides about 82 percent better performance than the Mid-Level Performance configuration. Either the Mid- or High-Level Performance configurations can be expanded to include up to 512K bytes of memory and/or support for up to 96 lines.

Physically, the 6661 occupies 7 square feet of floor space in 32- or 64-line configurations; the 96-line configuration requires 14 square feet of floor space.

The DATANET 6661 is logically compatible with the system software and user-generated programs of previous DATANET 6600 Family front-ends (e.g., Models 6678, 6641, and 6651), and supports Honeywell's Remote Terminal Supervisor (GRTS-II), Network Processing Supervisor (NPS), and Multics Communication System (MCS) software. Besides off-loading message management and line handling functions from the host, the 6661 (under NPS) can perform traffic statistics gathering, automatic restart/recovery, and host-independent message switching functions.

COMPETITIVE POSITION

The DATANET 6661 competes intramurally with Honeywell's more capable and less-expensive DATANET 8. The DATANET 6661 continues to be used in Honeywell's pre-SNA network environments. Honeywell continues to support these products but they strongly encourage users to migrate to DSA products. They attempt to make this migration a smooth one through several compatible and coexistence features that are found in their new products. The DATANET 6661 will continue to be offered as long as there are users in the pre-DSA environment, but it faces an uncertain future.

ADVANTAGES AND RESTRICITONS

As a front-end processor in simple Honeywell networks, there is nothing wrong with the DATANET 6661. How-

tions lines; each Channel Interface provides for physical connection of one or two lines to the Channel Interface Base.

The maximum system configuration allows for a total of up to 12 Channel Interface Bases and up to 48 Channel Interfaces. For more information on Channel Interface Bases and Channel Interfaces, see "TRANSMISSION SPECIFICATIONS" and Table 1.

The DATANET 6661 may be expanded in several steps to Mid- or High-Performance Levels. The first enhancement step (feature DCM6605) is a memory expansion to 128K bytes. This step also adds a page control logic unit, a table-driven mechanism by which memory beyond the basic 64K bytes can be accessed and protected. Next, a performance and line configurability enhancement (feature DCE6661) is added, which increases processor power by 47 percent and expands the line support to accommodate 64 lines, bringing the DATANET 6661 to the Mid-Performance Level. From that point, additional enhancements can be added in any order. Main memory can be expanded to 256K or 512K bytes. An additional line configurability option may be added, expanding the line support to accommodate 96 lines.

A cache memory can be added to raise the DATANET 6661 to the High-Performance Level. The cache memory is used to perform anticipatory main memory reads and to store data recently used by the processor for future iterations of the currently executing programs, thus decreasing the time required to fetch instructions and data stored in main memory. Given the approprate configuration and instruction mix, the cache memory provides an execution rate of up to 1M instructions per second. Systems with the cache memory give about 82 percent higher performance than the Mid-Performance configuration.

Other options available for the 6661 include a second Direct Interface Adapter and one or two Peripheral Interface Adapters. For more information on the Direct Interface Adapter, see "CONNECTION TO HOST COMPUTER." The Peripheral Interface Adapter provides access to the host system's mass storage processor. If a second Peripheral Interface Adapter is configured, only one may operate at any given time. One Peripheral Interface Adapter is required when NPS is selected as the 6661's operating system, to support its traffic statistics gathering, restart/recovery, and message switching capabilities.

TABLE 1. DATANET 6661 CHANNEL INTERFACES

Type of Line Interfaces	Maximum Speed, bps	Feature Number	Number of Lines Supported
20 ma Current Loop (dual ch. pck)	9600	DCF6610	2
Dual RS-232-C Synchronous	9600	DCF6611	2
Dual RS-232-C Asynchronous	9600	DCF6612	2
CCITT/V.25 HDLC*	72,000	DCF6623	1
CCITT/V.35 Broadband	72,000	DCF6627	1
MIL-STD 188-C Asynchronous	9600	DCF6615	2
MIL-STD 188-C Synchronous	9600	DCF6614	1
MIL-STD 188-C HDLC	9600	DCF6617	1
MIL-STD 188-C Broadband	72,000	DCF6616	1
Dual Bisynchronous	9600	DCF6618	2
Bisynchronous Broadband	72,000	DCF6621	1
HDLC Voice Grade	9600	DCF6620	1
HDLC Broadband*	72,000	DCF6622	1
Broadband	72,000	DCF6619	1
Direct Connect Asynchronous	9600	DCF6624	1
Direct Connect Synchronous	9600	DCF6625	1
Automatic Call Unit	—	DCF6613	2
Universal Modem Bypass	18,000 (asyn) 19,200 (sync)	DCF6927	1

**Requires two Channel Interface Base slots.*

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Configuration

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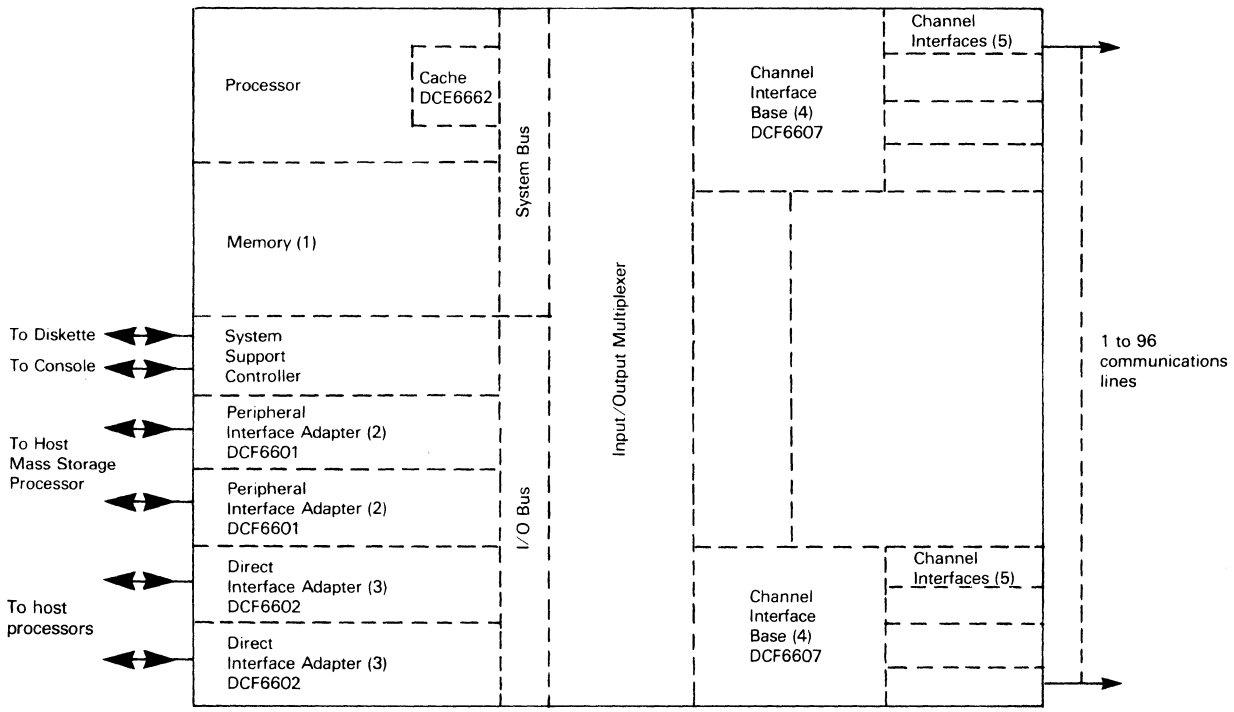

(1) Basic memory is 64K bytes, expandable to 128K, 256K, or 512K bytes via DCM6605, DCM6606, and DCM6607 memory increments.

(2) One or two Peripheral Interface Adapters are optional.

(3) One Direct Interface Adapter, providing connection to the host, is standard. A second adapter, which serves only for back-up redundancy, is optional.

(4) Up to 12 Channel Interface Bases can be included in a maximum system configuration.

(5) Up to four Channel Interfaces can be attached to one Channel Interface Base. Depending on the type of line to be connected, each interface can support one or two lines; see Table 1.

ever, Honeywell's priority is the DSA enviroment and the DATANET 6661 is not equipped to function in that environment. Users who want to work in a Honeywell network should take a serious look at both network processors and decide if they want to be in the DSA environment.

USER REACTION

Seven users of DATANET 6661 processors responded to Datapro's 1985 Network Users' Survey; among them, they had 14 systems. Their ratings are as follows:

	Excellent	Good	Fair	Poor	WA*
Overall performance	2	5	0	0	3.3
Ease of installation	1	6	0	0	3.1
Ease of operation	2	5	0	0	3.3
Ease of expansion	1	5	1	0	3.0
Hardware reliability	2	4	1	0	3.1
Quality of vendor's software/firmware	2	4	1	0	3.1
Ease of programming	2	2	2	0	3.0
Quality of vendor's maintenance service	2	4	1	0	3.1
Quality of vendor's technical support**	2	4	1	0	3.1

*Weighted Average based on a scale of 4.0 for Excellent.
**Technical support includes documentation, training, and troubleshooting performed by the vendor.

If network configuration demands more front-end processor power or capacity than a single 6661 FNP can deliver, up to eight 6661s, each with its own memory and with or without its own performance enhancement options, can be configured with a single host. Multiple 6661s can also provide for FNP redundancy and selection of networking software (e.g., by using NPS in one FNP and GRTS-II in another).

TRANSMISSION SPECIFICATIONS

Channel Interface Bases provide the connection between the I/O Multiplexer and the Channel Interfaces. Each Channel Interface Base contains four slots for Channel Interfaces. Each Channel Interface usually occupies one slot; the exceptions are that the HDLC Broadband and HDLC CCITT V.35 Channel Interfaces each require two slots. Up to 12 Channel Interface Bases can be configured in a 6661, providing support for up to 48 Channel Interfaces.

Eighteen different Channel Interfaces are offered to accommodate the requirements of various line types for specific data transfer rates, bit orders, bits per character, information codes, character sets, message formats, and communications control procedures. Synchronous data rates up to 72,000 bps and asynchronous data rates up to 9600 bps can be accommodated. Except for the Bisynchronous Interface (DCF6618), lines can be either half- or full-duplex. Synchronous and asynchronous direct cable connection is also available. Depending on the type of Channel Interface, either one or two communications lines can be connected.

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Datapro was unable to contact any DATANET 6661 users by telephone for more detailed information. □

Automatic dialing is available as a feature that occupies one interface slot in the Channel Interface Base. Each Automatic Call Unit can handle up to two lines. A Universal Modem Bypass feature is also available for direct communications line connection. See Table 1 for specifications of the various Channel Interfaces.

CONNECTION TO HOST COMPUTER: The DATANET 6661 can be channel-attached to a local DPS 8, DPS 88, DPS 8M, Level 66/DPS, or Level 68/DPS host computer operating under a GCOS 8, GCOS, or Multics operating system, respectively. The Direct Interface adapter provides the physical interface to the host. One Direct Interface Adapter is standard on the basic system. A second Direct Interface Adapter can be added for a total of two paths to one or two host computers. Since only one host link can be active at any given time, a second Adapter would normally be used for back-up purposes.

SOFTWARE

The software used to drive the DATANET 6661 when it is attached to a DPS 8, DPS 88, DPS 8M, or Level 66/DPS host is the Network Processing Supervisor (NPS), Release NT2 or later. NPS interfaces with the GCOS 8 and GCOS operating systems, and requires no applications reprogramming. As an alternative, the Remote Terminal Supervisor (either GRTS-I or GRTS-II), a low-overhead, limited-networking package, can be used. Both NPS and GRTS-I/II support remote job entry, direct program access, message concentration, transaction processing, and time-sharing facilities. NPS has additional capabilities that provide for device-unique control parameterization and more flexible customization that allows support for nonstandard terminals and protocols. NPS can also provide network traffic statistics journals, automatic restart/recovery, supervisory control through one or more Network Control Supervisory Stations, and host-independent message switching functions through the host system's mass storage processor, to which the 6661 is connected via a Peripheral Interface Adapter option.

When attached to a Level 68/DPS or DPS 8M host, the 6661 uses the Multics Communication System (MCS) software. MCS supports remote job entry and asynchronous, synchronous, and bisynchronous protocols and uses device tables to accommodate various asynchronous devices.

PERIPHERALS

CONSOLE: The System Support Controller serves as the interface between the I/O Multiplexer, the console, and a single 8-inch diskette drive, which is also standard and is used to load system test and diagnostic programs. The console is a desktop keyboard/printer terminal that prints 132 print positions per line at 30 cps using a 64-character ASCII-character set.

PERIPHERAL INTERFACE: Up to two Peripheral Interface Adapters are optional. The primary reason for this capability is the attachment of disk for audit, restart, and message-switch purposes with the NPS software. GRTS-I/II does not support this option.

PRICING

The DATANET 6661 is available for purchase or for rental under a one-, three-, or five-year agreement. The standard maintenance contract provides for service during the period from Monday through Friday from 8:00 a.m. to 6:00 p.m. Contracts for service beyond the standard period are available; the additional charge is based on a fixed percentage of the basic monthly maintenance fee. Alternatively, the user can obtain on-call maintenance service at hourly rates.

EQUIPMENT PRICES

		Monthly Charge*				
		1-Year Lease ($)	3-Year Lease ($)	5-Year Lease ($)	Purchase Prices ($)	Monthly Maint. ($)
DCU6661	Basic DATANET 6661; includes 64K bytes of memory, control panel, System Support Controller, one Direct Interface Adapter, and support for up to 32 communications lines	1,990	1,862	1,669	36,605	261
DCM6605	Memory Increment; expands main memory from 64K to 128K bytes; includes paging module; max. 1	589	562	522	8,400	218
DCM6606	Memory Increment; expands main memory from 128K to 256K bytes; requires DCM6605 and DCE6661; max. 1	693	673	624	10,920	109
DCM6607	Memory Increment; expands main memory from 256K to 512K bytes; requires DCM6605; DCM6606, and DCE6661; max. 1	1,387	1,345	1,248	21,840	218
DCE6661	Performance and Line Configurability Enhancement; increases processor performance to Mid-Performance Level; increases line configurability to a maximum of 64 lines; requires DCM6605	700	654	578	13,209	113
DCE6662	Cache Memory Performance Enhancement; increases processor performance to High-Performance Level; requires DCM6605 and DCE6661	1,365	1,267	1,120	29,840	65
DCE6663	Line Configurability Enhancement; increases line configurability to a maximum of 96 lines; requires DCM6605 and DCE6661	154	148	139	3,546	0
DCF6601	Peripheral Interface Adapter; max. 2	298	279	256	7,070	36
DCF6602	Second Direct Interface Adapter; max. 1	298	279	249	7,070	36
DCF6607	Channel Interface Base; max. 12	70	65	58	1,651	9
DCF6606	Heavy-duty console and stand (required for NPS)	283	278	262	7,345	35

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	Channel Interface Options—					
DCF6610	20 ma Current Loop Dual Channel Package	46	44	39	1,180	4
DCF6611	Dual Synchronous RS-232-C	60	56	50	1,450	7
DCF6612	Dual Asynchronous RS-232-C	26	25	23	590	4
DCF6613	Automatic Call Unit	46	44	39	1,180	4
DCF6614	Synchronous MIL-STD 188-C	63	59	53	1,501	8
DCF6615	Asynchronous MIL-STD 188-C	63	59	53	1,501	8
DCF6616	Broadband MIL-STD 188-C	63	59	53	1,501	8
DCF6617	HDLC MIL-STD 188-C	106	99	89	2,573	11
DCF6618	Dual Bisynchronous	60	56	50	1,450	7
DCF6619	Broadband	125	117	104	3,056	12
DCF6620	HDLC Voice Grade	106	99	89	2,573	11
DCF6621	Bisynchronous Broadband	125	117	104	3,056	12
DCF6622	HDLC Broadband	125	117	104	3,056	12
DCF6623	HDLC CCITT/V.35	139	129	114	3,430	12
DCF6627	Broadband CCITT/V.35	139	129	114	3,430	12
DCF6626	Direct Connect Feature	15	14	13	350	2
DCF6927	Universal Modem Bypass	30	30	24	415	11

SOFTWARE PRICES

		Monthly Charge ($)	Optional Support Service ($)
SVC8002	Network Processing Supevisor (NPS)	974	209
SVC8003	NPS HDLC Option	129	11
SVC8004	Extended FNP Support	139	28
SVC8006	Host File Transceiver for Level 6	16	6
SVC8050	Interactive BSC Support for NPS	75	15
SVC8000	Remote Terminal Supervisor-II (GRTS-II)	273	44
SVC8001	GRTS-II HDLC Option	129	11
SGC6800	Multics Communication System (MCS)	**275	—
SVC8040	Interactive BSC Support for GRTS-II	75	15
SVC8048	GRTS-I	450	110

**Includes prime-shift maintenance.*
***Includes support service.* ■

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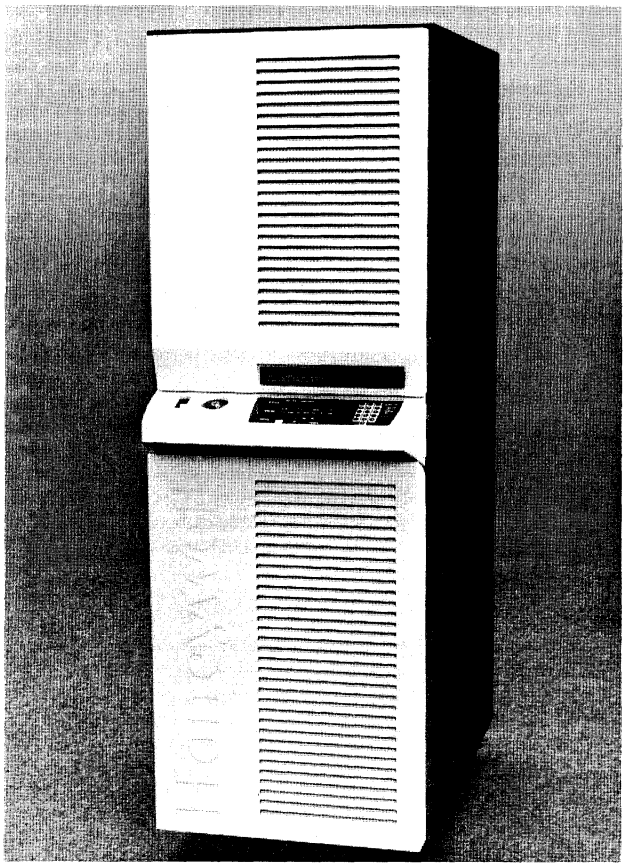

A front-end network processor for Honeywell's pre-DSA, large-scale computer systems.

The Datanet 6661 features up to 512K bytes of memory, a cache memory option, and support for up to 96 communications lines. The Datanet 6661 can be connected to a DPS 8, Level 66/DPS, or Level 68/DPS central system.

An entry level Datanet 6661, including 64K bytes of memory, a heavy-duty console, one host connection, and support for up to 32 communications lines is priced at $51,569 plus $301 per month for maintenance. One-, three-, and five-year leasing are also available.

MANAGEMENT SUMMARY

The Datanet 6661 Front-End Network Processor (FNP), introduced in March 1980, is designed to act as a dedicated communications system for Honeywell's DPS 8, DPS 88, DPS 8M, Level 66/DPS, and Level 68/DPS central systems in a Phase I (i.e., pre-DSA) Distributed Systems Environment (DSE) network. The 6661 is based on Honeywell's Level 6 minicomputer technology.

The basic Datanet 6661 consists of the processor, 64K bytes of memory, a heavy-duty console, a direct interface adapter and host connection, and configurational support for up to 32 communications lines.

It can be upgraded in two series of steps: Mid-Level Performance uses 128K bytes of memory, provides support for up to 64 lines, and boosts processor power by about 47%; High-Level Performance adds a cache memory and provides about 82% better performance than the Mid-Level configuration. Either the Mid- or High-Level Performance configurations can be expanded to include up to 512K bytes of memory and/or support for up to 96 lines.

Physically, the 6661 occupies 7 square feet of floor space in 32- or 64-line configurations; the 96-line configuration requires 14 square feet of floor space.

CHARACTERISTICS

VENDOR: Honeywell Incorporated, Honeywell Plaza, Minneapolis, MN 33408. Telephone (612) 870-5200.

DATE OF ANNOUNCEMENT: March 1980.

DATE OF FIRST DELIVERY: April 1980.

NUMBER DELIVERED TO DATE: Information not available.

SERVICED BY: Honeywell Incorporated.

CONFIGURATION

The Datanet 6661 front-end processor is based on Honeywell's Level 6 minicomputer technology. The basic configuration includes: the processor; 64K bytes of main memory; a System Support Controller with control panel and system diskette drive; a Direct Interface Adapter, which provides for connection to the host; and internal support for up to 32 communications lines. An optional, heavy-duty console is required for NPS operation.

The processor operates asynchronously under firmware control and uses an internal 18-bit word structure. An I/O Multiplexer is inherent in the basic system architecture, and provides interfacing for data travelling between the I/O bus, to which the Channel Interface Bases, host connectors, and I/O device controllers are connected, and the system bus, which connects the 6661 to the host processor and main memory. Internally, the I/O Multiplexer operates asynchronously in an interrupt-driven fashion. The maximum data transfer rate is approximately 2M bytes per second.

The high-speed RAM memory subsystem performs all storage functions without restrictions on address sequences, data patterns, or repetition rates. Memory features include single- and double-word fetch, self-contained initialize and refresh logic, and standard EDAC (error detection and correction) capability.

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The Datanet 6661 is logically compatible with the system software and user-generated programs of previous Datanet 6600 Family front-ends (e.g., Models 6678, 6641, and 6651), and supports Honeywell's Remote Teminal Supervisor (GRTS I or II), Network Processing Supervisor (NPS), and Multics Communication System (MCS) software. Besides off-loading message management and line handling functions from the host, the 6661 (under NPS) can perform traffic statistics gathering, automatic restart/recovery, and host-independent message switching functions.

COMPETITIVE POSITION

The Datanet 6661 competes intramurally with Honeywell's more capable and less-expensive Datanet 8. The Datanet 6661 remains the more popular of the two processors, since many current Honeywell users have yet to upgrade their networks to DSA. As Honeywell continues to realize the broad networking capabilities of DSA, Datanet 6661 users will migrate in increasing numbers to the Datanet 8.

ADVANTAGES AND RESTRICITONS

As a front-end processor in simple Honeywell networks, there is nothing wrong with the Datanet 6661. However, as Honeywell continues to develop DSA, the 6661 will have to fall by the wayside in favor of the DSA-compatible Datanet 8.

USER REACTION

Six users of Datanet 6661 processors responded to Datapro's 1983 Network Users' Survey; among them, they had 15 systems. Their ratings are as follows:

Channel Interface Bases and Channel Interfaces can be added to the system as needed. Each Channel Interface Base provides the logical interfacing for up to eight communications lines; each Channel Interface provides for physical connection of one or two lines to the Channnel Interface Base.

The maximum system configuration allows for a total of up to 12 Channel Interface Bases and up to 48 Channel Interfaces. For more information on Channel Interface Bases and Channel Interfaces, see "TRANSMISSION SPECIFICATIONS" and Table 1.

The Datanet 6661 may be expanded in several steps to Mid- or High-Performance Levels. The first enhancement step (feature DCM6605) is a memory expansion to 128K bytes. This step also adds a page control logic unit, a table-driven mechanism by which memory beyond the basic 64K bytes can be accessed and protected. Next, a performance and line configurability enhancement (feature DCE6661) is added, which increases processor power by 47% and expands the line support to accommodate 64 lines, bringing the Datanet 6661 to the Mid-Performance Level. From that point, additional enhancements can be added in any order. Main memory can be expanded to 256K or 512K bytes. An additional line configurability option may be added, expanding the line support to accommodate 96 lines.

A cache memory can be added to raise the Datanet 6661 to the High-Performance Level. The cache memory is used to perform anticipatory main memory reads and to store data recently used by the processor for future iterations of the currently executing programs, thus decreasing the time required to fetch instructions and data stored in main memory. Given the approprate configuration and instruction mix, the cache memory provides an execution rate of up to 1M instructions per second. Systems with the cache memory give about 82% higher performance than the Mid-Performance configuration.

Other options available for the 6661 include a second Direct Interface Adapter, and one or two Peripheral Interface Adapters. For more information on the Direct Interface Adapter, see "CONNECTION TO HOST COMPUTER."

TABLE 1. DATANET 6661 CHANNEL INTERFACES

Type of Line Interfaces	Maximum Speed, bps	Feature Number	Number of Lines Supported
20 mA Current Loop	9600	DCF6610	2
RS-232-C Synchronous	9600	DCF6611	2
RS-232-C Asynchronous	9600	DCF6612	2
CCITT-V.25 HDLC*	72,000	DCF6623	1
CCITT-V.35 Broadband	72,000	DCF6627	1
MIL STD 188-C Asynchronous	9600	DCF6615	2
MIL STD 188-C Synchronous	9600	DCF6614	1
MIL STD 188-C HDLC	9600	DCF6617	1
MIL STD 188-C Broadband	72,000	DCF6616	1
Bisynchronous	9600	DCF6618	2
Bisynchronous Broadband	72,000	DCF6621	1
HDLC Voice Grade	9600	DCF6620	1
HDLC Broadband*	72,000	DCF6622	1
Broadband	72,000	DCF6619	1
Direct Connect Asynchronous	9600	DCF6624	1
Direct Connect Synchronous	9600	DCF6625	1
Automatic Call Unit	—	DCF6613	2
Universal Modem Bypass	18,000 (async.) 19,200 (sync.)	DCF6927	1

**Requires two Channel Interface Base slots.*

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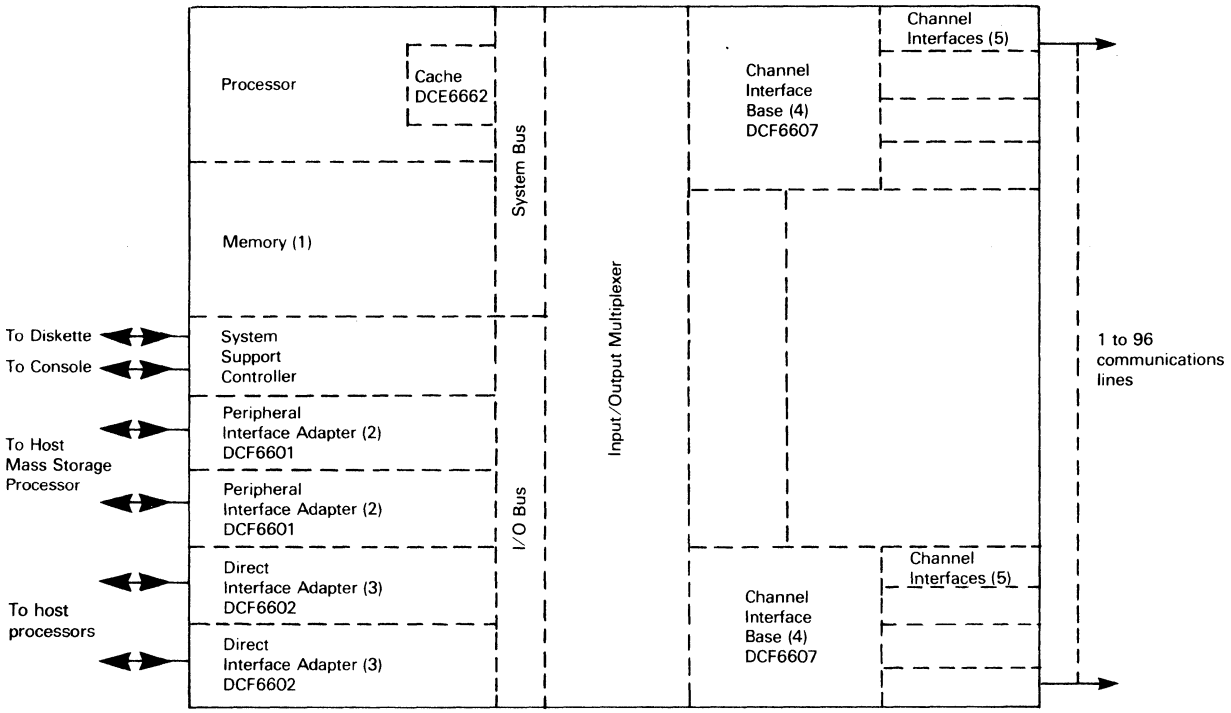
Front-end Network Processor

Configuration

DCU6661 Front-end Network Processor



(1) Basic memory is 64K bytes, expandable to 128K, 256K, or 512K bytes via DCM6605, DCM6606, and DCM6607 memory increments.

(2) One or two Peripheral Interface Adapters are optional.

(3) One Direct Interface Adapter, providing connection to the host, is standard. A second adapter, which serves only for backup redundancy, is optional.

(4) Up to 12 Channel Interface Bases can be included in a maximum system configuration.

(5) Up to four Channel Interfaces can be attached to one Channel Interface Base. Depending on the type of line to be connected, each interface can support one or two lines; see Table 1.

	Excellent	Good	Fair	Poor	WA*
Overall performance	2	4	0	0	3.3
Ease of installation	3	2	1	0	3.3
Ease of operation	3	3	0	0	3.5
Ease of expansion	1	3	2	0	2.8
Hardware reliability	3	3	0	0	3.5
Quality of vendor's software/firmware	1	3	2	0	2.8
Ease of programming	1	2	1	1	2.6
Quality of vendor's maintenance service	3	3	0	0	3.5
Quality of vendor's technical support**	1	4	1	0	3.0

*Weighted Average based on a scale of 4.0 for Excellent.
**Technical support includes documentation, training and trouble-shooting performed by the vendor.

Datapro was unable to contact any Datanet 6661 users by telephone for more detailed information. □

The Peripheral Interface Adapter provides access to the host system's mass storage processor. If a second Peripheral Interface Adapter is configured, only one may operate at any given time. One Peripheral Interface Adapter is required when NPS is selected as the 6661's operating system, to support its traffic statistics gathering, restart/recovery, and message switching capabilities.

If network configuration demands more front-end processor power or capacity than a single 6661 FNP can deliver, up to eight 6661's, each with its own memory and with or without its own performance enhancement options, can be configured with a single host. Multiple 6661s can also provide for FNP redundancy and selection of networking software (e.g., by using NPS in one FNP and GRTS-II in another).

TRANSMISSION SPECIFICATIONS

Channel Interface Bases provide the connection between the I/O Multiplexer and the Channel Interfaces. Each Channel Interface Base contains four slots for Channel Interfaces. Each Channel Interface usually occupies one slot; the exceptions are that the HDLC Broadband and HDLC CCITT V.35 Channel Interfaces each require two slots. Up to 12 Channel Interface Bases can be configured in a 6661, providing support for up to 48 Channel Interfaces.

Honeywell Datanet 6661
Front-end Network Processor

Eighteen different Channel Interfaces are offered to accommodate the requirements of various line types for specific data transfer rates, bit orders, bits per character, information codes, character sets, message formats, and communications control procedures. Synchronous data rates up to 72,000 bps and asynchronous data rates up to 9600 bps can be accommodated. Except for the Bisynchronous Interface (DCF6618), lines can be either half- or full-duplex. Synchronous and asynchronous direct cable connection is also available. Depending on the type of Channel Interface, either one or two communications lines can be connected. Automatic dialing is available as a feature that occupies one interface slot in the Channel Interface Base. Each Automatic Call Unit can handle up to two lines. A Universal Modem Bypass feature is also available for direct communications line connection. See Table 1 for specifications of the various Channel Interfaces.

CONNECTION TO HOST COMPUTER: The Datanet 6661 can be channel-attached to a local DPS 8, DPS 88, DPS 8M, Level 66/DPS, or Level 68/DPS host computer operating under a GCOS 8, GCOS, or Multics operating system, respectively. The Direct Interface Adapter provides the physical interface to the host. One Direct Interface Adapter is standard on the basic system. A second Direct Interface Adapter can be added for a total of two paths to one or two host computers. Since only one host link can be active at any given time, a second Adapter would normally be used for back-up purposes.

SOFTWARE

The software used to drive the Datanet 6661 when it is attached to a DPS 8, DPS 88, DPS 8M, or Level 66/DPS host is the Network Processing Supervisor (NPS), Release NT2 or later. NPS interfaces with the GCOS 8 and GCOS operating systems, and requires no applicatons reprogramming. As an alternative, the Remote Terminal Supervisor (either GRTS-I or GRTS-II), a low-overhead, limited-networking package, can be used. Both NPS and GRTS I/II support remote job entry, direct program access, message concentration, transaction processing, and time-sharing facilities. NPS has additional capabilities that provide for device-unique control parameterization and more flexible customization that allows support for non-standard terminals and protocols. NPS can also provide network traffic statistics journals, automatic restart/recovery, supervisory control through one or more Network Control Supervisory Stations, and host-independent message switching functions through the host system's mass storage processor, to which the 6661 is connected via a Peripheral Interface Adapter option.

When attached to a Level 68/DPS or DPS 8M host, the 6661 uses the Multics Communication System (MCS) software. MCS supports remote job entry and asynchronous, synchronous, and bisynchronous protocols and uses device tables to accommodate various asynchronous devices.

PERIPHERALS

CONSOLE: The System Support Controller serves as the interface between the I/O Multiplexer, the console, and a single 8-inch diskette drive, which is also standard and is used to load system test and diagnostic programs. The console is a desktop keyboard/printer terminal that prints 132 print positons per line at 30 cps using a 64-character ASCII character set.

PERIPHERAL INTERFACE: Up to two Peripheral Interface Adapters are optional. The primary reason for this capability is the attachment of disk for audit, restart, and message-switch purposes with the NPS software. GRTS-I/II does not support this option.

PRICING

The Datanet 6661 is available for purchase or for rental under a one-, three-, or five-year agreement. The standard maintenance contract provides for service during the period from Monday through Friday from 8:00 a.m. to 6:00 p.m. Contracts for sevice beyond the standard period are available; the additional charge is based on a fixed percentage of the basic monthly maintenance fee. Alternatively, the user can obtain on-call maintenance service at hourly rates.

		Monthly Charge*				
		1-Year Lease	3-Year Lease	5-Year Lease	Purchase	Monthly Maint.
DCU6661	Basic Datanet 6661; includes 64K bytes of memory, control panel, System Support Controller, one Direct Interface Adapter, and support for up to 32 communications lines	$1,990	$1,862	$1,669	$36,605	$261
DCM6605	Memory Increment; expands main memory from 64K to 128K bytes; includes paging module; max. 1	589	562	522	8,400	218
DCM6606	Memory Increment; expands main memory from 128K to 256K bytes; requires DCM6605 and DCE6661; max. 1	693	673	624	10,920	109
DCM6607	Memory Increment; expands main memory from 256K to 512K bytes; requires DCM6605; DCM6606, and DCE6661; max. 1	1,382	1,345	1,248	21,840	218
DCE6661	Performance and Line Configurability Enhancement; increases processor performance to Mid-Performance Level; increases line configurability to a maximum of 64 lines; requires DCM6605	700	654	578	13,209	113

*Includes prime-shift maintenance.
**Includes Support Service.

Honeywell Datanet 6661
Front-end Network Processor

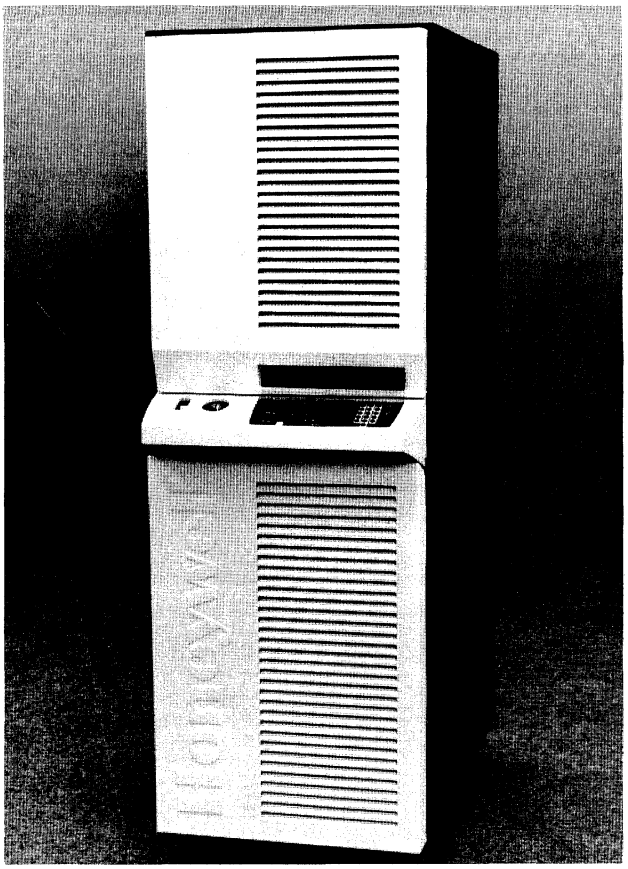
		Monthly Charge*				
		1-Year Lease	3-Year Lease	5-Year Lease	Purchase	Monthly Maint.
DCE6662	Cache Memory Performance Enhancement; increases processor performance to High-Performance Level; requires DCM6605 and DCE6661	1,365	1,267	1,120	29,840	65
DCE6663	Line Configurability Enhancement; increases line configurability to a maximum of 96 lines; requires DCM6605 and DCE6661	154	148	139	3,546	0
DCF6601	Peripheral Interface Adapter; max. 2	276	258	237	7,070	36
DCF6602	Second Direct Interface Adapter; max. 1	276	258	231	7,070	36
DCF6607	Channel Interface Base; max. 12	65	60	54	1,651	9
DCF6606	Heavy-duty console (required for NPS)	262	257	243	7,345	35
	Channel Interface Options—					
DCF6610	20 mA Current Loop	43	41	36	1,180	4
DCF6611	Synchronous RS-232-C	56	52	46	1,450	7
DCF6612	Asynchronous RS-232-C	24	23	21	590	4
DCF6613	Automatic Call Unit	43	41	36	1,180	4
DCF6614	Synchronous MIL STD 188-C	58	35	49	1,501	8
DCF6615	Asynchronous MIL STD 188-C	58	55	49	1,501	8
DCF6616	Broadband MIL STD 188-C	58	55	49	1,501	8
DCF6617	HDLC MIL STD 188-C	98	92	82	2,573	11
DCF6618	Bisynchronous	56	52	46	1,450	7
DCF6619	Broadband	116	108	96	3,056	12
DCF6620	HDLC Voice Grade	98	92	82	2,573	11
DCF6621	Bisynchronous Broadband	116	108	96	3,056	12
DCF6622	HDLC Broadband	116	108	96	3,056	12
DCF6623	HDLC CCITT-V.35	129	119	106	3,430	12
DCF6627	Broadband CCITT-V.35	129	119	106	3,430	12
DCF6624	Direct Connect Capability, asynchronous	13	13	11	350	1
DCF6625	Direct Connect Capability, synchronous	17	16	15	480	1
DCF6927	Universal Modem Bypass	28	28	22	415	11

Software

		Monthly Charge	Optional Support Service
SVC8002	Network Processing Supevisor (NPS)	$974	$209
SVC8003	NPS HDLC Option	129	11
SVC8004	Extended FNP Support	139	28
SVC8006	Host File Transceiver for Level 6	16	6
SVC8050	Interactive BSC Support for NPS	75	15
SVC8000	Remote Terminal Supervisor-II (GRTS-II)	273	44
SVC8001	GRTS-II HDLC Option	129	11
SGC6800	Multics Communication System (MCS)	275**	—
SVC8040	Interactive BSC Support for GRTS-II	75	15
SVC8048	GRTS-I	450	110

*Includes prime-shift maintenance.
**Includes Support Service. ■

Honeywell Datanet 6661



A front-end network processor for Honeywell's large-scale computer systems.

The Datanet 6661 features up to 512K bytes of memory, a cache memory option, and support for up to 96 communications lines. The Datanet 6661 can be connected to a DPS 8, Level 66/DPS, or Level 68/DPS central system.

An entry level Datanet 6661, including 64K bytes of memory, a heavy-duty console, one host connection, and support for up to 32 communications lines is priced at $64,849, plus $361 per month for maintenance. One-, three-, and five-year leasing is also available.

MANAGEMENT SUMMARY

The Datanet 6661 Front-End Network Processor (FNP), introduced in March 1980, is designed to act as a dedicated communications system to Honeywell's DPS 8, Level 66/DPS, and Level 68/DPS central systems in a Phase I (i.e., non-DSA) Distributed Systems Environment (DSE) network. The 6661 replaces the Datanet 6641 and 6651 front-ends previously offered for those systems. Improvements over the 6641/6651 include utilization of 16K MOS technology, which allows the system to be configured with 512K bytes of memory, and new bulkhead connectors, which simplify cable configuration and installation.

The 6661 is based on Honeywell's Level 6 minicomputer technology. The basic Datanet 6661 consists of the processor, 64K bytes of memory, a heavy-duty console, a direct interface adapter and host connection, and configurational support for up to 32 communications lines.

Upgrading of the Datanet 6661 is accomplished in two series of steps: Mid-Level Performance utilizes 128K bytes of memory, provides support for up to 64 lines, and boosts processor power by about 47%; High-Level ➢

CHARACTERISTICS

VENDOR: Honeywell Incorporated, Honeywell Plaza, Minneapolis, MN 33408. Telephone (612) 870-5200.

DATE OF ANNOUNCEMENT: March 1980.

DATE OF FIRST DELIVERY: April 1980.

NUMBER DELIVERED TO DATE: Information not available.

SERVICED BY: Honeywell Incorporated.

CONFIGURATION

The Datanet 6661 front-end processor is based on Honeywell's Level 6 minicomputer technology. The basic configuration includes: the processor; 64K bytes of main memory; a System Support Controller with attached heavy-duty system console and system diskette drive; a Direct Interface Adapter, which provides for connection to the host; and internal support for up to 32 communications lines.

The processor operates asynchronously under firmware control and utilizes an internal 18-bit word structure. An I/O Multiplexer is inherent in the basic system architecture, and provides interfacing for data travelling between the I/O bus, to which the Channel Interface Bases, host connectors, and I/O device controllers are connected, and the system bus, by which the processor and main memory are accessed. Internally, the I/O Multiplexer operates asynchronously in an interrupt-driven fashion. The maximum data transfer rate is approximately 2M bytes per second.

The high-speed RAM memory subsystem performs all storage functions without restrictions on address sequences, data patterns, or repetition rates. Memory features include single- and double-word fetch, self-contained initialize and refresh logic, and standard EDAC (error detection and correction) capability.

All Channel Interface Bases and all Channel Interfaces are added to the system as needed. Each Channel Interface Base provides the logical interfacing for up to eight communications lines; each Channel Interface provides for physical connection of one or two lines to the Channel Interface Base. ➢

Honeywell Datanet 6661

Table 1. Datanet 6661 Channel Interfaces

Type of Line Interfaces	Maximum Speed, bps	Feature Number	Number of Lines Supported
20 mA Current Loop	9600	DCF6610	2
RS-232-C Synchronous	9600	DCF6611	2
RS-232-C Asynchronous	9600	DCF6612	2
CCITT-V.35 HDLC*	72,000	DCF6623	1
CCITT-V.35 Broadband	72,000	DCF6627	1
MIL STD 188-C Asynchronous	9600	DCF6615	2
MIL STD 188-C Synchronous	9600	DCF6614	1
MIL STD 188-C HDLC	9600	DCF6617	1
MIL STD 188-C Broadband	72,000	DCF6616	1
Bisynchronous	9600	DCF6618	2
Bisynchronous Broadband	72,000	DCF6621	1
HDLC Voice Grade	9600	DCF6620	1
HDLC Broadband*	72,000	DCF6622	1
Broadband	72,000	DCF6619	1
Direct Connect (Asynchronous or Synchronous)	9600	DCF6626	1
Automatic Call Unit	—	DCF6613	2
Universal Modem Bypass	1800 (async.); 19,200 (sync.)	DCF6927	1

*Requires two Channel Interface Base slots.

Performance adds a cache memory and provides about 82% better performance than the Mid-Level configuration. Either the Mid- or High-Level Performance configurations can be expanded to include up to 512K bytes of memory and/or support for up to 96 lines.

Physically, the handsome 6661 occupies only 7 square feet of floor space in 32- or 64-line configurations; the 96-line configuration requires 14 square feet of floor space.

The Datanet 6661 is logically compatible with the system software and user-generated programs of previous Datanet 6600 Family front-ends (e.g., Models 6678, 6641, and 6651), and supports Honeywell's Remote Terminal Supervisor (GRTS I or II), Network Processing Supervisor (NPS), and Multics Communication System (MCS) software. Besides off-loading the host from message management and line handling functions, the 6661 (under NPS) can perform traffic statistics gathering, automatic restart/recovery, and host-independent message switching functions.□

The maximum system configuration allows for a total of up to 12 Channel Interface Bases and up to 48 Channel Interfaces. For more information on Channel Interface Bases and Channel Interfaces, see "TRANSMISSION SPECIFICATIONS" and Table 1.

The Datanet 6661 may be expanded in several steps to Mid- or High-Performance Levels. The first enhancement step (feature DCM6605) is a memory expansion to 128K bytes. This step also adds a page control logic unit, a table-driven mechanism by which memory beyond the basic 64K bytes can be accessed and protected. Next, a performance and line configurability enhancement (feature DCE6661) is added, which increases processor power by 47% and expands the line support to accommodate 64 lines, bringing the Datanet 6661 to the Mid-Performance Level. From that point, additional enhancements can be added in any order. Main memory can be expanded to 256K or 512K bytes. An additional line configurability option may be added, expanding the line support to accommodate 96 lines.

A cache memory can be added to raise the Datanet 6661 to the High-Performance Level. The cache memory is used to perform anticipatory main memory reads and to store data recently used by the processor for future iterations of the currently executing programs, thus decreasing the time required to fetch instructions and data stored in main memory. Given the appropriate configuration and instruction mix, the cache memory provides an execution rate of up to 1M instructions per second. Systems with the cache memory give about 82% higher performance than the Mid-Performance configuration.

Other options that are available for the 6661 include a second Direct Interface Adapter, and one or two Peripheral Interface Adapters. For more information on the Direct Interface Adapter, see "CONNECTION TO HOST COMPUTER." The Peripheral Interface Adapter provides access to the host system's mass storage processor. If a second Peripheral Interface Adapter is configured, only one may be operative at any given time. One Peripheral Interface Adapter is required when NPS is selected as the 6661's operating system, so that its traffic statistics gathering, restart/recovery, and message switching capabilities can be supported.

If network configuration demands more front-end processor power or capacity than a single 6661 FNP can deliver, up to eight 6661s, each with its own memory and with or without its own performance enhancement options, can be configured with a single host. Multiple 6661s can also provide for FNP redundancy and selection of networking software (e.g., by using NPS in one FNP and GRTS-II in another).

TRANSMISSION SPECIFICATIONS

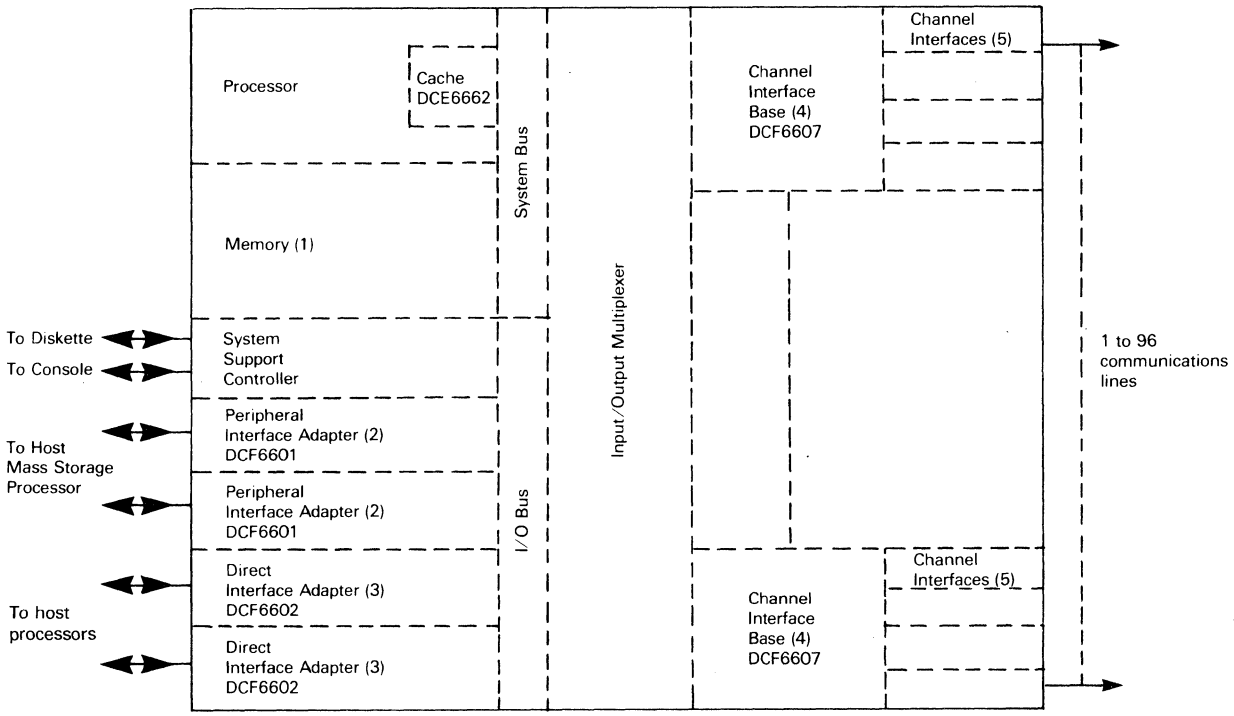
Channel Interface Bases provide the interfacing between the I/O Multiplexer and the Channel Interfaces. Each Channel Interface Base contains four slots for Channel Interfaces. Each Channel Interface generally occupies one slot; the exception is that the HDLC Broadband and HDLC CCITT V.35 Channel Interfaces each require two Channel Interface Base slots. Up to 12 Channel Interface Bases can be configured with a 6661, providing support for up to 48 Channel Interfaces.

Fifteen different Channel Interfaces are offered to accommodate the requirements of various line types for specific data transfer rates, bit orders, bits per character,

Honeywell Datanet 6661

Configuration

DCU6661 Front-end Network Processor



(1) Basic memory is 64K bytes, expandable to 128K, 256K, or 512K bytes via DCM6605, DCM6606, and DCM6607 memory increments.

(2) One or two Peripheral Interface Adapters are optional.

(3) One Direct Interface Adapter, providing connection to the host, is standard. A second adapter, which serves only for backup redundancy, is optional.

(4) Up to 12 Channel Interface Bases can be included in a maximum system configuration.

(5) Up to four Channel Interfaces can be attached to one Channel Interface Base. Depending on the type of line to be connected, each interface can support one or two lines; see Table 1.

information codes, character sets, message formats, and communications control procedures. Synchronous data rates up to 72,000 bps and asynchronous data rates up to 9600 bps can be accommodated. Except for the Bisynchronous Interface (DCF6618), lines can be either half- or full-duplex. Synchronous and asynchronous direct cable connection is also provided for. Depending on the type of Channel Interface, either one or two communications lines can be connected. See Table 1 for specifications of the various Channel Interfaces.

Automatic dialing is available as a feature that occupies one interface slot in the Channel Interface Base. Each Automatic Call Unit can handle up to two lines. A Universal Modem Bypass feature is also available for direct communications line connection.

CONNECTION TO HOST COMPUTER: The Datanet 6661 can be channel-attached to a local DPS 8, Level 66/DPS, or Level 68/DPS host computer operating under a GCOS 8, GCOS, or Multics operating system, respectively. The Direct Interface Adapter provides the physical interfacing to the host. One Direct Interface Adapter is standard on the basic system. A second Direct Interface Adapter can be added for a total of two paths to one or two host computers. Since only one host link can be active at any given time, use of a second Adapter would normally be used for back-up purposes.

SOFTWARE

The software used to drive the Datanet 6661 when it is attached to a DPS 8 or Level 66/DPS host is the Network Processing Supervisor (NPS), Release NT2 or later. NPS will interface with GCOS 8 and GCOS operating systems, and requires no applications reprogramming. As an alternative, the Remote Terminal Supervisor (either GRTS-I or GRTS-II), a low-overhead, limited-networking package, can be used. Both NPS and GRTS I/II support remote job entry, direct program access, message concentration, transaction processing, and time-sharing facilities. NPS has additional capabilities that provide for device-unique control parameterization and more flexible customization that allows non-standard terminals and protocols to be supported. NPS can also provide network traffic statistics journals, automatic restart/recovery, supervisory control through one or more Network Control Supervisory Stations, and host-independent message switching functions through the host system's mass storage processor, to which the 6661 is connected via a Peripheral Interface Adapter option.

Honeywell Datanet 6661

When attached to a Level 68/DPS host, the Multics Communication System (MCS) software is used. MCS supports remote job entry and asynchronous, synchronous, and bisynchronous protocols and utilizes device tables to accommodate various asynchronous devices.

PERIPHERALS

CONSOLE: The System Support Controller serves as the interface between the I/O Multiplexer, the heavy-duty console, which is a standard component of the basic system, and a single 8-inch diskette drive, which is also standard and is used to load system test and diagnostic programs. The console is a desktop keyboard/printer terminal that prints 132 print positions per line at 30 cps using a 64-character ASCII character set.

PERIPHERAL INTERFACE: Up to two Peripheral Interface Adapters are optional. The primary reason for this capability is the attachment of disk for audit, restart, and message-switch purposes with the NPS software. GRTS-I/II does not support this option.

PRICING

The Datanet 6661 is available for purchase or for rental under a one-, three-, or five-year agreement. The standard maintenance contract provides for service during the period from Monday through Friday from 8:00 a.m. to 6:00 p.m. Contracts for service beyond the standard period are available; the additional charge is based on a fixed percentage of the basic monthly maintenance fee. Alternatively, the user can obtain on-call maintenance service at standard hourly rates of $109 per man-hour.

		Monthly Charge*				
		1-Year Lease	3-Year Lease	5-Year Lease	Purchase	Monthly Maint.
DCU6661	Basic Datanet 6661; includes 64K bytes of memory, heavy-duty console, System Support Controller, one Direct Interface Adapter, and support for up to 32 communications lines	$1,843	$1,724	$1,545	$48,805	$261
DCM6605	Memory Increment; expands main memory from 64K to 128K bytes; includes paging module; max. 1	545	520	483	10,500	218
DCM6606	Memory Increment; expands main memory from 128K to 256K bytes; requires DCM6605 and DCE6661; max. 1	642	623	578	14,000	109
DCM6607	Memory Increment; expands main memory from 256K to 512K bytes; requires DCM6605, DCM6606, and DCE6661; max. 1	1,284	1,245	1,156	28,000	218
DCE6661	Performance and Line Configurability Enhancement; increases processor performance to Mid-Performance Level; increases line configurability to a maximum of 64 lines; requires DCM6605	648	606	535	16,512	113
DCE6662	Cache Memory Performance Enhancement; increases processor performance to High-Performance Level; requires DCM6605 and DCE6661	1,264	1,173	1,037	37,300	65
DCE6663	Line Configurability Enhancement; increases line configurability to a maximum of 96 lines; requires DCM6605 and DCE6661	143	137	129	4,443	0
DCF6601	Peripheral Interface Adapter; max. 2	256	239	219	7,070	36
DCF6602	Second Direct Interface Adapter; max. 1	238	231	219	7,070	36
DCF6607	Channel Interface Base; max. 12	60	56	50	1,651	9
	Channel Interface Options—					
DCF6610	20 mA Current Loop	40	38	33	1,180	4
DCF6611	Synchronous RS-232-C	52	48	43	1,450	7
DCF6612	Asynchronous RS-232-C	22	21	19	590	4
DCF6613	Automatic Call Unit	35	34	33	1,180	4
DCF6614	Synchronous MIL STD 188-C	48	47	45	1,501	8
DCF6615	Asynchronous MIL STD 188-C	48	47	45	1,501	8
DCF6616	Broadband MIL STD 188-C	48	47	45	1,501	8
DCF6617	HDLC MIL STD 188-C	79	77	74	2,573	11
DCF6618	Bisynchronous	52	48	43	1,450	7
DCF6619	Broadband	107	100	89	3,056	12
DCF6620	HDLC Voice Grade	79	77	74	2,573	11
DCF6621	Bisynchronous Broadband	107	100	89	3,056	12
DCF6622	HDLC Broadband	92	91	86	3,056	12
DCF6623	HDLC CCITT-V.35	103	100	94	3,430	12
DCF6627	Broadband CCITT-V.35	103	100	94	3,430	12
DCF6626	Asynchronous or Synchronous Direct Connect Capability	10	10	8	350	1
DCF6927	Universal Mode Bypass	28	28	22	415	11

SOFTWARE

	Monthly Charge	Optional Support Service
Network Processing Supervisor (NPS)	$847	$209
NPS HDLC Option	97	11
Remote Terminal Supervisor-II (GRTS-II)	206	44
GRTS-II HDLC Option	97	11
Multics Communication System (MCS)	605**	—

*Includes prime-shift maintenance.
**Includes Support Service.■