

Communication Processors

This Product Survey details the features of communication processors. The models covered function as front-end processors for host systems, remote concentrators, nodal processors, message switches, gateways to networks, or terminal controllers, or perform a combination of one or more of these functions. This report presents specifications on over **72 models** produced by **35 vendors**.

Listings are arranged alphabetically by vendor and then by specific model. Each model entry is divided into sections covering function, features, communications facilities, software, and pricing. An outline to refer the reader to vendors who market models with specific parameters precedes the detailed entries.

COMMUNICATION PROCESSORS OUTLINE

| COMPANY | MODEL | FUNCTION | Local Front End | Remote Concentrator | Nodal Processor | Message Switch | Electronic Mail | Terminal Controller | SNA Gateway | X.25 Gateway | HOSTS/NETWORKS | Control Data | Honeywell | IBM | NCR | Sperry | Other | LINE SUPPORT | | | |
|--------------------------|-----------------------|----------|-----------------|---------------------|-----------------|----------------|-----------------|---------------------|-------------|--------------|----------------|--------------|-----------|-----|-----|--------|-------|--------------|----------|-----------|----------|
| | | | | | | | | | | | | | | | | | | To 32 | 33 to 64 | 65 to 128 | Over 256 |
| Advanced Comp Comm (ACC) | IF-11 Series CP | • | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | • | --- | --- | --- |
| Amdahl Corporation | 3400 Series DSS | --- | • | • | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | • |
| Amdahl Corporation | 4400 Series NP | --- | • | • | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Amdahl Corporation | 4705 CP | • | • | • | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | • |
| Amdahl Corporation | 4705E CP | • | • | • | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | • |
| Amnet, Inc | Nucleus 6000 NP | • | • | • | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | • |
| BBN Computer Corp | C30 PCP | • | • | • | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | • |
| BBN Computer Corp | Pluribus PCP | • | • | • | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | • |
| BetaCom | PCM 2000 | • | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | • |
| Burroughs Corp | CP 3682 & 3682-01 CPS | • | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | • |
| Burroughs Corp | CP 9582/9585 CP | --- | • | • | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | • |
| C&W Incotel Ltd | IMX 100 MSS | --- | • | • | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | • |
| C&W Incotel Ltd | IMX 300 MSS | --- | • | • | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | • |
| C&W Incotel Ltd | IMX 750 MSS | --- | • | • | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | • |
| Cableshare Inc | CSI-X.25 Con | --- | • | • | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | • |
| Cableshare Inc | LSI-X.25 FEP/Con | • | • | • | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | • |
| Chi Corporation | CHI CCP Series | • | • | • | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | • |
| Codex Corporation | 6001 INP | --- | • | • | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | • |
| Codex Corporation | 6002 INP | --- | • | • | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | • |
| Codex Corporation | 6005 INP | --- | • | • | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | • |
| Codex Corporation | 6010 INP | --- | • | • | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | • |
| Codex Corporation | 6030/35/40 INP | --- | • | • | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | • |
| Codex Corporation | 6050 DCP | --- | • | • | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | • |
| Codex Corporation | 6520 FEP | • | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | • |
| Computer Comm, Inc (CCI) | CC-6 CP | • | • | • | • | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | • |
| Computer Comm, Inc (CCI) | CC-8F/8.5 CP | • | • | • | • | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | • |
| Computer Comm, Inc (CCI) | CC-8R/80/85 CP | • | • | • | • | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | • |
| Control Data Corp (CDC) | 2551-3/4 NP | • | • | • | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | • |
| Datastream Comm Inc | 774 RCC | --- | --- | --- | • | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | • |
| Datastream Comm Inc | 874 CC | • | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | • |

Communication Processors

| COMPANY | MODEL | FUNCTION | | SNA Gateway | | HOSTS/NETWORKS | | LINE SUPPORT | |
|---------------------------|------------------------|-----------------|---------------------|-------------|--------------|----------------|----------|--------------|------------|
| | | Local Front End | Remote Concentrator | Burroughs | Control Data | To 32 | 33 to 64 | 65 to 128 | 129 to 256 |
| Digital Comm Assoc (DCA) | System 335 NP | --- | • | --- | --- | • | • | • | • |
| Digital Comm Assoc (DCA) | System 355 NP | --- | • | --- | --- | • | • | • | • |
| Digital Comm Assoc (DCA) | System 375 NP | --- | • | --- | --- | • | • | • | • |
| Doelz Networks, Inc | Elite One Mpt CS | --- | • | --- | --- | --- | --- | --- | • |
| Doelz Networks, Inc | Esprit One HS CS | --- | • | --- | --- | --- | --- | --- | • |
| Gandalf Data Inc | PACX II/III/IV Systems | • | --- | • | --- | • | • | • | • |
| GTE Telenet Comm Corp | TP3005/3010 II | --- | • | --- | --- | --- | --- | --- | • |
| GTE Telenet Comm Corp | TP4000 Con/PS | --- | • | --- | --- | --- | --- | --- | • |
| GTE Telenet Comm Corp | TP5000 NCP | --- | • | --- | --- | --- | --- | --- | • |
| Honeywell Info Sys (HIS) | Datanet 8 (DN8) NP | • | • | • | • | --- | • | • | • |
| IBM Corporation | 3705-II CC | • | • | • | • | --- | • | --- | • |
| IBM Corporation | 3705-80 CC | • | • | • | • | --- | • | --- | • |
| IBM Corporation | 3725 Model 1 CC | • | • | • | • | --- | • | --- | • |
| IBM Corporation | 3725 Model 2 CC | • | • | • | • | --- | • | --- | • |
| Icot Corporation | 253 CP | --- | • | • | • | • | • | • | • |
| Icot Corporation | 254 CP | --- | • | • | • | • | • | • | • |
| Icot Corporation | 257 CP | --- | • | • | • | • | • | • | • |
| Innovative Electronics | Netmaster CP/Con | --- | • | • | • | • | • | • | • |
| Lemcon Systems, Inc | CMC-X Series | • | • | • | • | • | • | • | • |
| Lemcon Systems, Inc | DNP | • | • | • | • | • | • | • | • |
| Lemcon Systems, Inc | VLC | • | --- | --- | --- | • | --- | • | • |
| M/A-Com DCC, Inc | CP 9000 Series II PSN | --- | • | • | • | • | • | • | • |
| Micom Systems, Inc | Micro 600 Data PBX | --- | • | --- | --- | --- | --- | --- | • |
| Micom Systems, Inc | Micro 860 CS | --- | • | --- | --- | --- | --- | --- | • |
| NCR/Comten, Inc | 721-II CP | • | • | • | • | • | • | • | • |
| NCR/Comten, Inc | 3650 CP | • | • | • | • | • | • | • | • |
| NCR/Comten, Inc | 3690 CP | • | • | • | • | • | • | • | • |
| Northfield Communications | AMMS | --- | • | --- | --- | • | • | • | • |
| Northern Telecom | SL/10 PSS | --- | • | --- | --- | • | • | • | • |
| Paradyne Corporation | PIX-II CS | --- | • | --- | --- | • | • | • | • |
| Paradyne Corporation | Fixnet CS | --- | • | --- | --- | • | • | • | • |
| Peripherals Corp | T-Comm/CP | • | • | • | • | • | • | • | • |
| Protex Industries | Starnet II SW | --- | • | --- | --- | • | • | • | • |
| Sperry Computer Systems | DCP-10 DCP | • | • | • | • | • | • | • | • |
| Sperry Computer Systems | DCP-20 DCP | • | • | • | • | • | • | • | • |
| Sperry Computer Systems | DCP-40 DCP | • | • | • | • | • | • | • | • |
| Telefile | T2610 Telepac II ICP | --- | • | --- | --- | • | • | • | • |
| TRI-DATA | Netway CC | --- | • | --- | --- | • | • | • | • |
| Tymnet, Inc | Micro-Engine | --- | • | --- | --- | • | • | • | • |
| Tymnet, Inc | Mini-Engine | --- | • | --- | --- | • | • | • | • |
| Tymnet, Inc | Engine | --- | • | --- | --- | • | • | • | • |
| Westinghouse Canada Ltd | W1685 ICC | --- | • | --- | --- | • | • | • | • |

COMMUNICATION PROCESSORS FEATURES

Function • lists functions unit performed by and how it performs those functions. Front-end processing and remote concentration are the most prevalent functions performed. A number of independent companies offer replacements for vendor-supplied front ends, such as replacements for the IBM 3704/3705 Communications Processors running in emulation mode or the

270X hard-wired front ends for S/360 or S/370 hosts. Operating as a gateway to other networks, especially to X.25 packet-switched networks, is another important function some of these processors perform. Gateways commonly emulate terminals of another manufacturer, such as IBM 2780/3780 Remote Batch Terminal or IBM 3270.

Communication Processors

Associated System & Network • enumerates the vendor and host models with which the communication processor is compatible. In addition to the common mainframe vendor networks and processors, other networks such as Arpanet, X.25, **Reservations Systems**, and so on are listed.

Communications • lists number, type, and speed of lines supported; number of channel connections to host for front-end processors; and interfaces provided. The entry also lists the protocols supported such as BSC, SDLC, or HDLC. Aggregate maximum throughput for all lines is given if known.

Features • lists the pertinent characteristics of the processor and its options: type of processor, memory size, I/O facilities, peripheral devices. Also relates features to functions such as number of messages stored or use of peripherals.

Software • lists software that runs on the communication processor including operating system, communication

management and network control modules, emulators, and diagnostics.

Program Development • names of specific products used to develop applications on host processor or locally. Some systems run under software generated from specifications supplied by user from vendor-supplied modules. Software for communication processors tends to be driven by tables of network parameters: line types and speeds, number and types of terminals, number and type of hosts, and so on.

Configuration Flexibility • presents range of configurations available from base system to maximum configuration in terms of number of hosts supported, number of lines connected, backup facilities, and multiple processor facilities.

First Announced • announcement date.

Pricing • presents price of minimum to maximum configuration for typical configuration.

COMMUNICATION PROCESSORS LISTINGS

■ **ADVANCED COMPUTER COMMUNICATIONS (ACC)**

720 Santa Barbara Street, Santa Barbara, CA 93101 • 805-963-9431.

□ **ACC IF-11/X.25**

Function • microprocessor-based front end provides access to an X.25 packet-switched network; implemented on a board that plugs into a UNIBUS slot on the PDP-11 or VAX-11.

Associated Systems & Networks • DEC PDP-11 or VAX-11 computers and X.25 networks.

Communications • one trunk connection to the X.25 network at 56K bps; up to 32 local or remote terminal connections at up to 9600 bps each; RS-232C interface standard; RS-422/RS-449 optional; implements HDLC/LAPB protocols; provides PAD facilities for up to 32 concurrent virtual circuits.

Features • Z80 microprocessor, 16K-byte PROM; 4K-byte RAM; PAD protocol Levels I, II, III implemented in firmware; supports computer-to-computer file transfers; DTE to DCE (point-to-point capability).

Software • ACC distributes system-dependent software on magnetic tape or floppy disk for support of IF-11/X.25 under RSX-11M, RSX-11M PLUS, IAS, RSTS/E, and VAX/VMS; multichannel device driver included to connect application program to IF-11/X.25 for computer-to-computer operations.

Program Development • drivers and firmware furnished by ACC.

Configuration Flexibility • basic unit includes 4 dual-width boards; one Distribution Panel assembly (RS-232C or RS-422/RS-449); MIL-STD-118 or 114 optional; Interboard Cable Assemblies, and driver software.

First Announced • October 27, 1980.

Pricing • purchase price is \$9,500 for basic system with either RS-232C or RS-449/RS-422 Distribution Panel.

□ **ACC IF-11/X.25 Plus**

Function • microprocessor-based front end provides access to an X.25 packet-switched network; implemented on a board that plugs into a UNIBUS slot on the PDP-11 or VAX-11; performs same functions as IF-11/X.25 except under different operating systems.

Associated Systems & Networks • DEC PDP-11 or VAX-11 computers and X.25 networks.

Communications • one trunk line connection to X.25 network at 56K bps; up to 32 local or remote terminal connections at up to 9600 bps each; RS-232C interface standard; MIL-Std-118-114 and RS-449 optional; implements HDLC/LAPB protocol; provides PAD facilities for up to 32 concurrent virtual circuits.

Features • Z80 microprocessor with 32K-byte RAM; PAD protocols (X.3, X.28, X.29) implemented in firmware; implements X.25 protocol Levels I, II, and III.

Software • ACC distributes system-dependent software on magnetic tape or floppy disk support of IF-11 X.25 under RSX-11M, VAX/VMS, and UNIX V6/V7/V4.1/BSD.

Program Development • drivers and firmware furnished by ACC.

Configuration Flexibility • configuration depends on number of local terminals supported • for remote terminals only (up to 32 remote, 0 local), includes 2 hex-width boards, RS-232C Distribution Panel Assembly Interboard Cable Assemblies, and driver software • for 8 local terminals another hex-width board and interboard assemblies are added up to a total of 4 for 32 local terminals.

First Announced • March 10, 1983.

Pricing • purchase price is \$9,000 for up to 32 remote terminals; \$12,000 for 8 local, and 24 remote terminals; and \$4,000 for additional local terminal support upgrade (increase local by 8, decrease remote by 8).

□ **ACC IF-11Q/X.25**

Function • microprocessor-based front end provides access to an X.25 packet-switched network; implemented on a board that plugs into a Q-BUS slot on the LSI-11 • functionally similar to IF-11/X.25 except for Qbus instead of UNIBUS.

Associated Systems & Networks • DEC LSI-11 systems and X.25 networks.

Communications • one trunk connection to X.25 at 56K bps; up to 32 local or remote terminal connections at up to 9600 bps each; RS-232C/RS-449/MIL-Std-188-114 interfaces; implements HDLC/LAPB protocol; provides PAD facilities for up to 32 concurrent virtual circuits.

Features • Z80 microprocessor, 16K-byte PROM; 4K-byte RAM; PAD protocol Levels I, II, III implemented in firmware; supports computer-to-computer file transfers.

Software • application programs send and transmit data and control and send status messages through Supervisory Command Messages • the firmware implements 2 levels of software protocols: the lower level a multiplexing protocol, the higher level an X.25 protocol.

Program Development • drivers and firmware furnished by ACC • X.25 PAD and X.25 protocol Levels 1, 2, and 3 in firmware.

Configuration Flexibility • basic unit includes 2 hex-width boards, X.25 firmware, Distribution Panel Assembly, pair of Interboard Cable Assemblies and driver software; available with either RS-232C or RS-422/RS-449 Distribution Panel.

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First Announced • September 1983.

Pricing • purchase price is \$10,000 for basic unit with either RS-232C or RS-422/RS-449 Distribution Panel.

■ AMDAHL CORPORATION

1250 East Arques Avenue, Sunnyvale, CA 94086 • 408-746-6000.

□ Amdahl 3400 Series Data Switching System

Function • TDM circuit-switching processor composed of integrated set of components supporting a single-node or multinode digital network • performs TDM and STDM multiplexing functions, switching management, and diagnostics • interconnects wide range of synchronous and asynchronous terminals and computers in interactive environments • is an upgrade of and replaces Amdahl's (Tran) 3200 Series Network Processors.

Associated Systems & Networks • broad variety of synchronous/asynchronous terminals and computers; also supports facsimile, low-speed digitized voice, and encrypted digital signals • supports IBM, Sperry, DEC, Burroughs, and Honeywell networks.

Communications • single node supports up to 1000 terminations (terminals/computers); up to 16 nodes on a network • Network Processor (NP) on each node can support up to 30 trunks with aggregate throughput up to either 350K bps or 650K bps • synchronous data rates in TDM up to 19.2K bps and asynchronous up to 9.6K bps over full-duplex dedicated or switched lines; other communication facilities include Dataphone Service and private lines or microwave • asynchronous STDM transmissions with data rates up to 9600 bps • PACUIT-EXCUIT transmissions over TDM • satellite transmissions.

Features • Network Processor (NP) with up to 208K-byte ECC memory runs DSOS operating system to perform local switching control/management for the NP/NAC cluster; NAC (Network Access Concentrator) provides multiplexing and computer/terminal access to NP; optional Network Control Center (NCC) supports centralized network control in multinode environment; optional Network Billing System (NBS) provides central billing collection • node consists of an NP and at least one associated NAC; basic configuration can consist of an NP supporting 3 NACs; up to 30 NAC trunks; each NAC supports 3 trunks.

Software • Data Switching Operating System (DSOS) resides in each NP to handle call routines, node switching, reconfiguring • online diagnostics in background mode.

Program Development • turnkey system programmed by Amdahl; separately loaded programs on NP diskettes for off-line diagnostics • system initialization and parameters in PROM in Network Access Controller (NAC); RAM in NAC is downline loaded from NP via DSOS.

Configuration Flexibility • minimum configuration can be a single node NP with from 1 to 3 NACs • theoretical maximum supports up to 16 nodes; typical large system supports an 8-node network; maximum node support is 1000 terminals/computers.

First Announced • 1982.

Pricing • minimum NP/3-NAC configuration costs approximately \$100,000 • large system based on 16-node network costs approximately \$15,000,000.

□ Amdahl 4400 Series Network Concentrator & 4404 Administrator: Models 4440/4450/4460 & 4404

Function • network concentrators (NCs) and network administrator (NA) • NCs perform protocol conversion to provide access to X.25 public and private packet-switched networks by non-packet-switched terminals and hosts; offer PAD and remote polling functions • NA provides centralized network management and billing system, status reports, and network diagnostics; downline loads software to NCs.

Associated Systems & Networks • asynchronous and bisynchronous 3270-compatible devices; 3270 BSC with Display System Protocol (DSP) • NCs can be used with Amdahl 4410

Network Processor to structure private X.25 network • public X.25 networks; Datapac (Canada), Saponet (South Africa), Telenet, Tymnet, Uninet, and planned AT&T System X.25 network.

Communications • 8 maximum X.25 links on NC with data rates up to 19.2K bps; 4 maximum X.25 links on NA with data rates up to 19.2K bps; aggregate throughput 100K bps maximum (NC) and 70K bps maximum (NA) • Model 4440 NC supports up to 40 asynchronous device lines; Model 4450 supports up to 16 3270 BSC device lines; and Model 4460 supports up to 40 device lines for both asynchronous and 3270 BSC communications.

Features • Basic Processor Module (BPM) combines Intel 8086 microprocessor and 2 IOPs; 8086 supports 64K words (128K bytes) main memory and 64K words (128K bytes) shared memory; each IOP based on Z80 microprocessor that supports a 12K-byte RAM and 4 I/O ports • 4404 NA multiprocessor supports 1M-byte memory, 8-inch double-sided 1M-byte diskette, a 10M-byte disk, a network display console, and 2 line printers.

Software • the NA is programmed to provide centralized network control, billing, and diagnostics • downline loads software to configuration-dependent NCs.

Program Development • configuration/reconfiguration functions and software downline-loaded from NA to 4400 Series NCs.

Configuration Flexibility • NCs can be configured to operate as either Terminal Network Concentrators (TNCs) or Host Network Concentrators (HNCs); in back-to-back TNC-to-HNC configuration using dedicated lines, the NC can function as concentrator in non-packet-switched environment; NCs can be used with Amdahl 4410 Network Processor to structure a private X.25 network • each IOP (Input/Output Processor) supports 8 X.25 links on NC and up to 4 X.25 links on the NA • basic 8-port NC configuration can be extended by adding up to 4 Passive Processing Modules (PPMs); each PPM connects 8 additional device lines to a maximum 40-line configuration.

First Announced • 1982.

Pricing • a small configuration based on Model 4410-88 NC package which includes 1-board enclosure and provides 8-port support can be purchased for \$6,700 • a large configuration based on Model 4460-00 NC package includes 5-board enclosure to support 40-port system and costs approximately \$35,800, including 5-year maintenance • the 4404 Network Administrator can be purchased for \$30,000 plus maintenance costs.

□ Amdahl 4705 Communication Processor

Function • SNA-compatible front-end processor/remote communications controller • runs all IBM 3705 software.

Associated Systems & Networks • SNA; can replace IBM 270X, 3704, and 3705 processors; supports IBM S/370, 303X, 308X, and 4300, single-/multiprocessor SNA networks as well as Amdahl 580, and other IBM-compatible PCM hosts.

Communications • supports up to 352 physical communication lines (half-duplex) at speeds up to 56K bps • supports up to 4 channel-attached hosts simultaneously; other hosts attached through remote 4705s.

Features • central control unit (CCU) includes 64K-byte memory expandable to 512K bytes of NMOS in 64K-byte or 128K-byte increments • channel-attaches 1 to 4 hosts or remotely connected to host • compatible with IBM MVS, SVS, VS1 operating systems; BTAM, QTAM, TCAM, and VTAM IBM host access methods • 1 to 4 communication scanners (CSs) connect Line Interface Bases (LIBs) and Line Sets to CCU • CS Type 2 supports up to 6 LIBs, synchronous/asynchronous lines; CS Type 3 supports up to 4 LIBs, synchronous lines only, and transfers one block (up to 255 bytes) to/from CCU by "cycle steal" interrupt mode • LIBs provide control of line/transmission methods; each LIB supports up to 16 lines • Line Sets provide interface to 1 to 4 modems • Amdahl claims 4705 throughput has been measured at 1.8 times that of IBM 3705-II Model F8.

Software • utilizes IBM software: Emulation Program (EP), PEP, NCP, and ACF/NCP operating software Release 3, all previous

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releases, and EP releases • supports BTAM, QTAM, TCAM, and VTAM host access methods, ACF and MSNF.

Program Development • software load generated on host processor and then downline loaded into front end; IBM licensed system support programs (SSPs) required; include support programs for generating the control program, assembler, loader/dump facilities, and macro language.

Configuration Flexibility • basic system (frame) supports from 64 to 160 communications lines • expansion frame (maximum 2) adds up to 96 communication lines; total 352 lines • memory on processor ranges from 64K to 512K bytes.

First Announced • October 1980.

Pricing • purchase price is \$58,000 for a small system based on Model 5 with 64K-byte memory supporting up to 32 lines and including software and appropriate communication hardware • purchase price is \$383,000 for a large configuration based on Model 8 equipped with up to 512K-byte memory, software, and communication hardware for support of up to 266 lines.

Amdahl 4705E

Function • SNA-compatible front-end processor/remote communication processor • runs all IBM 3705 software.

Associated Systems & Networks • SNA; can replace IBM 270X, 3704, and 3705 processors; supports IBM S/370, 303X, 308X, and 4300, single-/multiprocessor SNA networks, as well as Amdahl 580 and other IBM S/370-compatible PCM hosts.

Communications • supports up to 352 half-duplex communication lines at speeds up to 64K bps • supports up to 4 channel-attached hosts simultaneously; other hosts attached through remote 4705s.

Features • central control unit (CCU) includes 256K bytes of memory expandable in 256-byte increments to 1M bytes • channel adapter provides for attachment of up to 4 different hosts or 4 channel attachments to the same host, supported simultaneously • up to 4 communication line scanners (CSs) connect Line Interface Bases (LIBs) and Line Sets to the CCU, can support up to 16 communication line sets; different line speeds and protocols can be handled by the same line interface base; line sets, supporting from 1 to 4 individual communication lines depending on type and speed of line • Amdahl claims the 4705E offers 25% higher performance than IBM 3725 at 85% to 88% of the cost.

Software • utilizes IBM software; Emulation Program (EP), PEP, NCP, and ACF/NCP/VS are obtained directly from IBM by the customer.

Program Development • software load generated on the host processor and then downline loaded into front-end; IBM licensed system supports programs (SSPs) required; includes support programs for generating the control program, assembler, loader/dump facilities, and macro language.

Configuration Flexibility • basic unit supports up to 2 scanners, up to 160 communication lines; requires expansion unit to support 2 additional scanners to connect 192 lines.

First Announced • 1983.

Pricing • purchase price is \$36,000 for basic unit; available for \$1,600 per month under 1-year lease; \$330 per month maintenance with purchased system • purchase price is \$25,000 for expansion unit; available for \$1,040 per month under 1-year lease; \$50 per month maintenance with purchased system.

■ AMNET, INC

101 Morse Street, P.O. Box 412, Watertown, MA 02172 • 617-923-1850.

Amnet Nucleus 6000

Function • X.25 gateway to public/private data packet-switched network • node in private packet-switching network; network management includes PAD (Packet Assembler/Disassembler) to

support synchronous non-packet mode terminal/host devices • X.75 gateway for internetwork communication.

Associated Systems & Networks • DEC PDP-11/23-based network management system • supports X.25 level 3, asynchronous/synchronous (bisync and SDLC); CCITT V.24/EIA RS-232, CCITT V.36/RS-449, or CCITT V.35 interfaces.

Communications • supports low-speed or high-speed Front-End Processing (FEP) cards: low-speed FEP provides 4 ports with data rates up to 19.2K bps full-duplex (aggregate throughput 38.4K bps); high-speed FEP provides single port interface at data rates up to 64K bps full-duplex; single Nucleus 6000 node supports up to 256 port module cards or 1024 ports • CCITT X.25 (1980 yellow book) support includes X.25 bis Physical Interface, LAPB Link Level Procedures, Permanent Virtual Circuits, Virtual Call, Closed User Groups, X.25 multicall.

Features • multiprocessor system using 16-bit microprocessors and 64K-bit RAM chips • Nucleus 6000 is composed of a series of control modules and port modules; a single Nucleus 6000 node can be housed in up to 6 cabinets • control modules are central processing/memory elements of the node and up to 11 are housed in the Control Chassis of Nucleus 6000 cabinet; four types of modules: Multibus Processor Module (MPM), up to 5 per node, provide major processing functions, include master MPM to physically connect NMP; Common Memory Module (CMM), up to 2 per node, provides shared memory resources for MPMs; Node Buffer Module (NBM) provides up to 1M-byte buffer area for data traffic, includes controller; Control Interface Card (CIC), up to 2 in single Control Chassis, provides interface between control and up to 4 Port Chassis • Port Chassis houses FEP port modules and nest interface cards (NIC), which provide interface between Port Chassis and Control Chassis through attachment to CIC; low-speed and high-speed FEPs; up to 16 FEPs per Port Chassis; up to 16 Port Chassis (256 port modules) per node; up to 2 NICs (for redundancy) in each Port Chassis provide interface between Port and Control Chassis • optional Network Management Processor (NMP) in separate cabinet, physically attaches through master MPM to Nucleus 6000 node; includes DEC PDP-11/23 processor and DEC RLG 2 disk drives (2), can support DEC LA38 Printer and DEC VT100 System Control Console (SCC); NPM runs under DEC RSX-11M Operating System.

Software • Network Management Processor software includes operating system, application programs, and database: DEC RSX-11M operating system used by operator for routine functions such as system start-up and disk copying; application programs allow operator to update database, change network parameters, draw statistical information from multibus level, and provides CONSOL (menus) and support programs; database includes configuration files, subscriber files, and system files • multibus processor software supports routing, flow control, addressing, prioritization, performance monitoring, and fault detection/isolation • FEP software supports physical, logical, and link-level interfaces and packet assembly/disassembly.

Program Development • turnkey system • online dynamic configuration changes through NMP • Nucleus 6000 programmed using higher level language.

Configuration Flexibility • typical node configuration supports from 4 to 1024 user ports and throughput of 250 to 2000 packets per second.

First Announced • 1982; first shipment 1983.

Pricing • configuration dependent; purchase price ranges from \$75,000 to approximately \$200,000 for a full processing, non-redundant node configuration.

■ BBN COMPUTER CORPORATION/Subsidiary of Bolt Beranek & Newman

33 Moulton Street, Cambridge, MA 02238 • 617-491-1850.

BBN C/30 Packet-Switch Processor

Function • packet-switch processor for high-speed communications environment; can operate as small node in large (Pluribus-compatible) packet-switch network or can implement small network • supports Arpanet-based network.

Communication Processors

Associated Systems & Networks • supports synchronous/asynchronous/bisynchronous devices (SDLC/HDLC) • Pluribus-compatible • 1822 Arpanet protocol/Arpanet host systems • Arpanet-based packet-switched network.

Communications • 4 basic communication I/O interfaces: medium-speed asynchronous/synchronous; high-speed asynchronous/synchronous; high-speed HDLC/SDLC; and high-speed 1822/Arpanet • supports asynchronous data rates from 50 bps to 19.2K bps; synchronous/binary synchronous data rates up to 56K bps; full- or half-duplex mode; 5/6/7/8-bit data bytes; 1, 1.5, and 2 stop bits; even/odd/none/marking parity; RS-232C/RS-422/423/MIL-188-114/V.28 interfaces; X.21 for HDLC/SDLC • provides up to 30 packets per second on 6 lines • 200-packet-per-second host computer throughput.

Features • basic C/30 CPU includes 32K words of 20-bit macromemory expandable to 512K words; 2K words of 32-bit micromemory, expandable to 8K words • basic chassis supports 4 cards (4 hosts), 2 CPU and memory cards, 2 I/O cards; expanded chassis supports 8 cards • I/O system supplied with several microcode routines to allow same hardware to handle variety of devices • optional software: Arpanet Interface Message Processor (IMP) software or Arpanet Terminal Interface Processor (TIP) software • use of microcode for most I/O logic allows high-speed communications port to support asynchronous/synchronous/bisynchronous devices by changing RAM-based microcode.

Software • microprogrammable; Arpanet Interface Message Processor (IMP) software or Terminal Interface Processor (TIP) software for managing Arpanet packet-switched network optional • self-configuring on start-up.

Program Development • micro-assembler and micro-loading for microprogramming • CPU 512x32-bit microcode ROM contains loader, debugger, console logic, and microcode memory of 2K, 4K, or 8Kx32 bit, which contains macro-instructions set and I/O emulation; runs in 16-bit or 20-bit mode at macro instruction level; microcode memory is loaded from microcassette holding up to 100K bytes.

Configuration Flexibility • basic C/30 configuration includes 2 serial asynchronous I/O ports, (1 for console terminal, the other for microcassette loader), a 4-slot chassis with battery backup power supply and 32K words of 20-bit 405-nanosecond semiconductor memory, and error detection and correction system • expanded C/30 provides an 8-slot chassis and larger power supply system.

First Announced • 1979.

Pricing • purchase price for basic standalone system begins at approximately \$23,000 and can be as high as \$40,000.

□ BBN Pluribus Packet-Switch Processor

Function • front-end packet-switch multiprocessor in multicomputer network; satellite packet network or standard packet-switch node • supported in Arpanet-based packet-switch networks.

Associated Systems & Networks • supports medium-speed asynchronous, high-speed synchronous, and medium-speed HDLC links • high-speed 1822/Arpanet host computer • Arpanet-based packet-switch networks.

Communications • supports 4 basic communications I/O interfaces: medium-speed asynchronous; high-speed asynchronous; medium-speed HDLC; high-speed 1822/Arpanet • medium-speed EIA Interface devices at up to 9600 bps • high-speed synchronous devices; compatible with AT&T 303, RS-232C, MIL-188-114, V.35, RS-422/423 • medium-speed HDLC, X.21 and X.21 (bisync) support • 1822-Arpanet supports local/remote 1822 host and very distant host (VDH); same as AT&T 303 • one line per device, except medium-speed HDLC interface supports 4 lines at 9600 bps or 1 line at 40K bps and medium-speed asynchronous interface supports 63 lines • throughput: 900 packets per second at host computer and 750 packets per second on communications lines.

Features • multiple I/O, memory, and processor busses, which allow use of redundant resources; critical I/O devices can be

dual-ported to different I/O busses in hot standby configuration • memory located both on processor (local) and I/O memory busses (global); maximum 1M-byte memory • load-sharing by maintaining hardware interrupt register which defines code modules needing service; maximum runtime for software modules is 2 milliseconds.

Software • Arpanet Interface Message Processor (IMP) or Arpanet Terminal Interface Processor (TIP) software; downline loaded on dynamically-assigned task basis; handles up to 1.8M-bps store/forward throughput • TIP allows a user to access network facilities without using host computer.

Program Development • basic operating kernel called "STAGE" stored in Pluribus functional unit (2 processors and local memory on one bus) determines current hardware configuration, configures device tables, and begins executing IMP software; when bus is disabled, IMP shuts down 20 to 30 seconds while STAGE reconfigures system • code modules and data structures verified by STAGE and IMP on constant basis: detect destroyed code, joins and loops in buffer queues, and stack overflows.

Configuration Flexibility • maximum 8-CPU configuration supports up to 16 trunk lines; up to 20 1822/Arpanet host ports; up to 420 medium-speed asynchronous/synchronous terminals and 20 hosts.

First Announced • 1975.

Pricing • purchase price for typical system is \$350,000 and can be as high as \$500,000.

■ BETACOM

245 East Sixth Street, St. Paul, MN 55101 • 612-292-8188.

□ BetaCom PCM 2000

Function • front end or message switch for communicating locally or remotely and accessing public or private databases, information services, timesharing bureaus, and message networks.

Associated Systems & Networks • any personal computer system with RS-232C interface, such as IBM PC/PC-XT and IBM-compatible microcomputers; Televideo 910 ASCII terminals; and Televideo 800/802/803; also supports parallel printers from leading manufacturers through Centronics Printer interface.

Communications • can provide for virtually any type of asynchronous transmission and many types of synchronous data transmissions; terminal-to-terminal or terminal-to-computer access support includes Telex, TWX, ASCII, Baudot message codes; IBM 2780/3780 BSC, IBM 3270 SDLC, Telex, and Telex 2 protocols; selectable speeds include 300/1200 bps, depending on modem.

Features • Message Mode, AUTOTALK, standard asynchronous protocols; 64K-byte RAM; and 2K-byte CMOS (expandable to 24K bytes) nonvolatile RAM (NVR).

Software • vendor-supplied for industry-specific or user-defined applications, including custom screen formats for off-line data presentation.

Program Development • used to develop software and firmware for industry specific or user-defined PCM 2000 applications.

Configuration Flexibility • basic unit includes Message Mode, AUTOTALK, standard asynchronous protocols, 64K-byte RAM, 2K-byte CMOS nonvolatile RAM (NVR), diagnostics-printer CRT, memory, RS-232C CRT port, RS-232C printer port, Centronics parallel printer port, 2 RJ11 communication ports • optional 300 bps for 103 Async/DDD, Telex, Telex 2 modems; 300/1200 bps for 212-compatible modems, also available in CCITT versions • optional hardware includes 4K-byte CMOS (maximum of 24K bytes), 64K-byte memory, battery backup • optional communication firmware includes Telex, Telex 2, 2780/3780 BSC, 3270 SDLC protocols.

First Announced • January 1983.

Pricing • purchase price is \$15,000 to \$25,000.

Communication Processors

■ BURROUGHS CORPORATION

Burroughs Place, Detroit, MI 48232 • 313-972-7000.

□ Burroughs CP3682 & CP3682-01 Communication Processors

Function • CP3682 front end supports a mix of up to 4 Burroughs B 2000/3000/4000 medium-range processors; available as single processor or with CP3682-01 as "Hot Standby" redundant processor; operates and manages online network.

Associated Systems & Networks • Burroughs networks; BDL support for Burroughs Network Architecture (BNA) • supports Burroughs Poll-Select/RJE/Point-to-Point protocols • access to IBM SNA through IBM Bisynchronous Point-to-Point 2780/3780; IBM Bisynchronous Multi-Point (3270); and IBM Inverse Bisynchronous (online IBM host communications) • access to NCR networks through support of NCR protocols: NCR 270 Variants; NCR 796 Variants; NCR Transparent Bisynchronous • other networks through support of Lear-Siegler ADM-2, AT&T/Teletype TTY and TWX, and AT&T VU-SET.

Communications • can handle communications for up to 4 hosts simultaneously; transfer rate up to 200K bytes per second • provides 2 microprocessor-based data communications interfaces: 8-line asynchronous adapter and 2-line asynchronous/synchronous adapter; each adapter supports maximum aggregate data rate of 64K bps and requires one port • direct connect interface unit connects one device line • supports up to 41 system I/O ports; up to 36 I/O ports can be used for data communications interfaces • maximum of 288 asynchronous multidrop communications lines; up to 72 synchronous multidrop lines • maximum aggregate throughput is 320K bps or 20 messages per second.

Features • basic CP3682: 256K-byte error-correcting memory standard; 256K bytes optional; 20M-byte disk storage capacity • can be attached to multiple B 2000/B 3000/B 4000 Series host processors by standard Burroughs controls or Data Link Processors (DLPs) • dual-port host interface features: up to 200K-cps data transfer rate to host; support for mixture of medium system hosts • options include Remote Diagnostic Facility and Power Fail Recovery Option • "Hot Standby" Redundancy (CP3682-01) duplicates 3682 configuration; runs under CP3600 Standby Communication Software (SCS) • hardware interface compatible with current B 874 host; standard DLP will provide interface for B X800 DLP-based and B X900 series; interface for all current B 2000/B 3000/B 4000 systems is through host transfer DLP.

Software • requires no (or minimal) application software change for current medium systems users: fully compatible with B 874 application software interface to B X700 and B 2800 series systems • CP3600 Data Communications Software (DCS) provides: generation of networks online with formatted entry of parameters for line, station, program; manages networks through online network control transactions; inquiry facility monitors specific network activities; online/off-line network statistics • DCS includes resident message control system: generates message control with formatted parameter data entry; 5-level security; dynamic or fixed message routing; online forms generation; supports applications on up to 4 hosts • SCS (Standby Communication Software) runs on CP3682-01 Standby System; logically attaches all data communications and host interfaces; maintains full network services • Remote Diagnostic Facility option monitors and diagnoses system problems; may be invoked while system supports normal operation • Power Fail Recovery option maintains system status and integrity during external power failure.

Program Development • uses Burroughs standard Network Definition Language (NDL) implemented on all Burroughs communications processors; NDL can run concurrently with CP3680 resident message control system.

Configuration Flexibility • single 256K-byte CP3682 can interface with 1 to 4 B 2000/B 3000/B 4000 systems in any combination; supports 2 microprocessor-based communication adapter types; each adapter uses one System I/O port; system requiring more than 9 System I/O ports requires I/O Expansion

Unit for additional 16 I/O ports; if more than 25 ports are required, Port Extender is used to provide an additional 16 ports for a total of 41 ports; 1 port required for system console; line adapters handle a single type of protocol: polled, IBM synchronous, AT&T/Teletype, Burroughs point-to-point or bit-oriented • redundant configurations require CP3682-01 system providing 16 System I/O ports; one I/O port is allocated for system console interface (console serves both systems); Port Extender provides an additional 17 ports for a total 33 System I/O ports.

First Announced • September 1981; systems available first quarter 1982.

Pricing • purchase price is \$118,119 for a small system based on single CP 3682 packaged system with 512K-byte memory, 14 I/O port interfaces, 20M-byte disk subsystem and interfaces, real-time clock, dual-channel port controller, firmware set, system console interface, system cabinet, diagnostic adapter for remote diagnostics and diagnostic modem; options added include system console, 1 host interface, adapters for 64 communication lines, and CP 3600 DCS software • purchase price is \$332,032 for a large system based on 3682 plus CP 3682-01 with 512K-byte memory, 20M-byte disk subsystem and interface, real-time clock, dual-channel port controller, firmware set, system cabinet, CP 3643-01 Dual Port Interface Unit, CP 3644-01 Dual System I/O Interface Unit, CP 3645-01 Expansion Unit Cabinet with CP 3646-01 I/O Port Extender and diagnostic adapter; options include additional 512K-byte memory module per processor, system console, power-fail recovery system, 4 host interfaces, adapters for 200 communications lines, 3 direct-connect interfaces, I/O extender unit with CP 3646-01 I/O port extender, dual system I/O interface; automatic calling unit, line interface extension, and DCS/SCS software.

□ Burroughs CP 9582-1/CP 9585 Communications Processor System

Function • programmable communication processors, remote concentrators, distributed processors, nodal processors, and standalone local data processors.

Associated Systems & Networks • all Burroughs processors and mainframes; IBM System/360/370, 303X, 308X, and 43XX utilizing an IBM SNA Interface that emulates a cluster controller; provides X.25 gateway • Burroughs Network Architecture (BNA) networks.

Communications • support synchronous/asynchronous, half-/full-duplex communication through data communications processors (DCPs) • single DCP accommodates 12 lines expandable through Line Expansion Module (LEM) to 32 lines; maximum transmission rate per line is 1800 bps asynchronous, 9600 bps synchronous or bisynchronous, and 38.4K bps direct connect • 3-MHz DCP used in CP 9582 and 9585 supports aggregate data rate of 15K cps; synchronous characters are usually 8 bits and asynchronous characters 10 bits • 9582 and 9585 support up to 4 DCPs (3 MHz) for aggregate data rate of 60K cps and up to 128 lines.

Features • multiprocessor system with 128 4/8 Burroughs Basic Data Systems (BDS) use 3-MHz microprocessors • 3-MHz microprocessors have a memory set of 64K/256K/512K bytes for a total of 3.4M bytes • system supports 2 disks and 8 I/O controls excluding data communication adapters • in a typical system, one processor with 256K-/512K-byte memory executes the Master Control Program (MCP); a second processor with 32K-/64K-byte memory provides direct access to attached disk devices; a third processor with 128K/256K/512K-byte memory provides direct interface to communication lines and executes the network control code generated by the NDL data communication language; a fourth processor with 128K/256K/512K-byte memory is an application processor and executes user application programs and utilities; CP 9582 and 9585 support 4 additional processors, 3 can be used as DCPs or application processors, and the fourth can be used only as an application processor; through the use of the I/O Select Module (IOSM), can provide operating system backup.

Software • Computer Management System (CMS) software; includes Master Control Program (MCP) operating system;

Communication Processors

utilities; languages such as COBOL, RPG, Message Processing Language (MPL-II); and Network Definition Language (NDL) compilers • Computer Management Distributed Information Systems (CMDIS) software includes: Transaction Distribution System (TDS), Generalized Message Control System (GEMCOS), Command and Edit (CANDE) language, On-Line Data Entry System (ODESY), Direct-On-Line Maintenance and Inquiry System (DOMAIN), online REPORTER, Burroughs Standard RJE, Burroughs System Communication Module (SYCOM), Burroughs Network Architecture (BNA), IBM 360-20 HASP Look-Alike, IBM 2780/3780 Look-Alike, IBM 3270 Interface, IBM SNA Interface, X.25 Interface, and Remote Supervisory Control (RSC) • IBM SNA Interface designates CP 9500 as Physical Unit-Type 2 cluster controller node • SNA RJE Pass Through 3270 SNA and interactive DMS interfaces are also available.

Program Development • through CMS COBOL (subset of ANSI '74 COBOL) used for communications-oriented or batch-oriented programs; CMS RPG for off-line batch programs; CMS Network Definition Language (NDL) used to generate code/tables required for custom network controller; and Message Processing Language (MPL-II) for development of Message Control System (MCS) programs or application programs.

Configuration Flexibility • can support from 4 to 8 3-MHz processors, 8 I/O controls for support of up to 64 lines; a single line can be multidropped with up to 8 concatenated terminals; supports up to 240M-byte fixed disk, up to 520M-byte disk pack, and magnetic tape with up to 160K-bps transfer rate.

First Announced • 1982 (CP 9582); 1984 (CP 9585).

Pricing • purchase price is \$72,108 for a small system based on CP 9582 System; includes cabinet with power supply and clock, 4 3-MHz processors, 2 with 64K-byte memory, 2 with 512K-byte memory, 1M-byte minidisk, 19M-byte fixed disk, disk loader, operator display terminal and control, 320-lpm line printer and control, 10 line adapters, 5 data set connectors and 5 direct-connect interfaces; software includes CMS package, full GEMCOS, RSC, ACNDE, Burroughs RJE, SYCOM, BNA, RNS, and COBOL compiler • purchase price is \$151,505 for a large system based on CP 9852; includes cabinet with 64K-byte memory and power supply, 4 3-MHz processors, DCP CSC Card, 64K-byte memory module, 2 512K-byte memory modules, and extended backplane with the following optional features: 4 additional 3-MHz processors, 2 64K-byte memory modules, 2 256K-byte memory modules, disk file cache control, operator console and control, 28.7M-byte fixed-disk drive with control, 243K-byte ICMD drive with control, 40 line adapters, 30 modem connect interfaces, 30 data sets direct-connect interfaces, 600-lpm printer with control; software same as for small system plus X.25 interface, IBM SNA interface, and IBM 3270 protocol.

■ C & W INCOTEL, LTD/Cable & Wireless Company

One Penn Plaza, New York, NY 10119 • 212-594-8340.

□ Incotel IMX 100

Function • store-and-forward message-switching system • supports Telex Batching • provides speed/code conversion, system monitoring, logging, and statistical status reporting.

Associated Systems & Networks • DEC PDP-11/23; RL01 disk drive; LA-38 (DECwriter) supervisory terminal • AT&T/Teletype-compatible terminals • interface to DDD, TWX, Domestic Telex, and International Telex networks • support CCITT No. 2 5-level Baudot or ASCII 8-level codes.

Communications • supports up to 24 asynchronous lines using different data codes and rates of 50 to 9600 bps • simplex, half-duplex, or full-duplex modes • controlled/uncontrolled dedicated circuits and dial-up lines at standard speeds • IATA Message Format • asynchronous protocols: 83B3, 81D1, 8A1.

Features • utilizes PDP-11/23 CPU with 256K-byte memory; 12 asynchronous communication ports; an RL01 disk drive; LA-38 Supervisory terminal • runs under INCOOS (Incotel Operating System Software) • use RL01 disk drives for system programs, in-transit storage of 800 messages and 30,000 messages on retrieval storage • Telex Batching feature on queue limit basis; priority code for urgent messages to bypass batching feature • store-and-forward feature routes messages via stored addresses of

3/5/7 characters • Wild Telex (direct entry of Telex number to be called) supported • delivery verification/confirmation by request of message originator • 3 levels of message priority supported.

Software • Incotel's INCOOS software developed specifically for message switching; provides monitoring functions for both communications network and remote terminals; peripheral device failure; open line failure; and failure of terminal to respond to poll/select • provides log and statistical reports on demand, hourly or daily.

Program Development • select modular standard software packages stored on system disk.

Configuration Flexibility • typical system consists of PDP-11/23 (256K-byte) CPU, one RL01 (5M bytes) disk drive, and LA-38 DECwriter supervisory terminal, one DLV11-J mux; 2 DLV11-B muxs; supports up to 12 asynchronous communication EIA lines expandable to 24 lines.

First Announced • 1983.

Pricing • purchase price is \$30,000 for basic single unit.

□ Incotel IMX300 Message-Switching System

Function • store-and-forward message-switching system • supports Telex Batching • provides speed/code conversion, system monitoring, logging, and statistical status reporting.

Associated Systems & Networks • PDP-11/34 (MX300); RL02 disk drive; LA-38 (DECwriter) supervisory terminal • AT&T/Teletype-compatible terminals • interface to DDD, TWX, Domestic Telex, and International Telex networks • support CCITT No.2 5-level Baudot or ASCII 8-level codes.

Communications • supports 16 to 128 asynchronous lines using different data codes and rates from 50 to 9600 bps • simplex, half-duplex, or full-duplex modes • controlled/uncontrolled dedicated circuits and dial-up lines at standard speeds • IATA Message Format • asynchronous protocols: 83B3, 81D1, 8A1.

Features • utilizes PDP-11/34 CPU with 128K-byte memory; 16 asynchronous communications ports; 2 RL02 disk drives; LA-38 Supervisory terminal (DECwriter) • systems run under INCOOS (Incotel Operating System Software) • uses RL02 disk drives for system programs, in-transit storage of 800 messages and 30,000 messages available for online retrieval • Telex Batching feature on queue limit basis; priority code for urgent messages to bypass batching feature • store-and-forward feature routes messages via stored addresses of 3/5/7 characters • Wild Telex (direct entry of Telex number to be called) supported • delivery verification/confirmation by request of message originator • 3 levels of message priority supported.

Software • Incotel's INCOOS software developed specifically for message switching; provides monitoring functions for both communications network and remote terminals; peripheral device failure; open line failure; and failure of terminal to respond to poll/select • provides log and statistical reports on demand, hourly or daily.

Program Development • select modular standard software packages stored on system disk.

Configuration Flexibility • a typical system consists of a PDP-11/34 CPU (128K bytes); 2 RL01 disks (Dual Drive Subsystem); an LA-38 DECwriter and DZ11 Multiplexer, supports up to 16 lines; can be expanded to 128 lines • systems are available with single or dual processors for different levels of reliability.

First Announced • 1974.

Pricing • purchase price is \$95,000 for basic IMX300.

□ Incotel IMX750 Message-Switching System

Function • turnkey store-and-forward message-switching system • supports self-monitoring of system operation, communications network, and remote terminals; performs routing and network changes on-/off-line • supports multisystem network configurations.

Communication Processors

Associated Systems & Networks • DEC VAX-11/730 and above, LA-100 Console Terminal • supports the following asynchronous/synchronous protocols: 81D1, 83B3, 85A, 8A1, Telex, TWX, DDD, Asynchronous Link Control, X.25; also IBM 2780/3780/3270 protocols; other optional protocols available include: 117B, 86B, 115B, 86A, and SDLC.

Communications • standard configuration supports 32 asynchronous EIA lines operating at different codes and speeds; expanded system supports up to 256 lines at up to 56K bps • synchronous line protocols require synchronous multiplexers • communication lines assigned to system in combination of circuit type/speed/protocol.

Features • uses DEC VAX-11/750 CPU (32-bit supermini) with 3M-byte memory; system includes 32 communication ports, LA-100 Console Terminal, and VAX/VMS Operating System; mass storage subsystems include two (2) RA81 (456M-byte) disks and controller combined with TU80 magnetic tape drive • Incotel software runs under VAX/VMS and supports protocols listed above • stores up to 60,000 intransit (750-character) messages on queue; equipped with a Mailbox feature; capable of interfacing with Electronic Mail software packages; wraparound journal can store 360,000 (750-character) messages • journal and in-transit files, mirrored on second disk; journal also mirrored to TU80 magnetic tape.

Software • Incotel communications software runs under control of standard VAX/VMS operating system for VAX-11/750; VAX/VMS supports multiuser, multiprogramming with concurrent multistream batch processing, real-time processing, and online program development • Incotel system software supports protocols listed in communications above and features self-monitoring of system operations as well as communications network and remote terminals; status of all peripheral devices; peripheral I/O failures logged to displayable error log file, open communications circuit, or failure of terminal to respond; provides routing and network changes online, off-line.

Program Development • FORTRAN, COBOL, BASIC, PL/1, Pascal, BLISS, and CORAL-66 are supported for new application development • Symbolic Dump, Symbolic Debugger, Systems Monitoring, and Formatted Disk Dump are standard utilities.

Configuration Flexibility • typical configuration includes VAX-11/750 CPU; VAX/VMS Operating System; 3M-byte memory; DZ11 or comparable UNIBUS, Asynchronous Multiplexers; two (2) RA81 Winchester Disk Drives (456M-bytes each); TU80 Tape Drive; LA-100 Console Terminal; TU58 Tape Cartridge Unit; optional Synchronous Line Interface Units • single or dual processor configurations to fit reliability requirements • maximum of 256 lines.

First Announced • February 1981.

Pricing • purchase price is about \$375,000 for a single processor system; purchase price is typically about \$600,000 for a dual system.

■ CABLESHARE, INC

20 Enterprise Drive, London, ON N6A 4L6 • 519-686-2900.

□ Cablesare CSI X.25

Function • data concentrator providing access to X.25 packet-switched network by host computers and intelligent terminals.

Associated Systems & Networks • vendor-independent hosts and terminals • X.25 packet-switched networks.

Communications • single or dual X.25 synchronous network access link(s) at speeds up to 56K bps; DCE or DTE support; 4/8/12/16 asynchronous ports supporting speeds up to 19.2K bps; XON/XOFF flow control; split-speed on asynchronous ports • supports HDLC LAP or LAPB frame formats.

Features • main board provides up to 128K bytes of RAM, 64K bytes of EPROM, 8K-byte CMDS with battery backup, one HDLC-DMA synchronous link, and 4 asynchronous ports supporting RS-232C and RS-423A interface.

Software • runs under Release 8.0 provided by Cablesare.

Program Development • turnkey system.

Configuration Flexibility • available with 4 to 16 ports and 1 X.25 link, an additional X.25 link can be added for each 8 ports implemented.

First Announced • 1978.

Pricing • purchase price is \$2,150 for 4-port system, \$2,840 for 8 ports, \$3,600 for 12 ports, \$4,160 for 16 ports, and \$360 for an additional X.25 link.

□ Cablesare LSI-X.25

Function • front-end processor and remote concentrator providing access to X.25 packet-switched network by a DEC PDP-11 or VAX-11 computer • turnkey system.

Associated Systems & Networks • DEC PDP-11 and VAX-11 computers and X.25 network.

Communications • multilink connection to the X.25 at line speeds up to 56K bps; up to 127 local or 128 remote terminal connections at up to 19.2K bps each; RS-232C interface; implements HDLC or BSC and LAP or LAPB protocols; DTE or DCE support; XON/XOFF flow control; selectable speed/code/parity.

Features • LSI-11/03, LSI-11/23, or LSI-12/23 Plus microprocessor with 32K-byte RAM memory; provides X.25 PAD and supports X.25 protocols Level I, II, III; PORTAL file transfer facility can function with both front-end processor and concentrator.

Software • automatically configured to customer's specifications; transparent to application software running on host systems; applications can treat X.25 virtual circuits as ordinary terminal ports.

Program Development • turnkey systems.

Configuration Flexibility • available with 4 to 16 ports and one X.25 link; an additional X.25 link can be added for each 8 ports implemented.

First Announced • 1978.

Pricing • purchase price is \$5,050 for 4 to 16 port system with 1123 board.

■ CHI CORPORATION

26055 Emery Road, Cleveland, OH 44122 • 216-831-2622.

□ Chi Communications Processor—CCP Series

Function • family of intelligent communication processors for Sperry 1100 Series systems; a single CCP can simultaneously be an intelligent front end, CTMC or GCS simulator, remote node, and backup for another CCP; for multihost applications, one CCP can be connected to eight 1100 Series channels • can be configured to meet a wide range of requirements from low-cost single processor system to redundant multiple processor systems • provide the ability to access IBM systems from Sperry systems; also provide certified X.25 interfaces • support most Sperry and IBM interactive and RJE terminals.

Associated Systems & Networks • Sperry 1100 Series Systems • X.25 Network • CCP Network • IBM Systems and SNA networks.

Communications • synchronous HDLC communications to 56,000 bps with ADLC line interface; synchronous and asynchronous communications to 19,200 bps with standard line interfaces.

Features • 32-bit processor family; up to 4M-byte main memory; up to 8 Sperry 1100 Series channel interfaces; up to 8 CCPs can connect to 1 Sperry 1100 Series channel through a channel multiplexer • provides for connection of communications line monitor without disconnecting modem cables; supports switching all lines from failed processor to backup processor.

Software • handlers for most Sperry and IBM interactive and RJE terminals; CTMC or GCS simulator permits compatible replacement of existing equipment with a planned migration to use intelligent front-end features; existing user-written

Communication Processors

communications routines will run without change; MCB interface can provide access to TIP without CMS; Uniscope network management software allows Sperry terminals on one line to access separate handlers or even different hosts • CCP network permits local terminals to access local or remote hosts; dynamic routing sends traffic through best path; asynchronous terminal handler with screen editor and line editor supports CRT, hard copy, and storage tube devices; asynchronous to Uniscope protocol conversion permits asynchronous terminals to access Sperry applications such as MAPPER that require Uniscope or UTS terminals • certified X.25 HDLC interface at speeds up to 56,000 bps and BSC interface at speeds to 19.2K bps.

Program Development • performed on 1100 Series host computer using a Chi-modified 1100 Assembler (CHIASM), Chi-developed high-level implementation language (CHILI), and 1100 Series MAP processor; code generated for CCP tested on 1100 Series under CCP simulator; downline loaded to the CCP; diagnostic software also downline loaded from 1100.

Configuration Flexibility • from 8-line single-processor remote node to several-hundred-line multiprocessor redundant system; systems field expandable.

First Announced • 1972, current models 1984.

Pricing • purchase prices begin at \$30,000.

■ CODEX CORPORATION/Subsidiary of Motorola, Inc

20 Cabot Boulevard, Mansfield, MA 02048 • 617-364-2000.

□ Codex 6001 Intelligent Network Processor (INP)

Function • intelligent statistical multiplexer provides point-to-point connections in Codex 6000 network; also can be used as 6000 node • error-free transmission via GO-BACK-N ARQ scheme.

Associated Systems & Networks • Codex 6005, 6010, 6030, 6040, and 6050 INPs • Codex 6000 Communications Network • supports X.25 Level 2 compatible link protocol.

Communications • supports 4 or 8 asynchronous channels at up to 9600 bps each; auto-speed (INP determines speed and character format of async data) up to 9600 bps • network port support over synchronous trunk up to 14.4K bps; aggregate data rate of 76.8K bps for 8-channel configuration • supports burst rate of 38.4K bps • full-duplex CCITT X.25 Level 2 compatible operation includes cyclical redundancy checking (CRC) for error detection and GO-BACK-N ARQ transmissions • point-to-point, 4-wire, full-duplex leased, unconditioned lines: 4800-bps modem is CCITT V.27 bis compatible; 9600-bps modem is CCITT V.29 compatible; required line is AT&T 3002 or equivalent.

Features • 4-channel and 8-channel models • terminal ports with 16K-byte RAM use Codex Multiplexer Port Protocol to transfer data error-free to remote unit; status of network link and RAM displayed on LED • selectable master/slave configuration; speed/code settings on per-channel basis; auto-echo, data restraint, flyback on unit basis • both models have choice of 2 integral modems, see Communications.

Software • configuration parameters defined by setting DIP switches: low-speed channel support; auto-speed; flyback delay (for terminals operating below 600 bps; data restraint; auto-echo; EIA Control Signals; statistics gathering and monitoring; diagnostics.

Program Development • done by Codex.

Configuration Flexibility • supports 4 or 8 asynchronous devices; synchronous trunk to 14.4K bps; CCITT X.25 Level 2 compatible link protocol.

First Announced • March 1981.

Pricing • purchase price is \$1,500 for 4-channel 6001 INP and \$2,250 for an 8-channel.

□ Codex 6002 Intelligent Network Processor (INP)

Function • intelligent statistical multiplexer provides point-to-point connections in Codex 6000 network; also can be used as 6000 node, allowing network control port to be used to

downline load 6001 configuration and initiate loopback diagnostics • error-free transmission via GO-BACK-N ARQ scheme.

Associated Systems & Networks • Codex 6005, 6010, 6030, 6040, and 6050 INPs • Codex 6000 Communications Network • supports X.25 Level 2-compatible link protocol • standard support for Hewlett-Packard, Wang, and Tandem computers and terminals.

Communications • supports 4 or 16 asynchronous channels at up to 9600 bps each; auto-speed (INP determines speed and character format of async data) up to 9600 bps • network port support over synchronous trunk up to 16.8K bps; aggregate data rate of 153.6K bps for 8-channel configuration • supports burst rate of 71.8K bps • full-duplex CCITT X.25 Level 2-compatible operation includes cyclical redundancy checking (CRC) for error detection and GO-BACK-N ARQ transmissions • point-to-point, 4-wire, full-duplex leased, unconditioned lines; 4800-bps modem is CCITT V.27 bis compatible; 9600-bps modem is CCITT V.29 compatible; required line is AT&T 3002 or equivalent.

Features • 4-channel and 8-channel models • terminal ports with 16K-byte RAM use Codex Multiplexer Port Protocol to transfer data error-free to remote unit; status of network link and RAM displayed on LED • selectable master/slave configuration; speed/code settings on per-channel basis; auto-echo, data restraint, flyback on unit basis • both models have choice of 2 integral modems, see Communications.

Software • configuration parameters defined by setting DIP switches; low-speed channel support; auto-speed; flyback delay (for terminals operating below 600 bps; data restraint; auto-echo; EIA Control Signals; statistics gathering and monitoring; diagnostics.

Program Development • as Codex 6000 node, central port of network can be used to downline load 6002 configuration and initiate loopback diagnostics.

Configuration Flexibility • supports 4 or 8 asynchronous devices; synchronous trunk to 9600 bps; CCITT X.25 Level 2-compatible link protocol.

First Announced • March 1984.

Pricing • purchase price is \$1,900 for 4-channel 6002 INP and \$2,900 for an 8-channel system.

□ Codex 6005 Intelligent Network Processor (INP)

Function • statistical multiplexer provides full-duplex communication between intermix of asynchronous/synchronous terminals through a single communication channel • error-free transmission via GO-BACK-N ARQ scheme.

Features • microprocessor with 32K-byte ROM for stored software, 1K-byte configuration memory (CMEM) with battery backup for system parameters • supports 4, 8, 12, or 16 terminal ports; separate Control Port allows full terminal port configuration, system monitoring, and diagnostics functions online from remote console • optional modems for point-to-point, 4-wire, full-duplex, leased, unconditioned lines; the 4800-bps modem is CCITT V.27 bit compatible and the 9600-bps modem is CCITT V.29 compatible; other options include quad-terminal port boards; hardware for split speeds on terminal ports.

Software • software stored in 32K-byte ROM; system parameters in 1K-byte configuration memory (CMEM).

Program Development • designated Control Port (CP) Terminal at local or remote site defines the Terminal Port characteristics and system configuration parameters during system installation; programmed configurations stored in system's main memory; individual checksum maintained for each terminal port and network port configuration; parameters can be entered or changed during online operations • local and remote loopback tests from both control port and any asynchronous terminal port.

Configuration Flexibility • system available in 2 basic enclosures; one supports 4 or 8 terminal ports, and the other supports 4, 8, 12, or 16 terminal ports.

First Announced • 1984.

Communication Processors

Pricing • purchase price is \$3,300 for a minimum 4-channel system and \$8,000 for 16-channel system with synchronous support.

☐ Codex 6010 Intelligent Network Processor (INP)

Function • intelligent network link management for centralized control • statistical multiplexer provides point-to-point connections in Codex 6000 network; dynamic allocation of high-speed bandwidth to active terminals on demand; can communicate via communications link with another 6010, directly to CPU port, or as integral part of larger 6000 network • error-free transmission via GO-BACK-N ARQ scheme.

Associated Systems & Networks • Codex 6001 and 6005 INP, 6030 INP, 6040 INP, 6050 Distributed Communications Processor, or 6500 Series front-end INP • Codex 6000 communications network • supports X.25 Level 2 link protocol.

Communications • supports up to 30 asynchronous terminals; asynchronous channel transmissions at standard data rates up to 4800 bps; trunk rates up to 9600 bps synchronous • features data codes with 5/6/7/8 bits, parity odd/even/none; 1, 1.5, or 2 stop bits; flyback control; data restraint on port-to-port basis; auto-echo; modem hold • full-duplex protocol for high-speed communications includes cyclical redundancy checking (CRC) for error detection and GO-BACK-N ARQ transmissions.

Features • typical configuration includes the 6010 base unit, central terminal, and terminal port modules; base unit consists of dual-processor module, memory and central module, and port nest to perform mainframe logic operations • network port and control terminal console occupy one of 16 slots in port nest • control terminal, or any 110-, 150-, 300-, 1200-bps asynchronous ASCII terminal, performs function of status panel; terminal console must define operational parameters of each terminal and network port • 6010 control terminal at either end of 6010 link or 6030/6040 operator console elsewhere in network controls configuration, diagnostics, and statistical functions • options include: Network Port/Central Port Module; Dual Universal Terminal Port Module; Dual Current Loop Terminal Port Module; Autospeed; Control Terminal (110-/300-bps asynchronous TI Silent 700 KSR 743); MIL-STD-188C Interface Modules.

Software • configuration parameters retained in nonvolatile configuration memory loaded via Control Terminal, CPU port, or 6030/6040; parameters include character structure, speed, flyback control, auto-echo enable, and modem hold or loss of trunk carrier • system configuration parameters concern maximum frame rate and retransmit queue size functions • statistics provided by control terminal and status panel for monitoring, diagnosis, and network optimization • auto-speed option.

Program Development • requires no terminal or computer programming, or protocol modification • central/monitoring/diagnostics through central terminal or status panel.

Configuration Flexibility • supports up to 30 asynchronous terminals or tail circuits.

First Announced • 1978.

Pricing • purchase price is \$3,500 for a 6010 Basic INP including single port nest capable of housing 15 port modules; software included; monthly lease rate under 2-year plan is \$120.

☐ Codex 6030 & 6040 Intelligent Network Processors

Function • network management with centralized network control • intelligent statistical multiplexer provides point-to-point connections between any 2 ports on a 2-node or multinode network; dynamic allocation of bandwidth to active terminals on demand • error-free transmission via retransmission • supports any mix of asynchronous or BSC terminals.

Associated Systems & Networks • Codex 6001/6005 INP and 6010, 6050 INP • Codex 6000 communications network • supports terminals using BSC ASCII, BSC EBCDIC, EBCDIC, BSC Transcode, 2741 Correspondence, asynchronous protocols.

Communications • supports data rates up to 19.2K bps at network port; Network Port to Digital Network Interface via Data

Service Unit up to 9600 bps; standard asynchronous speeds up to 4800 bps • BSC mode supports ASCII or EBCDIC codes as well as transparent text mode • terminal port receive clock up to 9600 bps; HDLC Terminal Port Module accepts external clocks or internal strap-selectable clocks up to 7200 bps; NRZI data received and transmitted via strap selection • Multiplex Port Module operates synchronously up to 9600 bps and presents data terminal (DTE) interface at its EIA-type port connector • Codex 6030 supports up to 124 ports; Codex 6040 supports up to 248 ports.

Features • INP functional unit includes mainframe, port nest(s), and an Operator Console • mainframe contains 5 types of modules sharing common bus: Master Control, which provides interrupt, I/O bus, and memory control functions; processor module; ROM module; and option module • port nest interfaces to mainframe via I/O bus and may contain Nest Interface Card, Network Port, Universal Terminal Port Modules, and Multiplex Port Modules interconnected via nest interface cards • 4-Port Nest Space: first nest supports 14 card slots; second/third/fourth nests contain 16 card slots each • one Universal or Current Loop Terminal Port Module occupies one card slot and provides 2 terminal interfaces; Multiplex Port Module occupies 2 card slots and must be adjacent to Network Port Module; Time-of-Day Module occupies 1 card slot in highest address slot in first port nest and is used in conjunction with Report Logging/Control Terminal Port (optional) • hardware options include: processor module; buffer memory, which provides additional 16-byte increment of RAM storage; operator console for system configuration/status/performance; Configuration Memory Expansion, which provides additional nonvolatile configuration memory for up to 21 ports • memory consists of nonvolatile CMOS RAM (NVR) • Data Restraint feature prevents data overrun by warning terminals when RAM buffers are 75% utilized.

Software • programs are contained on ROM cards mounted in any slot in the mainframe; standard firmware modules include: Statistics and Performance Monitoring information via optional Operator Console, Central Terminal Port, or Report Logging/Control Terminal Port; Terminal Port (TP) Statistics; Network Port (NP) Statistics; Node Statistics; Monitoring (Threshold Values); Operator Console Support; Asynchronous Terminal Support; Auto Echo; BSC Synchronous Terminal Support; Satellite Link/Variable Length ARQ • optional firmware modules include: Control Terminal Port Support; Supervisory Communications Support; Report Logging/Control Terminal Port; Autospeed; HDLC Terminal Support; 6030/6040 Interface Support; 6000 Interface Support.

Program Development • requires no custom programming or protocol modification; ROM-based diagnostics in each port detect hardware failure.

Configuration Flexibility • Codex 6030: a basic 6000 INP contains one port nest and includes RAM buffer and one nonvolatile configuration memory module for up to 28 ports (14 port modules); a maximum configuration includes 4 port nests and includes buffer RAM and 4 memory modules for up to 124 ports (62 port modules) • Codex 6040: a basic 6000 INP with one port nest includes RAM buffer and nonvolatile memory for up to 24 ports (12 port modules); a maximum configuration provides 8 port nests and includes RAM buffer and memory for up to 248 ports (124 port modules).

First Announced • 1975.

Pricing • purchase price is \$6,000 for 6030 INP with one port nest, 16K-byte RAM, and support for up to 28 ports; \$11,700 for 6030 INP with support for 28 ports; \$14,800 for 6040 INP with one port nest, 16K-byte RAM, and support for up to 24 ports; and \$29,600 for 6040 INP with support for 248 ports.

☐ Codex 6035 Intelligent Network Processor

Function • network management with centralized network control • intelligent statistical multiplexer provides point-to-point connections between any 2 ports on a 2-node or multinode network dynamic allocation of bandwidth to active terminals on demand • error-free transmission via retransmission • supports any mix of asynchronous or BSC terminals.

Communication Processors

Associated Systems & Networks • Codex 6001, 6002, 6005, 6010, 6030/40, 6050 INP • Codex 6000 communications network • supports terminals using BSC ASCII, BSC EBCDIC, EBCDIC, BSC Transcode, 2741 Correspondence, asynchronous protocols.

Communications • supports data rates up to 19.2K bps at network port; Network Port to Digital Network Interface via Data Service Unit up to 9600 bps; standard asynchronous speeds up to 4800 bps • BSC mode supports ASCII or EBCDIC codes as well as transparent text mode • terminal port receive clock up to 9600 bps; HDLC Terminal Port Module accepts external clocks or internal strap-selectable clocks up to 7200 bps; NRZI data received and transmitted via strap selection • Multiplex Port Module operates synchronously up to 9600 bps and presents data terminal (DTE) interface at its EIA-type port connector • supports up to 124 ports; supports dual high-speed links between nodes.

Features • INP functional unit includes mainframe, port nest(s), and an Operator Console • mainframe contains 5 types of modules sharing common bus: Master Control, which provides interrupt, I/O bus, and memory control functions; processor module; ROM module; RAM module; and option module • port nest interfaces to mainframe via I/O bus and may contain Nest Interface Card, Network Port, Universal Terminal Port Modules, and Multiplex Port Modules interconnected via nest interface cards • 4-Port Nest Space: first nest supports 14 card slots; second/third/fourth nests contain 16 card slots each • one Universal or Current Loop Terminal Port Module occupies one card slot and provides 2 terminal interfaces; Multiplex Port Module occupies 2 card slots and must be adjacent to Network Port Module; Time-of-Day Module occupies 1 card slot in highest address slot in first port nest and is used in conjunction with Report Logging/Control Terminal Port (optional) • hardware options include: processor module; buffer memory, which provides additional 16-byte increment of RAM storage; operator console for system configuration/status/performance; Configuration Memory Expansion, which provides additional nonvolatile configuration memory for up to 21 ports • memory consists of nonvolatile CMOS RAM (NVR) • Data Restraint feature prevents data overrun by warning terminals when RAM buffers are 75% utilized.

Software • programs are contained on ROM cards mounted in any slot in the mainframe; standard firmware modules include: Statistics and Performance Monitoring information via optional Operator Console, Central Terminal Port, or Report Logging/Control Terminal Port; Terminal Port (TP) Statistics; Network Port (NP) Statistics; Node Statistics; Monitoring (Threshold Values); Operator Console Support; Asynchronous Terminal Support; Auto Echo; BSC Synchronous Terminal Support; Satellite Link/Variable Length ARQ • optional firmware modules include: Control Terminal Port Support; Supervisory Communications Support; Report Logging/Control Terminal Port; Autospeed; HDLC Terminal Support; 6030/6040 Interface Support; 6000 Interface Support; Automatic Fallback and Recovery on failure of one link in a dual link connection.

Program Development • requires no custom programming or protocol modification; ROM-based diagnostics in each port detect hardware failure.

Configuration Flexibility • a basic 6035 INP contains one port nest and includes RAM buffer and one nonvolatile configuration memory module for up to 28 ports (14 port modules); a maximum configuration includes 4 port nests and includes buffer RAM and 4 memory modules for up to 124 ports (62 port modules).

First Announced • 1984.

Pricing • purchase price is \$4,500 for 6035 INP with one port nest, 16K RAM, and support for up to 28 ports.

□ Codex 6050 Distributed Communications Processor (DCP)

Function • nodal processor and statistical multiplexer for Codex networks of 6050 DCPs and Codex 6000 Intelligent Network Processors (INPs) connected to a host/front-end processor (FEP)

computer complex • provides complete network control for fixed node/system topology for data communications.

Associated Systems & Networks • each 6050 DCP in 6050 DCP network or in a Codex 6000 INP network supports up to 120 terminals in any mixture of asynchronous, bisynchronous, and HDLC line protocols in transparent mode; compatible with Codex 6000 INP systems.

Communications • interfacing to 6050 DCP is through 2 basic types of intelligent ports; each DCP node supports up to 59 (primary node) or 63 (secondary node) intelligent ports • one basic type of network port is the Intelligent Network Port that connects 6050 DCP to high-speed network link; one variation is the network port (I/NP) that supports data rates up to 19.2K bps; another variation (I/GNP) supports Group Band network link rates up to 64K bps; a third variation, Intelligent Multiplexer Port (I/MXP), provides 9.6K-bps gateway link between DCP node and Codex 6000 Intelligent Network Processor (INP) Series network; I/MXP supports up to 32 terminal links from INP; each DCP node can connect up to 32 network ports and can address up to 127 other nodes • the second basic type of network port, the Intelligent Multiple Asynchronous Terminal Port (I/MATP) supports up to 4 asynchronous user connections, accepts 3 additional Quad Asynchronous Terminal Port (QBYTA) expansion cards each providing 4 EIA RS-232C/CCITT V.24 user interface connections, generates internal clock or accepts external clocks to support speeds from zero to 19,200 bps • Intelligent Multiple Synchronous Terminal Port (I/MSTP), similar to I/MATP but handles synchronous data • Block Mode Bisynchronous (IBM 2780/3780/IES) Protocol Intervention Port supports single EIA RS-232C/V.24 connection for speeds up to 9.6K bps • Intelligent Bit Oriented Port (I/BOP) supports one RS-232C/CCITT V.24 user connection; protocol transparent (HDLC, SDLC, ADCCP); data rates up to 9.6K bps • Intelligent Control Terminal Port (I/CTP) provides RS-232C/V.24 connection for asynchronous terminal to control network: online configuration, network monitoring, control and diagnostics; supports printer • Intelligent Terminal Ports connect user data terminal equipment or tail circuit modem; also for asynchronous, bisynchronous, and HDLC-type protocol connection.

Features • 6050 node is multimicroprocessor mainframe housing intelligent communications ports interfaced to I/O bus by Intelligent Nest Interface Cards (I/NIC) • software resident on floppy disk is loaded into node at system initialization by control terminal • line transmission capabilities increased by: statistical multiplexing of data using GO-BACK-N ARQ schemes for error correction and dynamically assigning bandwidths to active terminals; optional protocol intervention capability for block mode by synchronous terminals transmitting on satellite links; and data compression technique allows 2 priority levels for link use • dynamic alternate routing and end-to-end checking scheme provide error detection and prevent data loss due to link failures.

Software • Intelligent Floppy Disk Port supports dual/double side diskette drives to store system software and format for report/statistics collection; loaded into 6050 mainframe and individual intelligent communication ports at power-up; local node downline loads software into adjacent nodes • Software provides Intelligent Network processing, adaptive routing, central network control and management, data interface to Codex 6000 INP Series, protocol intervention, and User Destination Routing (UDR) • online facility at control terminal, diskette, or hard copy terminal provides collection/computation/reporting statistics on network.

Program Development • modular software selected to fit configuration.

Configuration Flexibility • modular with almost unlimited number of variations depending on selection of intelligent port modules • node includes software and at least one port nest, which provides 16 slots for intelligent ports; one slot must be used for Intelligent Network Interface Card to connect nest to mainframe processor; primary node must also include Intelligent Control Terminal Port (I/CTP) for network control terminal device and Intelligent Floppy Disk Port (I/FDP) for dual floppy disk drive • rest of slots in primary or secondary node nest can support any

Communication Processors

of the other intelligent port modules; node can include up to 4 port nests • maximum configuration can include up to 120 logical terminal circuits; limitation based on throughput requirements; maximum aggregate sustained throughput limited to 20K cps • smallest network should have 2 or 3 nodes.

First Announced • October 1980.

Pricing • purchase price is \$30,000 to \$55,000 for typical system, depending on configuration.

□ Codex 6520 Front-End Processor

Function • communications processor for data communications and real-time control • operates as front end for up to 4 IBM System 370-compatible host computers; can operate as plug-compatible replacement for IBM 270X/3704 Communication Controllers and for 3705s operating in emulation program (EP) mode • supports networks and up to 10 Codex 6000 Intelligent Network Processors (INPs) operating as remote cluster controllers; also supports IBM 3270 terminals running under 3271 and 3275 cluster controllers.

Associated Systems & Networks • IBM System 370-compatible systems; Codex network • terminals supported: Codex Color Console, IBM-types 1030, 1050, 2250, 2260/2848, 2265/2845, 2740, 2741, 2770, 2780, 3270, 3275, 3741, 3767, 3780; TTY Models 28, 32, 33, and 35; IBM S/3, S/32, S/7, 1130, S360/370 remote computers; Dataspeed 40; HASP workstation.

Communications • up to 8 Asynchronous Line Sets (ALS) are interfaced through Asynchronous Line Interface Base (ALIB); maximum 30 ALIBs (240 lines); data rate up to 9.6K bps • supports 112 synchronous lines at data rates of 1200 to 9600 bps for BSC communications and up to 230.4K bps for Wide Band Line Set (WBLS) • supports up to 10 Codex 6000 INPs with data rates up to 19.2K bps; Codex Mux Port Protocol (Level 2 HDLC-compatible) • up to four channel adapters connect to IBM-compatible hosts' byte-multiplexer channels.

Features • system includes Communications and Control Processor (CCP) for data communications and control functions; supports CCP and up to 256 character devices; also supports direct memory access devices • I/O processor (IOP) is DMA device that provides block transfers between memory and up to 7 attached disks/host computers; supports host channel adapters; IOP data rate is 1M bps • memory 48K to 64K bytes; used to store program modules, data buffers, and tables • basic system includes 48K-byte memory; 256K-byte diskette, which provides permanent core image of operational software and supervisory control terminal; 40M-byte disk drive is optional • Supervisory Control Terminal (SCT) is a 4-color CRT console; it allows dynamic reconfiguration and monitoring of system status/error conditions; maximum 2 consoles per system • Multiplexed Network Interface (MNI) provides direct connection for local/remote Codex 6000 Series INPs to allow multiple data terminals to communicate with host over single connection.

Software • Networking System Software (NSS) used with Codex 6500 Series Communications Processors includes: NSS-1 operating system that provides Emulation Program compatibility with IBM's EP program; supports up to 4 hosts; provides Dynamic Application Selection (DAS) that allows up to 16 application programs in hosts; Multipoint Dynamic Application Selection (MDAS) extends selection to IBM 3270 class terminal users; Operational Control and Monitoring provides network and monitoring control; Multiple Subchannel Line Selection permits transfer of lines from subchannels between hosts; Code Conversion between terminals and hosts; Advanced Polling allows variety of polling techniques such as slow poll • software operates with IBM access methods in IBM hosts: BTAM, QTAM, RTAM, TCAM, and HASP/RJE.

Program Development • no user program development.

Configuration Flexibility • basic 6520 system includes 48K-byte memory, diskette, one color SCT, one IBM channel • minimum configuration can include basic system and one ALS and one ALIB to support 8 communication lines • maximum 240-line configuration requires, in addition to basic system, 3 channel adapters, 30 ALIBs, 8 ALS, an additional color SCT, one Memory Bus Extension, additional 16K bytes of memory, and a

40-byte diskette drive • supports up to 10 Codex 6000 Series INPs.

First Announced • April 1979.

Pricing • purchase price is \$43,300 for basic 6520, \$45,325 for 8-line configuration, and \$143,800 for maximum 240-line (30 ALIBs) configuration as described above.

■ **COMDEX, LIMITED—See LEMCOM**

■ COMPUTER COMMUNICATIONS INC (CCI)

2610 Columbia Street, Torrance, CA 90503 • 213-320-9101.

□ CCI Communications Processors (CC-6/8F/8.5/8R/80/85)

Function • front-end processors and remote concentrators; field upgradeable • provide IBM 270X/370X system emulation, emulation of 370X running in EP mode only, independent front-end processing, networking (including remote concentration), message switching • X.25 support • offers statistics collection and display, multiple host support, diagnostics, code conversion, polling, terminal emulation, and dynamic application selection.

Associated Systems & Networks • IBM S/360 and 370-compatible hosts, terminals and protocols supported: IBM 2740, 2740-I, 2740-II, 2741, 1050; 2770, 2780, 3270, 3735, 3770, 3780, 3790 terminals, remote IBM S/3, S/32, S/7, 1130, S/360, and S/370 computers TTY models 28/32/33/35 • gateway to Telenet and Tymnet public data networks via X.25 support.

Communications • Model CC-6 supports up to 32 asynchronous/BSC/mixed lines at data rates from 75 to 9600 bps; up to 4 lines can be wideband with synchronous data rates up to 56K bps • Model CC-8F supports up to 240 lines at data rates from 50 to 9600 bps (asynchronous) and 1200 to 230.4K bps (synchronous); 200K-cps sustained aggregate throughput on synchronous lines; peak load 400K cps • Model CC-8.5, logical extension of CC-8, doubles aggregate sustained throughput to 400K cps • Model CC-80 supports 240 lines expandable to 1,232 in mixture of speeds/protocols; aggregate sustained synchronous throughput 200K cps • Model CC-85 supports up to 1,232 synchronous lines; aggregate sustained synchronous data rate up to 400K cps.

Features • CC family of communications processors are designed with same basic hardware: communication and control processor is 16-bit minicomputer containing logic, arithmetic unit, sequencing controls; single access memory ranges from 40K to 512K bytes; I/O processor (IOP) supports up to 7 high-speed I/O channel adapters and mass storage units, Channel Adapters (CA) interface CCP to IBM S/370-compatible host computer's byte multiplexer channel; CA support ranges from 2 on CC-6 to 13 on CC-85; 1 CA required for each host connection; mass storage devices range from 256K-/512K-byte diskette, 250K-bps transfer rate to 40M-byte formatted disk drive and 806K-byte-per-second transfer; maximum of 3 disk drives per system; line adapters to redundant system configurations for complete or fractional backup • models are field-upgradable • CC-6 supports up to 2 IBM S/370-compatible hosts; upgrades to CC-8F • the 64K-byte CC-8F, smaller version of the CC-80, supports up to 4 IBM-compatible hosts and is upgradeable to CC-80 • the CC-8.5 is a logical extension of the CC-8F and provides double throughput rate at 400K-cps BSC and reduced memory access time • the CC-80 supports up to 512K bytes of memory and can function as local controller, remote concentrator, or front-end replacement for IBM 270X/370X controller; utilizes Intercomputer Communications Protocol (ICP) for transmission between controllers; offers packet switching; supports up to 13 hosts simultaneously and 320M bytes of mass storage; the CC-85 supports all standard/optional features of CC-80; provides over twice the processing power of CC-80 at sustained synchronous throughput of 500K cps.

Software • Network Communications System (NCS) communications-oriented software modules provide operating system/data communications processing software • NCS-1.4 operating system for CC-6/8F/8.5 processors supports remote concentration, packet switching, IBM 270X/370X emulation, and

Communication Processors

independent front-end processing, including terminal-initiated application and integrated networking applications; emulation of 370X is of 370X running in emulation mode (of 270X) only • Communications Processing System (CPS) customized operating system for CC-80/-85 provides features of NCS-1.4 plus support of message switching, electronic mail, and airline reservation application functions • monitoring and supervisory capabilities include line tracing, real-time reconfiguration, full system statistical storage/retrieval, self-diagnostics • X.25 program provides access to public data networks; separate microprocessors perform Level-2 tasks such as addressing, data integrity, housekeeping; Level-3 packet assembly/disassembly (PAD) incorporated into NCS • NCS software loaded from disk thus all configurations of CC-8X require 1 disk device.

Program Development • turnkey configurations; modular expansion; CCI assembler runs on CC-8X processor; IBM S/360 or 370 can also assemble CC-8X programs and channel-load them into CC-8X for execution.

Configuration Flexibility • configurations can range from a CC-6 with 40K bytes of memory, 262,144-byte diskette with support for 1 host and 8 communications lines to a CC-85 with 512K bytes of memory, 320M bytes of disk storage, connections to up to 13 host processors, and line interface adapters for 1,232 lines.

First Announced • 1975 (CC-80), 1976 (CC-8), 1979 (CC-85), 1981 (CC-6).

Pricing • purchase prices range from approximately \$19,000 for a CC-6 system supporting up to 8 communications lines to approximately \$533,700 for a large CC-85 system supporting 952 lines and including 5-year maintenance.

■ **COMTEN—See NCR/COMTEN**

■ CONTROL DATA CORPORATION (CDC)

8100 34th Avenue South, Minneapolis, MN 55440 • 612-853-8100.

□ Control Data 2551-3 & -4 Network Processing Units

Function • front-end or remote network processor/multiplexer for Control Data CYBER and older CDC 3000 Series host computer systems.

Associated Systems & Networks • CYBER 70/170/6000 Series computers and CDC 3170/3300/3500 Series computers • X.25 packet-switched networks.

Communications • loop multiplexers interface 16 communication line adapters (CLAs) providing 32 lines (2551-3) and 32 CLAs providing 64 lines (2551-4); expansion capacity up to 254 communication lines on 2551-2 • synchronous, half- or full-duplex at data rate up to 56K bps; asynchronous data rate up to 9600 bps • EIA RS-232C or CCITT V.24 and V.35 interface and compatibility with AT&T 103, 113, 202 data sets in asynchronous transmissions • EIA RS-232C interface and compatibility with AT&T 201 and 208 data sets in synchronous transmissions.

Features • NPUs include 16-bit word processor, 128K-byte MOS memory with expansion to 256K bytes • optional Channel Couplers provide host computer I/O channel interface for NPUs; the 2551 NPU can control up to 2 couplers; at least one is required when NPU is utilized as front end • 2551-3 NPU can be upgraded to a 2551-4 • remote loading option provides hardware for automatic loading and restoring a remote NPU and requires cassette subsystem when 2551-4 is used as remote NPU.

Software • Communications Control Program (CCP): Base System Software provides operating system functions and includes: system monitor, interrupt handler, console utility for diagnostic functions, buffer maintenance, and queue utilities; Host-Interface Program controls and formats data moving between NPU memory and host computer; and Terminal Interface Program (TIP) provides interface between standard internal processor protocol and different terminal protocols: AT&T/Teletype, IBM 2741, CDC Mode 4, APL-mode, IBM 2780/3780/3270, IBM HASP Multileaving, and HDLC protocol for CCITT X.25 interface; Line Interface Program controls information transfer between local and remote 2551 NPUs.

Program Development • Pascal • CYBER Cross System, which runs on a CYBER host, provides series of support tools: Pascal compiler, link editor, macro/micro assembler, and library maintenance capability.

Configuration Flexibility • up to 32 lines on 2551-3 NPU and up to 254 lines on 2551-4 NPU; maximum configuration requires one Expansion Console for every 2 loop multiplexers; supports up to 8 loop multiplexers.

First Announced • 1974.

Pricing • purchase price is \$48,730 for typical 2551 NPU system with 16 CLAs; purchase price of \$61,290 with 32 CLAs; maximum configuration depends on user-option additions.

■ DATASTREAM COMMUNICATIONS, INC

1115 Space Park Drive, Santa Clara, CA 95050 • 408-727-2980.

□ Datastream 774 Remote Cluster Controller

Function • terminal controller allows almost any ASCII/TTY II terminal to operate in IBM remote 3270 BSC networks.

Associated Systems & Networks • IBM 3277/3278 and 3287 terminals/printers; IBM 3271/3274 BSC-compatible controllers • can be upgraded for 3274 SNA/SDLC compatibility.

Communications • supports 7, 11, or 15 asynchronous ports; data rates up to 9600 bps; RS-232C interface; asynchronous transmission on switched or nonswitched, point-to-point facilities; synchronous transmission on nonswitched, point-to-point, multipoint, or direct-connect facilities.

Features • Z80 microprocessor-based; supports 7, 11, or 15 ASCII devices in remote 3270 BSC networks; emulation characteristics are software-based to permit easy configuration, remote dial-in diagnostics, and easy system update or revision; features password security • supports 2 host links concurrently; second application or second host can be selected without A/B switches or host and front-end software; can be used for line redundancy and backup in critical applications.

Program Development • cassette-loaded programs; new software programs and diagnostics can be downline loaded to online controller.

Configuration Flexibility • can control up to 15 ASCII devices and connect to up to 2 hosts.

First Announced • 1980.

Pricing • purchase price ranges between \$7,900 to \$15,000.

□ Datastream 874 Controller

Function • local or remote controller that provides IBM 3270 functionality for ASCII terminals, personal computers, word processors, and Datastream Display Stations • emulates IBM 3274/SDLC controller.

Associated Systems & Networks • IBM SNA networks and IBM or IBM-compatible hosts; also any network or system that supports IBM 3274 SNA/SDLC controller.

Communications • supports 7, 11, or 15 device ports and up to 2 host links; both user ports and host links can operate at up to 19.2K bps; RS-232C user interface; transmission for user ports can be over switched or nonswitched, point-to-point facilities • host communications can be over direct-connect, multipoint, point-to-point, or switched facilities.

Features • 8086 microprocessor-based; supports 7, 11, or 15 ASCII device ports • allows ASCII devices to operate as IBM remote 3270 SNA/SDLC devices; all emulation characteristics are software-based to permit easy configuration, remote dial-in diagnostics, and easy system update or revision; provides password security; can support 2 host links concurrently; this can also be used for line redundancy and backup in critical applications.

Software • operating software programs, as well as self-diagnostics, configuration, and emulation programs on cassette.

Program Development • cassette-loaded programs; new

Communication Processors

software programs and diagnostics can be downline loaded to online controller.

Configuration Flexibility • can control up to 15 ASCII devices and support up to 2 host communication links.

First Announced • 1982.

Pricing • purchase price ranges between \$10,950 to \$16,950.

■ DIGITAL COMMUNICATIONS ASSOCIATES (DCA)

303 Research Drive, Atlanta, Norcross, GA 30092 • 404-448-1400.

□ DCA System 335 Network Processor

Function • bus-centered, firmware-based processor provides master switching, communication control/management, and point-to-point, multipoint, and multilink statistical multiplexing in small-to-medium-scale dedicated networks • supports interactive-, batch-, and block-mode applications • control routing, host selection, and port contention • can operate as master network processors controlling complete network.

Associated Systems & Networks • DCA Series 100 and 200 multiplexers, INA/TIP, and 325 NetSwitch • use bit-serial interfaces for compatibility with any host; optional protocol conversion module allows terminal user to access any host on network; uses first-come-first-served contention scheme • DCA INA (Integrated Network Architecture) and DCA's Netlink • gateway through X.25 interface to public packet-switched networks (Uninet, Telenet, Tymnet, and Datapac); thus to host computers supporting X.25 protocol.

Communications • supports up to 4 synchronous trunk lines at 9600-/19.2K-bps data rate per trunk • supports interactive asynchronous terminals/devices at data rates from 50 to 9600 bps over 42 ports • multipoint configurations support up to 16 terminal clusters over single line • handles 1 or 2 X.25 data streams through X.25 Level 3 gateway interface.

Features • supervisory processing module (PM) supports 64K-byte memory; additional 64K-byte PMs available for extended configurations and for X.25 support • System 335 can be upgraded to 355 by adding a few modules.

Software • no operating system; firmware-based system run by general-purpose processing modules (PMs) • individual programs are loaded into RAM of each PM to provide both internal/external communication/network management functions • advanced software package provides macro command language for network operator control • allows network operator to manage entire network from single location; routing port contention, host selection, and multidrop multiplexer.

Program Development • not user programmable, console macro facility to execute user commands • cartridge-based program load subsystem stores program or configuration information; user-specified parameters for vendor-supplied software • Network Design System (NDS) allows user to create or to change network configurations at any time on-site.

Configuration Flexibility • supports up to 42 ports and 4 trunk lines.

First Announced • 1983.

Pricing • purchase price is \$6,795 for 335-201 with 64K-byte PM, no enclosure; \$7,195 for 335-200 with enclosure • \$272/\$288 (201/200) per month under 1-year lease • \$476/\$504 per month maintenance (201/200).

□ DCA System 355 Network Processor

Function • bus-centered, firmware-based processor provides master switching, communication control/management, and point-to-point, multipoint, and multilink statistical multiplexing in small-to-medium-scale dedicated networks • supports interactive-, batch-, and block-mode applications • control routing, host selection, and port contention • can operate as master network processor controlling complete network • can operate as front-end processor for DECsystem 10.

Associated Systems & Networks • DCA Series 100 and 200

multiplexers, INA/TIP, and 325 NetSwitch • use bit-serial interfaces for compatibility with any host; optional protocol conversion module allows terminal user to access any host on network; uses first-come-first-served contention scheme • DCA INA (Integrated Network Architecture) • gateway through X.25 interface to public packet-switched networks (Uninet, Telenet, Tymnet, and Datapac); thus to host computers supporting X.25 protocol.

Communications • supports up to 44 synchronous trunk lines at 9600-/19.2K-bps data rate per trunk • supports interactive asynchronous terminals/devices at data rates from 50 to 9600 bps over up to 126 ports • multipoint configurations support up to 16 terminal clusters over single line • handles 1 or 2 X.25 data streams through X.25 Level 3 gateway interface.

Features • supervisory processing module (PM) supports 64K-byte memory; additional 64K-byte PMs available for extended configurations and for X.25 support.

Software • no operating system; firmware-based system run by general-purpose processing modules (PMs) • individual programs are loaded into RAM of each PM to provide both internal/external communication/network management functions • advanced software package provides a macro command language for network operator control • allows network operator to manage entire network from single location; routing port contention, host selection, and multidrop multiplexer.

Program Development • not user programmable, console macro facility to execute user commands • cartridge-based program load subsystem stores program or configuration information; user-specified parameters for vendor-supplied software • Network Design System (NDS) allows user to create or to change network configurations at any time on-site.

Configuration Flexibility • supports up to 126 ports and 44 trunk lines.

First Announced • 1980.

Pricing • purchase price is \$9,995 for basic unit; \$10,995 for basic unit plus freestanding rack enclosure, 4 feet high; \$11,295 for basic unit and freestanding rack enclosure, 6.5 feet high (last 2 with fan assembly) • \$400/\$440/\$452 per month under 1-year lease • \$700/\$770/\$791 per month maintenance.

□ DCA System 375 Network Processor

Function • bus-centered, firmware-based processor provides master switching, communication control/management, and point-to-point, multipoint, and multilink statistical multiplexing in small-to-medium-scale dedicated networks • supports interactive-, batch-, and block-mode applications • control routing, host selection, and port contention • can operate as master network processors controlling complete network.

Associated Systems & Networks • DCA Series 100 and 200 multiplexers, INA/TIP, and 325 NetSwitch • use bit-serial interfaces for compatibility with any host; optional protocol conversion module allows terminal user to access any host on network; uses first-come-first-served contention scheme • DCA INA (Integrated Network Architecture) • gateway through X.25 interface to public packet-switched networks (Uninet, Telenet, Tymnet, and Datapac); thus to host computers supporting X.25 protocol.

Communications • supports up to 114 synchronous trunk lines at data rates up to 56K bps per trunk • supports interactive asynchronous terminals/devices at data rates from 50 to 9600 bps over up to 128 ports • multipoint configurations support up to 16 terminal clusters over single line • handles 1 or 2 X.25 data streams through X.25 Level 3 gateway interface.

Features • supervisory processing module (PM) supports 64K-byte memory; additional 64K-byte PMs available for extended configurations and for X.25 support • is an enhanced version of System 355.

Software • no operating system; firmware-based system run by general-purpose processing modules (PMs) • individual programs are loaded into RAM of each PM to provide both internal/external communication/network management functions • advanced software package provides macro

Communication Processors

command language for network operator control • allows network operator to manage entire network from single location; routing port contention, host selection, and multidrop multiplexer.

Program Development • not user programmable, console macro facility to execute user commands • cartridge-based program load subsystem stores program or configuration information; user-specified parameters for vendor-supplied software • Network Design System (NDS) allows user to create or to change network configurations at any time on-site.

Configuration Flexibility • supports up to 128 ports and 114 trunk lines.

First Announced • 1984.

Pricing • purchase price is \$16,995 for basic unit with 2 trunk link cables; \$18,295 for basic unit plus freestanding rack enclosure and fan assembly • \$700/\$732 per month under 1-year lease • \$1,190/\$1,281 per month maintenance.

■ **DIGITAL COMMUNICATIONS CORPORATION (DCC)—See M/A-COM DCC, INC**

■ **DOELZ NETWORKS, INC**

18581 Teller Avenue, Irvine, CA 92715-1693 • 714-851-2223.

□ **Doelz Elite One**

Function • multipoint concentrator switch for use in wide area networks and data distribution networks.

Associated Systems & Networks • vendor-independent; networks are formed by a single Elite One Network Link or by interconnecting a series of links via Esprit One Switches.

Communications • 1 to 32 asynchronous or synchronous ports at data rates up to 9600 bps; user ports accept asynchronous/synchronous/SDLC/X.25 protocols; RS-232C interface • 4 data links per node; 60 nodes per network link at data rates up to 72K bps; RS-232C/V.35 interface or integral modem.

Features • proprietary modular distributed real-time operating system.

Software • proprietary real-time operating system and comprehensive software; provides end-to-end transmission and control.

Program Development • turnkey network.

Configuration Flexibility • can accommodate up to 32 user ports; can address up to 60 nodes.

First Announced • March 1984.

Pricing • purchase price is \$4,500 for 8-port unit.

□ **Doelz Esprit One**

Function • high-speed concentrator switch for use in wide area networks; interconnects elite One Network Links and provides ports for local users.

Associated Systems & Networks • Doelz networks; vendor-independent.

Communications • network can interconnect up to 99 Esprit One units, over 400,000 user addresses; each switch provides 67 link ends; 4,096 user addresses, up to 8 trunks between 2 switches; data rates up to 72K bps (1.544M bps Release 2); implements V.35/RS-232C interfaces or integral modem; asynchronous/synchronous rates for user ports up to 19.2K bps (56K bps Release 2); RS-232C interface standard; user ports can accept asynchronous/BSC/SDLC/X.25 protocols.

Features • proprietary modular distributed real-time operating system.

Software • proprietary real-time operating system and comprehensive software.

Program Development • turnkey network.

Configuration Flexibility • up to 67 link ends; 4,096 user addresses; up to 8 trunks between any 2 switches • network can interconnect up to 99 Elite Ones.

First Announced • March 1984.

Pricing • purchase price is \$40,000 for basic unit.

■ **DPF, INC (No longer markets communications systems)**

■ **ECOTRAN—See CHI CORP**

■ **EXXON CORPORATION—See PERIPHONICS CORP**

■ **GANDALF DATA, INC**

1019 South Noel, Wheeling, IL 60090 • 312-541-6060.

□ **Gandalf PACX (Private Automatic Computer Exchange) II/III/IV Systems**

Function • provides switching and contention resolution on first-come, first-served basis and communication controls between serial data devices • supports transparent data transfer between up to 16,000 different local/remote vendor devices such as intelligent/dumb terminals, word processors, micro/mini/supercomputer systems; provides statistical data on system loading and system status indicators; provides data communication controls and switching logic, and contention resolution on first-come, first-served basis.

Associated Systems & Networks • supports devices using EIA RS-232C/CCITT V.24, RS-422, TTL, MIL-188-114 interfaces on front ends, computer ports, multiplexers, and modems; terminal support includes the 125 Terminal Board, which is compatible with Gandalf's LDS 125 and MLOS 126 Data Set located at terminal; the 135 Terminal Board provides 103-Type FSK modems compatible with existing 103/113 dedicated remote units; available with built-in AT&T-compatible modems or limited distance data sets; EIA RS-232C interface cards • PACX private network • gateways to X.25, R.F. Coax, data-over-voice, fiber optic, and IBM 3270 networks.

Communications • asynchronous data transmission up to 9600 bps; synchronous transmission up to 19.2K bps • support from 4 to 512 terminal lines; from 8 to 512 port lines simultaneously • PACX II, III, and IV also offer dual system configurations which double capacity of single unit.

Features • a typical PACX system accommodates up to 254 terminals and up to 126 port connections; PACX II, III, and IV can provide a dual PACX system which provides 510/509/512 terminal and 254/252/256 port connections; available in redundant configurations • a PACX system can include the following components: Asynchronous Modem Terminal Boards; Synchronous Modem Terminal Board (125 or 135 terminal boards); Asynchronous Port Board or a Synchronous Port Board; Operator Display Panel; Operator Control Panel; Terminal Address Panel; Port Board Address Panel • choice of 5 terminal boards on PACX III with 4 providing dial-up capability; data rates up to 9600 bps • Keyboard Class Select/Statistics Output (standard with PACX III) allows user to request specific class (64 available) of service through digit-code from terminal keyboard; accepts ASCII and IBM 2741 terminal codes using BCD, EBCDIC, or correspondence codes.

Software • software for control panel allows operator to communicate with system for data control and system monitor functions: port channel status confirmed or changed; port channel class code confirmed or changed; tests all LEDs; observe errors in parity or memory contents • reallocates ports using up to 128 different service classes • controls access of up to 16 groups of terminal users to specific service classes • checks user status.

Program Development • no language; special class/status code procedures.

Configuration Flexibility • four basic mainframe configurations: mini-PACX supports up to 48 terminals and 28 ports; COMPACX supports 128 terminals and 128 ports; PACX supports 256 terminals and 128 ports; Dual PACX supports 512 terminals and 256 ports; Quad PACX supports 1024 terminals and 512 ports.

First Announced • line began in 1971; PACX IV latest model in March 1984.

Communication Processors

Pricing • purchase price for basic mini PACX is approximately \$7,000 • purchase price for a typical PACX IV configuration is \$35,000 to \$40,000.

■ GTE TELENET COMMUNICATIONS CORP

8229 Boone Boulevard, Vienna, VA 22180 • 703-442-1000

□ GTE Telenet TP3005 Network Interface Processor

Function • asynchronous host/terminal concentrator with access to X.25 network (economical version of TP3010).

Associated Systems & Networks • GTE Telenet asynchronous terminals/hosts • X.25 access line with BSC/HDLC framing (CCITT X.25 1980 or 1976).

Communications • supports 4 asynchronous full-duplex device ports (CCITT X.3, X.28, X.29) at 75- to 9600-bps data rates; single X.25 network access line at 1200-bps to 19.2K-bps data rates; full-duplex.

Features • Zilog Z80-A single CPU with 400-nanosecond cycle time; 48K-byte EPROM local program storage and 64K-byte RAM main memory; 2K-byte nonvolatile EPROM configuration storage • fully supported by GTE Telenet network control facilities • throughput 4000 cps.

Software • same software as TP3010: Network Control Center (NCC) provides network management/control/monitoring; Telenet Diagnostic Tool (TDT-II) via asynchronous terminal or NCC.

Program Development • local loading from EPROM or downline load from NCC • configuration control from NCC via TP3030 or TP5000 or locally attached terminal; same programs as 3010.

Configuration Flexibility • supports up to 4 asynchronous terminals/hosts and a single X.25 asynchronous link.

First Announced • January 1983.

Pricing • purchase price is \$2,050 for TP3005 with 64K-byte RAM, 48K-byte EPROM, and 2K-byte nonvolatile RAM (NVR); hardware/software maintenance is available for \$40 monthly; Telenet network control center support at \$60 monthly.

□ GTE Telenet TP3010-II Network Interface Processor

Function • network concentrator and gateway to X.25 networks; provides X.25 interface for terminals and computers; can be configured as statistical multiplexer.

Associated Systems & Networks • asynchronous/bisynchronous terminals: AT&T/Teletype TTY and IBM 2780/3780 and 3270 devices • gateway to X.25 packet-switching networks • Telenet.

Communications • one X.25 network access line with BSC or HDLC framing supports up to 27 asynchronous device ports or up to 8 synchronous device ports • network access line at data rates 1.2K to 19.2K bps, full-duplex; synchronous ports at data rates 1200 to 9600 bps, half-duplex; asynchronous ports at data rates of 75 to 9600 bps • ASCII, EBCDIC codes; selectable parity; auto-answer; automatic speed detection; local and remote poll processing; internal/external clocking.

Features • Zilog Z-80 CPU with 64K-byte MOS memory • I/O and peripheral device control: PIO (parallel input/output) port; I/O port (serial input/output); CTC (computer-to-computer); Z-80 DMA (optional) • peripherals include magnetic tape, optional TTY console, Network Address Facility (NAF), and Initial Program Load (IPL) • basic system has one X.25 access line port and 3 terminal or host ports; each port can be individually configured • Extended Line Adapter (ELA) expands port capacity to up to 27 terminal or host lines • backup Communications Line Processing (CLP) with 64K-byte memory is optional; automatic switching in case of failure • TP3010 can be accessed from central 3030 NCF (Network Control Facility) or a local console to run diagnostics; off-line diagnostics can be loaded through cassette tape drive on control panel.

Software • provides IBM 3270, ITI, and IBM 2780 support • Telenet 3030 Network Control Facility (NCF) provides network management/control/monitoring; downline loading, online diagnostic testing, event reporting, and report generation •

extensive diagnostic capabilities through Telenet Diagnostic Tool (TDT).

Program Development • Network Address Facility and support for 3270, ITI (International Terminal Interface CCITT recommendations X.3, X.28, and X.29), and 2780 software modules included with system; other modules separately priced.

Configuration Flexibility • basic TP3010 supports 3 terminals and hosts; port capacity expanded in increments of 8 to support up to 27 terminals or hosts • multiple TP3010 processors can be configured with TP3030 Network Control Facility to manage the network.

First Announced • 1979.

Pricing • purchase price is \$6,800 for a TP3010-II with 64K-byte memory and \$7,500 for one with NAF (Network Address Facility); monthly maintenance is \$65.

□ GTE Telenet TP4000 Host/Terminal Processor & Packet Switch

Function • concentrators interfacing asynchronous terminals/host computers to X.25 packet-switching network; perform PAD functions and statistical multiplexing; packet-switch functions • Telenet • other X.25 networks.

Associated Systems & Networks • connects IBM BSC 2780/3780, HASP/ML1, or 3270 terminals/host computers to X.25 packet-switching network; X.25, HDLC, asynchronous, and IBM bisynchronous protocols for IBM 2742, 2780/3780, and HASP II multileaving terminals.

Communications • TP4031: 1 synchronous X.25 network access link with BSC framing operating at 2400/4800/9600 bps, a second network access link or 1 to 4 synchronous non-X.25 BSC links operating at 4800 to 56K bps, and up to 56 asynchronous BSC half-/full-duplex ports in 8-port increments operating at 300 to 9600 bps • TP4032: 1 synchronous X.25 network access link using BSC framing operating at 2400/4800/9600 bps, a second network access link and 2 4-port synchronous BSC links or 3 4-port synchronous BSC links, and up to 80 asynchronous half-/full-duplex ports in 8-port increments operating at 300 to 9600 bps • TP4041: 1 synchronous X.25 link with BSC or HDLC framing link operating at 2400/4800/9600 bps, a second network access link or a synchronous 4-port BSC link or a synchronous 8-port HDLC link, and up to 56 full-/half-duplex asynchronous ports operating at 300 to 9600 bps • TP4042: 1 synchronous X.25 network access link with BSC or HDLC framing operating at 2400/4800/9600 bps, a second network access link with 2 4-port BSC or 2 8-port HDLC synchronous links operating at up to 56K bps or 3 4-port BSC or 3 8-port HDLC synchronous links operating at up to 56K bps, and up to 80 asynchronous full-/half-duplex ports operating at 300 to 9600 bps • TP4051: 1 synchronous X.25 network access link with BSC or HDLC framing operating at 2400/4800/9600 bps, a second network access link or a synchronous 4-port BSC link or a synchronous 8-port HDLC link operating at up to 56K bps, and up to 56 full-/half-duplex asynchronous ports operating at 300 to 9600 bps • TP4052: 1 X.25 synchronous network access link with BSC or HDLC framing, a second synchronous network access link with 2 4-port BSC links or 2 8-port HDLC links or 3 4-port synchronous BSC links or 3 8-port HDLC links operating at up to 56K bps, and up to 112 half-/full-duplex asynchronous ports operating at 300 to 9600 bps.

Features • MOS TECH 6502-based processor supporting up to 256K-byte memory with 500-nanosecond cycle time; 2 interrupt levels (maskable/unmaskable); 7 interrupts; error detection and correction • models TP4030 and 4040 function as concentrators interfacing asynchronous, BSC 2780/3780, HASP/ML1, or 3270 terminals/host computers to X.25 packet-switching network; perform PAD functions and statistical multiplexing; supports X.25 HDLC, asynchronous, and IBM bisynchronous protocols for IBM 2742, 2780/3780, and HASP II multileaving terminals; can support from 8 LPU's (56 lines) to 10 LPU's (80 lines) asynchronous/synchronous operation; 10 to 12 lines can accommodate BAS communication • redundant configurations available for some models • connect to TP5000 for comprehensive diagnostics and program downline loading •

Communication Processors

TP4040 also supports X.25 packet-mode devices • TP4050 provides similar features to the TP4030/40 processors, except it also functions as a packet switch; and can perform routing functions; provides event reporting/accounting and statistical data services; supports up to 14 LPUs for a maximum 112-line configuration.

Software • TPOS operating system with user-specified parameters • software-controlled monitoring in TP4000 provides network status and receives configuration data from Telenet Network Control Center (NCC) which provides all management functions: Telenet Diagnostic Tool (TDT) and Status Monitor at NCC identify malfunctioning modules and perform downline loading of new software and network parameters for TP4000 • such asynchronous terminal support functions as padding, echoing, break handling, flow control provided by interactive terminal interface (ITI) parameters; synchronous support through Telenet block mode terminal (BMTI) protocols.

Program Development • user selects Telenet software modules for communication protocol and monitoring/diagnostic functions, downline loaded from Network Control Facility at Network Control Center.

Configuration Flexibility • a basic TP4000 configuration supports from 8 (56 lines) to 10 (80 lines) LPUs for asynchronous/synchronous devices • maximum TP4000 configuration supports up to 14 LPUs for a 112-line system.

First Announced • 1979.

Pricing • purchase price is \$26,000 for a TP4031 Host/Terminal Concentrator with 8 LPUs and 56 asynchronous/synchronous ports in single chassis; monthly maintenance is \$180.

□ GTE Telenet TP5000 Network Control Processor

Function • host computer in Telenet Network Control Center (NCC) • provides commands and management for TP2000/TP3010/TP4000 network concentrators and switches on dedicated packet-switched network; builds tables with user-specified parameters; downline loads programs into each concentrator or switch • performs diagnostics and maintenance functions.

Associated Systems & Networks • GTE Telenet TP2000, TP3010, and TP4000 Network Interface Concentrators and Packet Switches • GTE Telenet dedicated packet-switched networks • X.25 interface to public packet-switching networks.

Communications • synchronous full-duplex lines with data rates up to 9600 bps • Asynchronous Multi-Line Controller (AMLC) board supports up to 16 asynchronous display terminals used as consoles for Telenet Processor Reporting Facility (TPRF) and Telenet Diagnostic Tool (TDT) applications • Multi-Data Link Control (MDLC) board provides up to 4 X.25 links (BSC or HDLC format) to packet-switching network.

Features • based on Prime Series 50 minicomputer: Models 250-II, 550-II, and 750; supports from 2M- to 6M-byte memory, 80M- to 300M-byte disk storage • basic system includes 9-track magnetic tape hard copy or CRT console, 2-line Multiple Data Link Controller (BSC or HDLC) and 16-line Asynchronous Data Link Controller • optional 300- or 750-lpm printer, up to 3 additional, and up to 8 additional disk drives.

Software • runs under the PRIMOS operating system with Telenet-designed enhancements; PRIMENET controls X.25 interface • GTE Telenet specialized programs generated by Network Control Center (NCC) for table building, program loading, diagnostic functions • Telenet Processor Reporting Facility (TPRF) and Telenet Diagnostic Tool (TDT) reside in the TP5000 to provide monitoring, diagnostics, maintenance functions for TP2000, TP3010, and TP4000 network interface concentrators.

Program Development • user-selected Telenet software modules for communication protocol and monitoring/diagnostic functions, downline loads TP network processor from TP5000 at NCC.

Configuration Flexibility • the TP5011 NCP is a small configuration designed to manage less than 10 switching nodes; provides 2M-byte virtual memory and 2K-byte bipolar cache memory • the mid-range TP5021 can support from 10 to 100

nodes and includes an 8K-byte cache memory, floating-point arithmetic and up to 4M bytes memory • the high-capacity TP5031 controls from 100 to 200 nodes, provides a 16K-byte cache memory and up to 8M-byte memory.

First Announced • 1978.

Pricing • purchase price is about \$450,000 for a small configuration fully equipped with hardware and software and including 5-year maintenance • large configuration fully equipped and including 5-year maintenance charges can cost up to \$842,000.

■ HONEYWELL INFORMATION SYSTEMS—See also ACTION COMMUNICATIONS SYSTEMS

200 Smith Street, Waltham, MA 02154 • 617-895-3246.

□ Honeywell Datanet 8 Front-End Network Processor (DN8)

Function • front-end processing system for DPS 8 host processor running under General Comprehensive Operating Supervisor 8 (GCOS 8), DPS 7 host under GCOS 64; Distributed Network Supervisor (DNS) software supports communication facilities for host-to-host file transfers, remote job entry, file transfer to and from Honeywell family of micro-, mini-, and supermini computer DPS 6 executing under GCOS 6 timesharing, and transaction processing; can also operate as standalone network processor with switching and concentration capabilities • supports Honeywell family of micro-, mini-, and supermini computer DPS 6 executing under GCOS 6 for distributed concentration (routing), file transfer, distributed transaction processing, remote batch and local data entry and office automation • provides gateway to public data networks (PDNs) and value added networks (VANs), which include X.25 packet-switched and X.21 circuit-switched networks.

Associated Systems & Networks • DPS 8 host processor running GCOS 8; Level 64/DPS host running GCOS 64; Level 6 computers functioning as distributed systems in Honeywell DSA network • Distributed Systems Architecture (DSA) network • X.25 packet-switched public data networks • X.21 circuit-switched value added networks.

Communications • supports 2-, 8-, or 16-channel interface bases; each base supports up to 8 lines and accepts up to 4 channel interfaces in combination with any two transmission types: RS-232C dual synchronous, up to 9.6K bps each; RS-232C dual asynchronous, up to 19.2K bps each; single HDLC RS-232C channel, up to 9.6K bps; single HDLC wide band channel, up to 56K bps; and single HDLC wide band CCITT V.35 channel, up to 56K bps.

Features • based on Honeywell DPS 6 system • all components connect to the Datanet 8 Megabus, which handles data transfers between devices through asynchronous communication controller for the console and integral diskette; host interface adapter; and channel interface bases; maximum aggregate Megabus data rate is 6M bytes per second • central processor can execute up to 1M instructions per second with high-speed option • memory subsystem provides single- and double-word fetch and error detection and correction; capacity is up to 512K bytes • automatic control function provides PROM extension to main memory, system timer, and control settings for failure detection and restart.

Software • Distributed Network Supervisor (DNS) resident in DN 8 • provides communications interfaces among compatible devices in DSA network and performs administrative functions: network monitoring, software loading, dumping, inline tests, software generation, and logging data in a file for statistical, billing, and maintenance purposes; includes Node Administration (NAD) • options include Node Operator Interface (NOI), Network Administration Utilities (NAU): Syntax Analyzer, Dump Editor, Log File Editor, and Log File for Accounting Editor.

Program Development • user-specified, vendor-supplied; user specifies parameters for system generation, which can be done on host or the Datanet 8.

Configuration Flexibility • basic DN 8 includes 512K bytes of main memory, diskette, and automatic control function; can be configured with up to 2 channel interface bases (up to 16

Communication Processors

communication lines); requires one host connection and one 30- or 120-cps communications console; expandable by additional memory up to 1.5M bytes maximum; high-speed processor option, 4 host connections, and up to 128-line communication capability; 8 DN 8s can be configured with one DPS 8 or DPS 88 host and 2 with one DPS 7 host.

First Announced • April 1981.

Pricing • purchase price for basic DN 8 with 120-cps console and provisions for 16 lines is \$43,020 • typical configuration with provision for 128 lines and with the 120-cps console, \$88,000 • monthly license for DNS is approximately \$678; connection to value added network is available at monthly license fee of approximately \$166 • maximum fully configured 128-line configuration can cost up to \$251,113.

■ IBM/Data Processing Division

1133 Westchester Avenue, White Plains, NY 10604 • 914-696-1900.

□ IBM 3705 II Series Communications Controller

Function • programmable local/remote communications controllers.

Associated Systems & Networks • IBM S/370, 303X, 3081, and 4300, single-/multiprocessor SNA networks • S/360 Model 40 upwards in 270X emulation mode only • X.25 gateway from SNA to other networks.

Communications • supports up to 352 half-duplex 9600-bps lines • maximum line rate of 230K bps • supports up to 4 channel-attached hosts simultaneously; other hosts attached through remote 3705s.

Features • central control unit (16-bit word) with 32K- to 256K-byte, 1-microsecond monolithic memory 3705 Models E through H, or with 320K- to 512K-byte, 900-nanosecond memory (3705-II Models J through L) • CPU is priority interrupt driven and operates at 5 priority levels: 4 foreground and 1 background 3705-II available in 1 to 4 frame configurations; Frame 1 contains control panel, space for up to 256K bytes of memory, up to 2 channel adapters, single communication scanner, up to 4 line interface bases (LIBs), and remote program loader; Frame 2 contains space for additional 256K bytes of memory, up to 2 channel adapters, single communication scanner, and up to 6 LIBs; Frame 3 contains space for single communication scanner and up to 6 LIBs; Frame 4 contains space for single communication scanner and up to 6 LIBs • 3705-II Model E series are single frame controllers • 3705-II Model F and J series are dual frame controllers • 3705-II Model G and K series are triple frame controllers • 3705-II Model H and L series are quad frame controllers.

Software • operating system residing in 3705 controllers governs data transfers between stations and hosts in the communications network; it is generated at the host using IBM-supplied macro language, assembler, and utility software; system is loaded from the host and executed in response to host commands; takes 2 forms; Network Control Program (NCP) for full programmable front-end processing tasks and Emulation Program (EP) for emulating IBM 2701/2702/2703 (270X) hardwired controllers; EP and NCP/VS can both be obtained as System Control Programs (SCPs), which are in the public domain and hence do not incur license fees • when Advanced Communication Function (ACF) licensed program products (PPs) associated specifically with NCP/VS are added to the system, then a special version of NCP/VS Release 5.0, called ACF/NCP corequisite SCP, must be used; this combination SCP and PP is the actively developing element of 3705 and SNA control software; developments in the EP SCP operating mode are few and far between • non-SNA interconnection facility is a step in the direction of eliminating EP, PEP, and NTO • local program support is required for an SCP, a single fee is charged based on the processor rather than the number of SCPs.

Program Development • via SSPs at host facilities; SSPs provide control program macro language, assembler, and load/dump utilities.

Configuration Flexibility • possibilities virtually unlimited due to ways multiple 3705s can be connected to each other and to hosts • multiple 3705s can front end one host computer; up to 4 single or attached processor hosts can share a 3705, its NCP, and the resources under its control • multiple 3705s can be locally or remotely attached in series • each 3705 and its attached resources are owned by the access method (generally ACF/VTAM/VS) in a host (called a domain); interdomain communication is initiated and terminated through the local 3705s and the access method in the hosts • up to 352 half-duplex communication lines can be connected to each 3705, with reductions to accommodate high-speed or full-duplex lines; the number that can operate concurrently depends on line speeds and activity; any number of terminals or subsystems can connect to each line.

First Announced • Models E through H 1976; Models J through L 1979.

Pricing • purchase price of 3705-II Model E8 with 256K-byte memory and Frame 1 • smallest model that can run ACF/NCP/VS is \$49,220, with a monthly maintenance fee of \$273; it can support 2 channel adapters to connect to host processors and up to 16 medium-speed lines, 12 high-speed lines, or one 260.4K-bps line • purchase price of the 3705 Model L4, the largest model with 512K bytes memory and 4 frames for maximum configuration, is \$107,040 with a monthly maintenance fee of \$447 • these are stripped systems without communication scanners, channel adapters, line interface bases, and line sets.

□ IBM 3705-80 Series Communications Controller

Function • programmable local/remote communications controllers.

Associated Systems & Networks • IBM S/370, 303X, 3081, and 4300, single-/multiprocessor SNA networks • S/360 Model 40 upwards in 270X emulation mode only • X.25 gateway from SNA to other networks.

Communications • supports up to 16 full-duplex 9600-bps lines • maximum line rate of 57.6K bps • supports up to 2 channel-attached hosts simultaneously; other hosts attached through remote 3705s.

Features • central control unit (16-bit word) with 32K- to 256K-byte, 1-microsecond monolithic memory 3705-80 • CPU is priority interrupt driven and operates at 5 priority levels: 4 foreground and 1 background 3705-II available in 1 to 4 frame configurations: Frame 1 contains control panel, space for up to 256K bytes of memory, up to 2 channel adapters, single communication scanner, up to 4 line interface bases (LIBs), and remote program loader; Frame 2 contains space for additional 256K bytes of memory, up to 2 channel adapters, single communication scanner, and up to 6 LIBs; Frame 3 contains space for single communication scanner and up to 6 LIBs; Frame 4 contains space for single communication scanner and up to 6 LIBs • 3705-80 available in 3 fixed configurations: M81, M82, and M83 • basic 3705-80 includes a Business Machine Clock of 134.5 bps, an Operator Panel Key Lock, and Communications Scanner Type 2 (CS2); minimum configuration also requires a channel adapter for connection to a host processor or a Remote Program Loader; other features include the CA1 and CA4 channel adapters, line sets, and line attachments to connect to communication facilities, up to 3 additional Business Machine Clocks for a total of 4 high-speed 14.4K- to 57.6K-bps local-attachment devices, high-speed line attachment for 19.2K bps to 56K bps using CCITT V.35 or Digital Interface, digital interface for full- or half-duplex 50K-bps line, remote program loader for remote operation.

Software • same as for IBM 3705-II.

Program Development • same as for IBM 3705-II.

Configuration Flexibility • much more limited than 3705-II: access limited to 2 hosts concurrently with manual switch connection to 2 more hosts for backup only; limited to 4 (M81), 10 (M82), and 16 (M83) lines for connection to local or remote devices; connection with other 3705s limited to 57.6K-bps link •

Communication Processors

on the other hand, 3705-80 models are much easier to configure than 3705-II; include integrated communications scanner and RS-232C/CCITT V.24 line attachments.

First Announced • May 1981.

Pricing • purchase prices for 3705-80 models are \$36,600 for M81 with \$219 monthly maintenance, \$46,600 for M82 with \$229 monthly maintenance, and \$52,600 for M83 with \$239 monthly maintenance.

□ IBM 3725 Model 1 Communication Controller

Function • programmable local/remote communication controllers • operate as intermediate nodes in SNA networks.

Associated Systems & Networks • IBM S/370, 303X, 3081, 3083, 3084, and 4300, single-/multiprocessor SNA networks • S/360 Model 40 upwards in 270X emulation mode only • X.25 gateway from SNA to other networks.

Communications • supports up to 256 half- or full-duplex lines at 50 bps to 230.4K bps; interfaces for BSC, SDLC, and start/stop asynchronous transmission with auto-call • can attach to up to 8 IBM S/370-compatible host channels, 6 can operate concurrently; can coreside compatibly on SNA networks with 3705 communication controllers running under ACF/NCP Version 2 for 3705 and ACF/NCP Version 1 Releases 2.1 and 3.

Features • includes 512K-byte (Models 1 and 2) memory with up to 2 256K-byte modules optional on Model 1; no disk support but diskette used to run diagnostics • consists of central control unit (CCU), main storage, maintenance and operator subsystem (MOSS), transmission subsystem (TSS), and 2 line attachment bases (CLABs) • MOSS includes IPL and utility procedures for 3725 operator; implemented using independent processor with microcode, diskette drive, and operator console attachment; 3727 Operator Console required for maintenance • TSS includes line attachment bases (LABs) with microprocessor-based scanners, line interface couplers (LICs), and optional internal clock control (ICC) units; integrated modems unavailable but compatible with IBM modems 3863 Models 1 and 2, 3864 Models 1 and 2, 3865 Models 1 and 2, 3872, and 3874, as well as 3867 Link Diagnostic Unit • Model 1 supports up to 96 lines in basic system, 2 channel adapters, and 2 Two-Processor Switches; requires 3726 Communication Controller Expansion to support 4 additional channel adapters and up to 160 additional communication lines.

Software • operating system residing in 3725 controllers handles the data transfers between stations and hosts in the communications network; generated at the host using IBM-supplied macro language with assembler and utility software; loaded from the host and executed in response to host commands; takes 2 forms: Advanced Control Function/Network Control Program (ACF/NCP) Version 2 for the IBM 3725 to perform full-function front-end processing tasks, and Emulation Program for 3725 (EP/3725) to emulate IBM 2701/2702/2703 (270X) hardwired controllers • ACF/NCP Version 2 for IBM 3725 and the EP/3725 are compatible with, but enhanced versions of, the ACF/NCP V.2 and EP for the 3705; both 3705 and 3725 systems can coreside on the same network; a remote 3725 can communicate with a host system through a local channel-attached 3705 and vice versa • ACF/NCP Version 2 for 3725 and EP/3725 can each run standalone on the 3725 or can run concurrently to provide Partitioned Emulation Programming (PEP) extension to ACF/NCP Version 2 for IBM 3725 • both operating systems for the 3725 require the ACF/System Support Programs (ACF/SSP) Version 2 Release 1.1 running on an IBM S/370-compatible host computer for system generation • both were designed to support host systems running under VSE/AF Release 3, OS/VS1 Release 7, MVS/370, and MVS/XA operating systems • the EP/3725 also supports host systems running under VM/SP 2.1 and CMS; MVS/370 refers to MVS 3.8, MVS 3.8 with System Extension licensed program, and MVS 3.8 with the SP Version 1 licensed program • ACF/NCP Version 2 for 3725 supports the functional level of ACF/TCAM Version 2 Release 4, ACF/VTAM Version 1 Release 3 (MVS only), and ACF/VTAM Version 2 access methods running on S/370-compatible host computers; EP/3725 supports BTAM, BTAM-ES, BTAM-SP, ACF/TCAM, and RTAM access methods running on S/370-compatible host computers • both operating systems for

3725 offer enhanced features over those of the comparable operating systems running on 3705: enhanced problem determination and error recoding and notification, and improved availability through continued operation and controlled shutdown when various failures occur; the 3725 controller operator under either system can perform a wrap test, activate a line test for testing the operation of lines and modems, obtain a dump of the controller's maintenance and diagnostic records or of the communication scanner processor (CSP) storage or maintenance and operator subsystem storage, activate line trace, and activate scanner interface trace for a given line to isolate problems to NCP, EP, or CSP.

Program Development • 3725 assembly and macro language runs under ACF/SSP Version 2 Release 1.1 on S/370-compatible host running under VSE/AF R3, OS/VS1 R7, MVS/370 R3.8, or MVS/XA.

Configuration Flexibility • includes 512K-byte memory, 1 integral line attachment base (for up to 96 lines), and 2 integral scanners; options include 2 256K-byte memory increments (for 1M-byte total memory), 3727 operator console, 1 4921 Line Interface Coupler for 230.4K-bps line, 3726 communications controller expansion (for up to 160 lines), 3602 Line Increase Feature, 6 4771 Line Attachment Bases Type A (with integral scanners), 56 4911 Line Interface Couplers Type 1 (support up to 224 full-duplex 9600-bps lines), 8 4666 Internal Clock Controls, 8 1561 Channel Adapters, 2 8320 2-Processor Switches, ACF/NCP/VS V2 for 3723, EP for 3725, NTO R2 for 3725, X.25 NPSI Release 4, and ACF/SSP V2 Release 1.1 (runs on host for program development).

First Announced • 1983.

Pricing • purchase price is \$75,000 for 3725 with CPU and 512K-byte memory, MOS, TSS, and 2 CLABs each; each CLAB includes 1 communication scanner and can attach up to 32 half- or full-duplex communication lines through 8 optional line interface couplers (LICs) • the basic model can include 2 channel adapters, 2 2-processor switches (TPSs), 1 additional LAB, up to 2 256K-byte storage increments, and 1 IBM 3726 Communication Controller Expansion • requires use of 1 primary IBM 3727 operator console • \$3,485 per month 1-year rental including maintenance • \$213 per month maintenance.

□ IBM 3725 Model 2 Communication Controller

Function • programmable local/remote communication controllers • operate as intermediate nodes in SNA networks.

Associated Systems & Networks • IBM S/370, 303X, 3081, 3083, 3084, and 4300, single-/multiprocessor SNA networks • S/360 Model 40 upwards in 270X emulation mode only • X.25 gateway from SNA to other networks.

Communications • supports up to 24 half- or full-duplex lines at 50 bps to 230.4K bps; interfaces for BSC, SDLC, and start/stop asynchronous transmission with auto-call • can attach to up to 2 IBM S/370-compatible host channels, 2 can operate concurrently; can coreside compatibly on SNA networks with 3705 communication controllers running under ACF/NCP Version 2 for 3705 and ACF/NCP Version 1 Releases 2.1 and 3.

Features • same as IBM 3725 Model 1 • see above.

Software • same as IBM 3725 Model 1 • see above.

Program Development • same as IBM 3725 Model 1 • see above.

Configuration Flexibility • includes 512K-byte memory, 1 integral line attachment base, integral scanner, integral clock, and ACF/NCP/VS Version 2 for the 3725; options include 6 line interface couplers to attach 24 full-duplex, 9600-bps communication lines, 1 channel adapter to connect to IBM S/370-compatible host, and 3727 operator console.

First Announced • 1984.

Pricing • purchase price is \$60,500 for 3725 with CCU and 512K-byte memory, MOSS, TSS, and 1 standard LAB; the LAB includes 1 communication scanner and can support up to 24 half- or full-duplex communication lines through 6 optional line interface couplers (LICs) • the basic model can include 2 channel

Communication Processors

adapters; neither can support a 2-processor switch (TPS) • \$2,630 per month 1-year rental including maintenance • \$190 per month maintenance.

■ ICOT CORPORATION

830 Maude Avenue, Mountain View, CA 94043 • 415-964-4635.

□ Icot 25X Series: Models 253/254/257 Communications Processors

Function • nodal communications processors that perform protocol/code conversion, line concentration, and message packet switching, message reformatting, multipoint line polling (terminal management), network control, and network statistics reporting.

Associated Systems & Networks • IBM, Burroughs, Tandem, and NCR terminals and hosts; also ASCII terminals.

Communications • maximum configuration supports 5/32/112 9600-bps asynchronous lines 0/8/28 19.2K-bps synchronous lines on Models 253/254/257, respectively • supports wide variety of protocols: IBM 3270 BSC; IBM 2780/3780 BSC; PARS; SITA (P1024); IBM 3271 SDLC; IBM SNA/SDLC Physical Unit 2; X.25; TINET; Burroughs PIS; and NCR 279/725.

Features • multiple Intel 8085 (253) or 8088 (254/257) implement Line Processor Modules (LPMs) for line control; up to 5 on Model 253, 4 on Model 254, and 14 on Model 257; LPMs share system resources, system RAM (32K bytes on 253 and 64K or 128K bytes on 254 and 257), 8K bytes of PROM, and nonvolatile RAM (256 bytes on 253 and 2K or 4K bytes on 254/257) • LPM includes local RAM (2K bytes on 253 and 4K to 16K bytes on 254/257) and local PROM (12K bytes on 253 and 16K to 128K bytes on 254/257).

Software • no software operating system • firmware provides standard and application-dependent program modules.

Program Development • turnkey systems; no languages • unique system parameters stored in non-volatile RAM (NVR); application uses parameters to customize installation.

Configuration Flexibility • minimum configuration based on 32K-byte Model 253 processor; supports 4 byte synchronous/asynchronous lines (up to 9600 bps) • maximum configuration based on 64K-byte Model 257 processor; supports 112 asynchronous 9600 bps, 42 synchronous lines at up to 9600 bps, or 28 high-speed 19.2K-bps synchronous lines.

First Announced • 1979.

Pricing • purchase price is \$275 per asynchronous port, \$1,100 per port for all other protocols, except \$1,700 per port for SNA/SDLC and X.25.

■ INCOTEL—See C & W INCOTEL LTD

■ INDUSTRIAL COMPUTER CONTROLS, INC—See MICOM SYSTEMS, INC

■ INNOVATIVE ELECTRONICS

4714 NW 165th Street, Miami, FL 33014 • 305-624-1644.

□ Innovative Netmaster

Function • remote concentrator in a credit card authorization/data entry network system for retail and banking applications • also available for industrial data collection and applications.

Associated Systems & Networks • IBM hosts and 3705/25 communications controllers; NCR or Burroughs controllers and terminals.

Communications • one upline and 3 downline ports that can operate at up to 19.2K bps • upline is SNA/SDLC link to IBM 3705/3725 front end on which Netmaster appears to be an IBM 3274 controller • 2 downline ports can support up to 2 Burroughs or NCR Poll/Select links with data rate determined by the Burroughs or NCR controller, usually 1200/2400 bps • other downline port is used for modem sharing by IBM 3274 or 3276 controllers; Netmaster is transparent to both the controllers and the host.

Features • microprocessor converts SNA/SDLC to NCR or Burroughs Poll/Select protocol; performs preprocessing on Point-of-Sale Terminal (POST); inbound and outbound data, typical processing consists of taking salesperson totals or store totals for day.

Software • for retail and banking applications software is included with system.

Program Development • source code written in PLM/86; if user can buy source code and change processing module to conform to application.

Configuration Flexibility • basic system includes Intel 8086 with 56K-byte EPROM, 256K-byte RAM, time-of-day clock with battery backup, RS-232 port, controller with 320K-byte diskette drive, and 4 ports • system can support up to 4 320K-byte diskette drives, up to 2 5M-byte hard disks, up to 4 10M-byte hard disks, or one floppy and one 5M-byte hard disk; requires factory installation.

First Announced • May 1984; deliveries began July 1984.

Pricing • purchase price is \$3,200 for basic unit with 320K-byte diskette drive.

■ LEMCOM SYSTEMS, INC

2104 West Peoria Avenue, Phoenix, AZ 85029 • 602-944-1543.

□ Lemcom Communications Micro-Controller: CMC-4, CMC-8, CMC-32

Function • front-end or remote telecommunications control unit for IBM S/360, S/370, 303X, 4300, and compatible systems.

Associated Systems & Networks • pre-SNA networks controlled by IBM 270X or 370X running in EP mode.

Communications • resident emulators of IBM Types I, II, and III, IBM SDA II and AT&T/Teletype II line protocols • IBM Type I emulator supports IBM 1050, 1060, 1070, 2740, and 2741 terminals as well as auto-call, auto-answer, auto-poll, and break • IBM Type II supports 1030 terminal and auto-poll • Type III supports 2260/2848 and 2265/2845 terminals • IBM SDA II supports 1130, 1131, 2770, 2780, 3271/3277, 3274-1C in BSC mode, 3770, 3780, S/7, S/360, S/370, 4300, 303X, 308X, and S/370-compatible systems as well as dual code, transparency, auto-call, auto-poll, and auto-answer • AT&T/Teletype II supports TTY 33/35/37 and their compatibles as well as auto-call, auto-answer, and break • each 4-line group microprocessor-controlled; microprocessor throughput is 57.8K bps maximum in any configuration: 1 line over 20.4K bps up to 56K bps, 3 lines up to 19.2K bps, or 4 lines up to 9600 bps • RS-232C, WE 301/303 (wideband) and CCITT V.35 (digital) interfaces.

Features • microprocessor control for each 4 lines implemented; up to 8 can operate in parallel as on CMC-32 • optional console can be assigned to any 4-line group for activating resident diagnostics; can also trace data, commands and status without disrupting communications; parallel console can be remotely attached to a service center for specialized expertise • interfaces to a host's byte multiplexer channel or connects via 56K bps link to remote CMC front end • Pollmatic feature can capture IBM SDA II poll list and CMC can initiate subsequent polls; reduces polling overhead in host by 99% • fail soft features: if a line group fails, other line groups are unaffected.

Software • modules supplied by vendor for emulating 2701 and for line control.

Program Development • by vendor.

Configuration Flexibility • a 4-line system (CMC-4) can support 4 terminals in point-to-point configuration; up to 4,000 terminals on multidrop line; 8-line system (CMC-8) and 32-line system (CMC-32) support from 8 to 32 terminals point-to-point, and like CMC-4, up to 4000 terminals on multidrop line.

First Announced • 1977 (CMC-4), 1980 (CMC-8), 1979 (CMC-32).

Pricing • purchase price from \$14,000 to \$20,000 (CMC-4); from \$16,000 to \$30,000 (CMC-8); from \$20,000 to \$60,000 (CMC-32).

Communication Processors

□ Lemcom Distributed Network Processor (DNP)

Function • IBM-compatible front end emulating a 270X or 370X in Emulation Program mode; remote concentrator/multiplexer.

Associated Systems & Networks • IBM S/360, S/370, 303X, 308X, 4300, and IBM-compatible processors.

Communications • up to 32 concurrent host computers supported on byte multiplexer channel; each channel supports data rates over 100K cps; over 1024 communication lines attached with line speeds from 45 bps to 57.6K bps • distributed remote concentrator communication over full-duplex HDLC link with X.25 level 2 LAPB protocol; data rates up to 19.2K bps • supports 3270 BSC terminals over multipoint, dedicated, leased lines; 2780/3780 RJE point-to-point, switched or dedicated; TTY, 2741 point-to-point, switched or dedicated.

Features • modular DNP/hardware components configured for user-specified connectivity, throughput, and other application requirements; include Adapter Control Module (ACM), Bubble Memory Adapter (BMA), IBM Channel Interface Adapter (ICA), Asynchronous/Synchronous Adapter (ASA), and Packet Transfer Interface Adapter (PTIA) • ACM includes microprocessor with static RAM or program storage, adapter bus to communicate with various adapters; with additional adapters can support up to 26 communication lines; also includes 2 general-purpose serial communication lines (up to 57.6K bps) • BMA can attach from one to four 131,072-byte bubble memories to an ACM via adapter bus and provides storage for initial program loading of DNP; each BMA has 2 general-purpose serial communication lines • the ICA has microcontroller and static RAM program storage; provides interface to IBM-compatible channel for DNP; performs command processing and sequences channel signals; can be programmed to operate on byte/block multiplexer channel or selector channel; includes 2 serial communication lines • ASA attaches 8 general-purpose serial communication lines • the PTB, internal to each DNP cabinet, is a parallel bus that allows ACMs to communicate with each other at transfer rates of 2M bytes per second; the PTB can be extended into other cabinets via PTIA.

Software • executive program in ACM supports memory management, dynamic loading, and buffer allocation • console program on console terminal allows user to dynamically load programs onto DNP and serves as interactive interface to other DNP software • bubble memory software programs support system configuration files, system program storage, and application selection tables • AMIGO is one of maintenance programs; simulates IBM channel commands independent of host; when executed with emulation program, generates simulated commands as test for terminal • Application Selection (APS) Software packages allow dynamic selection of one of several host applications to support 3270 BSC, 2780/3780 RJE, and nonpolled start/stop terminals (TTY, 2741).

Program Development • user can dynamically load support packages via console either attached directly to DNP or attached in parallel via an acoustic coupler to another console at remote service center; multiple configurations (programs) can be loaded in bubble memory as well as loaded independently of the host; through console, network generator (software) interacts on session basis with user to configure operational system independent of host.

Configuration Flexibility • up to 32 concurrent hosts can be supported and over 1024 terminal/devices communication lines • DNP cabinet sizes offered from single-host interface, 13-line support to 4-host interface 83 lines support console; Remote Concentrator DNP cabinets with network lines interface (up to 19.2K bps) to concentrate up to 23 lines; cabinets are added for system expansion.

First Announced • 1981.

Pricing • minimum configuration can be purchased for approximately \$25,000 (depending on hardware/software and user requirements); a practical maximum configuration can be purchased for approximately \$50,000 (depending on user requirements).

□ Lemcom Virtual Local Controller

Function • IBM-compatible front end that operates as a controller for remote SDLC IBM 3274/3276 controllers; appears as local IBM 3274 controller to IBM host; used in place of 3705 • also operates as a remote concentrator • provides dynamic host selection.

Associated Systems & Networks • IBM S/370-compatible hosts.

Communications • supports up to 3000 lines with data rate at 4800 bps; less lines at higher data rates such as 250 lines at 57.6K bps • provides dynamic host selection for up to 32 hosts • RS-232C, WE 301/303 (wideband), CCITT V.35 (digital), and other interfaces • IBM 270X/370X-EP emulation • uses HDLC X.25 Level 2 LAPB protocol for communication between remote concentrators and local controller • supports multidropped SDLC 3270 controllers.

Features • member of DNP family • uses multiple microcomputer architecture with each microcomputer configurable to any line speed • connects to byte or block multiplexer channel of IBM S/370-compatible host • standard SNA VTAM compatible • no geographical restriction on location of hosts.

Software • modular DNP software supplied by Lemcom; any software module can reside in any microcomputer.

Program Development • user can dynamically load support packages via console; bubble memory provides nonvolatile storage for IPL and general file storage • Lemcom can provide custom applications.

Configuration Flexibility • up to 250 microcomputer modules per system; each microcomputer can support 1 57.6K-bps line, 3 19.2K-bps lines, 6 9600-bps lines, or 12 4800-bps lines • available in 3 cabinet sizes; all can operate as a local controller or remote concentrator • small cabinet provides 13 lines plus console with single host interface; medium cabinet provides up to 23 lines plus console and single host interface; large cabinet provides up to 83 lines plus console and up to 4 host interfaces.

First Announced • March 1984.

Pricing • purchase price ranges from \$1,600 to \$20,000.

■ M/A-COM DCC, INC

11717 Exploration Lane, Germantown, MD 20874 • 301-428-5500.

□ M/A-COM DCC CP9000 Series II Packet-Switching Network

Function • a total network solution for packet-switching data networking • system provides switching nodes, a complete Network Control System, and Network Operator Consoles.

Associated Systems & Networks • X.25 network interface, with X.75 interface for communication with other data networks • asynchronous and bisynchronous devices supported via PADS • physical interfaces include RS-232C, RS-449, X.21, V.35, Ethernet, and SASI disk interface.

Communications • flexible architecture allows configuration from 4 lines to over 1000 lines per node • line speed ranges from 50 to 64K bps • each Line Interface Module (LIM) contains its own 16-bit microprocessor and memory, supporting up to 8 lines.

Features • Network Control System provides complete network management and control for network configuration, performance monitoring, maintenance and debugging, network component downline load, statistics gathering, call setup assistance, and storage of billing information • Network Management Access provides human interface to the network by way of a menu screen for entry and display of management data; monitors and changes network configuration, views events, calls records and statistical data, initiates maintenance, and diagnostic functions • based on CP9000 Series II packet switch—high-performance 16-bit microprocessors and error correcting memory on all packet-switch modules provide high throughput and modular expansion • system redundancy provided via 1-for-N packet-switching cluster sparing, power supply sparing, redundant interface bus, dual network control processors, and redundant supervisory network • security features include data

Communication Processors

encryption and hardware-enforced memory access protection, along with user access validation procedures.

Software • complete network software for packet switching, network control, and operator interface.

Program Development • additional packet-switch software may be developed on microprocessor development system; network control software developed on 32-bit minicomputer system.

Configuration Flexibility • extremely flexible configuration • processor, line, and disk modules connect to form clusters, clusters connected via high-speed bus to form nodes (multiple high-speed buses can be used in a node), network operator consoles may be connected anywhere in network • additional Network Service Processors may be added as network grows to share network loading.

First Announced • 1983.

Pricing • contact vendor.

■ MICOM SYSTEMS, INC

20151 Nordhoff Street, Chatsworth, CA 91311 • 213-998-8844.

□ Micom Micro 600 Port Selector

Function • data PABX that provides port contention, intelligent switching, access control, fallback switching, and terminal-to-terminal switching.

Associated Systems & Networks • vendor-independent; Micom Micro 800/2 Concentrators and Micro 8000 Concentrator Modems.

Communications • Model 1 up to 60 lines/ports and Model 2 up to 1504 lines/ports for up to 489 simultaneous connections at up to 9600 bps • Micro 650 Model 1 provides up to 30 lines/ports and Model 2 provides up to 126 lines/ports for up to 63 connections at up to 19.2K bps • 20-mA current loop and RS-232C and RS-422 asynchronous interfaces • statistics log port for TTY-compatible terminal for data rate of 110 to 9600 bps • Micro 600 Model 2 has 2 Monitor Ports allowing monitoring of bidirectional data between any 2 connected lines or ports.

Features • uses solid-state, time-division switching technique with microcomputer control of points; worst case switching delay is 1.7 milliseconds at 300/1200/2400 bps, 5 milliseconds at 4800 bps, and 2.9 milliseconds at 9600 bps for Micro 600, and 2.6 milliseconds at 1200 bps, 2.2 milliseconds at 2400 bps, 2 milliseconds at 4800 bps, 1.9 milliseconds at 9600 bps, and 1.8 milliseconds at 19.2K bps • Micro 600 provides up to 127 port classes; 64 may have symbolic names • Micro 650 provides 99 port classes.

Software • provided with system.

Program Development • user enters system parameters from Command Console.

Configuration Flexibility • ranges from 30 lines/ports on Micro 650 Model 1 to 1504 lines/ports on Micro 600 Model 2.

First Announced • 1977.

Pricing • purchase price is \$7,000 for Micro 650 Model 1, Rack-Mount (30 lines/ports); \$12,500 for Micro 650 Model, Floor-Standing (62 lines/ports); \$6,000 for Micro 600 Model 1, Table-Top (60 lines/ports); and \$10,000 for Micro 600 Model 2, Floor-Standing (120 lines/ports).

□ Micom Micro 860 Concentrator Switch

Function • data concentrator switch that interconnects up to 8 Micro 800/2 data concentrators; operates as local hub to allow any asynchronous channel to connect with any channel on that concentrator or any other concentrator; supports matrix switching, field-destination switching, local switching, and class selection • used to manage interconnections of terminals and computer ports.

Associated Systems & Networks • vendor-independent; Micom networks of Micro 800/2 concentrators and Micro 8000 Concentrator Modems.

Communications • 4/8 synchronous links to remote 800/2 data

concentrators or 8000 modem concentrators; data rates up to 19.2K bps but maximum aggregate rate is 57.6K bps; full-duplex RS-232C interface • asynchronous, half-/full-duplex command port that can operate at 110 to 9600 bps; RS-232C interface • asynchronous log port operating at 100, 300, or 1200 bps; RS-232C interface.

Features • designed for tabletop installation, rackmounting optional • command port for switch control: set system parameters, perform diagnostics, and configure channels; log port used to monitor alarms and log operating statistics • provides contention, switching, and centralized management.

Software • provides switch facilities, command port operations, password protection, fallback switching, user camp-on queues for port contention, connection dialogue, testing capabilities, and logging functions.

Program Development • through parameters entered through console/terminal connected to command port.

Configuration Flexibility • Model 864 supports 4 data concentrators which can be connected to up to 64 terminals or computer ports; Model 868 supports 8 data concentrators which can be connected to up to 128 terminals or computer ports; both models include command port and log port.

First Announced • March 15, 1983.

Pricing • purchase price is \$2,550 for basic unit; \$3,250 for maximum unit.

■ MOTOROLA, INC—See CODEX CORPORATION

■ NCR CORPORATION—See also NCR/COMTEN

1700 Patterson Boulevard, Dayton, OH 45479 • 513-449-2000.

■ NCR/COMTEN, INC

2700 Snelling Avenue North, St. Paul, MN 55113 • 612-638-7777.

□ NCR 721-II Communications Processor

Function • local/remote communications or nodal processor in multinode transaction-oriented networks.

Associated Systems & Networks • NCR Century, 8000 Series, or 9000 Series host computers and NCR 725 controller for retail terminals • connects to other systems through support of TTY, BSC, IBM 2780/3780, and HASP multileaving RJE protocols • X.25 (Datapac, Transpac) networks.

Communications • supports up to 95 communication lines operating in half-duplex mode; up to 62 lines operating in full-duplex mode; and up to 255 lines with 8 additional adapter cages • number of terminals supported is a function of application • synchronous transmission rates up to 56K bps; asynchronous transmission rates up to 9600 bps; synchronous NCR/DLC protocol (based on ISO-HDLC recommendation); transmission rates up to 56K bps • Public Data Networks interfaces supporting X.25, 721 to 721, TTY PADS.

Features • system consists of 16-bit word minicomputer; 256K-byte memory expandable to 1M bytes in 256K-byte increments; interfaces to variety of cable-connected peripherals such as disk drives, magnetic tapes, printers; a communication multiplexer can scan up to 256 adapters; an operator console consisting of keyboard, control switches, and 2 magnetic tape cassette handlers • terminal interfaces to NCR financial, retail, and general-purpose terminals • point-of-service (POS) interface supports NCR multipoint asynchronous protocol allowing 721-II to communicate with NCR retail terminal controllers; AT&T/Teletype interface supports point-to-point private lines; General Purpose Bisynchronous Interface (GPB); 7300 CRT Interface; IBM 2780/3780 Interface in point-to-point contention mode with BSC line procedures allows batch and interactive communication between 721 and remote processors using IBM 2780/3780 protocol; HASP Multileaving (M/L) Interface operates in either terminal or host nodes; NCR DLC General-Purpose Interface enables 721 to communicate with device employing ISO-HDLC procedures; Internode Interface (BSC) allows 721 nodal processors to communicate with each other at speeds up to 56K bps • processor interfaces include NCR

Communication Processors

B1 Common Trunk Interface to up to 2 NCR Century, 8000 or 9000 Series hosts using a common trunk to each host or a common trunk to one host and a bit serial link to the other host; NCR B2 Common Trunk Interface with NCR Century on 8500 Series operating under B2 Executive or VRX; BSC Poll-Inward Communications Interface to non-NCR host (to either IBM 3705 and IBM S/370 or TRW 4000); 725-DCU Interface; HASP Multileaving Interface: VRX-TAM, IRX-TAM, VRX Transparent mode • 690-103 Auxiliary Bay adapter houses 2 cages, each with maximum 26 adapter plug-in slots; up to 8 additional adapter cages (4 bays) can be connected to 721, for maximum of 255 communication lines.

Software • Transaction Oriented Executive (TOX) operating system consists of 3 types of software modules: executive tasks, driver tasks, control tasks • executive tasks perform operating functions of TOX; include message scheduling, operator control, message queuing, and debugging • driver tasks provide process I/O data including verification of data transfer, error retries, protocol (polling) handling • control tasks include message routing, terminal dependent functions, diagnostics, and supporting a wide variety of NCR terminals.

Program Development • user-specified, vendor-supplied software.

Configuration Flexibility • typical configuration up to 95 half-duplex communication lines; up to 62 full-duplex communication lines • number of terminals supported depends on application response time turnaround, messages generated per transaction, number of concentrators on network, message size, message volume, and so on: most financial networks support up to 500 terminals; retail networks (POS or CRT) up to 2000 terminals • maximum configuration requires eight 690-103 Auxiliary Bay Adapters to support up to 255 communication lines • supports up to 2 NCR host processors.

First Announced • 1977.

Pricing • typical price ranges are \$70,200 for 20-line system; \$118,000 for 50-line system • software price for 20-line configuration is \$21,000; for a 50-line configuration is \$22,400

□ NCR/Comten 3650, 3690 Communications Processors

Function • programmable local front-end communication processor; remote concentrator; standalone data switching system; or combination front-end and data switching system.

Associated Systems & Networks • IBM 360/370, 303X, 308X, and 43XX single-/multiprocessor, IBM S/370-compatible processors such as Amdahl 470 Series, and NCR • compatible interface (emulation) with IBM 270X transmission control units and IBM 370X Communications Controllers • X.25 gateway from SNA.

Communications • supports from 128 to 512 full-duplex communication lines, from 1 to 8 hosts with multiple channel interface adapters and accompanying software.

Features • 32-bit processor with 16-bit-wide data path to memory; 128K to 4M bytes of memory (1M bytes supported by software); up to 8 disk drives per system with 400M-byte maximum storage capacity • Block Multiplexer Channel compatible with IBM block multiplexer I/O channel provides interface to peripheral controllers • Modem Interface Modules (MIMs) are logic modules integral to 3600 to attach to variety of modems: A-MIM supports up to 16 asynchronous lines; BSC-MIM supports up to 16 synchronous lines; DLC-MIM supports up to 16 lines • peripherals include disk drives with 58.3M- and 116M-byte capacity; magnetic tape/controller units (9 tracks, 800/1600 bpi, 75 ips); line printers (600 lpm); card readers (600 cpm); HASP workstations (with printer and card reader); and Link Processor System (LPS) microprocessor-controlled multiplexing system.

Software • Comten version of Network Control Program (NCP) and Advanced Communications Function/Network Control Program (ACF/NCP) are used to control operations of the network • Comten NCP can co-reside with Emulation Processing (EP) in a Partitioned Emulation Processing (PEP) network • ACF/NCP works with ACT/VTAM or ACF/TCAM in the host and supports the IBM Multi-System Networking Facility (MSNF) that

allows access to up to 8 hosts.

Program Development • using CODEL, the Comten communication definition language; executes under the Comten monitor, language structure similar to IBM BAL; CODEL can be run on IBM 370/370, 303X, 308X, 43XX, or equivalent processors.

Configuration Flexibility • up to 2/8 host channel support and 128/512 line support on the 3650 and 3690, respectively • up to 2/15 peripheral controllers per 3650/3690 processor • multiple 3600 processor can front end S/370-compatible host.

First Announced • 3650, 1976; 3690, 1978.

Pricing • purchase price is \$48,125 for 3650 configuration with up to 2 CIAs, 128 communication lines, 128K-byte memory, and peripheral block multiplexer channel; monthly maintenance is \$322 • purchase price is \$162,150 for 3690 with up to 8 CIAs, 512 lines, 512K-byte memory, and peripheral interface block multiplexer channel; monthly maintenance is \$793.

■ NORFIELD

3 Depot Place, East Norwalk, CT 06855 • 203-853-2777.

□ Automated Message Management System (AMMS)

Function • store-and-forward message switching system integrating and managing a variety of devices/terminals/computers in mixed environments • electronic mail.

Associated Systems & Networks • supports asynchronous and IBM 2780/3780 BSC protocols: Western Union TWX/Telex and International Telex; SESAME, BPO/ILTMS, TRT, RCA, WUI, ITT, FTC; AT&T/Teletype 40 Dataspeed terminals over WATS, DDD, or private line; Wiltek/2260; INFOCOM, INOMASTER; ARX, AIRCON; and various DDD, point-to-point, and multidrop protocols.

Communications • handles all synchronous and asynchronous communications at various data rates through polling with protocol, speed, and code conversion; up to 25K messages per hour depending on mix of transmission speeds/protocols • data rates from 50 to 9.6K bps • auto-dial, point-to-point, multidrop, local loop asynchronous, special-purpose asynchronous protocol environment.

Features • Series 300 small message-switching system supports 48 asynchronous ports and 1K- to 3K-message-per-hour throughput capacity; Series 400 medium message-switching system supports up to 64 ports and 3K- to 5K-message-per-hour throughput, synchronous protocols, table-driven applications, and Electronic Mail; Series 500 large message-switching system supports up to 500 ports and 5K- to 25K-message-per-hour capacity and includes multiprocessor, multinode, and multiuser shared configurations • turnkey configurations housed in industry-standard enclosures include the following hardware components: basic CPU can be configured with 64K-byte (System 300), 256K-byte (System 400), and 512K- to 4M-byte (System 500) memory; disk drive capacities range from 2.5 to 160M bytes each; multiple disk subsystems, each supporting 4 disk drives; communication controller supports 2 to 16 lines; optional 1600-bpi magnetic tape and 300-lpm printer • redundant configurations available; battery backup to support memory • system console includes KSR terminal; performs all supervisory control functions; system advisories and statistical reports, polling cycles, line activity, intercept, port assignments, and long term retrieval functions can be installed/changed with no software modification; multiple priority levels; alternate queue routing/message routing.

Software • appropriate software modules integrated into system provide line/protocol/discipline required; TRT/Norfield provides specially designed operating system; remote and local diagnostics; table-drive applications, including Electronic Mail • redundant disk feature allows software changes to be integrated after installation; system recovery on backup disk; REPAIR diagnostic program utilized after system failure tests disk sector links for discontinuity.

Program Development • initial program loading from disk using supervisory console; network configuration (assigned communication links and station ID) • special application

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programs written by TRT/Norfield, by user, or by independent software vendor; requires familiarity with TRT/Norfield operating system.

Configuration Flexibility • minimum or small configuration supports up to 48 ports, 64K-byte memory, and 80M-byte disk subsystem to handle up to 6K messages of 1K characters each per day for 10 days traffic; throughput capacity up to 3K messages per hour • large system supports up to 500 ports, 4M-byte memory, and subsystem(s) supporting 160M bytes of storage with 4 disk drives; throughput capacity up to 25K messages per hour depending on mix of data speeds/protocols; long-term storage and retrieval requires a 1600-bpi magnetic tape subsystem with a 2400-foot tape for recording more than 20K messages of 1K characters per message • switching rack can include 4 assemblies in a single cabinet; each rack provides 16 circuits to handle up to 64 channels; cables for connecting components are 50 feet long • to increase circuits in a system with no spare ports, a communication controller is inserted in an optional prewired processor slot; added ports are activated from supervisory console.

First Announced • February 1982.

Pricing • from \$50,000 to \$100,000 for small (System 300) configuration; from \$250,000 to \$1,000,000 for large (System 500) configuration.

■ NORTHERN TELECOM, INC

1101 East Arapaho Road, Richardson, TX 75081 • 214-238-3660.

□ Northern Telecom SL-10 Packet-Switching System

Function • packet-switching node in small network of terminals and a host computer or in large network of nodes, serving variety of terminals and hosts; provides packet-switching and administrative functions.

Associated Systems & Networks • X.25 packet networks; supports Standard Network Access Protocol SNAP (CCITT X.25) and the Interactive Terminal Interface (ITI) or X.3/X.28; Multi-Leaving Interface (MLI) for remote batch terminals; IBM 3270 Interface, and IBM 2780/3780 terminals.

Communications • high-speed HDLC line facility interfaces to host computer and provides switch-selectable data rates from 48K to 72K bps; supports a variety of configurations including 4 at 64K bps HDLC lines, 2 at 64K bps HDLC lines, plus 60 asynchronous/synchronous lines to 9600 bps; 120 asynchronous/synchronous lines at up to 9.6K bps/19.2K bps • other line support for: asynchronous lines up to 9600 bps; synchronous HDLC up to 9600 bps; and BSC up to 9600 bps • control processor handles 20 calls per second • trunk processors serve one inter-node line each and operate from 9.6 to 112K bps • each line processor interfaces up to 60 synchronous or 120 asynchronous lines • typical aggregate throughput for interactive application is 1000 packets per second and for high-speed line processor is 80 to 120 packets per second.

Features • nodal hardware organized in multiprocessor structure: interprocessor communications are through bus supporting up to 22 processors; SL-10 node varies in size from 3 to 15 processors, and size of node is determined by number of lines it supports; failure of one processor has no effect on operation of other processors • Network Control Center (NCC) is part of node or is a separate node (with specialized software/disk storage added to normal nodal software/hardware) • basic system is housed in 2 cabinets (additional cabinets and modules can be configured) include Common Control Cabinet and Line Cabinet • Common Control Cabinet includes common memory module RAM of 384K bytes; two 16-bit Control Processor Modules for routing/accounting management functions (operate in load sharing mode) to transfer data between memory or I/O devices and processor; and Trunk Processor Module that handles trunk connections to other network trunks • Trunk Processor provides MUX interface to AT&T 303, RS-232C (V.24/V.28) DMAI and V.35 facilities; Common Memory Interface that converts 8-bit word format to 16-bit format required by common bus and acts as bus switch from local trunk to common bus; ROM memory; and a trunk controller for high-speed internodal line support • Line Cabinet houses Line Processor Modules which provide

hardware/software to support subscriber terminal protocols and manage virtual circuits: High Speed Line Processor Module (HSLP) consists of SL-10 processor, memory, bus switch, line scanner, and/or 48K to 64K bps HDLC line card; Line Card Module consists of number of Line Card shelves, each Line Card Shelf accommodates up to 13 Line Cards, including asynchronous line card supporting 2 lines, binary synchronous line card supporting single line, and HDLC Line Card • remote concentrator provides mini-node capability: extends the full nodal service facilities with minimum distribution of hardware/software.

Software • Office Master initializes node (office); creates Master Processes to control separate subsystem: Call Services Subsystem (Service Master); Subnet Subsystem (Global Router Interface Master); File Subsystem (File Master); Resource Subsystem (Resource Master); Node Administration Subsystem (Node Administration Master); Network Control Center Subsystem (NCC Master) • Network Communications functions categorized by 3 layers of data communications management: Operating System (OS) provides program loading, establishes process environment, provides message-switching facilities, and error detection analysis/recovery; Network System (NS) provides basic network communication facilities including packet subnet and process liaison facilities; Access System (AS) provides interfaces for computers/terminals: X.25, X.3/28/29, X.75, and IBM 3270/2780/3780.

Program Development • vendor-supplied; software programs and data are loaded into memory from magnetic tape cartridge.

Configuration Flexibility • network configuration depends on factors which influence the number of nodes and locations (types of service, location/distribution of terminals/computers, availability/access to dial-access switching center, and data line facilities) and the number of trunks required (internodal traffic, requirement for access to individual nodes from NCC Network Control Center, need for multiple routing), and the need for an NCC for accounting/billing facilities, and so on • Northern Telecom provides 2 examples: node serving 100 asynchronous (300 bps) and 100 binary synchronous (2400 bps) lines requires 2 line control cabinets, containing 3 high-speed line processors and line card shelves; a node serving 50 asynchronous lines at 300 bps and 4 lines at 56K bps requires 1 line control cabinet containing 2 HSLPs each equipped with 2 high-speed line cards and 2 line card shelves • NCC can be part of node or installed as separate node; recommended that 2 ASCII terminals be installed at each node; 4 ASCII terminals for the NCC for operational/maintenance functions • common bus of SL-10 permits maximum of 15 processor connections: one position reserved for each control processor, trunk processor, line processor, or disk controller (standard trunk processor shelf supports up to 3 trunk processors).

First Announced • 1976.

Pricing • depending on node size required, system purchase price begins at approximately \$250,000.

■ PARADYNE CORPORATION

8550 Ulmerton Road, Largo, FL 33541 • 813-536-4771.

□ PIX Communication System (PIX II or PIXNET)

Function • nodal processor support for point-to-point connection in single-host environment (PIX II concept) or expanded multihost environment (PIXNET concept) • provides communication interface between host processor and PIXNET communication network through any of 5 controllers: attached Communications Processor (ACP) connects a Response distributed processing system to PIXNET; Local Control Unit (LCU) interfaces a host (IBM or IBM-compatible system) processor's byte multiplexer channel and PIXNET communication system; Remote Control Unit (RCU) interfaces remote Paradyne or IBM peripherals or terminals to PIXNET communication system; and Network Control Unit (NCU) provides application and alternate routing functions for network as well as supports the PIXNET administrator's console for network control functions.

Associated Systems & Networks • host processors: IBM System 360/370, 303X, 308X, and 43XX; an IBM S/370-Plug

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Compatible System such as an NAS, AMDAHL, or Paradyne RESPONSE distributed processing system • Paradyne peripheral devices; IBM and compatible devices, and PIXNET 3890 Remote Check Processing System • Paradyne's Coordinated Network Architecture.

Communications • NCU can support up to 7 communication lines to other NCU's and up to 7 lines to LCUs, RCUs, and/or ACPs • point-to-point data link configurations include: computer-to-computer, computer-to-terminal, and terminal-to-terminal • standard data rates application-dependent at 2400, 4800, 9600, 19.2K, or 56K bps (between LCUs) • satellite, digital, and terrestrial services • number of simultaneous sessions on a line controlled by weighting factor assigned according to line data rate: twice the number of sessions are assigned to 9600-bps line as to 4800-bps line • data compression facilitates high-speed transmissions • Paradyne version of SDLC protocol: block length 256 bytes for terrestrial communications link; up to 512 bytes on satellite links.

Features • microcoded minicomputer processor offering basic 32K-byte memory expandable to 64K bytes • LCU processor subsystem interfaces to host processor's byte multiplexer channel and includes 64K-byte memory, cassette interface, line controllers (one for each communication line), and device handlers (one for each peripheral); number of lines and device addresses that can be added depends on available card slots and memory; 2 identical subsystems can be added to an LCU; controllers for high-speed communications lines (40K to 60K bps) have DMA access to memory • RCU processor subsystem is similar to LCU, but device controllers replace the multiplexer channel interface and device addresses found on LCU; contains only one subsystem • NCU is similar to LCU and RCU but includes Network System Console; has no multiplexer channel interface, no device address handlers, nor device controllers • PIX allows host software to support remote devices as local devices • ACP can support 1 line control module for communicating with NCU and 4 channel adapter boards for Network Interactive Translation Communication (NITCOMM), Bulk File Transfer, and loading PIXNET service names • ACP can optionally support a line printer controller and a loop controller for attaching 4/16/32/48 1478 displays and/or character printers • ACP can also be configured for specific applications.

Software • PIXNET devices interface to IBM S/370-compatible host: Access Methods (BSAM, QSAM, VSAM, BTAM, TCAM, and VTAM); Spoolers (ASP, HASP, JES/II/III, Power/VS, Print, and EDOS/ESF); Operating Systems (DOS through MVS), and online monitors (TSO, APL, CICS, and so on) • Paradyne supplies Initial Program Load (IPL) with diagnostics, Link Initialization for non-NCU links, restart/recovery, and NCU software • NCU contains network parameter tables for routing, line selection, traffic and destination, and supports software for the Network Administration's Console and its command repertoire for session establishment, configuration control, configuration reporting, and servicing aids • ACP provides Bulk File Transfers, NITCOMM, and loading PIXNET service names.

Program Development • self-configuring system; software modules selected from system tape to match hardware circuit boards installed • in PIXNET System with an NCU, one basic system cassette provides software for LCU, ACP, or RCU and includes handlers for reader, printer, tape, line control, and I/O modules; a second system cassette provides software for NCU.

Configuration Flexibility • minimum communication network consists of one LCU, one RCU, and one server node (an NCU directly connected to LCU, ACP, and/or RCU) • maximum configuration includes an NCU supporting up to 14 ports (7 NCUs and 7 LCUs, ACPs, or RCUs); each ACP, LCU, and RCU can support up to 32 displays and printers.

First Announced • 1976 (PIXNET); 1980 (RESPONSE).

Pricing • purchase price for a typical point-to-point configuration including an LCU, an RCU, an NCU, and network controller is approximately \$94,000.

■ PERIPHONICS CORP/Affiliate of EXXON Corporation

4000 Veterans Memorial Highway, Bohemia, NY 11716 • 516-467-0500.

□ Periphonics T-Comm Communications Processor (PCP)

Function • front-end communication processor, remote concentrator, nodal processor, provides message switching control functions in data/voice transaction processing network; supports multinodal network communications.

Associated Systems & Networks • IBM networks through emulation of IBM 2803/3803, 2848, 3272, 2701/3270; other emulations include Burroughs TC-500/700, NCR-270, and Honeywell VIP-775/785 • T-Comm Voice Response Information Systems, Universal Network Control Systems, Integrated Voice Response/Data Communication Systems, and peripheral devices including disk drives, tape drives, and printers.

Communications • supports up to 416 synchronous/asynchronous communication lines with data rates up to 9600 bps; SDLC terminal protocol; any combination of voice response lines • half-duplex mode on local, leased, and dial-up lines; autocall also available • programmable selection of 5/6/7/8-bit characters with or without even or odd parity for synchronous/asynchronous transmission; 8-bit character or byte for SDLC • Line Interface Modules (LIMs) for serial, SDLC, and current-loop interfaces • aggregate throughput for Type 3 is 75K bps.

Features • single communication processor chassis includes: 16-bit processor with 64K-byte MOS memory with 64K- and 192K-byte increments provided by PERIPACS (Periphonics Programmable Auxiliary Computer Storage) for a total of 256K bytes; LIM (Line Interface Module) Bus to accommodate LIMs; voice response multiplexer; peripheral controllers for disk/tape drives, floppy disks, line printers, and console writer; MPI (Multiple Processor Interface) high-speed data link between 2 or more processors; compatible with UNIBUS on Digital Equipment's DEC processors • single, high-speed I/O Bus connects all system components and peripherals; simultaneous operation among devices at maximum DMA rates; multiple levels of priority interrupt • voice vocabulary stored in digital MOS memory modules on the LIM bus; stores 32 seconds of voice response (64 words of speech); IU (Interface Unit) Channel provides local channel connection between T-Comm and IBM S/370-compatible byte multiplexer, block multiplexer, or selector channel; responds to single channel address and looks like a control unit to host; up to 4 IUs can be connected to single processor; thus, T-Comm can connect to 4 hosts • MPI for all models of Periphonics processors; maximum configuration includes 3 MPIs, which can interconnect 4 T-Comm PCPs.

Software • PERI-COMM operating system is control table and interrupt driven; includes scheduler (priority-basis task execution), message/buffer pool management • PERIOCS replaces requirements for BTAM, TCAM, VTAM • H-PACS (Host-Pac) provides software modules and hardware interfaces for communications with host processor • other PACs provide Message Control Programs.

Program Development • I/O Gen Network Generation Language: Periphonics program allows IBM/T-Comm users to reconfigure on IBM host the line/terminal definitions of network controlled by T-Comm.

Configuration Flexibility • typical system supports up to 416 communication lines; maximum system with 4 T-Comm PCPs supports up to 416 lines • one processor can support up to 800 terminals, thus maximum system can support 3200 terminals.

First Announced • 1979.

Pricing • purchase price for a minimum configuration is approximately \$50,000; a maximum configuration of 4 T-Comm PCPs that can support 416 lines is approximately \$300,000.

■ PROTEX INDUSTRIES INC/Starnet Data Systems Division

1331 West Evans Avenue, Denver, CO 80223-4098 • 303-935-3566.

□ Protex Starnet II

Function • nodal processor in Starnet local area network; message-switching system • provides code conversion,

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transmission speed matching, multicharacter sequence conversion, and communication formatting.

Associated Systems & Networks • vendor-independent.

Communications • supports up to 16 ports; network can include from 1 to 256 nodes • ports supported include asynchronous/synchronous RS-232C/CCITT V.28; 5-, 6-, 7-, or 8-bit code; 1, 1.5, 2 stop bit(s); even, odd, mark, space, or no parity, all software selectable; 20-/60-mA current loop; RS-449 compatible; TTL; Centronics and Dataproducts parallel printer interface; AT&T 103- and 212-compatible integral modem; auto-select, auto-answer, auto-dial, or originate; 16-channel A/D conversion with 12-bit resolution; ASCII/EBCDIC/Baudot/BCD codes • protocols include hardware CTS, XON/XOFF, AT&T Repeat, ENQ/ACK, DC1/DC2, and custom protocols.

Features • microprocessor with 96K-byte memory; each node interfaces 4/8/12/16 devices; 11 industry-standard interfaces as well as customization modules are offered.

Software • functions are provided by data imbedded commands.

Program Development • vendor-supplied customized to the user's requirements.

Configuration Flexibility • 4, 8, 12, 16 ports; each can be upgraded to a maximum of 16 ports per unit; a network can support a maximum of 256 nodes.

First Announced • 1981.

Pricing • purchase price for 4-port unit is \$5,890; includes standard I/O port (serial) and 1 standard protocol.

■ SPERRY CORP/Division of Sperry Rand Corporation

P.O. Box 500, Blue Bell, PA 19424 • 215-542-4011.

□ Sperry DCP 10

Function • programmable front-end processor, remote concentrators, or network processors.

Associated Systems & Networks • Sperry 1100 Series and 90 Series host processing systems in Distributed Communications Architecture (DCA) networks • X.25 gateway from DCA to other networks • BSC gateway to IBM systems • public data networks such as NPDN, DATEX-P, PSS, TRANSPAC, DATAPAC • SNA gateway planned for 1984.

Communications • supports up to 20 asynchronous or 5 synchronous lines; half-/full-duplex 2400-bps asynchronous or 9600-bps synchronous lines • medium-to-high-speed modules support asynchronous communication to 19.2K bps and BSC data rates up to 9600 bps, and UDLC and other Sperry synchronous protocols up to 19.2K or 64K bps; X.21 circuit/packet line module to 19.2K bps • attachment to 1 direct channel-interfaced host.

Features • microprocessor-based systems include general-purpose communication processor with associated memory to control network and manage messages; input/output processors (IOPs) handle I/O units, host channel connections, and line modules • 512K bytes • support diskette cartridge disks, nonremovable disks, magnetic tape, and console with printer peripherals.

Software • DCP native-mode operating system; Telcon software • includes communication software modules for network control; network management interface, internetwork communication, statistics gathering for error control, online diagnostics, status monitoring, command processing, and system synchronization • once loaded, DCP processors can handle all network control functions independent from the host, thus network can continue to function even when host goes down • general network management functions include data flow control through pacing and throttling message routing, message prioritizing, handling broadcast and unsolicited messages, and automatic or demand status and events logging and reporting • operator interface allows initialization, rebooting, shutdown, reconfiguration, performance of diagnostics and recovery maintenance, solicitation of status information, I/O start/stop control, and automated line-switching control • Telcon now at Release 5 which provides enhancements over previous releases for ease of

use, better system resilience, reduced initialization time, increased availability and maintainability, interprocess control, and Telcon/CMS 1100 Fastpath; supports warm DCP standby for 3 active DCPs and load sharing among up to 8 DCPs at a node.

Program Development • assembler, system generator, collector, and network generator facilities on Series 1100 or 90 host • application-unique assembled programs stored in library as relocatable binary elements; input parameter statements define system so collector can select standard system modules.

Configuration Flexibility • minimum configuration: 512K-byte memory • single host interface; 5 line interfaces (ports) • integral 256K-byte diskette • optional 1K-byte standalone diskette subsystem or disk subsystem supports 4 6M/9.2M/14.25M/28.5M bytes of storage • operator console • maximum configuration: 512K-byte memory • supports single host and 8 communication ports; 5 communication ports with multiline adapter can provide 20 asynchronous lines; each of 3 communication ports support single synchronous line • integral 256K-byte diskette and 28.5M bytes of disk storage • operator console with 80-/200-cps printer.

First Announced • 1983.

Pricing • purchase price is \$27,687 for CPU with 512K-byte memory; operator and maintenance panels power supply, 1 ISI host I/F line module, integral 256K-byte diskette, and freestanding diskette subsystem with 2 drives • supports 5 communication ports and optional disk storage • front-end configuration for Series 1100 System • requires UTS 20 or UNISCOPE-compatible terminal as a console; 6136-92 operating system software; and communication line modules to fit application • \$814 per month 1-year lease • \$159 per month maintenance • \$32,631 for same as above, but with 14M-byte disk instead of freestanding diskette subsystem • \$1,127 per month 1-year lease • \$220 per month maintenance.

□ Sperry DCP 20

Function • programmable front-end processor, remote concentrators, or network processors.

Associated Systems & Networks • Sperry 1100 Series and 90 Series host processing systems in Distributed Communications Architecture (DCA) networks • X.25 gateway from DCA to other networks • BSC gateway to IBM systems • public data networks such as NPDN, DATEX-P, PSS, TRANSPAC, DATAPAC • SNA gateway planned for 1984.

Communications • up to 48 half-/full-duplex 2400-bps asynchronous or 9600-bps synchronous lines • medium-to-high-speed modules support asynchronous communication to 19.2K bps and BSC data rates up to 9600 bps, and UDLC and other Sperry synchronous protocols up to 19.2K or 64K bps; X.21 circuit/packet line module to 19.2K bps • attachment up to 3 (DCP/20) direct channel-interfaced hosts.

Features • microprocessor-based systems include general-purpose communication processor with associated memory to control network and manage messages; input/output processors (IOPs) handle I/O units, host channel connections, and line modules • up to 17 "virtual" IOPs and up to 3 microprocessor-based IOPs • throughput for each IOP is 1.13M bps • 3 modes of operation: native mode • support 256K-byte diskettes, 10M-byte dual disk drives, magnetic tapes, and console with printer.

Software • DCP native-mode operating system; Telcon software • includes communication software modules for network control; network management interface, internetwork communication, statistics gathering for error control, online diagnostics, status monitoring, command processing, and system synchronization • once loaded, DCP processors can handle all network control functions independent from the host, thus network can continue to function even when host goes down • general network management functions include data flow control through pacing and throttling, message routing, message prioritizing, handling broadcast and unsolicited messages, and automatic or demand status and events logging and reporting • operator interface allows initialization, rebooting, shutdown, reconfiguration, performance of diagnostics and recovery, maintenance, solicitation of status information, I/O start/stop control, and

Communication Processors

automated line-switching control • Telcon now at Release 5 which provides enhancements over previous releases for ease of use, better system resilience, reduced initialization time, increased availability and maintainability, interprocess control, and Telcon/CMS 1100 Fastpath; supports warm DCP standby for 3 active DCPs and load sharing among up to 8 DCPs at a node.

Program Development • assembler, system generator, collector, and network generator facilities on Series 1100 or 90 host • application-unique assembled programs stored in library as relocatable binary elements; input parameter statements define system so collector can select standard system modules.

Configuration Flexibility • minimum configuration: 256K-byte memory • 1 host and 1 line interface • integral 256K-byte diskette and 10M-byte disk modules • operator console • maximum configuration: 512K-byte memory • 3 host and 48 line interface ports; with multiline adapter can connect up to 192 asynchronous lines • integral 256K-byte diskette and 28.5M bytes of disk storage • 25-ips 800-bpi tape module • operator console with 80-/200-cps printer.

First Announced • 1981.

Pricing • purchase price is \$46,980; includes preconfigured diskette-based DCP/20 for Series 1100 host systems • includes DCP/20 CPU with 384K bytes of memory, 2M bytes of diskette storage, integrated 1939 diskette, Series 1100 I/F, and 8-bit peripheral I/F • supports up to 13 communication ports • requires UTS 20 or UTS 400 as console, DPS/200S, and communication line modules to fit application • \$1,242 per month 1-year lease • \$249 per month maintenance • \$66,489 includes preconfigured cartridge disk-based DCP/20 for Series 90 host systems • includes 8597-99 DCP/20, F1939-00 integrated diskette, F1947-00 S/90 host I/F, F1948-01 16-bit peripheral I/F, 8408-02 disk controller, F2380-XX 10M-byte disk drive, and F2895-00 Active Line Indicator • supports up to 11 communication ports; requires UTS 20 or UTS 400 as console, DPS/20 OS, and communication line modules to fit the application • \$1,706 per month 1-year lease • \$380 per month maintenance.

□ Sperry DCP 40

Function • programmable front-end processor, remote concentrators, or network processors.

Associated Systems & Networks • Sperry 1100 Series and 90 Series host processing systems in Distributed Communications Architecture (DCA) networks • X.25 gateway from DCA to other networks • BSC gateway to IBM systems • public data networks such as NPDN, DATEX-P, PSS, TRANSPAC, DATAPAC • SNA gateway planned for 1984.

Communications • supports up to 255 half-/full-duplex 2400-bps asynchronous or 9600-bps synchronous lines • medium-to-high-speed modules support asynchronous communication to 19.2K bps and BSC data rates up to 9600 bps, and UDLC and other Sperry synchronous protocols up to 19.2K or 64K bps; X.21 circuit/packet line module to 19.2K bps • attachment to 8 direct channel-interfaced hosts • DCP 40 in MCC-compatible mode can support up to 3 Type II scanner subsystems with ports for 64 full- or 128 half-duplex lines each, and data rates of 1800/9600 bps asynchronous/synchronous; support for up to 1 Series 90 or 2 Series 1100 channel-attached hosts in compatible mode, wideband facilities for 19.2K/40.8K/50K/230K bps • X.21-compatible adapter for synchronous line up to 100K bps; wideband facilities for 1 line from 19.2K to 230K bps; V.35-compatible interface for AT&T DDS at rates up to 56K bps.

Features • microprocessor-based systems include general-purpose communication processor with associated memory to control network and manage messages; input/output processors (IOPs) handle I/O units, host channel connections, and line modules • supports up to 16 IOPs • throughput for each IOP is 1.13M bps • 3 modes of operation: native mode (both DCP 20 and 40), compatible mode to bridge from older DCA systems to current DCA systems, and MCC (Multi-Channel Communications Controller) mode whereby DCP 40 emulates MCC front ending a Series 90 host • support 256K-byte diskettes, 10M-byte dual disk drives, magnetic tapes, and console with printer.

Software • DCP native-mode operating system; Telcon software • includes communication software modules for network control: network management interface, internetwork communication, statistics gathering for error control, online diagnostics, status monitoring, command processing, and system synchronization • once loaded DCP processors can handle all network control functions independent from the host, thus network can continue to function even when host goes down • general network management functions include data flow control through pacing and throttling, message routing, message prioritizing, handling broadcast and unsolicited messages, and automatic or demand status and events logging and reporting • operator interface allows initialization, rebooting, shutdown, reconfiguration, performance of diagnostics and recovery, maintenance, solicitation of status information, I/O start/stop control, and automated line-switching control • Telcon now at Release 5, which provides enhancements over previous releases for ease of use, better system resilience, reduced initialization time, increased availability and maintainability, interprocess control, and Telcon/CMS 1100 Fastpath; supports warm DCP standby for 3 active DCPs and load sharing among up to 8 DCPs at a node.

Program Development • assembler, system generator, collector, and network generator facilities on Series 1100 or 90 host • application-unique assembled programs stored in library as relocatable binary elements; input parameter statements define system so collector can select standard system modules.

Configuration Flexibility • DCP 40 native-mode configurations: minimum configuration: 256K-byte memory • 1 host and 1 line interface • integral 256K-byte diskette and standalone 4.6M-byte fixed disk drive or 10M-byte disk cartridge • operator console • maximum configuration: 3.5M-byte memory • 16 host and 255 line interface ports; with multiline adapter can connect over 1000 asynchronous lines • integral 256K-byte diskette and 28.5M bytes of disk storage • 25-ips 800-bpi tape module • operator console with 80-/200-cps printer • DCP 40-compatible mode configurations: minimum configuration: 128K-byte memory • 1 host and 64/128 full-/half-duplex line interfaces • integral 256K-byte diskette and standalone 512K-byte diskette modules • operator console • maximum configuration: 128K-byte memory • 1 host and 192/384 full-/half-duplex line interfaces • integral 256K-byte diskette and standalone 512K-byte diskette modules • operator console with 200-/300-cps printer.

First Announced • 1980.

Pricing • purchase price for minimum native mode is \$84,245, which includes CPU with 512K-byte memory using 64K-bit chips, integral IOP, operator and maintenance panels, and power supply • space for up to 3 additional 512K-byte memory modules, 3 additional IOPs, 64 line modules, 1 host interface • requires F1939 series integral diskette; F2380 with F8408 disk cartridge; or 8409 disk subsystem with F3878 line module; UTS 20 or UTS 400 console; 6136 operating system software; host I/F and communication line modules to fit application • \$2,195 per month 1-year lease • \$402 per month maintenance • maximum native mode is \$133,319, which includes preconfigured cartridge disk-based DCP 40 for Series 90 host systems • same as minimum except includes second IOP and supports up to 25 communication ports • requires UTS 20 or UTS 400 as console and 6136-01 DCP 40 OS • \$3,448 per month 1-year lease • \$748 per month maintenance • minimum compatible-to-native mode is \$5,665, which converts DCP 40 8596-98-compatible mode processor to 8596-97 native mode model • 128K-byte memory • requires 8408 disk cartridge or 8409 disk subsystem and 6136-XX DCP/40 OS • subsequent upgrades are as 8596-97 system • \$150 per month 1-year lease • \$34 per month maintenance • maximum compatible-to-native mode is \$39,170, same as above except memory is 1M bytes instead of 128K bytes.

■ TELEFILE COMPUTER PRODUCTS

17131 Daimler Street, Irvine, CA 92714 • 714-557-6660.

□ Telefile Telepac II Communications Processor

Function • advanced X.25 nodal processor; interconnects hosts that support X.25 Level 3, X.25 Level 2 statistical multiplexers, and X.25 Level Packet Multiplexers.

Associated Systems & Networks • mainframe and

Communication Processors

minicomputers supporting CCITT X.25 Level 3 may be directly connected through an RS-232C/V.24/RS-422 synchronous interface, those not supporting X.25 can be attached through a series of asynchronous ports connected to a statistical multiplexer which may be remote from the Telepac • public X.25 networks, Ethernet, or complete statistical multiplexer network.

Communications • up to 128 synchronous channels at data rates up to 72K bps; RS-232C/V.24, RS-422 interface • asynchronous ports provided through statistical multiplexer with ports operating at 50 to 19.2K bps; X.25 (LAP or LAPB) protocol.

Features • MC68000 processor, 64K RAM expandable to 256K bytes • designed to operate unattended • maximum throughput of 1.2M bytes per second.

Software • configuration automatically loaded from floppy disk; stored backup configuration; nonvolatile memory, line specific diagnostics at Control Console.

Program Development • X.29-type parameters default per line; session settings configured by host or user; transparent operation or special line editing; CTS or XON/XOFF flow control; special support for IBM VM/370.

Configuration Flexibility • up to 1,000 terminals and virtual circuits per node.

First Announced • December 1983.

Pricing • purchase price is \$17,100 for Telepac with 4 X.25 ports, 64K CMOS RAM, and software.

■ **TRAN TELECOMMUNICATIONS CORPORATION—See AMDAHL (CORP)**

■ TRI-DATA

505 East Middlefield Road, Mountain View, CA • 415-969-3700.

□ TRI-DATA Netway Models 200 & 274

Function • nodal processor providing remote and local networking facilities.

Associated Systems & Networks • IBM (274), Honeywell, Burroughs, DEC, Sperry, Control Data Corp (CDC), International Computer LTD (ICL) (200).

Communications • up to 32 workstations/host ports at data rates up to 56K bps • RS-232C interface • supports IBM 3270 BSC/SNA/SDLC, IBM 2780/3780, Burroughs Poll/Select, ICL C01/C03, IBM 1006 IPARS, TTY, X.25 (with X.3, X.28, X.29).

Features • Z80 microprocessor using 8-bit microprocessor and 256K-byte RAM; auxiliary storage provided by 800K-byte floppy disk; optional external storage with 10M- or 20M-byte Winchester disk.

Software • Netway Communications Operating System (NCOS); high-level macro library provided for additional protocols.

Program Development • vendor-supplied NCOS written in Z80 assembler.

Configuration Flexibility • basic unit includes floppy disk system for loading system software, configuration, and networking information, 6 serial I/O boards, high-speed bus for Netway to Netway communications, and a parallel printer port; processor board includes microprocessor, dynamic RAM, memory management, multiple DMA controllers for high-speed I/O operations, 2 RS-232C ports.

First Announced • 1982 (200); 1984 (274).

Pricing • purchase price is \$6,880 for basic 200 and \$12,510 for basic 274.

■ **TRT DATA PRODUCTS—See NORFIELD**

■ TYMNET, INC/A Tymshare Company

2710 Orchard Parkway, San Jose, CA 95134 • 408-946-4900.

□ Tymnet Micro-Engine

Function • small nodal processor for Tymnet; performs network supervision, management, and control; supports terminal

concentration, host interfaces, and network gateways; electronic mail • provides support for multiple protocols.

Associated Systems & Networks • Tymnet public network and any other public or custom network via standardized gateways.

Communications • up to 16 asynchronous ports with data rates from 50 bps to 4800 bps and 4 or 8 synchronous ports with data rates up to 19.2K bps; internal clocking on asynchronous lines and synchronous lines of 4800 bps, 9600 bps, and 19.2K bps; RS-232C interface standard • supports async, polled async, IBM 3270 BSC, X.25, SDLC, RJE/HASP, 2946, and Honeywell VIP 7700 terminal protocols.

Features • 32-bit microprocessor with 256K- or 512K-byte memory; provides network monitoring; variable-length, multiuser packets; virtual circuit network paths; remote asynchronous terminal interfacing and terminal concentration; protocol, speed, and code translation; multiple host targeting.

Software • resident or downline loaded system software; Internally Switched Interface System (ISIS) software architecture supports multiple custom configured interfaces and maps them to standard internal protocol; support both terminal and host interfaces and freestanding applications programs.

Program Development • vendor-supplied system-dependent software.

Configuration Flexibility • Micro 1 includes 256K-byte memory; supports 16 asynchronous ports and 4 synchronous network ports • Micro 2 with 512K-byte memory supports 16 asynchronous ports and 8 synchronous network ports.

First Announced • 1983.

Pricing • purchase price ranges from \$12,000 to \$16,000.

□ Tymnet Mini-Engine

Function • intermediate nodal processor for Tymnet; performs network supervision, management, and control; supports terminal concentration, host interfaces, and network gateways; electronic mail • provides support for multiple protocols.

Associated Systems & Networks • Tymnet public network and any other public or custom network via standardized gateways.

Communications • up to 2 asynchronous boards with up to 32 ports each for 64 ports maximum; data rates from 50 bps to 4800 bps; internal clocking; RS-232C interface • 2 synchronous boards, up to 16 ports each for 32 ports maximum; data rates up to 19.2K bps; internal clocking at 4800 bps and 9600 bps; RS-232C interface • one SIO board supports up to 16 ports maximum; 16 V.24 asynchronous ports (at data rates up to 9600 bps), 16 V.24 synchronous ports (HDLC/SDLC) at data rates up to 19.2K bps, 4 V.35 synchronous ports (HDLC/SDLC) at data rates up to 76K bps, and 6 optical coupled links at data rates up to 162.5K bps • supports async, polled async, IBM 3270, BSC, X.25, SDLC, RJE/HASP, 2946, and Honeywell VIP 7700 terminal protocols.

Features • 32-bit microprocessor with 512K- or 1M-byte memory; asynchronous, synchronous, or SIO boards; provides network monitoring; variable-length, multiuser packets; virtual circuit network paths; remote terminal asynchronous interfacing; asynchronous and synchronous host interfacing and terminal concentration; terminal or host protocol, speed, and code translation; multiple host targeting; and network gateways.

Software • resident or downline loaded system software; Internally Switched Interface System (ISIS) software architecture supports multiple custom configured interfaces and maps them to standard internal protocol; supports both terminal and host interfaces and freestanding applications programs.

Program Development • vendor-supplied system-dependent software.

Configuration Flexibility • up to 64 V.24 asynchronous ports (up to 9600 bps), 32 V.24 synchronous ports (up to 19.2K bps), and 16 V.24 asynchronous (up to 9600 bps)/synchronous ports (up to 19.2K bps) or 4 V.35 synchronous ports (up to 76K bps) or 6 optical coupled links (up to 162.5K bps).

First Announced • 1976.

Communication Processors

Pricing • purchase price ranges from \$35,000 to \$60,000.

☐ Tymnet Engine

Function • modular nodal processor for Tymnet; performs network supervision, management, and control; supports terminal concentration, host interfaces, and network gateways; electronic mail • provides support for multiple protocols.

Associated Systems & Networks • Tymnet public network and any other public or custom network via standardized gateways.

Communications • up to 8 asynchronous boards, up to 32 ports each, 256 ports maximum; data rate from 50 bps to 4800 bps; internal clocking; RS-232C interface • up to 2 synchronous boards, up to 16 ports each, 32 ports maximum; data rates up to 19.2K bps; internal clocking at 4800 bps and 9600 bps; RS-232C interface • up to 4 SIO boards which support 64 ports maximum; each SIO board supports 16 V.24 asynchronous ports at up to 9600 bps each; or 16 V.24 synchronous ports (HDLC/SDLC) at up to 19.2K bps; or 4 V.35 synchronous ports (HDLC/SDLC) at up to 76K bps; or 6 optical coupled links at up to 162.5K bps • supports async, polled async, IBM 3270 BSC, X.25, SDLC, RJE/HASP, 2946, and Honeywell VIP 7700 terminal protocols.

Features • 32-bit microprocessor with 512K- or 1M-byte memory; asynchronous, synchronous, or SIO boards • provides network supervision and control; security access control; accounting information log; gateways; electronic mail; variable-length, multiuser packets; virtual circuit network paths; remote asynchronous terminal interfacing and terminal concentration; terminal or host protocol, speed, and code translation; and multiple host targeting.

Software • resident or downline loaded system software; Internally Switched Interface System (ISIS).

Program Development • vendor-supplied system-dependent software.

Configuration Flexibility • up to 256 RS-232C asynchronous ports operating at 50 to 4800 bps; up to 32 RS-232C ports operating at up to 19.2K bps; and up to 64 ports that can be a combination of V.24 asynchronous ports operating at up to 9600 bps, V.24 synchronous ports (HDLC/SDLC) operating at up to 19.2K bps, V.35 synchronous HDLC/SDLC ports (maximum of 16) operating at up to 72K bps, and optical coupled links (maximum of 24) operating at up to 162.5K bps.

First Announced • 1976.

Pricing • purchase price ranges from \$65,000 to \$90,000.

■ WESTINGHOUSE CANADA LTD/Electronic Systems Division

777 Walker's Line, Burlington, ON L7R 4B3 • 416-528-8811.

☐ Westinghouse W1655 Intelligent Communications Controller (ICC)

Function • online real-time message switcher and line concentrator; transfers data between central CPU and various remote data terminal groups.

Associated Systems & Networks • supports remote terminals conforming to IPARS (International Passenger Airlines Reservation System), U-100 (Sperry), special protocols (Air Canada), and link control procedures.

Communications • communication with remote data terminals over up to 8 lines and 8 backup lines at 4800 bps; data transfers to CPU over up to 4 trunk lines at up to 9600 bps • 2 independent Line Controllers per processor; 2 modem interfaces per controller with common Transmitter and separate Receivers • full- or half-duplex, synchronous/asynchronous; single/double synchronous character; internal/external synchronous detect; 5- to 8-bit character lengths; odd/even parity; 1/1.5/2 stop bits • RS-232C-compatible • remote polling (queue) and error handling procedures.

Features • multiprocessor Multibus-based system that includes 3 types of printed circuit boards plugged into a motherboard: processor (Intel 8080A microprocessor), line interface, and system memory; Multibus configuration supports Trunk Line Processor (TLI) that controls up to 4 trunk lines, and Remote Line Processors (RLI) that control up to 16 remote lines • 8080A microprocessor is an 8-bit parallel CPU with 14K-byte program memory, 1K-byte local "scratch-pad" RAM; system bus structured for shared access to common system memory; processor bus structured for internal ROM and RAM • 32K bytes of RAM maximum system memory • Line Interface Card supports 2 independent Line Controllers and 2 Modem Interfaces per controller.

Software • self-checking routines applied at power-up; can also be called up from operating systems • operating software includes Trunk Line Processor functions and remote software • Trunk Line Processor functions include: power-up and initial self-checking function; housekeeper functions that include management of buffers, general time keeping responses, and dumping to remote console; receiver function establishes link procedure and deals with output data from CPU; transmit function handles block numbering and multiblock message assembly/chaining procedures; remote line processing; polling, error, and message handling; statistics accumulated on "per line" and "per drop" basis; and console operation allows terminal operator to call up configuration status/line statistics for display • remote software tasks include power up and initial testing, housekeeping functions, transmit and receive functions.

Program Development • user-specified, vendor-supplied.

Configuration Flexibility • typical network system supporting 8 lines can have 30 display terminals connected to each line operating at 2400 bps synchronous, transmitting and receiving 125-character data blocks • maximum system supports up to 8 lines, 8 backup lines, and up to 4 trunk lines.

First Announced • 1976.

Pricing • purchase price for a typical configuration runs between \$15,000 to \$20,000; does not include application software development.

• END