



CDC® CYBER 18 COMPUTER SYSTEMS

OVERVIEW MANUAL

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PREFACE

This manual provides a general scope of the Control Data® CYBER 18 System. It also contains information to aid users and maintenance personnel in understanding the configurations, maintenance concept, and technical manual support of the subject equipment.

Product numbers contained in this manual are for reference only. The configuration authority is the corporate pricing manual.



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This section includes descriptions of the CYBER 18 computer system configurations. CYBER 18 computer systems are general purpose systems that consist of a central processor, expansion options, and a variety of peripheral subsystems. Refer to section 3 for the available processor and processor system-applicable expansion options, system-applicable peripheral subsystems, product numbers, equipment designations, and maintenance manual correlation.

The CYBER 18 systems are organized around processors that may be configured in numerous forms using basic hardware. The interface between processors and peripherals is made possible through controllers housed in the processor chassis. The controllers connect to the A/Q

or A/Q-DMA bus of the processor through a common chassis backplane. Interface cable(s) connect the controllers to the peripheral devices through push-on connectors that mount directly on the processor backplane.

The system configurations differ in processor options, memory-expansion capability, and peripheral subsystems. CYBER 18 products exist in two forms:

- Complete systems that include processor memory and peripherals as one product
- Individual processors, memory, controllers, and peripherals as separate products



CYBER 18-10M PROCESSOR

The CYBER 18-10M Processor consists of a cabinet that houses the processor chassis, an operator panel, a power supply, a controller for the operator's console display, and a flexible disk drive with a controller for diagnostic loading. The CYBER 18-10M Processor features include:

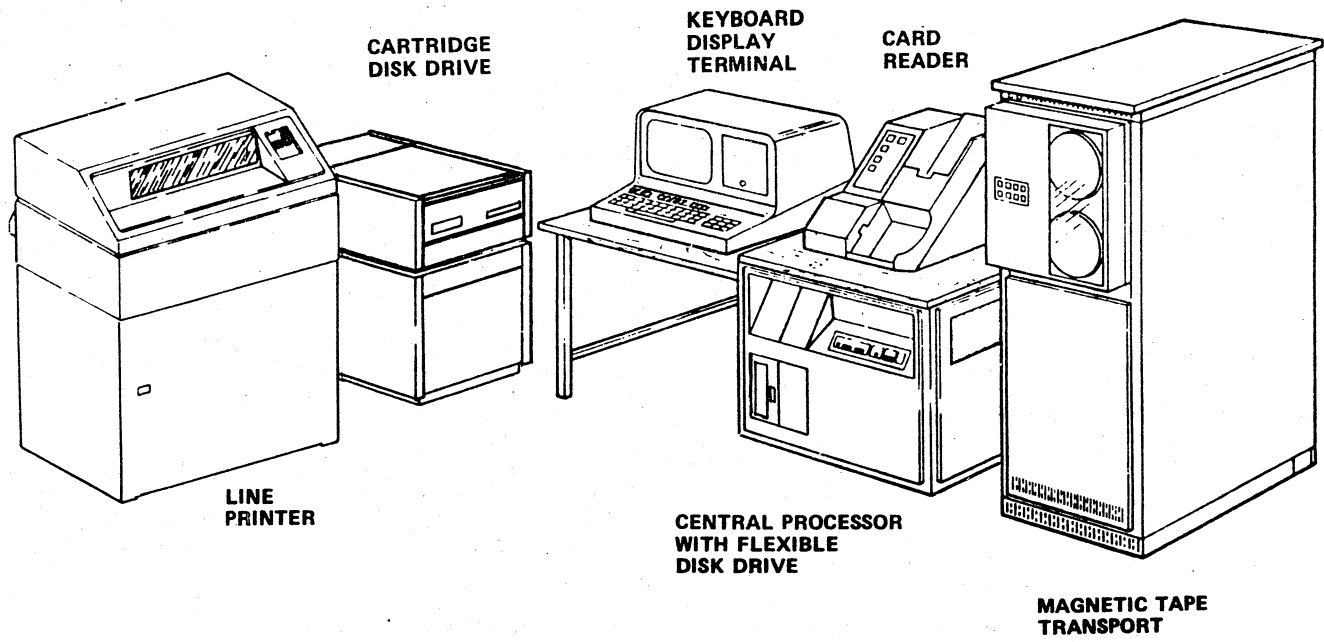
- Hardware multiply/divide
- Sixteen levels of interrupts
- Automatic data transfer
- Real-time clock
- Deadstart load/autoload capability

The CYBER 18-10M Processor supports up to four A/Q type peripheral-device controllers plus up to four A/Q-DMA controllers, and one MO5 device. In addition, the processor accommodates 32K through 128K bytes (8-bit) (16K words through 64K words) of MOS main memory (one parity bit and one protect bit per every two bytes).

Table 1-1 lists the basic equipment supplied with a CYBER 18-10M computer system. Figure 1-1 illustrates a typical system employing a CYBER 18-10M Processor. Refer to section 3 and figure 1-1 for optional peripheral subsystems, expansion equipment, product numbers, equipment designations, maintenance manuals, and publication numbers.

TABLE 1-1. CYBER 18-10M PROCESSOR EQUIPMENT SUPPLIED

Quantity	Equipment Name	Equipment Number
1	Equipment cabinet, including:	AA132
1	Basic MOS CPU, which includes:	
1	Status mode interrupt (SMI) printed wiring assembly (PWA)	
1	Arithmetic logic unit (ALU) PWA	
1	1700 Transform PWA	
1	Control no. 1 PWA	
1	Control no. 2 PWA	
1	I/O-TTY controller	
1	MOS memory interface	BA212†
1	Power supply (+5 V and +12 V dc)	
1	Flexible disk drive subsystem, consisting of:	
1	Flexible disk drive controller	FA730†
1	Flexible disk drive	BR803†
1	Power supply (24 V dc)	
1	Tabletop extension (supplied with AA132-C only)	AV102
†Subassembly equivalent to this equipment		



PROCESSOR OPTIONS	I/O OPTIONS	
1870-2	722-10	1855-1
1872-3	1811-1	1855-100
1874-1	1811-2	1856-1
1875-1	1828-1	1856-2
1875-2	1828-2	1856-3
1882-16	1833-4	1856-4
1882-32	1843-1	1860-1
1888-3	1843-2	1860-2
1890-1	1843-3	1860-3
1890-2	1843-4	1860-4
1890-3	1843-5	1860-5
1890-4	1843-100	1860-6
1890-5	1843-101	1862-1
	1843-200	1865-2
	1843-201	1888-4
	1850-1	10430-1

SEE SECTION 3 FOR PRODUCT, EQUIPMENT AND MAINTENANCE MANUAL CORRELATION.

1868-1

Figure 1-1. Typical CYBER 18-10M Configuration

CYBER 18-20 PROCESSOR

The CYBER 18-20 Processor consists of a cabinet that houses a micro programmable processor chassis, an operator's panel, power supplies, a flexible disk drive and controller, and I/O controller to support a 722-10 or an 1811-1/2 communication console. The CYBER 18-20 Processor features include:

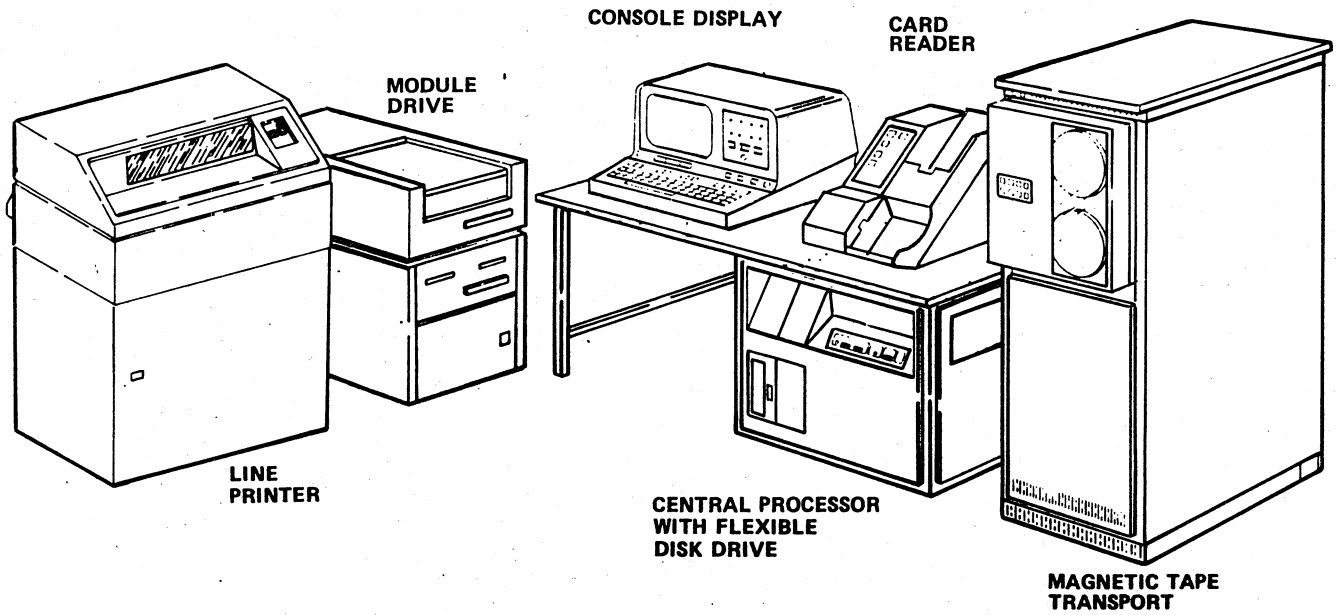
- Hardware multiply/divide
- Sixteen levels each of micro and macro interrupts
- Automatic data transfer
- Real-time clock
- Deadstart facility from peripherals

The CYBER 18-20 Processor supports an AQ I/O port and an A/Q-DMA I/O port. The A/Q I/O port sustains up to four peripheral controllers. The A/Q-DMA I/O port supports up to four A/Q-DMA devices, one MOS device, and accommodates up to 262,144 8-bit bytes (one protect and one parity bit provided for every two bytes) of MOS main memory.

Table 1-2 lists the basic equipment supplied with a CYBER 18-20 computer system. Figure 1-2 illustrates a typical system employing a CYBER 18-20 Processor. Refer to section 3 and figure 1-2 for optional peripheral subsystems, expansion equipment, product numbers, equipment designations, maintenance manuals, and publication numbers.

TABLE 1-2. CYBER 18-20 PROCESSOR EQUIPMENT SUPPLIED

Quantity	Equipment Name	Equipment Number
	Equipment cabinet, including:	AA132
1	Basic MOS CPU, which includes:	
1	Status mode interrupt (SMI) PWA	
1	Arithmetic logic unit (ALU) PWA	
1	1700 Transform PWA	
1	Control no. 1 PWA	
1	Control no. 2 PWA	
1	I/O-TTY controller	
1	MOS memory interface	BA212†
1	Power supply (+5 V dc and +12 V dc)	
1	Flexible disk drive subsystem, consisting of:	
1	Flexible disk drive controller	FA730†
1	Flexible disk drive	BR803†
1	Power supply (+24 V dc)	
1	Tabletop extension (applicable to step-down cabinet cubicles AA132-C and D)	AV102
†Subassembly equivalent to this equipment.		



PROCESSOR OPTIONS	I/O OPTIONS	
1870-2	722-10	1856-3
1872-3	1811-1	1856-4
1874-1	1811-2	1860-1
1875-1	1828-1	1860-2
1875-2	1828-2	1860-3
1882-16	1833-1	1860-4
1882-32	1833-2	1860-5
1888-3	1833-4	1860-6
1890-1	1833-6	1862-1
1890-2	1843-1	1865-2
1890-3	1843-2	1867-1
1890-4	1843-3	1867-2
1890-5	1843-4	1867-3
	1843-5	1867-4
	1843-100	1867-10
	1843-101	1867-20
	1843-200	1867-40
	1843-201	1868-1
	1850-1	1888-4
	1855-1	10430-1
	1855-100	10445-1
	1856-1	10445-2
	1856-2	

SEE SECTION 3 FOR PRODUCT, EQUIPMENT AND MAINTENANCE MANUAL CORRELATION.

1869-2

Figure 1-2. Typical CYBER 18-20 Configuration

CYBER 18-25 PROCESSOR

The CYBER 18-25 Processor consists of two processors (designated main and communication) housed in a dual-processor cabinet and a separate communication subsystem cabinet that houses the multiplexer for the communication line adapters. The main processor contains the same features, characteristics, and I/O capabilities as the CYBER 18-20 Processor. The communication processor is similar to the CYBER 18-20 Processor except for the I/O capability. Each processor includes a flexible disk drive for diagnostic loading and a read/write micro-memory with a 2048 16-bit instruction capability. Although no main memory is included, each processor can accommodate from 32K bytes to 262K bytes of MOS main memory. The communication multiplexer can accommodate up to sixteen 2561-1 communication line adapters. The main processor and communication processor are linked by interrupt/status lines and have the ability to share each other's main memory. One console display may be switched between processors.

Table 1-3 lists the basic equipment supplied with a CYBER 18-25 computer system. Figure 1-3 illustrates a typical

system employing a CYBER 18-25 Processor. Refer to section 3 and figure 1-3 for optional peripheral subsystems, expansion equipment, product numbers, equipment designations, maintenance manuals, and publication numbers.

The CYBER 18-25 Processor also includes a vertical cabinet (figure 1-4). This cabinet houses the communication line expansion power supply, communication line expansion unit, and communication multiplexer adapters.

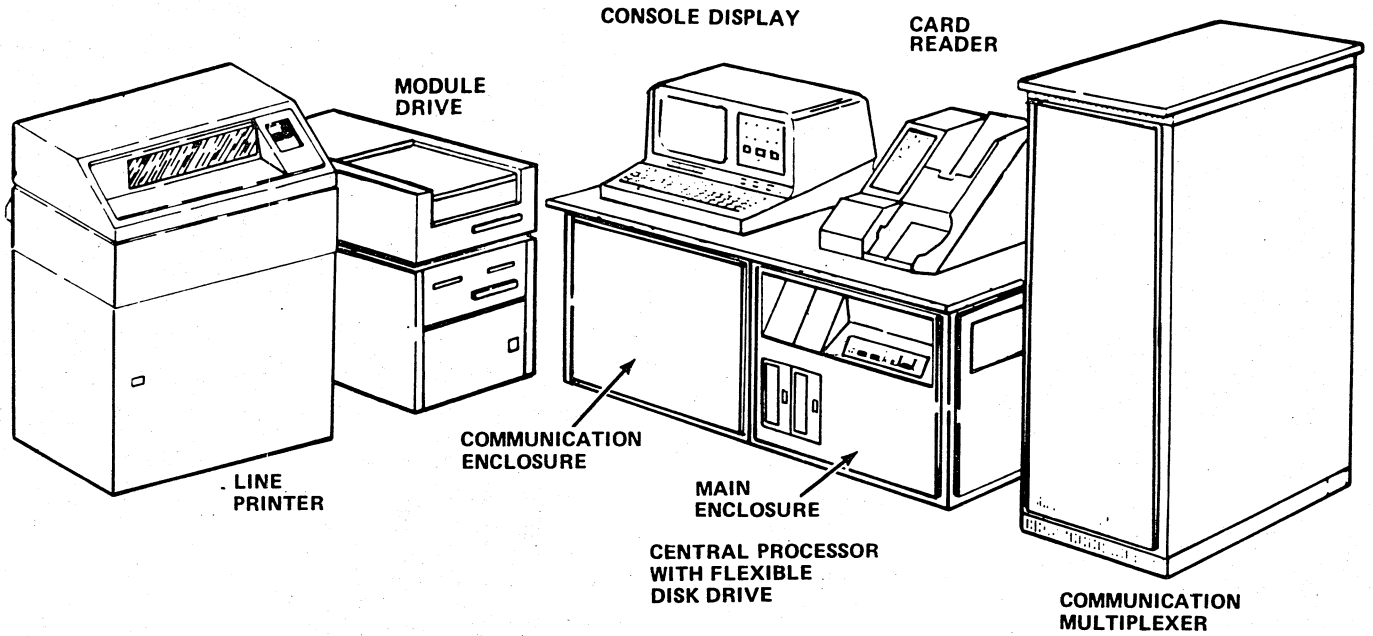
The communication line expansion capabilities of a CYBER 18-25 system can be expanded by adding a 10431-1 communication multiplexer expansion subsystem. This provides facilities to increase the communication line capabilities of the CYBER 18-25 system from 32 lines to 64 lines. The 10431-1 subsystem consists of a vertical cabinet, power supply, blower assembly, communication line expansion chassis, loop multiplexer PWA, and loop multiplexer interface cable (figure 1-4). The interface cable interconnects the two communication line expansion subsystems.

TABLE 1-3. CYBER 18-25 PROCESSOR EQUIPMENT SUPPLIED

Quantity	Equipment Name	Equipment Number
1	Equipment cabinet, including: Main Processor, which includes:	AA153
1	Basic MOS CPU:	
1	Status mode interrupt (SMI) PWA	
1	Arithmetic logic unit (ALU) PWA	
1	1700 Transform PWA	
1	Control no. 1 PWA	
1	Control no. 2 PWA	
1	I/O-TTY controller	
1	MOS memory interface	BA212 [†]
1	Power supply (+5 V dc and +12 V dc)	
1	Flexible Disk Drive	BR803 [†]
1	Flexible Disk Drive Controller	FA730 [†]
	Communication Processor, which includes:	
1	Communication processor:	
1	Status mode interrupt (SMI) PWA	
1	Arithmetic logic unit (ALU) PWA	
1	1700 Transform PWA	
1	Control no. 1 PWA	
1	Control no. 2 PWA	
[†] Subassembly equivalent to this equipment		

TABLE 1-3. CYBER 18-25 PROCESSOR EQUIPMENT SUPPLIED (Contd)

Quantity	Equipment Name	Equipment Number
	Communication processor (contd):	
1	I/O-TTY controller	
1	MOS memory interface	BA212 [†]
1	Power supply (+5 V dc and +12 V dc)	
1	Flexible Disk Drive:	BR803 [†]
1	Flexible Disk Drive Controller	FA730 [†]
1	Communication multiplexer subsystem:	
1	Multiplexer loop interface adapter (MLIA), consisting of:	DY192 [†]
1	MLIA no. 1 (input loop)	
1	MLIA no. 2 (output loop)	
1	MLIA no. 3 (processor interface)	
1	Communication line expansion	DY198 [†]
1	Power supply (+5 V dc and +12 V dc)	
1	Equipment cabinet (vertical), which includes:	XA123 [†]
1	Power supply ^{††}	
1	Communication line expansion ^{††}	
[†] Subassembly equivalent to this equipment ^{††} Equipment of communication multiplexer subsystem		

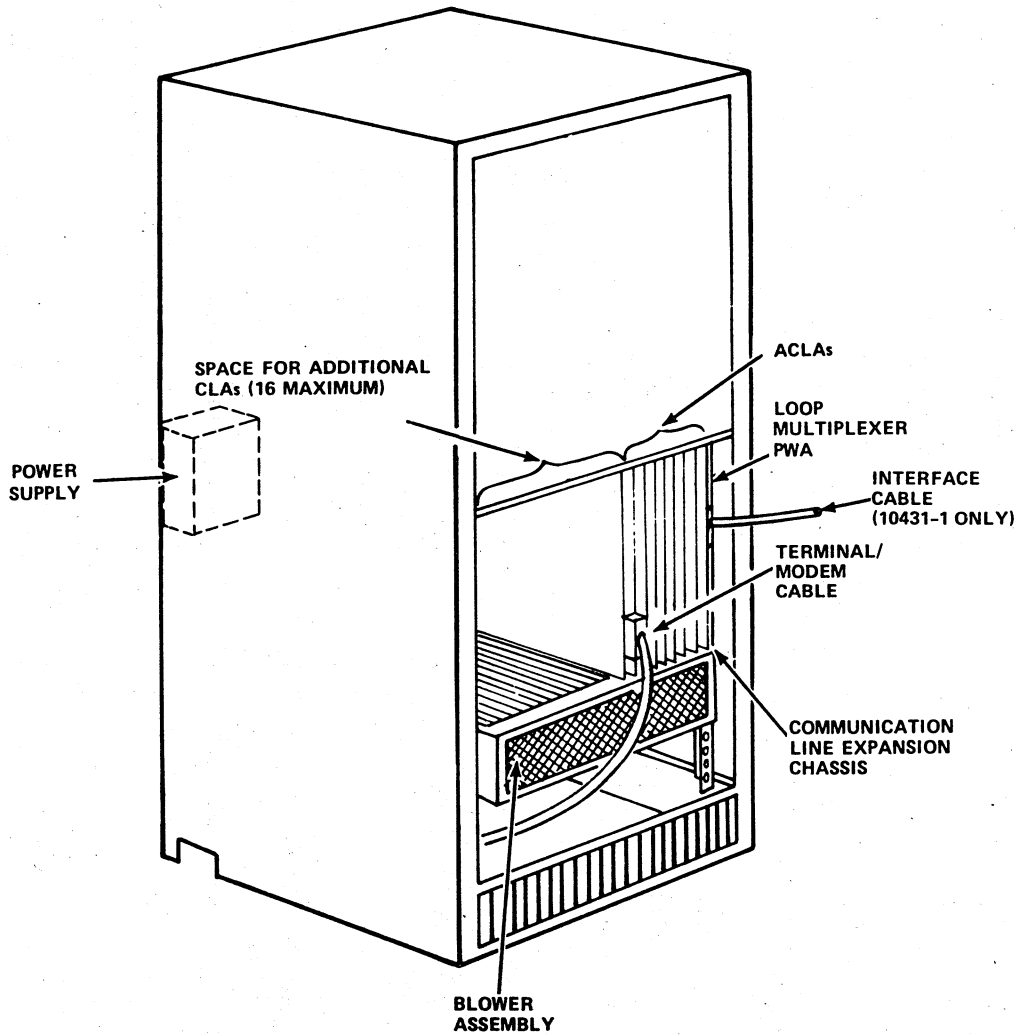


PROCESSOR OPTIONS	I/O OPTIONS	
1870-2	722-10	1860-4
1872-3	1811-1	1860-5
1874-1	1811-2	1860-6
1875-1	1828-1	1862-1
1875-2	1828-2	1867-1
1882-16	1833-4	1867-2
1882-32	1833-6	1867-3
1883-3	1843-2	1867-4
	1843-3	1867-10
	1843-5	1867-20
	1850-1	1867-40
	1855-1	1868-1
	1856-1	1887-4
	1856-2	1887-5
	1856-3	1888-4
	1856-4	10431-1
	1860-1	10445-1
	1860-2	10445-2
	1860-3	2561-1
		2561-12

SEE SECTION 3 FOR PRODUCT, EQUIPMENT AND MAINTANCE MANUAL CORRELATION.

1870-2

Figure 1-3. Typical CYBER 18-25 Configuration



1377-2

Figure 1-4. Communication Multiplexer, Loop Multiplexer Configuration

CYBER 18-30 TIMESHARE SYSTEM

The CYBER 18-30 Timeshare System consists of two processors (designated timeshare and communication) housed in one enclosed cabinet and is based on the CYBER 18 product line designed to support educational timesharing applications with shared memory. The basic system supports 16 optional terminals with an expansion capability of up to 64 terminals. The timeshare processor has 128 bytes of MOS memory and the communications processor has 98K bytes. Each processor has memory paging registers and read/write micro-memory for 2K instructions. The system comment device is switched between processors at the operator's panel. The timeshare processor includes the appropriate controllers for one each of the following:

- Module drive, 50M byte
- Nine-track tape unit
- Card reader, 300 card-per-minute
- Line printer, 300 line-per-minute
- Tape cassette transport

The communication processor includes:

- Multiplexer loop interface adapter
- Loop multiplexer
- Tape cassette transport

All controllers, cables, power supplies, and cabinets are also included.

Table 1-4 lists the basic equipment supplied with a CYBER 18-30 computer cabinet. Figure 1-5 illustrates a typical system employing a CYBER 18-30 Timeshare System. Refer to section 3 and figure 1-5 for optional peripheral subsystems, expansion equipment, product numbers, equipment designations, maintenance manuals, and publication numbers.

The CYBER 18-30 Timeshare System also includes a vertical cabinet (figure 1-6). This cabinet houses the communication line expansion power supply and communication line expansion unit. The cabinet also provides facilities for housing the magnetic tape transport and translator printed wiring assembly or formatter, if an optional magnetic tape subsystem (NRZI or phase encoded) is included with the system.

TABLE 1-4. CYBER 18-30 TIMESHARE SYSTEM EQUIPMENT SUPPLIED

Quantity	Equipment Name	Equipment Number
1	Equipment Cabinet including: Timeshare Processor, which includes:	AA133
1	Basic MOS CPU:	
1	Status mode interrupt (SMI) PWA	
1	Arithmetic logic unit (ALU) PWA	
1	1700 Transform PWA	
1	Control no. 1 PWA	
1	Control no. 2 PWA	
1	I/O-TTY controller	
1	MOS memory interface	BA212 [†]
1	Power supply (+5 V dc and +12 V dc)	
2	MOS memory array (32K)	AT241 [†]
1	2K-instruction micro memory (RAM)	BA210 [†]
1	Tape cassette subsystem	
1	Tape cassette controller	FA104 [†]
2	Tape cassette transport (one connected to each processor)	BE602 [†]
[†] Subassembly equivalent to this equipment		

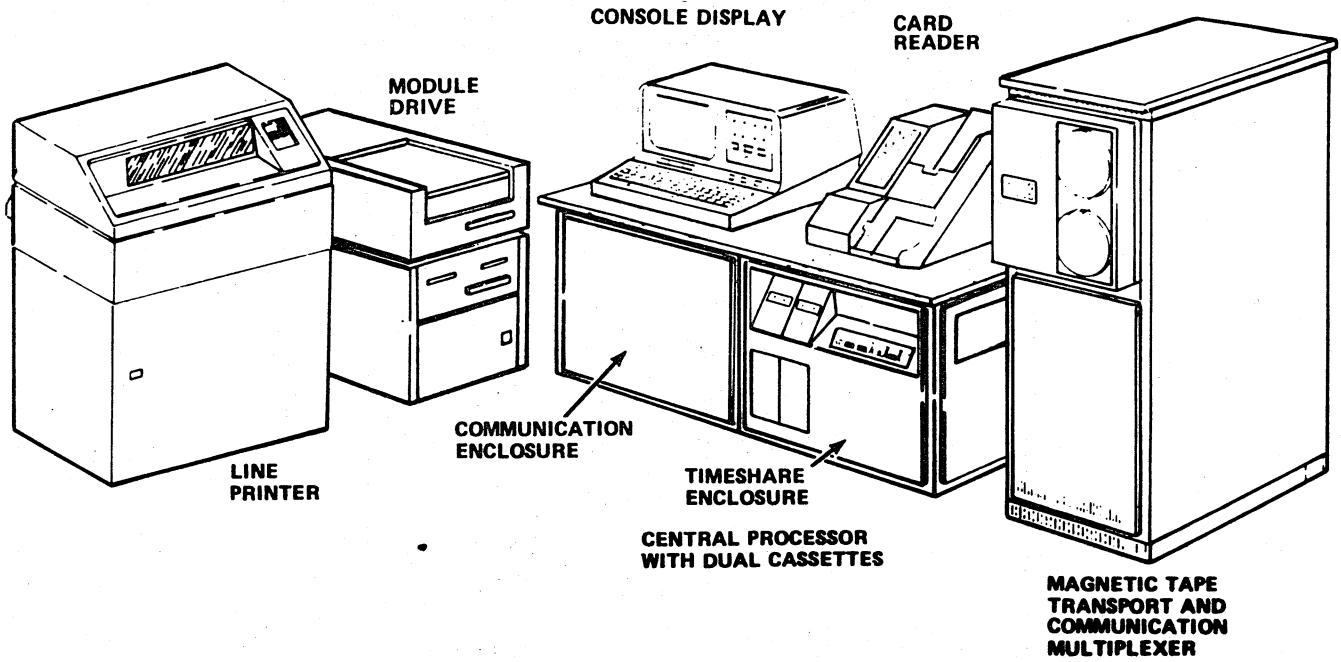
TABLE 1-4. CYBER 18-30 TIMESHARE SYSTEM EQUIPMENT SUPPLIED (Contd)

Quantity	Equipment Name	Equipment Number
	Timeshare Processor (contd):	
1	Magnetic tape transport subsystem	
1	Magnetic tape controller (NRZI)	FA107†
1	Translator	BW812†
1	Magnetic tape transport (9 track)	BW303†
1	Card reader and line printer subsystems	
1	Card reader line printer controller	FH301†
1	Card reader	CB104†
1	Band printer	CT105/CT103/CT106†
	Drum printer	CL408/CL411
1	Storage module drive (SMD) subsystem	
	Module drive interface	GB138†
	Module drive control unit	FA727†
	Module drive	BJ701†
	Communication Processor, which includes:	
1	Communication processor:	
1	Status mode interrupt (SMI) PWA	
1	Arithmetic logic unit (ALU) PWA	
1	1700 Transform (with read-only memory or binary coded decimal arithmetic) PWA	
1	Control no. 1 PWA	
1	Control no. 2 PWA	
1	I/O-TTY controller	
1	MOS memory interface	BA212†
1	Power supply (+5 V dc and +12 V dc)	
1	MOS memory array (32K)	AT241†
1	MOS memory array (16K)	AT275†
1	2K-instruction micro memory (RAM)	BA210†
1	Tape cassette subsystem	
1	Tape cassette controller	FA104†
1	Tape cassette transport (contained in timeshare cabinet)	

†Subassembly equivalent to this equipment

TABLE 1-4. CYBER 18-30 TIMESHARE SYSTEM EQUIPMENT SUPPLIED (Contd)

Quantity	Equipment Name	Equipment Number
	Communication Processor (contd):	
1	Communication multiplexer subsystem	
1	Multiplexer loop interface adapter (MLIA), consisting of:	DY192†
1	MLIA no. 1 (input loop)	
1	MLIA no. 2 (output loop)	
1	MLIA no. 3 (processor interface)	
1	Communication line expansion	DY198†
1	Power supply (+5 V dc and +12 V dc)	
1	Breakpoint controller	FC402†
1	Breakpoint panel	DT120†
1	Console display	CC614† or CC628†
1	Equipment cabinet (vertical)	GH447†
1	Power supply†††	
1	Power distribution box	
1	Magnetic tape transport††	
1	Translator††	
1	Communication line expansion†††	
†Subassembly equivalent to this equipment		
††Equipment of magnetic tape transport subsystem		
†††Equipment of communication multiplexer subsystem		

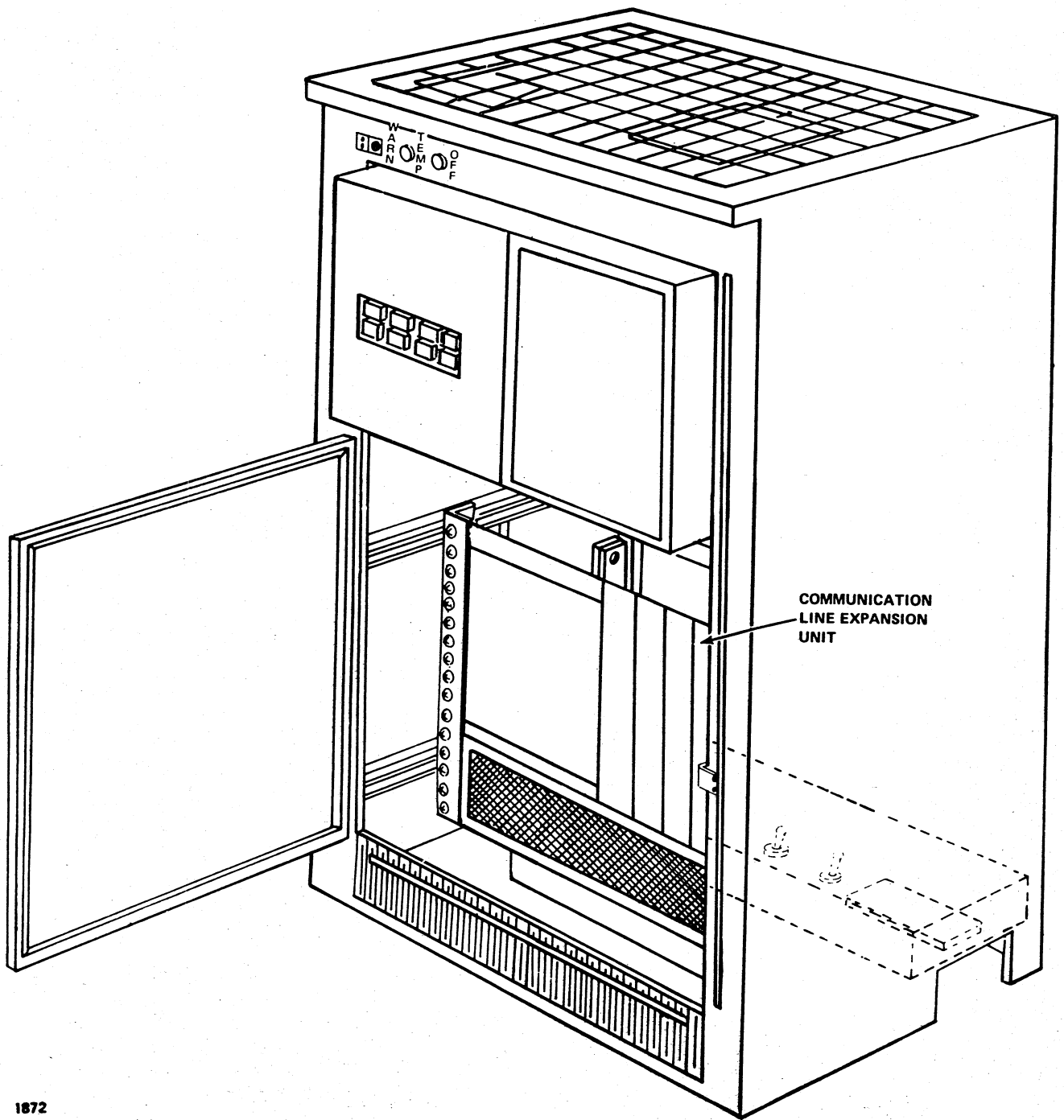


PROCESSOR OPTIONS	I/O OPTIONS	
1872-3	722-10	1860-72
1874-1	1811-1	1860-92
1882-16	1811-2	1862-1
1882-32	1828-1	1867-1
1888-1	1828-2	1867-2
1888-3	1833-4	1867-4
	1833-6	1867-10
	1843-1	1867-20
	1843-2	1867-40
	1850-1	1868-1
	1860-1	1888-4
	1860-2	10431-1
	1860-3	10445-1
	1860-4	10445-2
	1860-5	2561-1
	1860-6	

SEE SECTION 3 FOR PRODUCT, EQUIPMENT AND MAINTENANCE MANUAL CORRELATION.

1871-3

Figure 1-5. Typical CYBER 18-30 Timeshare System Configuration



1872

Figure 1-6. Vertical Cabinet Configuration



This section provides a description of the customer engineer approach to a maintenance call. Included is a table for anticipated time required for various tasks and figures that indicate the procedural routines. Levels 1 and 2 in table 2-1 are recommended customer performance, but should be verified by the customer engineer during an emergency maintenance.

ON-SITE SERVICE APPROACH

The following procedure outlines a customer engineer approach to a maintenance call.

1. Before going to the customer's site, assemble all the necessary documentation applicable to the site configuration. Know what spare parts may be required.
2. Upon arriving at the customer's site, talk to the customer to obtain information regarding the nature of the system failure. Determine whether the customer can identify specifically what is wrong with the system.
3. Regardless of how the customer describes the malfunction, always make sure that all cables are connected securely. Also, check that all printed wiring assemblies are properly seated in the processor.
4. If the malfunction is in the peripheral unit, first run the Loadcheck and Instruction Test diagnostic decision logic tables (DDLTs) in the processor manual. After completing these tests, test the defective device. If a fault exists but the customer cannot identify what is wrong, a complete test of each subsystem may be required.
5. Whenever there are multiple units on a subsystem (more than one magnetic tape transport, module drive, and so forth), start at the beginning of the respective table to test each unit. If all the units have been tested, go to the next subsystem test. If diskettes are the load medium, and there are two flexible disk drives (FDDs) in the FDD subsystem, the complete subsystem test must be repeated with the diskette inserted in the second FDD. The test is also to be repeated in the dual mode if available. This same method should be used if tape cassettes are the load medium. For either loading device, begin at the start of the particular subsystem table and continue normally.
6. After taking corrective action, rerun the subsystem test starting at sheet 1 of the DDLT to make sure the fault has been corrected.
7. After testing is complete, perform any required preventive maintenance as listed in table 2-1. Be sure to set all switches used during testing to the proper positions for customer use of the system.
8. Finally, before leaving the customer site, talk to the customer. Never leave the site without first receiving assurance that the customer is satisfied.

PREVENTIVE MAINTENANCE

Preventive maintenance is a scheduled maintenance routine performed to keep the equipment operating at its optimum level. The maintenance index (table 2-1) indicates the time interval for preventive maintenance of the special subsystem equipments in the typical CYBER 18 computer system. Refer to the respective subsystem manual in section 3 for procedures that pertain to the actions designated in table 2-1.

CABLING

Refer to the installation manual referenced in section 3 for the cable interface information to interconnect the CYBER 18 processor backplanes, controllers, and peripherals that are part of the system.

CORRECTIVE MAINTENANCE

Corrective maintenance begins with the running of operational diagnostic system (ODS) tests in conjunction with the diagnostic decision logic tables (DDLTs) contained in the processor and subsystem hardware maintenance manuals and field repair guides listed in section 3. Any time a subsystem malfunction is suspected, the Loadcheck and Instruction Test DDLTs in the processor manual must be successfully completed before testing the suspect subsystem. Figure 2-1 illustrates the procedure. If the system malfunction cannot be identified specifically, run a test of each subsystem. This is accomplished by running all system-applicable ODS tests and DDLTs in sequence, as illustrated in figure 2-2.

When multiple units are employed in the system configuration, such as magnetic tape, module drive, and so forth, the respective tests must be reloaded and new parameters determined before testing, subsequent units. Testing begins at the first sheet of the particular subsystem DDLT.

DIAGNOSTICS

The ODS tests that reside on diskette and cassette are periodically revised. Therefore, on-site-maintenance personnel should refer to CYBER 18 Diagnostic Service Bulletins pertaining to ODS 2.0 release or availability for the part numbers of ODS diskettes or cassettes. The service bulletins are issued by Control Data Engineering Services. When orders are placed for any of the basic part numbers, the latest revision level is supplied.

If the system being tested is a CYBER 18 system with the flexible disk drive subsystem supplied as a standard loading device, the diskettes are required. If the system being tested is a CYBER 18 system with the tape cassette subsystem supplied as the standard loading device, the tape cassettes are required. In systems that include a card reader, the off-line test card decks listed in the hardware maintenance manuals in section 3 are provided for operational testing and adjustment of the card reader.

When testing the system using ODS tests and DDLT procedures, all tests must be run using one load medium. If testing is started with flexible disk drive diskettes, all processor and subsystem tests must be completed using diskettes. If testing is started with tape cassettes, all processor and subsystem tests must be completed using tape cassettes. Do not mix the load media.

TABLE 2-1. PREVENTIVE MAINTENANCE PLAN FOR CYBER 18 SUBSYSTEMS

Equipment	Level†					Action	Time Required (Minutes)	
	1	2	3	4	5			
Processor	X					Perform visual inspection.	15	
			X			Clean fan filter.	10	
			X			Check fans.	15	
Breakpoint panel			X			Perform visual inspection and removal of accumulated dust from panel surfaces	2	
Card reader	X					Perform visual inspection.	3	
		X				Inspect/clean.	15	
			X			Vacuum inside card reader.	10	
				X		Check throat gap setting.	30	
				X		Check head skew.	40	
				X		Inspect drive belt.	20	
				X		Inspect timing disk.	45	
Console display	X	X				Perform visual inspection and removal of accumulated dust from keyboard and exposed surfaces.	2	
Keyboard display terminal	X	X				Perform visual inspection and removal of accumulated dust from keyboard and exposed surfaces.	2	
Line printer (drum)	X					Inspect/clean.	15	
			X			Clean print drum.††	30	
			X			Lubricate.	15	
Paper tape reader	X					Inspect/clean.	15	
†Level 1		Before power-up after sustained shutdown						
Level 2		150 hours or weekly						
Level 3		700 hours or monthly						
Level 4		2100 hours or quarterly						
Level 5		6000 hours or annually						
††		Cleaning frequency depends upon usage.						

TABLE 2-1. PREVENTIVE MAINTENANCE PLAN FOR CYBER 18 SUBSYSTEMS (Contd)

Equipment	Level†					Action	Time Required (Minutes)
	1	2	3	4	5		
Paper tape punch		X				Inspect/clean.	15
Magnetic tape transport (NRZI/PE)	X					Inspect/clean.	15
		X				Check operators panel light bulb.	15
			X			Check blower.	20
Tape cassette transport	X					Clean.	10
		X				Inspect.	15
Flexible disk drive	X			X		Clean read/write head.	30
Module drive				X		Inspect accuator assembly.	2
				X		Clean primary filter.††	5
				X		Test power supply voltage.	5
				X		Clean shroud and spindle.	5
				X		Clean/lubricate lockshaft.	5
				X		Clean carriage rails and bearings.	5
					X	Replace absolute filter.††	20
			X			Clean control unit air filter.	10
Cartridge disk drive			X			Inspect and clean read/write heads.	5
			X			Inspect and clean disk cartridge.	2
			X			Inspect and clean fixed disk.	5
			X			Clean prefilter.	5
					X	Check and replace disk brush.	15
Line printer (band)					X	Replace absolute filter.††	20
			X			Inspect/clean.	30
			X			Clean and check band.	10
				X	Lubricate (gate).	10	

† Level 1 Before power-up after sustained shutdown
 Level 2 150 hours or weekly
 Level 3 700 hours or monthly
 Level 4 2100 hours or quarterly
 Level 5 6000 hours or annually

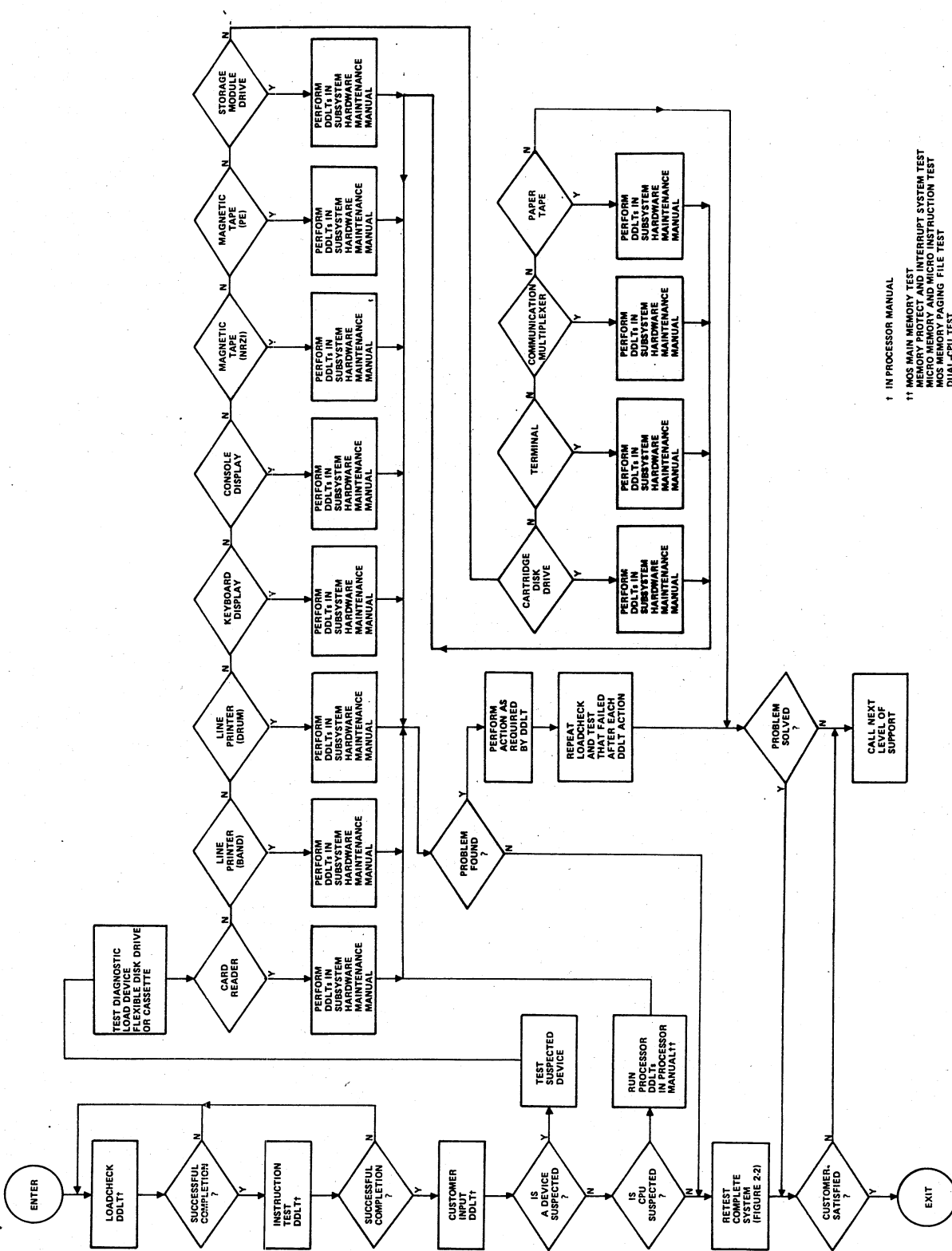
†† May require more or less frequent cleaning or replacement depending upon the environmental conditions.

TABLE 2-1. PREVENTIVE MAINTENANCE PLAN FOR CYBER 18 SUBSYSTEMS (Contd)

Equipment	Level [†]					Action	Time Required (Minutes)
	1	2	3	4	5		
Matrix printer			X			Inspect/clean.	20
			X			Lubricate.	10
Communication multiplexer	X					Perform visual inspection.	10
			X			Clean fan filter. ^{††}	5
			X			Check fans.	5

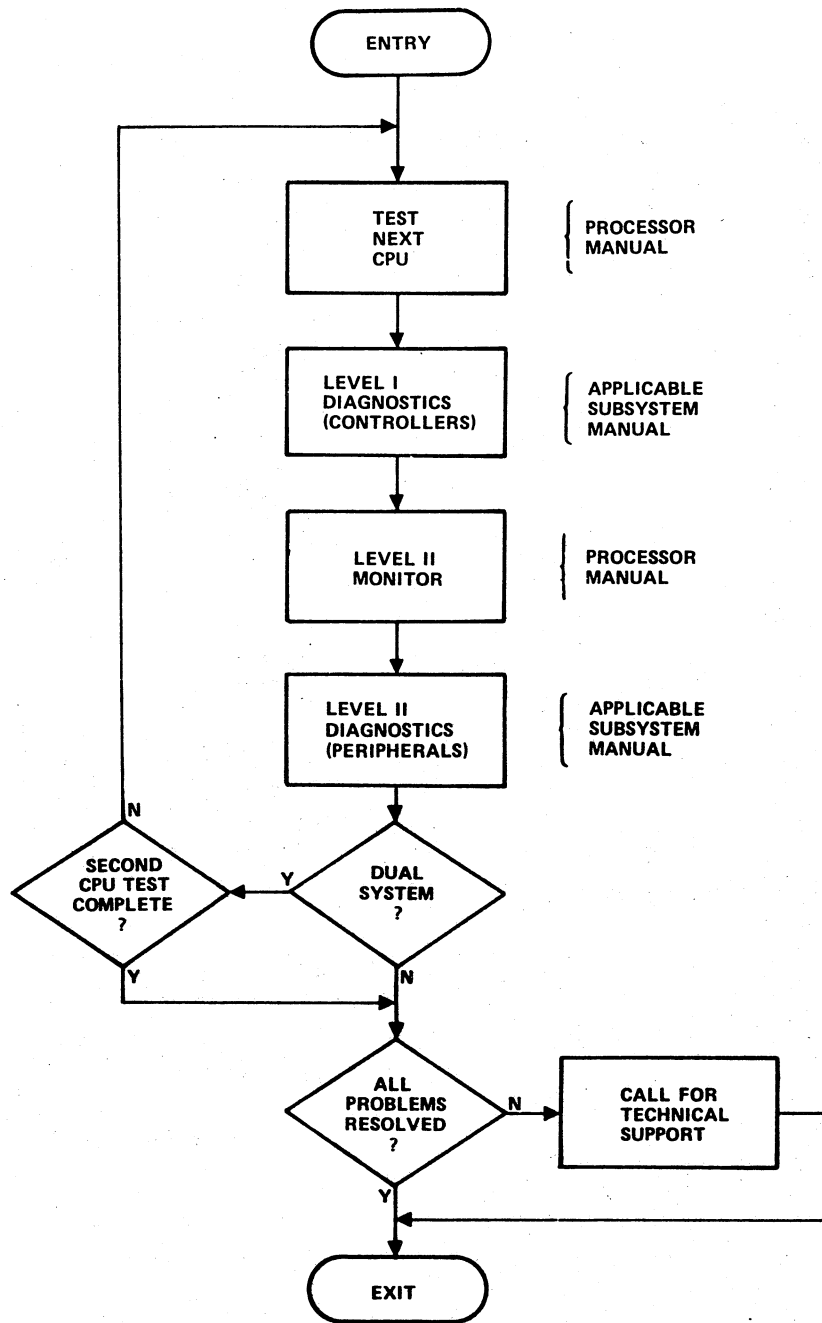
[†]Level 1 Before power-up after sustained shutdown
 Level 2 150 hours or weekly
 Level 3 700 hours or monthly
 Level 4 2100 hours or quarterly
 Level 5 6000 hours or annually

^{††}May require more or less frequent cleaning or replacement depending upon the environmental conditions.



1 IN PROCESSOR MANUAL
 11 MOS MAIN MEMORY TEST
 12 MOS MEMORY ADDRESS AND INTERRUPT SYSTEM TEST
 13 MICRO MEMORY ADDRESS AND INTERRUPT SYSTEM TEST
 14 MOS MEMORY ADDRESS AND INTERRUPT SYSTEM TEST
 15 MOS MEMORY ADDRESS AND INTERRUPT SYSTEM TEST
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 17 MOS MEMORY ADDRESS AND INTERRUPT SYSTEM TEST
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Figure 2-1. System Troubleshooting Flowchart



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Figure 2-2. Flowchart for a Complete System Test Sequence

APPLICABLE DOCUMENTS

3

Maintenance documents applicable to the CYBER 18 computer systems are listed in table 3-1. This table lists the manuals associated with the computer processor and the optional peripheral subsystem hardware maintenance manuals. It provides product numbers, equipment numbers, product names, titles and publication numbers of the hardware maintenance, reference, field repair guide, and parts identification manuals required to test, adjust,

and repair the listed processors and peripheral subsystems. The referenced publication titles may include equipment numbers for additional equipment that applies to the manual. These titles indicate only the equipment number(s) of equipment(s) used by related CYBER 18 subsystems. If the subsystem equipment number is listed, the manual content is applicable to the system or subsystem.

TABLE 3-1. PROCESSOR AND PROCESSOR SUBSYSTEM OPTIONS

Product Number	Equipment Number	Product Name	Maintenance Documents	Publication Number
ALL	--	--	General Information Manuals AA132, AA133, AA153, AA155 CYBER 18 Processor with MOS Memory Field Print Package Manual AA132, AA133, AA153, DT120, FC402 CYBER 18 Computer Systems Central Processor Field Repair Guide AA132, AA133, AA153, GH447, GH461 CYBER 18 Equipment Cabinets Hardware Reference/Maintenance Manual AT241, AT275, BA212, DT223 MOS Memory Subsystem Hardware Reference/Maintenance Manual BR803 Flexible Disk Drive Hardware Maintenance Manual BR803, GD310, FA730 Flexible Disk Drive Subsystem Field Repair Guide Basic Micro-Programmable Processor Hardware Maintenance Manual CC614 Console Display Subsystem Field Repair Guide CYBER 18 Computer Systems Site Planning Kit CYBER 18 Computer Systems with MOS Memory Installation Manual CYBER 18 Processor with MOS Memory Macro Level Hardware Reference Manual FA730 Flexible Disk Drive Controller Hardware Reference/Maintenance Manual GD122-B, GD122-E, XA148-A Power Supply System Hardware Reference/Maintenance Manual Micro Programmable Computer Family 1700 Enhanced Processor with Core Memory Hardware Reference Manual Micro-Programmable Computer Family Micro Processor Hardware Reference Manual Operational Diagnostic System (ODS) Version 2 Reference Manual	60475100 60475001† 96768280 96768600 77834769 60475010† 39451400 60475021† 96768510 96768360 96768300 96768800 96729200 88973500 88973400 96768410

† Contains Diagnostic Decision Logic Tables (DDLTs)

TABLE 3-1. PROCESSOR AND PROCESSOR SUBSYSTEM OPTIONS (Contd)

Product Number	Equipment Number	Product Name	Maintenance Documents	Publication Number
18-10M	AA132	Processor	All General Information Manuals See also available options	
18-20	AA132	Processor	All General Information Manuals See also available options	
18-25	AA153	Processor	All General Information Manuals DY192, DY198 CYBER 18-25/30 Communication Multiplexer Subsystem Hardware Reference/Maintenance Manual DY192, DY198, GH447, GH461 Communication Multiplexer Subsystem Field Repair Guide See also available options	96768610 60475080†
18-30 Timeshare	AA133	Processor	All General Information Manuals FA104, BE602 Tape Cassette Subsystem Hardware Maintenance Manual FA104-A Tape Cassette Controller Hardware Reference/Maintenance Manual See also 18-25, 1827-30/31, 1827-32/60/90, 1828-1, 1829-30/60, 1833-1/2, 1833-3, 1860-3/4, 1867-1/2, 1870-1, 1870-2, 1875-1, 1875-2, 1882-16, 1882-32 and available options	60475060† 96711900

† Contains Diagnostic Decision Logic Tables (DDLTs)

TABLE 3-1. PROCESSOR AND PROCESSOR SUBSYSTEM OPTIONS (Contd)

Product Number	Equipment Number	Product Name	Maintenance Documents	Publication Number
722-10	CC628	Display Terminal	722-10 (CC628) Display Terminal Hardware Maintenance Manual (Site Information) 722-10 (CC628) Display Terminal Operator Guide/Installation Instructions 722-10 (CC628) Display Terminal Reference Manual CA150, CA153, CA154, CC555, CC628, CT104, FC109, FC539, FJ441, FJ442 Terminal Equipment Subsystem Field Repair Guide CC555, CC628 Keyboard Display Terminal Subsystem Field Repair Guide	62940003 62940002 62940001 60475070† 60475022†
752-30 752-40	CC555	Keyboard Display Terminal	752 Keyboard Display Terminal Hardware Maintenance Manual	62957400
752-202 752-204	CA150	Keyboard	752 Keyboard Display Terminal Operator Guide/Reference Manual CA150, CA153, CA154, CC555, CC628, CT104, FC109, FC539, FJ441, FJ442 Terminal Equipment Subsystem Field Repair Guide CC555, CC628 Keyboard Display Terminal Subsystem Field Repair Guide	62957300 60475070† 60475022†
752-270 752-271	CA153 CA154	Data Entry Keyboard	CA153, CA154 Keyboard Module Hardware Maintenance Manual See also 752-30	62985400
1811-1	CC614 XA150	Console Display Extended Memory Option	751-10 Terminal Subsystem Hardware Maintenance Manual 751-10 Terminal Subsystem Operators Guide Basic LIAT Display Logic Hardware Maintenance Manual CC614 Console Display Subsystem Field Repair Guide	62962300 62951400 62961700 60475021†

† Contains Diagnostic Decision Logic Tables (DDLTs)

TABLE 3-1. PROCESSOR AND PROCESSOR SUBSYSTEM OPTIONS (Contd)

Product Number	Equipment Number	Product Name	Maintenance Documents	Publication Number
1827-7	CT104	Matrix Printer	CA150, CA153, CA154, CC555, CC628, CT104, FC109, FC539, FJ441, FJ442 Terminal Equipment Subsystem Field Repair Guide CT104-A Matrix Printer Field Service/Reference Manual CT104-A Matrix Printer Parts Identification Manual	60475070† 95445028 95445027
1827-30	CL408 or CL411	Drum Printer (300 LPM, 60 Hz)	CL408, CL411, FC109, FC539, FH301, Line Printer Subsystem Hardware Maintenance Manual CL408, CL411 Line Printer Field Service Manual, Volume 1 CL408, CL411 Line Printer Field Service Manual, Volume 2 CL408, CL411 Line Printer Parts Identification Manual CL408, CL411 Line Printer Reference Manual Line Printer Equipment Field Service Manual Line Printer Equipment Special Option Manual	60475032† 91858400 91858500 91859100 59709100 95445003 95445077
1827-31	CL408 or CL411	Drum Printer (300 LPM, 50 Hz)	See 1827-30	
1827-32	CT105	Band Printer (300 LPM)	CT103, CT105 Line Printer Equipment Parts Identification Manual CT103, CT105, CT106, FC109, FC539, FH301 Line Printer Subsystem Field Repair Guide CT103-A/B, CT105-A/B, CT106-A Line Printer Equipment Field Service Manual CT103-A/B, CT105-A/B, CT106-A Line Printer Equipment Preparation/ Instruction Manual CT103, CT105 Line Printer Equipment Field Service/Reference Manual Line Printer Equipment Special Option Manual	95445067 60475033† 44677818 44677817 95445060 95445077

† Contains Diagnostic Decision Logic Tables (DDLTs)

TABLE 3-1. PROCESSOR AND PROCESSOR SUBSYSTEM OPTIONS (Contd)

Product Number	Equipment Number	Product Name	Maintenance Documents	Publication Number
1827-60	CT103	Band Printer (600 LPM)	See 1827-32	60475033†
1827-90	CT106	Band Printer (900 LPM)	CT103, CT105, CT106, FC109, FC539, FH301, Line Printer Subsystem Field Repair Guide CT103-A/B, CT105-A/B, CT106-A Line Printer Equipment Field Service Manual CT103-A/B, CT105-A/B, CT106-A Line Printer Equipment Preparation/ Instruction Manual CT106 Line Printer Equipment Parts Identification Manual CT106 Line Printer Equipment Reference/Field Service Manual Special Option Manual	44677818 44677817 95445050 95445055 95445077
1828-1	FH301	Card Reader/Line Printer Controller	CB104, FC109, FC539, FH301 Card Reader Subsystem Field Repair Guide CL408, CL411, FC109, FC539, FH301 Line Printer Subsystem Hardware Maintenance Manual CT103, CT105, CT106, FC109, FC539, FH301 Line Printer Subsystem Field Repair Guide FH301 Card Reader/Line Printer Controller Hardware Reference/ Maintenance Manual	60475031† 60475032† 60475033† 96728800
1828-2	FC109 or FC539	Card Reader/Line Printer/Communication Line Adapter Controller	CB104, FC109, FC539, FH301 Card Reader Subsystem Field Repair Guide CL408, CL411, FC109, FC539, FH301 Line Printer Subsystem Hardware Maintenance Manual CT103, CT105, CT106, FC109, FC539, FH301 Line Printer Subsystem Field Repair Guide FC109, FC539 Card Reader/Line Printer/Communication Line Adapter Controller Hardware Reference/Maintenance Manual	60475031† 60475032† 60475033† 60475830

†Contains Diagnostic Decision Logic Tables (DDLts)

TABLE 3-1. PROCESSOR AND PROCESSOR SUBSYSTEM OPTIONS (Contd)

Product Number	Equipment Number	Product Name	Maintenance Documents	Publication Number
1829-30	CB104	Card Reader (300 CPM)	CB104, FC109, FC539, FH301 Card Reader Subsystem Field Repair Guide	60475031†
1829-60	CB104	Card Reader (600 CPM)	CB104, CB105, CB106, CB202, CB203, Card Reader Hardware Reference/Maintenance Manual	49757900
1832-4	BW812 FA107	Translator Magnetic Tape Transport Controller (NRZI)	See 1829-30 BW101, BW303, BW812, FA107 Magnetic Tape Transport (NRZI) Subsystem Field Repair Guide BW812 Interface Manual	60475041† 49756600
1833-1	GB138	Storage Module Drive Interface, Single CPU	FA107 Magnetic Tape Controller (NRZI) Hardware Reference/ Maintenance Manual BJ402, BJ701, BZ403, FA727, GB138, GB145 Module Drive Subsystem Field Repair Guide	96728600 60475051†
1833-2	GB138	Storage Module Drive Interface, Dual CPU	GB138 Storage Module Drive Interface Hardware Reference/ Maintenance Manual	96761300
1833-3	FA727	Storage Module Control Unit	See 1833-1 BJ402, BJ701, BZ403, FA727, GB138, GB145 Module Drive Subsystem Field Repair Guide	60475051†
1833-4	FA111 or FA750	Cartridge Disk Drive Controller	FA7A8, FA727 Storage Module Drive Controller/Formatter Hardware Maintenance Manual BR704, FA111, FA750 Cartridge Disk Drive Subsystem Hardware Maintenance Manual FA111, FA750 Cartridge Disk Drive Controller Hardware Reference/ Maintenance Manual	83312400 60475052† 60476000

†Contains Diagnostic Decision Logic Tables (DDLTs)

TABLE 3-1. PROCESSOR AND PROCESSOR SUBSYSTEM OPTIONS (Contd)

Product Number	Equipment Number	Product Name	Maintenance Documents	Publication Number
1833-5	FA730	Flexible Disk Drive Controller	BR803 Flexible Disk Drive Hardware Maintenance Manual BR803, GD310, GD308, FA730 Flexible Disk Drive Subsystem Hardware Maintenance Manual FA730 Flexible Disk Drive Controller Hardware Reference/Maintenance Manual See 1833-3 and 1833-11	77834769 60475010† 96768800
1833-6	FA727	Storage Module Control Unit		
	GB145	Module Drive Adapter		
1833-11	GB145	Module Drive Adapter, Single CPU	BJ402, BJ701, BZ403, FA727, GB138, GB145 Module Drive Subsystem Field Repair Guide GB145 Module Drive Adapter Hardware Reference/Maintenance Manual See 1833-3	60475051† 60475800
1833-31	FA727	Module Drive Control Unit		
1843-1	FJ441	Dual-Channel Communication Line Adapter	CA150, CA153, CA154, CC555, CC628, CT104, FC109, FC539, FJ441, FJ442 Terminal Equipment Subsystem Field Repair Guide Communications Handbook FJ441 Dual-Channel Communication Line Adapter Hardware Reference/Maintenance Manual	60475070† 60405100 39452000
1843-2	FJ442	Eight-Channel Communication Line Adapter	CA150, CA153, CA154, CC555, CC628, CT104, FC109, FC539, FJ441, FJ442 Terminal Equipment Subsystem Field Repair Guide FJ442 Eight-Channel Communication Line Adapter Hardware Reference/Maintenance Manual	60475070† 96767920

† Contains Diagnostic Decision Logic Tables (DDLTs)

TABLE 3-1. PROCESSOR AND PROCESSOR SUBSYSTEM OPTIONS (Contd)

Product Number	Equipment Number	Product Name	Maintenance Documents	Publication Number
1843-3	FJ127	Buffered Communication Line Adapter (Primary)	DT610, DY221, FJ127, FJ128 Buffered Communication Line Adapter Field Repair Guide	60475130 †
1843-4	FJ128	Buffered Communication Line Adapter (Expansion)	FJ127, FJ128 Buffered Communication Line Adapter Hardware Reference/Maintenance Manual	96768550
1843-5	FJ129 or FJ448	Synchronous Data Link Control Communication Line Adapter	See 1843-3	60475140 †
1843-100	DT610	Current Loop Adapter (Primary)	FJ129, FJ448, FV678 Synchronous Data Link Control Communication Line Adapter Field Repair Guide	96768440
1843-101	DY221	Power Supply	FJ129, FJ448, FV678 Synchronous Data Link Control Communication Line Adapter Hardware Reference/Maintenance Manual	
1843-200	DT610	Current Loop Adapter (Expansion)	See 1843-3	
1843-201	FV678	Local Link Coupler (Channel 1)	See 1843-3	
	FV678	Local Link Coupler (Channel 2)	See 1843-5	

† Contains Diagnostic Decision Logic Tables (DDLTs)

TABLE 3-1. PROCESSOR AND PROCESSOR SUBSYSTEM OPTIONS (Contd)

Product Number	Equipment Number	Product Name	Maintenance Documents	Publication Number
1850-1	AT352	1500 Series Adapter	AT352-A 1500 Series Adapter Field Print Package AT352 CYBER 18/1500 Series Adapter Hardware Reference/Maintenance Manual AT353-A 1500 Adapter Finalization Kit Field Print Package Core-Resident Real-Time Maintenance Systems Users Guide	96750191 96768320 96756865 88790000
1855-1	FV679	Auto Restart Loader	FV679, FV701 Auto Restart Loader Hardware Reference/Maintenance Manual	96768330
1855-100	FV701	Stall Alarm Panel	FV679, FV701 Auto Restart Loader Subsystem Field Repair Guide See 1855-1	60475120†
1856-1	CW218	I/O Expansion Unit	AT314, AU115, BU272, CW218 I/O Expansion Subsystem Hardware Reference/Maintenance Manual	60475540†
1856-2	BU272	DMA Extender	See 1856-1	
1856-3	AT314	A/Q Extender	See 1856-1	
1856-4	AU115	Dual Mode Access Option	See 1856-1	
1860-1/2	- -	Magnetic Tape Subsystem (7-track NRZI) Magnetic Tape Transport (7-track NRZI) Translator Magnetic Tape Transport Controller (NRZI)	See 1832-4 and 1860-72	

† Contains Diagnostic Decision Logic Tables (DDLTs)

TABLE 3-1. PROCESSOR AND PROCESSOR SUBSYSTEM OPTIONS (Contd)

Product Number	Equipment Number	Product Name	Maintenance Documents	Publication Number
1860-3/4	--	Magnetic Tape Subsystem (9-track NRZI)	See 1832-4 and 1860-92	
	BW303	Magnetic Tape Transport (9-track NRZI)		
	BW812	Translator		
	FA107	Magnetic Tape Transport Controller (NRZI)		
1860-5/6	--	Magnetic Tape Subsystem (9-track Dual Mode)	BW305, DZ101, FA464, FA465 Magnetic Tape Transport (NRZI/PE) Dual Mode Subsystem Field Repair Guide	60475042†
	BW305	Magnetic Tape Transport (9-track NRZI/PE)	See 1860-95	
	DZ101	Magnetic Tape Formatter	DZ101-A Magnetic Tape Formatter Field Service/Reference Manual	49760400
	FA464 or FA465	Magnetic Tape Transport Controller (NRZI/PE)	FA464, FA465 Magnetic Tape Transport Controller Hardware Reference/Maintenance Manual	60476010
1860-72	BW101	Magnetic Tape Transport (7-track NRZI)	BW101/301/302/303/304/305 Magnetic Tape Transport Field Service Manual	49756400
			BW101/301/302/303/304/305 Magnetic Tape Transport Parts Identification Manual	49756500
			BW101/301/302/303/304/305 Magnetic Tape Transport Reference Manual	49756300
1860-92	BW303	Magnetic Tape Transport (9-track NRZI)	See 1860-72	
1860-95	BW305	Magnetic Tape Transport (9-track NRZI/PE)	See 1860-72	

† Contains Diagnostic Decision Logic Tables (DDLIs)

TABLE 3-1. PROCESSOR AND PROCESSOR SUBSYSTEM OPTIONS (Contd)

Product Number	Equipment Number	Product Name	Maintenance Documents	Publication Number
1862-1	DK609 or DL103	Paper Tape Relay Station	DK609-A, DL103-A/B, FE308-A, FE516-A Paper Tape Subsystem Hardware Maintenance Manual	60475810†
1865-1/2	FE308 or FE516	Paper Tape Reader/Paper Tape Punch/Card Punch Controller	DK609, DL103, FE308, FE516 Paper Tape Reader/Paper Tape Punch/Card Punch Controller and Paper Tape Relay Station Hardware Reference/Maintenance Manual	60475820
1866-12	BR803	Flexible Disk Drive	See 1833-5	
1866-14	BR704	Cartridge Disk Drive (2.2-megabyte)	9427-H Cartridge Disk Drive Hardware Maintenance Manual	77834675
1866-1	BR704	Cartridge Disk Drive (4.4-megabyte)	See 1866-12	
1867-1	Storage Module Subsystem (25-megabyte)	Storage Module Subsystem (25-megabyte)	See 1833-1, 1833-3, 1867-10 and 1867-11	
	BJ701	Storage Module Drive		
	FA727	Module Drive Control Unit		
	GB138	Storage Module Drive Interface		
1867-2	Storage Module Drive Subsystem (50-megabyte)	Storage Module Drive Subsystem (50-megabyte)	See 1833-1, 1833-3, 1867-20 and 1867-21	
	BJ701	Storage Module Drive		
	FA727	Module Drive Control Unit		
	GB138	Storage Module Drive Interface		

† Contains Diagnostic Decision Logic Tables (DDLts)

TABLE 3-1. PROCESSOR AND PROCESSOR SUBSYSTEM OPTIONS (Contd)

Product Number	Equipment Number	Product Name	Maintenance Documents	Publication Number
1867-3	BJ701	Storage Module Drive Subsystem (25-megabyte)	See 1833-3, 1833-11, 1867-10 and 1867-11	83322820
	FA727	Storage Module Drive Module Drive Control Unit		
	GB145	Storage Module Drive Module Drive Adapter		
1867-4	BJ701	Storage Module Drive Subsystem (50-megabyte)	See 1833-3, 1833-11, 1867-20 and 1867-21	83322830
	FA727	Storage Module Drive Module Drive Control Unit		
	GB145	Storage Module Drive Module Drive Adapter		
1867-5	BZ403	Mini-Module Drive	BZ30x, BZ40x, BZ3Mx, BZ4Mx Mini Module Drive Hardware Maintenance Manual	83322820
			BZ30x, BZ40x, BZ3Mx, BZ4Mx Mini Module Drive Hardware Reference Manual	83322830
1867-10	BJ701	Storage Module Drive (25-megabyte, 60 Hz)	See also 1833-3 and 1833-11	83311300
			BJ701, BJ781 Storage Module Drive Hardware Maintenance Manual	83317300
1867-11	BJ701	Storage Module Drive (25-megabyte 50 Hz)	See also 1833-1 and 1833-3	
1867-20	BJ701	Storage Module Drive (50-megabyte, 60 Hz)	See 1833-1 and 1867-10	
1867-21	BJ701	Storage Module Drive (50-megabyte 50Hz)	See 1867-10	

TABLE 3-1. PROCESSOR AND PROCESSOR SUBSYSTEM OPTIONS (Contd)

Product Number	Equipment Number	Product Name	Maintenance Documents	Publication Number
1867-40	BJ402	Storage Module Drive (180-megabyte 50/60 Hz)	BJ401, BJ402 Storage Module Drive Hardware Maintenance Manual BJ401, BJ402 Storage Module Drive Hardware Reference Manual See also 1833-3 and 1833-11	83322450 83322460
1868-1	BZ403	Mini-Module Drive	See 1867-5	
1870-1	BA209	512-Instruction Micro Memory	BA209, BA210, BS158 512-, 2048-, 8192-Instruction Micro Memory Hardware Reference/Maintenance Manual	96767900
1870-2	BA210	2048-Instruction Micro Memory	See 1870-1	
1872-1	BA210	Scientific Expansion	See 1870-1	
1872-2	BA210	Commercial Expansion	See 1870-1	
1872-3	BA210	Scientific/Commercial Expansion	See 1870-1	
1874-1	DT223	ECC MOS Array 192K bytes	AT241, AT275, BA212, DT223 MOS Memory Subsystem Hardware Reference/Maintenance Manual	96768600
1875-1	FC402	Breakpoint Controller (Panel Interface)	DT120, DT195, FC402 Breakpoint Controller and Breakpoint Panel Hardware Reference/Maintenance Manual	96729000
1875-2	DT120	Breakpoint Panel (Maintenance Panel)	See 1875-1	
1882-16	AT275	16K MOS Main Memory Storage	See 1874-1	
1882-32	AT241	32K MOS Main Memory Storage	See 1874-1	

TABLE 3-1. PROCESSOR AND PROCESSOR SUBSYSTEM OPTIONS (Contd)

Product Number	Equipment Number	Product Name	Maintenance Documents	Publication Number
1887-4		Upright Equipment Cabinet	AA132, AA133, AA153, GH447, GH461 CYBER 18 Equipment Cabinets Hardware Reference/Maintenance Manuals	96768280
	XA123	Double Pedestal Cabinet		
	XA184	Power Distribution Box		
1887-5	BU281	Module Drive Enclosure	BJ402, BJ701, BZ403, FA727, GB138, GB145 Module Drive Subsystem Field Repair Guide CYBER 18 Computer Systems with MOS Memory Installation Manual	60475051† 96768360
1888-1	XA118	Power Conversion Transformer	CYBER 18 Computer Systems with MOS Memory Installation Manual	96768360
1888-3	GK203	Power Conversion Unit	See 1888-1	
1888-4	GK205	Power Conversion Unit	See 1888-1	
1890-1	MD426	200UT Emulation Option	Batch Terminal Controlware Installation Handbook Batch Terminal Controlware Operator Guide Batch Terminal Controlware Reference Manual	96768900 96768920 96768910
1890-2	MD427	2780 Emulation Option	See 1890-1	
1890-3	MD428	3780 Emulation Option	See 1890-1	
1890-4	MD432	HASP RJE Workstation Controlware Deck	HASP RJE Workstation Controlware Installation Handbook HASP RJE Workstation Controlware Operators Guide HASP RJE Workstation Controlware Reference Manual	60475360 60475350 60475340

† Contains Diagnostic Decision Logic Tables (DDLTs)

TABLE 3-1. PROCESSOR AND PROCESSOR SUBSYSTEM OPTIONS (Contd)

Product Number	Equipment Number	Product Name	Maintenance Documents	Publication Number
1890-5	MD433	HASP RJE Workstation Controlware Diskette	See 1890-4	
10338-1	FA727	Module Drive Controller Expansion	See 1833-3	
10428-1	DU169	Extended CYBER 18 Transform	Basic Micro-Programmable Processor Hardware Maintenance Manual	39451400
10430-1	AT391	I/O Connector Mounting Panel	CYBER 18 Computer Systems with MOS Memory Installation Manual See also 1843-3 and 1843-5	96768360
10431-1	DY198	Communication Multiplexer Expansion	DY192, DY198 CYBER 18-25/30 Communication Multiplexer Subsystem Hardware Reference/Maintenance Manual DY192, DY198, GH447, GH461 Communication Multiplexer Subsystem Field Repair Guide	96768610 60475080†
10442-1	DU169	Character Mode ADT/Page Memory	See 10428-1	
10445-1	GB145	Module Drive Subsystem Upgrade	See 1833-11	
10445-2	GB145	Module Drive Dual CPU Access Option	See 1833-11	
† Contains Diagnostic Decision Logic Tables (DDLTs)				

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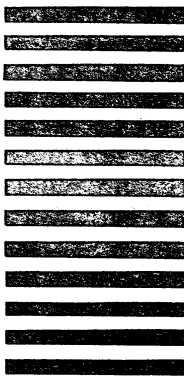
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