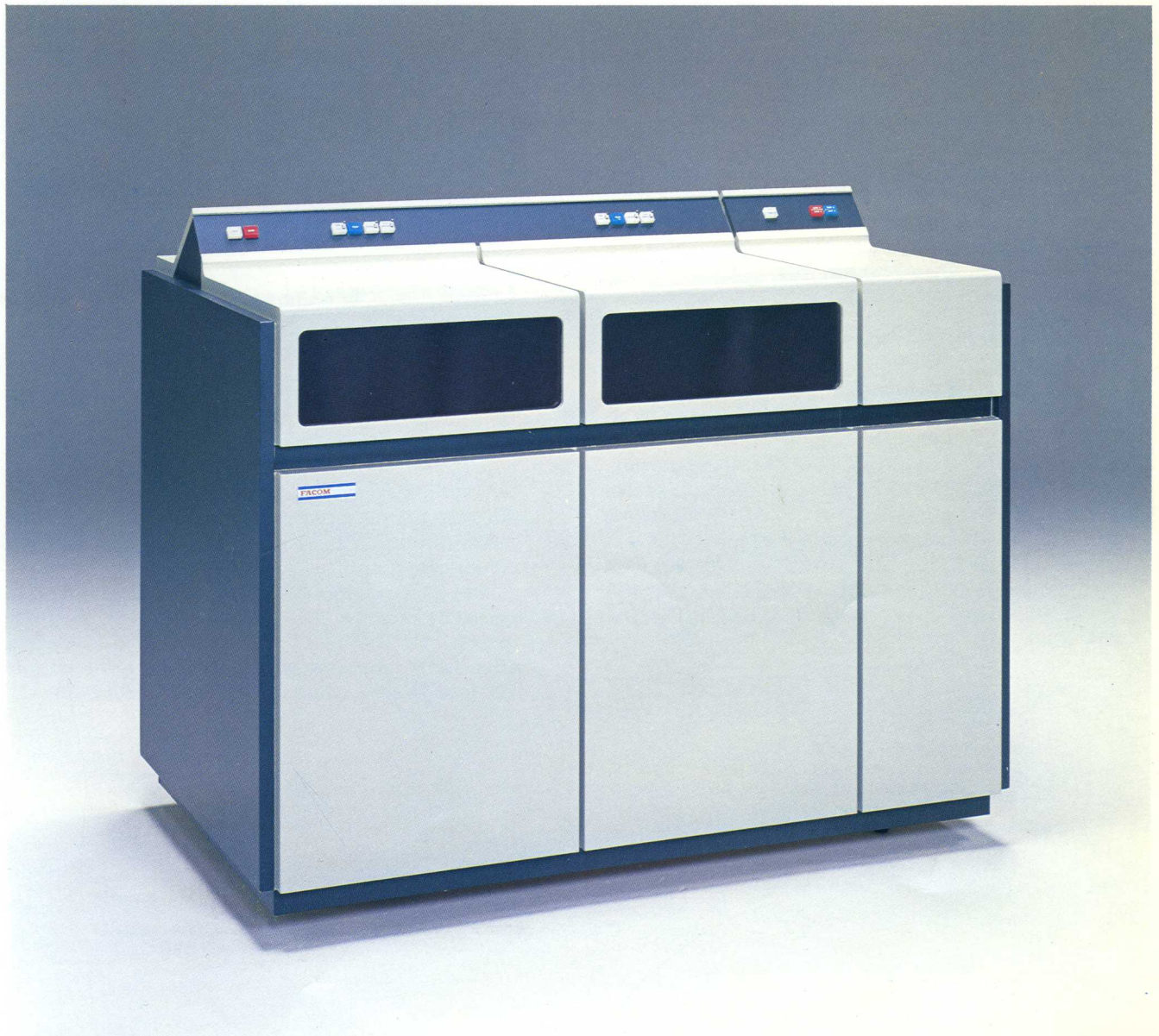# DISK DRIVE UNITS
FACOM 493/496

FACOM 493 and FACOM 496 are large capacity, high-performance disk drive units with fixed medium, and developed for such uses for online data base or shared files, in order to cope with increased volume of transactions and increasingly extensive range of applications. Each FACOM 493 and FACOM 496 consists of six models including those for cross-call mode configurations and those with the fixed head feature, thereby permitting efficient and flexible disk drive subsystem configurations.

FACOM 496A2/C2

FUJITSU

FEATURES

Large Storage Capacity

A FACOM 493 or FACOM 496 disk drive unit has two spindles, each having 317.5 megabytes (FACOM 493) or 635 megabytes (FACOM 496; assumed to be two logical spindles of 317.5 megabytes) and approximately 1.2-megabytes-per-second data transfer rate. Each spindle of FACOM 493 models K2F, L2F, and M2F, and FACOM 496 models A2F, B2F, and C2F is provided with an additional 1.14-megabyte fixed head storage area for faster retrieval of frequently accessed data.

Up to four FACOM 493s or FACOM 496s constitute a string which is connected to a FACOM 1772B disk controller or an integrated channel such as Integrated File Processor 3 (IFP3 — for FACOM M-160F and FACOM M-150F), or File Adapter 3 (FA3 — for FACOM M-140F).

Compatibility

FACOM 493 can be operated in 100-megabyte or 200-megabyte compatible mode as well as its native mode in 317.5 megabytes, while, FACOM 496 can be operated in 200-megabyte or 317.5-megabyte compatible mode. This means any program modification is unnecessary in substituting FACOM 493 strings for FACOM 478 or FACOM 479 strings, or FACOM 496 strings for FACOM 479 or FACOM 493 strings.

Flexible Subsystem Configuration

Up to eight FACOM 493 strings can be connected to a FACOM 1772B disk controller with the optional 64-spindle extension, or up to four 493 strings can be attached to an IFP3 with the optional 32-spindle extension. In both cases, two FACOM 493 strings can be replaced by one FACOM 496 string. A maximum of two FACOM 493 strings, or each one of FACOM 493 string and FACOM 496 string can be attached to an FA3.

The FACOM 1772B disk controller, IFP3 and FA3 permit attachment of the FACOM 493 or FACOM 496 string concurrently with the FACOM 479 or FACOM 478 string.

String configurations

Some possible string combinations are as follows:

Controller	Strings		
	FACOM 493	FACOM 496	FACOM 478/ FACOM 479
FACM 1772B with 64-spindle extension	8	—	—
	6	—	2
	4	2	—
	2	2	2
	—	2	4
FACOM 1772B or IFP3 with 32-spindle extension	4	—	—
	3	—	1
	2	1	—
	2	—	2
	1	1	1
	—	1	2
IFP3	2	—	—
	1	1	—
	1	—	1
	—	1	1
FA3	2	—	—
	1	1	—
	1	—	1
	—	1	1

FACOM 493 models M2 and M2F, and FACOM 496 models C2 and C2F are provided for cross-call operation at device level. In the cross-call mode configuration, a FACOM.478 or FACOM 479 string with the disk pack cross-call adapter (DPXA) can also be intermixed.
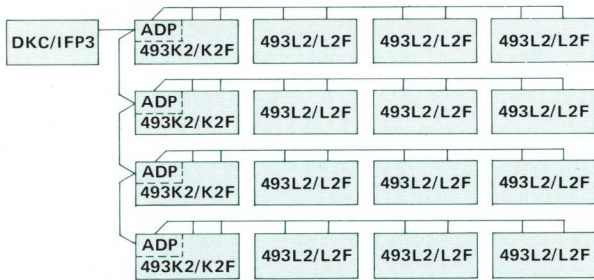
High Reliability

Each FACOM 493 and FACOM 496 incorporates two completely sealed assemblies of magnetic disks and read/write heads, in order to cope with high reliability requirements in handling large volumes of data. An optional spare disk drive circuit is provided for FACOM 496 to avert total system-failures caused by drive circuit failure. Switching to the spare circuit can be performed via operator panel.

Excellent operational stability and reliability are supported by extensive use of custom-designed LSIs. Logic circuits, for example, incorporate 500-gate-per-chip LSIs, while read/write and servo circuits, incorporate 200-gate-per-chip LSIs and analog master slice LSIs.
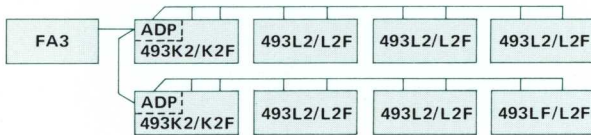
Some Examples of Disk Drive Subsystems

A basic configuration for attaching to the disk controller or integrated file processor

```
DKC/IFP3 ── ADP 493K2/K2F ── 493L2/L2F   493L2/L2F   493L2/L2F
          ── ADP 493K2/K2F ── 493L2/L2F   493L2/L2F   493L2/L2F
          ── ADP 493K2/K2F ── 493L2/L2F   493L2/L2F   493L2/L2F
          ── ADP 493K2/K2F ── 493L2/L2F   493L2/L2F   493L2/L2F
```
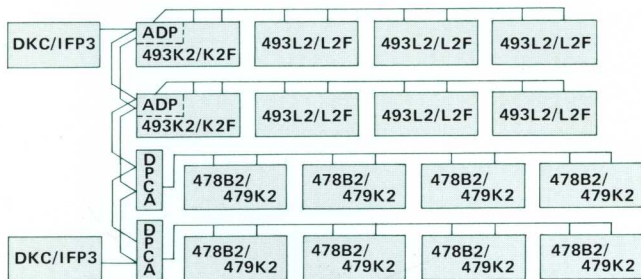
Note 1. IFP3 must have an optional 32-spindle extension.
Note 2. One 496 string can substitute for two 493 strings.

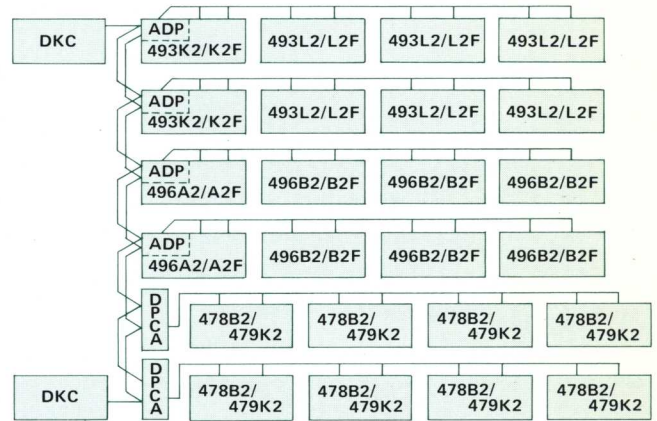### A basic configuration for attaching to file adapter on M140F.

```
FA3 ── ADP 493K2/K2F ── 493L2/L2F   493L2/L2F   493L2/L2F
    ── ADP 493K2/K2F ── 493L2/L2F   493L2/L2F   493LF/L2F
```

Note 1. One 496 string can substitute for one of 493 strings.

A string switch configuration

```
DKC/IFP3 ── ADP 493K2/K2F ── 493L2/L2F   493L2/L2F   493L2/L2F
         ── ADP 493K2/K2F ── 493L2/L2F   493L2/L2F   493L2/L2F
         ── DPCA ── 478B2/479K2  478B2/479K2  478B2/479K2  478B2/479K2
DKC/IFP3 ── DPCA ── 478B2/479K2  478B2/479K2  478B2/479K2  478B2/479K2
```
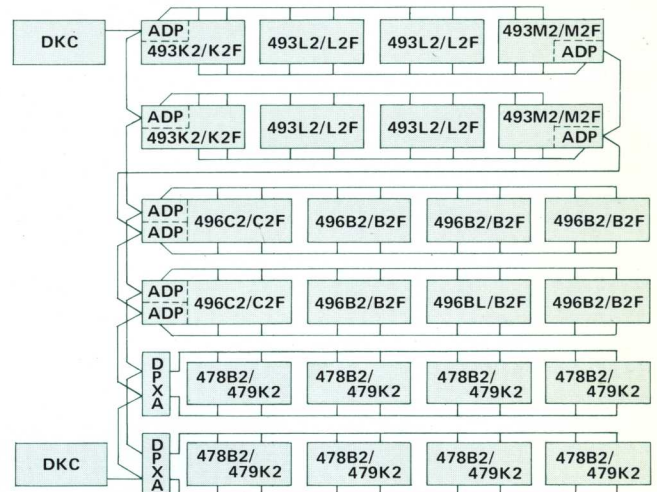
Note 1. Each IFP3 must have an optional 32-spindle extension.
Note 2. Each 493 K2/K2F must have an optional dynamic string switch.
Note 3. Each DPCA must have an optional dynamic or manual string switch.
Note 4. One 496 string can substitute for two 493 strings or 478B2/479K2 strings.

A maximum configuration with string switch function

```
DKC ── ADP 493K2/K2F ── 493L2/L2F   493L2/L2F   493L2/L2F
    ── ADP 493K2/K2F ── 493L2/L2F   493L2/L2F   493L2/L2F
    ── ADP 496A2/A2F ── 496B2/B2F   496B2/B2F   496B2/B2F
    ── ADP 496A2/A2F ── 496B2/B2F   496B2/B2F   496B2/B2F
    ── DPCA ── 478B2/479K2  478B2/479K2  478B2/479K2  478B2/479K2
DKC ── DPCA ── 478B2/479K2  478B2/479K2  478B2/479K2  478B2/479K2
```

Note 1. Each DKC must have an optional 64-spindle extension.
Note 2. Each 493K2/K2F and 496A2/A2F must have an optional dynamic string switch.
Note 3. Each DPCA must have an optional dynamic or manual string switch.
Note 4. One 493 string can substitute for one 478B2 or 479K2 string, and one 496 string can substitute for two 493 strings or 478B2/479K2 strings.

A maximum configuration with cross-call function

```
DKC ── ADP 493K2/K2F ── 493L2/L2F   493L2/L2F   493M2/M2F ADP
    ── ADP 493K2/K2F ── 493L2/L2F   493L2/L2F   493M2/M2F ADP
    ── ADP/ADP ── 496C2/C2F   496B2/B2F   496B2/B2F   496B2/B2F
    ── ADP/ADP ── 496C2/C2F   496B2/B2F   496BL/B2F   496B2/B2F
    ── DPXA ── 478B2/479K2  478B2/479K2  478B2/479K2  478B2/479K2
DKC ── DPXA ── 478B2/479K2  478B2/479K2  478B2/479K2  478B2/479K2
```

Note 1. Each DKC must have an optional 64-spindle extension.
Note 2. Each 493 and 496 must have an optional cross-call feature.
Note 3. Each 478B2 and 479K2 must have an optional cross-call attachment.
Note 4. One 493 string can substitute for one 478B2/479K2 string, and one 496 string can substitute for two 493 strings or 478B2/479K2 strings.

Legends
ADP : Adapter
DKC : FACOM 1772B disk controller
DPCA : FACOM 9070B disk pack control adapter
DPXA : FACOM 9071A disk pack cross-call adapter
FA3 : File Adapter 3
IFP3 : Integrated File Processor 3

DISK DRIVE UNITS

SPECIFICATIONS

Item	Model		FACOM 493K2/K2F/ L2/L2F/M2/M2F			FACOM 496A2/A2F/ B2/B2F/C2/C2F	
Operation mode			Native	479 compatible *2	478 compatible *	493 compatible *3	479 compatible *2
Storage capacity	Movable head (megabytes/spindle)		317.5	200	100 x 2	317.5 x 2	200 x 2
	Fixed head (megabytes/spindle)		1.144 *4	0.742 *4	0.742 *4	1.144 *4	0.742 *4
Number of spindles			2	2	2	2	2
Average positioning time(msec)			20	20	20	20	20
Average rotational delay(msec)			8.33	8.33	8.33	8.33	8.33
Data transfer rate(megabytes/sec)			1.198	1.198	1.198	1.198	1.198
Bytes per track			19.069	13.030	13.030	19.069	13.030
Tracks per cylinder			30	19	19	30·	19
Cylinders per spindle	Data		555	808	404 x 2	555 x 2	808 x 2
	Alternate		5	7	7 x 2	5 x 2	7 x 2
Number of adapters *5			1(493K2/K2F/M2/M2F)			1(496A2/A2F)or2(496C2/C2F)	

* In this mode, one spindle of the 493 is logically equivalent to two spindles of the 478 disk pack drive unit.
*2 In this mode, one spindle of the 493 is equivalent to one spindle of, or one spindle of 496 is equivalent to two spindles of, the 479 disk pack drive unit.
*3 In this mode, one spindle of the 496 is equivalent to two spindles of the 493.
*4 Available for 493K2F/L2F/M2F and 496A2F/B2F/C2F only
*5 Interface to controller, having functions including serial-parallel conversion of read/write of data, error detection, etc.

INSTALLATION REQUIREMENTS

Item	Model	FACOM 493K2/ K2F/M2/M2F	FACOM 493L2/L2F	FACOM 496A2/A2F	FACOM 496B2/B2F	FACOM 496C2/C2F	FACOM 1772B
Power supply		200 VAC ± 10%, 3-phase, 50/60 Hz ± 1%					
Power consumption (KVA)		2.4	2.0	3.3	2.9	3.6	2.5
Heat dissipation (Kcal/hr)		1,800	1,500	2,600	2,200	3,000	2,000
Air flow (m³/min)		15	15	14.5	13.0	16.0	20
Environment	Temperature	15 to 32°C (operating), 5 to 43°C (non-operating)					
	Relative humidity	20 to 80% (operating, non-operating)					
	Vibration	Continuous: Max. 0.2G (operating), Max. 0.4G (non-operating) Instantaneous:Max.1G (non-operating)					
	Dust	0.072 mg/m³ or less					
Physical Dimensions	Width (mm)	1,200	1,700	1,370	1,070	1,370	1,040
	Height (mm)	1,130	1,130	1,185	1,185	1,185	1,590
	Depth (mm)	850	850	850	850	850	710
	Weigfh (kg)	465	420	600	520	640	300

(Specifications are subject to change without notice.)