

DPS 8 CONFIGURATION GUIDE

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DPS 8
CONFIGURATION GUIDE

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SUBJECT

**Information for Configuring Any Portion of a DPS 8 System except for
Terminals**

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DPS 8 Configuration Guide

PREFACE

This guide attempts to provide nearly complete freestanding information for configuring any portion of a DPS 8 system except for terminals. Included in this outline are only the DPS 8 systems as announced in October, 1979. In addition this material covers all peripherals which are the most current for DPS 8, Level 66, and 66/DPS systems. To configure mainframes and front-end network processors for other than DPS 8 systems use the Level 66/Level 66/DPS Configuration Guide DH92.

To configure GCOS software refer to the Large Systems Software Products and Services Catalog.

The guide is constructed to be as self-teaching as possible and to provide for configuring both initial system orders and subsequent add-ons.

Unless stated otherwise the term "GCOS" will be understood to mean both GCOS (III) and GCOS 8.

Material in this outline dealing with DPS 8 mainframes consists mainly of a set of charts and brief summaries which are designed to be largely self-explanatory. By following the appropriate flowcharts and tables you will be able quickly and easily to configure any initial system order or add-on order accurately.

This material is divided into gross functional sections. Be sure to read the Table of Contents in full before using the configuration material. The table will show you the pattern of approach used in configuring.

Section I summarizes key general rules and policies which govern configuration of DPS 8 systems. Before doing any configuring you should always review Section II.

Section II provides master flowcharts which identify the sequence and components to be considered in configuring. Detach the pertinent flowchart(s) and keep it in view while you use it to access other portions of this material in order to configure easily, completely, accurately. The flowchart has page numbers for various sections to refer to for configuration of the component at each level of the flowchart.

Section III contains overview configurators to give you the perspectives for complete systems.

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Section IV checks with the configuring of gross mainframes and memory sizes. Included in this section are all marketing identifiers for all mainframes or central processing systems.

Section V covers the aspects for configuring the components needed within each IOM. These components relate to physical IOM channels for peripheral subsystems, the assignment of logical channels (data paths) for each physical channel, and the assignment of the scratchpad feature called DRE (data rate expansion).

Sections VI thru IX cover configuring for unit record, magnetic tape, mass store, and console subsystems.

Section X introduces you to some generic terms and concepts related to data communications and front-end network processors (FNPs).

Section XI covers configuring the DN6661 and DN8 FNPs.

Section XII covers configuring the DHP0700/0701 Document Handler Processors and DHU1600/800 families of document handlers.

Section XIII deals with manually controlled peripheral switches.

Section XIV includes the motor-generator sets and circumstances dealing with their use.

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SECTION I
General Policies

A. Minimum and Maximum Peripheral Subsystems per System

1. Lower speed peripheral subsystems

	Min	Max
a. Console subsystem	1	(1)
b. Card reader or card reader/punch	1	As needed (5)
c. Card punch	0	As needed (5)
d. Printer	1	As needed (5)
e. DHP0700/0701	0	1-3 (2) (4)
f. FNP (3)	0	2 or 8 (4)

Footnotes:

- 1) Every DPS 8 system must contain at least one CSU6601 console subsystem. GCOS supports a maximum of 4 consoles (5 console CRT screens). Maximum of two console subsystems for DPS 8/20/44/44D/52/62, four for DPS 8/70. See console discussion in Peripherals outline
- 2) A DHP0700 may have up to 4 document handlers running simultaneously. A DHP0701 may run one or two simultaneously. Depending on DPS 8 model and memory size, and amount of work done per document by DHP, it may be possible to use up to 5 DHPs per system, and a maximum of 12 document handlers simultaneously
- 3) Depends on memory size of DPS 8 system
- 4) Maximum combination of FNPs and DHPs is two on DPS 8/20/44/44D/52/62, eight on DPS8/70
- 5) Maximum of four unit record devices on URP in MFP8000 for DPS 8/20/44/44D. Maximum of eight devices on other URPs

SECTION I
General Policies

2. Higher speed peripherals

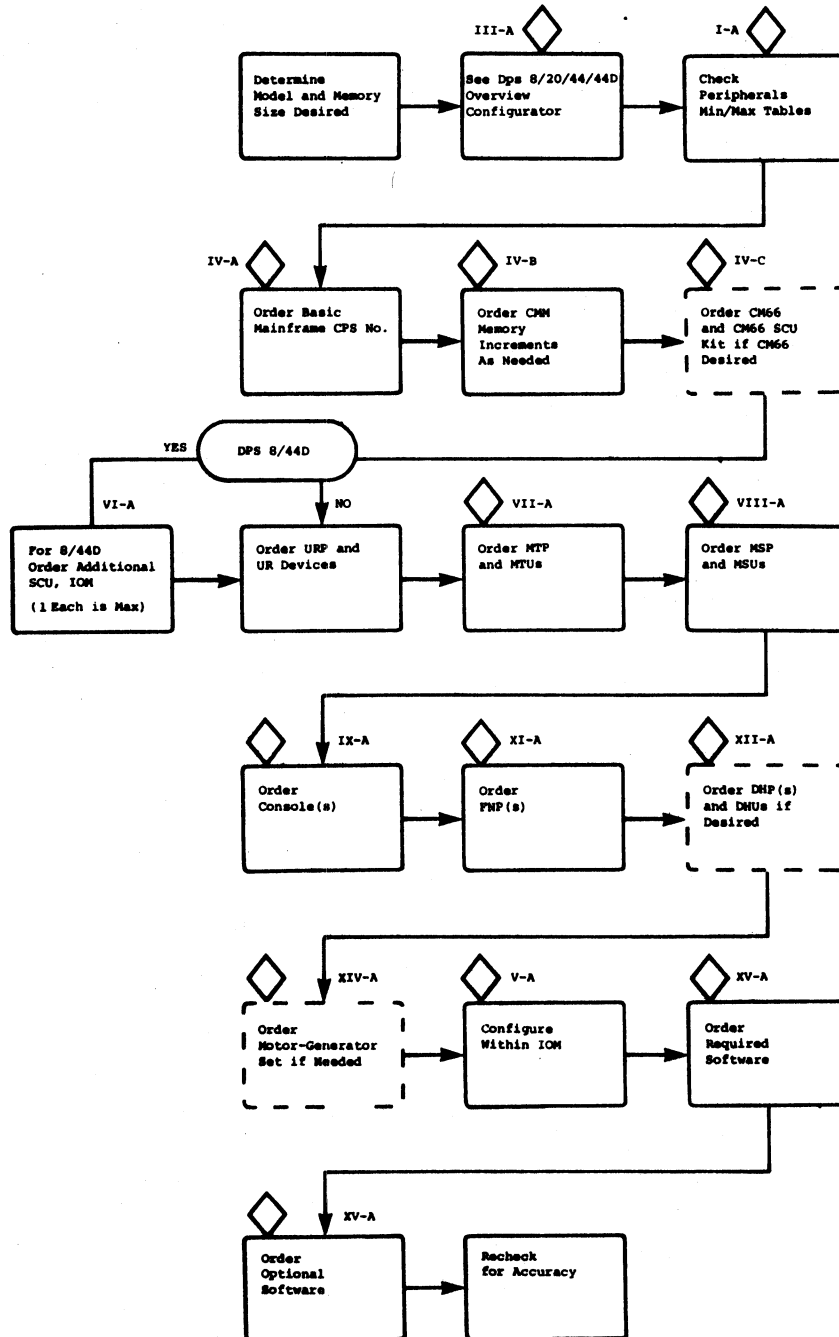
	Min	Max
a. Magnetic tapes	1-3 (1)	As needed (2)
b. Disk storage	About 75-100 million bytes (3)	As needed (4)

Footnotes:

- 1) Check with your GCOS technical support people. One tape unit is normally used for the GCOS Statistical Collection File. Other tape units may be needed for the GCOS system journal file used by FMS for file recovery, for TP journals, etc. At software release installation time the availability of a minimum of only one tape unit complicates the System Edit process. Two or three (better three) tape units make the System Edit process easier and simpler. If three tape units are not available for System Edit process an appreciable quantity of disk scratch space must be available
- 2) The maximum is 8 tape units on single-channel MTP, 16 on dual-channel MTP. Max of 8 tapes on MFP8000.
- 3) Check with your GCOS technical support people. This figure does not necessarily provide for any user data files or user temporary files. It represents the recommended minimum of GCOS residence, GCOS scratch files, SYSOUT file space and the minimum for other Phoenix-supported software. GCOS 8 also needs virtual storage temporary space
- 4) You must provide space for GCOS System Scheduler, NPS execution modules, NPS journal files, NPS checkpoint dump areas, and user files

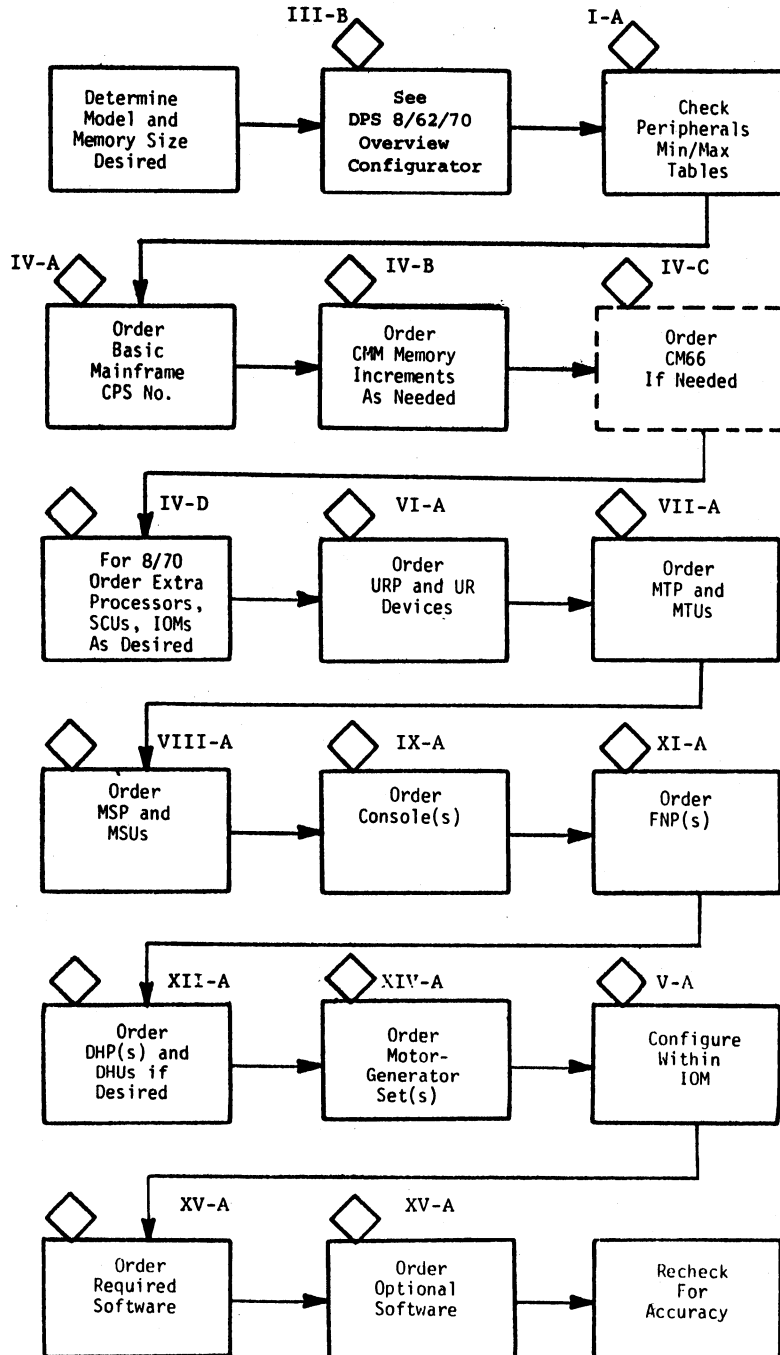
SECTION II
Master Flowcharts for DPS 8 Configuring

A. For DPS 8/20/44/44D systems



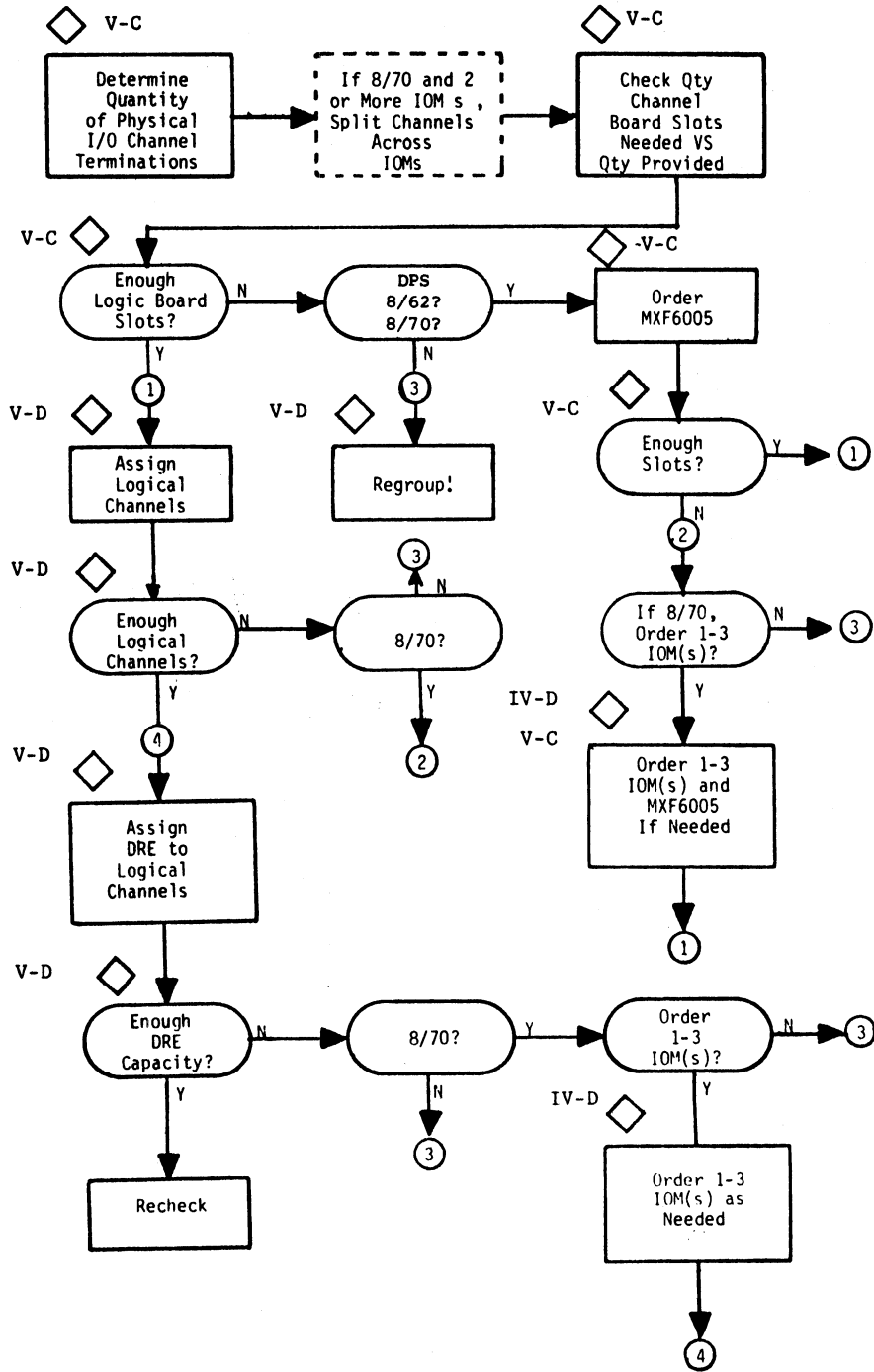
SECTION II
Master Flowcharts for DPS 8 Configuring

B. For DPS 8/52/62/70 systems



SECTION II
Master Flowcharts for DPS 8 Configuring

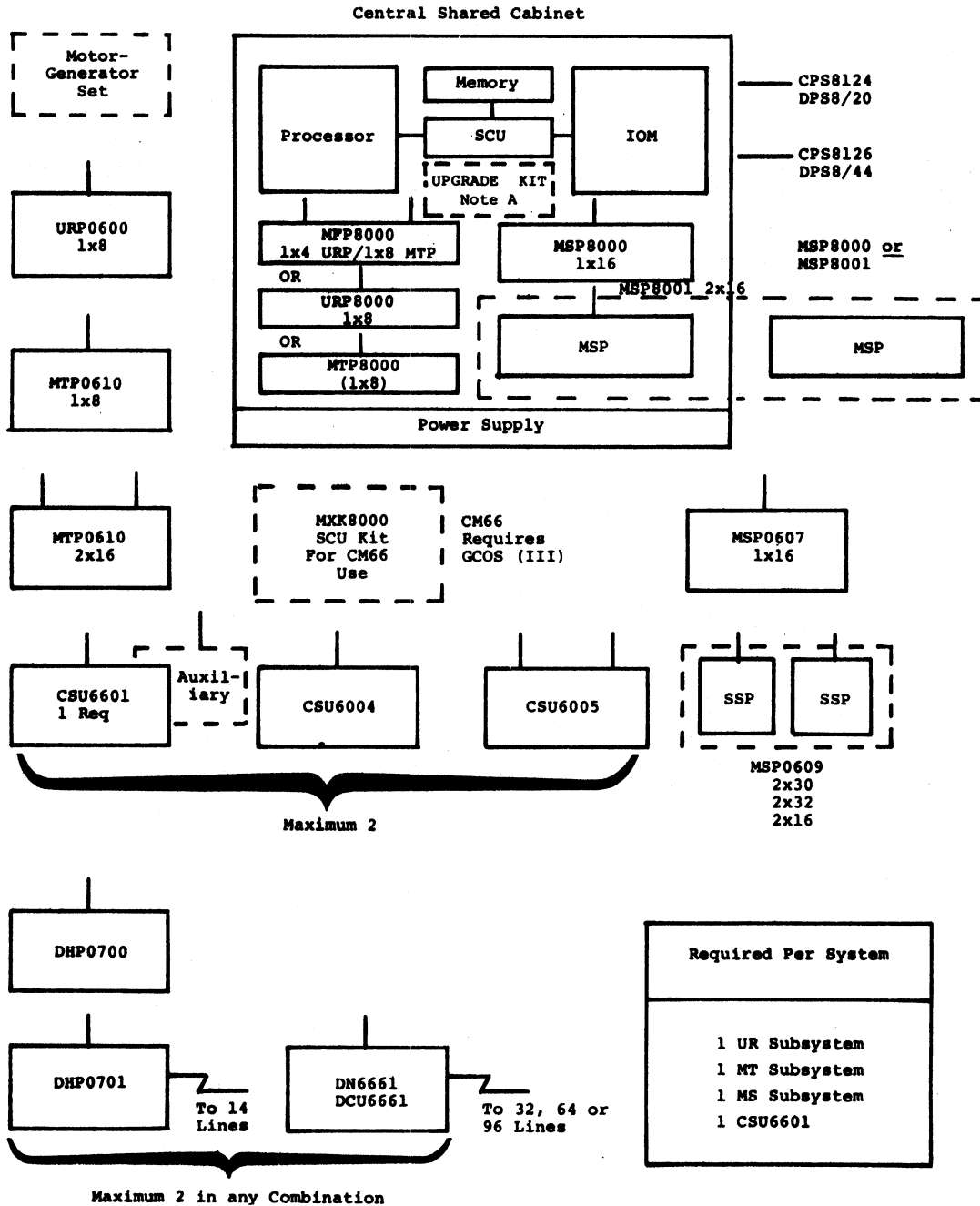
C. For configuring within any IOM -- all DPS 8 models





SECTION III Configurator Overview

A. DPS 8/20/44

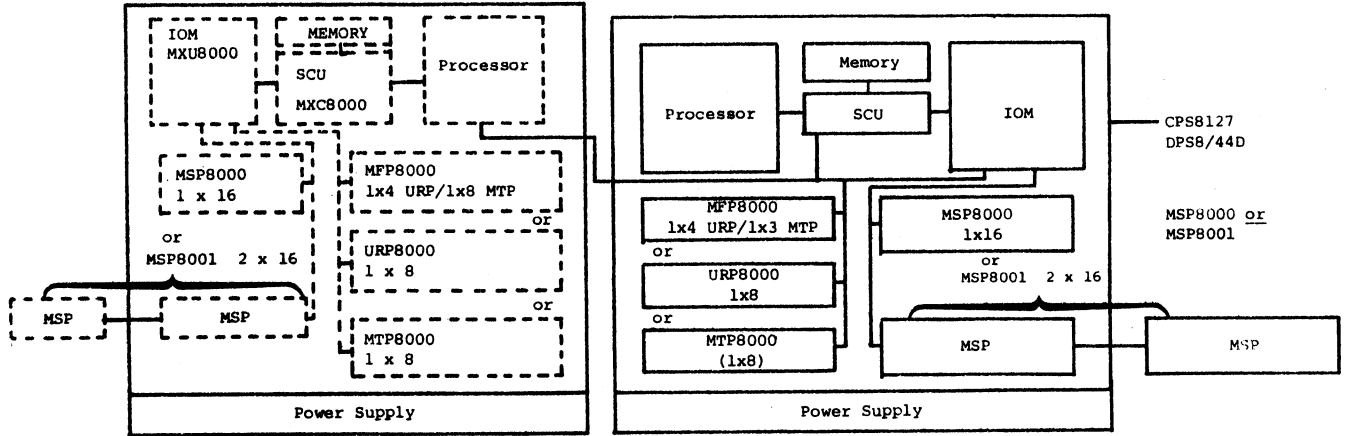


NOTES:

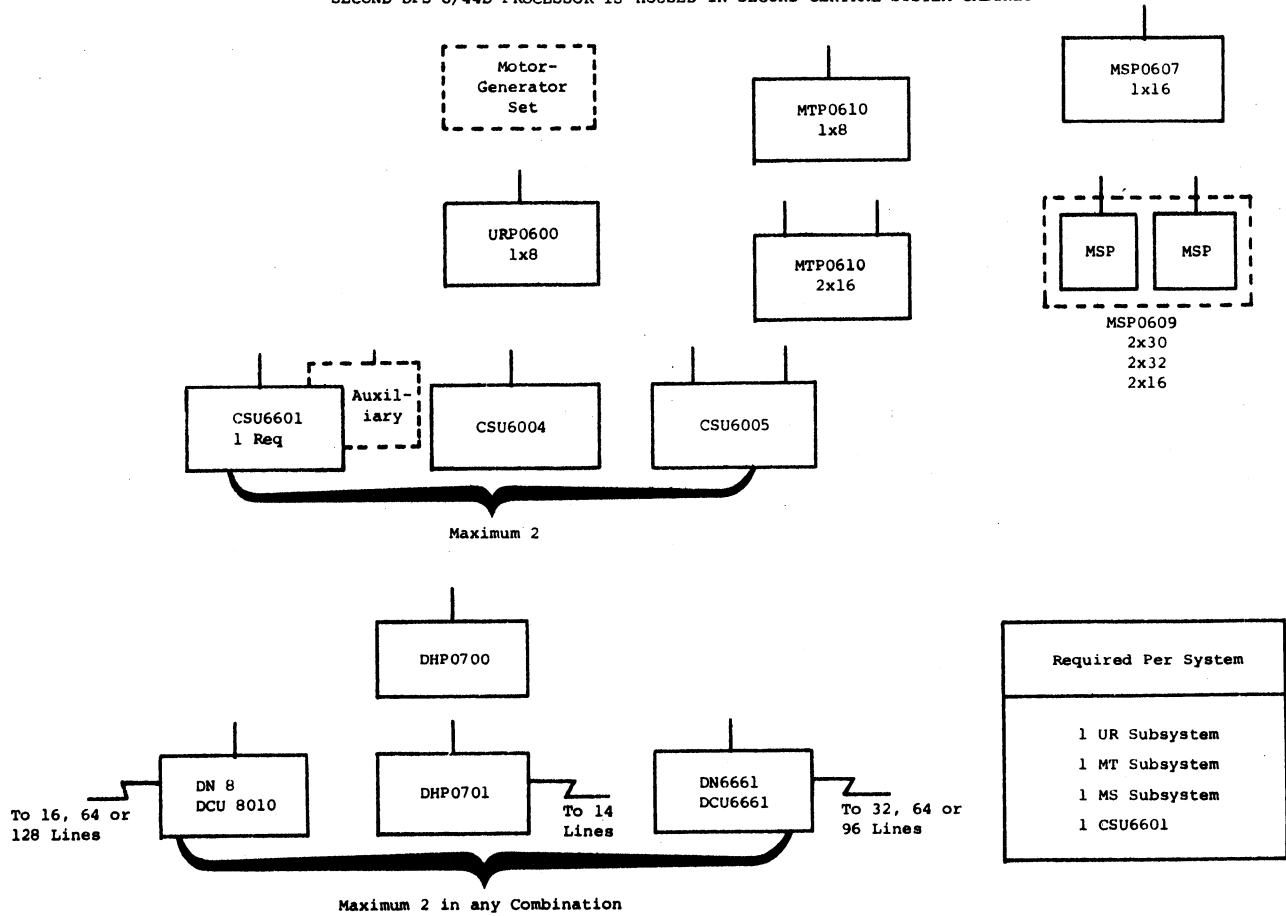
- (a) Upgrade Kit DPS 8/20 to 8/44 is CPK8126.
Upgrade Kit DPS 8/44 to 8/44D is CPK8127 and
Requires MXK8000.

SECTION III Configurator Overview

B. DPS 8/44D

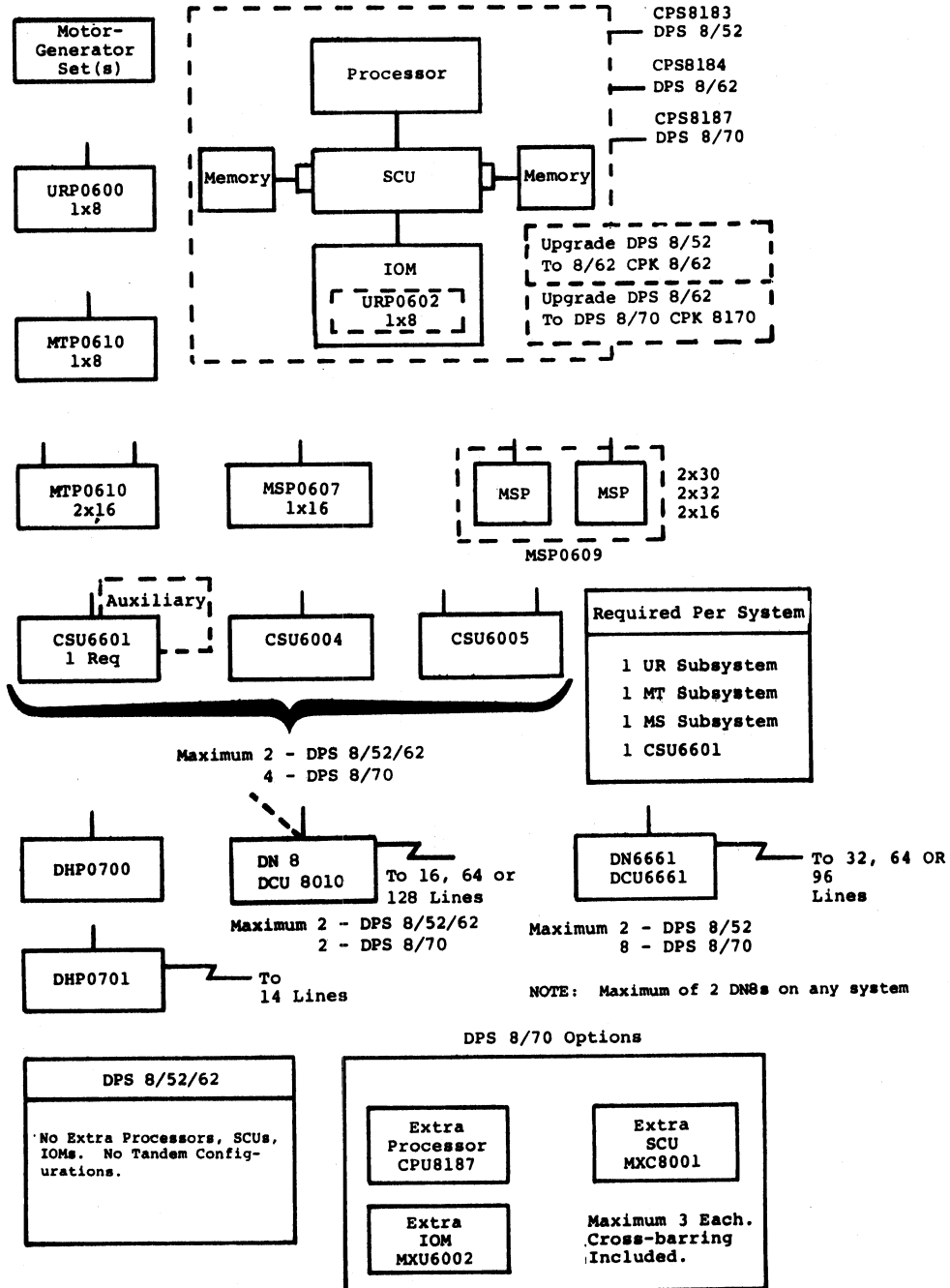


SECOND DPS 8/44D PROCESSOR IS HOUSED IN SECOND CENTRAL SYSTEM CABINET



SECTION III Configurator Overview

C. DPS 8/52/62/70



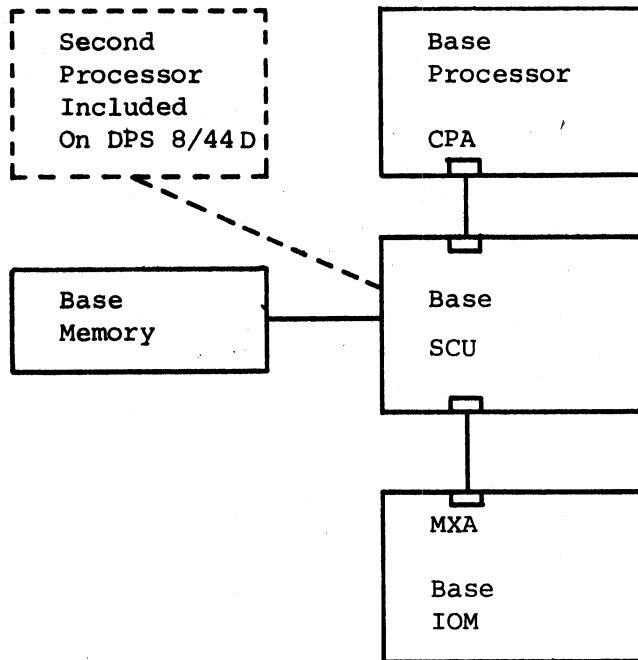


SECTION IV
Mainframe Configuring

A. Ordering basic central processing system (CPS) or mainframe

1. Note -- remember that performance of DPS 8 systems is optimized around use of ASCII code and ASCII-oriented files. Use of BCD (6-bit character) files will cause degradation of performance, particularly in the DPS 8/20/44/44D systems
2. This is the configuration which is the heart of each mainframe. It is obtained by use of the CPS marketing identifier for the model you want to order. The base CPS identifier is the first identifier that you write on your initial order. All additions at the time of the initial order or after the system has been installed are made to the base CPS system. Base CPS system is also known as base system, or basic system or base mainframe

a. Components of each DPS 8 base CPS system:



Each CPS identifier gives you a complete mainframe as shown:

One processor, (except for DPS 8/44D which has 2 processors), one SCU with a base quantity of 1MB memory, one IOM, plus one Central Processor Addressing feature or port (CPA) in base processor and one IOM Addressing feature or port (MXA) in base IOM. Components in base CPS system do not have individual identifiers.

SECTION IV
Mainframe Configuring

3. DPS 8/20/44/44D CPS identifiers
 - a. CPS8124 for DPS 8/20
 - b. CPK8126 Upgrade Kit from CPS8124 to CPS8126
 - c. CPS8126 for DPS 8/44
 - d. CPK8127 Upgrade Kit from CPS8126 to CPS8127
(Requires MXK8000)
 - e. CPS8127 for DPS 8/44D
 - f. Each CPS identifier includes:
 - 1) Central system cabinet (CSC)
 - 2) Processor, SCU, IOM - 1 each, with connecting cables and addressing features. IOM includes 19 logic board slots for physical I/O channels. DPS 8/44D includes a second cabinet with a second processor and power supply.
 - 3) 1 MB memory on one memory port and capacity for 4 MB total memory on the one memory port supplied. (DPS 8/44D can grow to 8 MB of memory with the addition of a second SCU.)
 - 4) Power supply for all components within CSC
 - 5) Space for one MSP8000 or one MSP of MSP8001
 - 6) Space for one MFP8000 or one MTP8000 or one URP8000. The peripheral processors themselves are not included in CPS8124/8126/8127 identifiers.
 - 7) All items above contained in CSC
4. DPS 8/52/62/70 CPS identifiers
 - a. CPS8183 for DPS 8/52
 - b. CPK8162 Upgrade Kit from CPS8183 to CPS8164
 - c. CPS 8184 for DPS 8/62

SECTION IV
Mainframe Configuring

- d. CPK8170 Upgrade Kit from CPS8184 to CPS8187
- e. CPS8187 for DPS 8/70
- f. Each CPS identifier includes:
 - 1) One processor and its power supply
 - 2) One SCU and 1 MB memory on one memory port. Capacity for up to 8 MB in DPS 8/52 or DPS 8/62, and up to 16 MB for DPS 8/70. Support for 16 MB memory size requires GCOS 8. SCU has own power supply
 - 3) One IOM with own power supply and inclusion of 35 logical board slots for physical I/O channels. Capacity for 19 more board slots for I/O channels via MXF6005 Channel Expansion option. Capacity for URPO602 within IOM cabinet, powered from IOM power supply. URPO602 and MXF6005 are mutually exclusive
 - 4) 3 freestanding cabinets -- processor, SCU, IOM. Connecting cables and addressing features are included in CPS identifier

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Mainframe Configuring

B. DPS 8 Memory Configurators

DPS 8/20/44/44D

Total Memory Size

	1MB	2MB	4MB
CPS8124 DPS 8/20	Standard	CMM8001 (Adds 2MB)	CMM8002 (Adds 2MB) Requires CMM8001
CPS8126 DPS 8/44			
CPS8127 DPS 8/44D			

CMM8003
(Adds 4MB)
Requires
CMM8001 and
CMM8002 and
MXC8000

DPS 8/52/62/70

Total Memory Size

	1MB	2MB	4MB
CPS8184 DPS 8/62	Standard	CMM8011 (Adds 1MB)	CMM8012 (Adds 2MB) Requires CMM8011
CPS8183 DPS 8/52			
CPS8187 DPS 8/70			

8MB	16MB
CMM8013 (Adds 4MB) Requires CMM8012, CMM8011	Not available for CPS8183, DPS 8/52 or CPS8184, DPS 8/62
	CMM8014 (Adds 8MB) Requires CMM8013, CMM8012, CMM8011

16MB Memory Size
Requires GCOS 8

SECTION IV
Mainframe Configuring

1. Each memory size is a prerequisite to the next higher memory size
 2. To upgrade memory size on an installed DPS 8 system simply select each appropriate identifier for the total size you want, less the identifiers already used for the currently installed memory size
 - a. Example -- to increase an installed DPS 8/52 from its present 2MB to 8MB memory you order one CMM8012 (2MB to 4MB) and one CMM8013 (4MB to 8MB)
- C. Series 200/2000 Compatibility Mode (CM66)
1. Marketing identifier -- CPF6001
 - a. Following options are available. One must be ordered. All are no-charge items
 - 1) CPK6001 -- No code translation
 - 2) CPK6002 -- ASCII (7-bit)
 - 3) CPK6003 -- Unsigned EBCDIC
 - 4) CPK6004 -- Signed EBCDIC
 - 5) CPK6005 -- ASCII (7-bit) and unsigned EBCDIC
 - 6) CPK6006 -- ASCII (7-bit) and signed EBCDIC
 2. MXK8000 System Controller Unit Port Expansion Feature
 - a. Required only for DPS 8/20/44 (Included in DPS 8/44D)
 - b. Adds another port to SCU to provide for connection of CM66, which involves a stripped 2000-type processor
 - c. Field installable
 3. Operating system support for CM66 is by GCOS only, not GCOS 8

SECTION IV
Mainframe Configuring

D. Ordering the extra SCU, and IOM for DPS 8/44D

1. One more SCU and/or IOM can be ordered initially, or later as additions
 - a. Maximum of two, SCUs, and IOMs per DPS 8/44D system
 - b. Marketing identifiers
 - 1) SCU -- MXC8000
 - 2) IOM -- MXU8000
 - c. All necessary connecting cables and addressing features will be automatically included. Each processor and each IOM will be cross-barred to each SCU by FE at site. You must supply cable lengths
2. Tandem DPS 8/44D configurations
 - a. Must be two processors and two SCUs and two IOMs
 - b. Allows operation as one system (one mainframe) running under one operating system
 - c. Allows operator (via switches on processor and IOM) to separate the configuration into two or more independent mainframes, each with its own operating system
 - 1) The integrated MTP8000, URP8000, MFP8000 and MSP8000, 8001 can not be cross connected between the two IOMs because they do not have a non-simultaneous switched channel. The channels on the MSP8001 can be split between the two IOMs if desired. Peripheral switches can also be used to switch the peripheral from one integrated controller to another.

E. Ordering extra processors, SCUs, IOMs for DPS 8/70

1. Up to 3 more processors and/or SCUs and/or IOMs can be ordered initially, or later as additions.
 - a. Maximum of four processors, SCUs, IOMs per DPS 8/70 system.

SECTION IV
Mainframe Configuring

- b. Marketing identifiers
 - 1) Processor -- CPU8187
 - 2) SCU -- MXC8001
 - 3) IOM -- MXU6002
 - c. All necessary connecting cables and addressing features will be automatically included. Each processor and each IOM will be cross-barred to each SCU by FE at site. You must supply cable lengths.
2. Tandem mainframe configurations
- a. Allows operation as one system (one mainframe) running under one operating system.
 - b. Allows operator (via switches on processor and IOM) to separate the configuration into two or more independent mainframes, each with its own operating system.
 - 1) Allows MT subsystems equipped with switched channel features (or MTP with dual channels) to be shared concurrently between the two mainframes and operating systems. Specific tape units would need to be dedicated to each mainframe and operating system. Catalogued disk files can be shared between the two operating systems via GCOS (III) Shared Mass Storage (SMS) option. No SMS equivalent will be available for first releases of GCOS 8
3. Memory interleaving aspects
- a. The DPS 8/52, DPS 8/62 and DPS 8/70 support 2-way interleaving on one SCU with configurations of 2 MB or more. Requires memory to be evenly divided on each of the two memory ports of SCU
 - 1) Interleavable quantities of total memory are 2MB, 4MB, 8MB, and (if DPS 8/70 and GCOS 8) 16MB

SECTION IV
Mainframe Configuring

- b. DPS 8/70 may have more than one SCU, to total of four in one system
- 1) If two SCUs exist in one system 4-way interleaving is possible. Requires same amount of memory on each of the four memory ports involved (two per SCU). Total memory sizes permitting 4-way interleaving -- 4MB, 8MB, 16MB
 - 2) If three SCUs exist in one system 4-way interleaving is possible on two of the SCUs, 2-way interleaving on the third SCU. Total memory sizes permitting interleaving on three SCUs -- 8MB, 16MB
 - 3) If four SCUs exist in one system two sets of 4-way interleaving are possible. Total memory sizes permitting two sets of 4-way interleaving -- 8MB, 16MB
- c. Interleaving causes physical memory addresses to be distributed sequentially across two memory ports on one SCU (2-way) or across four memory ports (two ports each for two SCUs for 4-way)

- 1) Example of 2-way interleaving

Addresses	<u>Port 1</u>	<u>Port 2</u>
Addresses	0-1	2-3
	4-5	6-7
	8-9	10-11
	etc.	etc.

SECTION IV
Mainframe Configuring

2) Example of 4-way interleaving addresses

SCU 1		SCU 2	
<u>Port 1</u>	<u>Port 2</u>	<u>Port 1</u>	<u>Port 2</u>
0-1	2-3	4-5	6-7
8-9	10-11	12-13	14-15
16-17	18-19	20-21	22-23
etc.	etc.	etc.	etc.

d. Benefits of interleaving

- 1) Increases effective speed of memory where memory locations are accessed in sequence. Allows the restore portion of a memory cycle on one memory port to be overlapped by the fetch portion of next memory cycle from next port in succession

F. Configuration examples for initial orders and additions

1. Initial mainframe order examples

a. Customer wants DPS 8/20 system with 2MB memory

1 CPS8124	DPS 8/20 mainframe with 1MB
1 CMM8001	1MB to 2MB Expansion

b. Customer wants DPS 8/44 with 4MB memory

1 CPS8126	DPS 8/44 mainframe with 1MB
1 CMM8001	1MB to 2 MB
1 CMM8002	2MB to 4MB

c. Customer wants tandem DPS 8/70 with 8MB total

2 CPS8187	2 DPS 8/70 mainframes, 1MB each
2 CMM8011	1MB to 2MB for each CPS
2 CMM8012	2MB to 4MB for each CPS

State on your order that you want a tandem system and give all cable lengths needed to cross-bar each processor and IOM to each SCU

d. Customer wants DPS 8/52 with 4MB memory

SECTION IV
Mainframe Configuring

1 CPS8183 DPS 8/52 mainframe with 1MB
1 CMM8011 1MB to 2MB
1 CMM8012 2MB to 4MB

2. Additions to mainframe orders -- examples

- a. Customer has a DPS 8/20 installed with 2MB.
Wants memory upgrade to 4MB

1 CMM8002 2MB to 4MB

- b. Customer has a DPS 8/44D installed. Wants a
second IOM and SCU.

1 MXC8000 SCU
1 MXU8000 IOM

- c. Customer has a 1-processor, 1-IOM DPS 8/70
installed with 4MB and 2 SCUs (1 optional).
Wants to add a second processor

1 CPU8187 2nd processor (Specify cable length)

SECTION V
Configuring Within Any IOM

A. Objectives of Section V

1. To show how you determine the number of physical I/O channels required for the peripheral subsystems you wish for your system
2. To show how, by using the information from #1 above, you determine the quantity of logic boards required to contain the electronic logic for the number and type of physical I/O channels you desire. Also, in this section you will determine whether there are sufficient channel board slots available on a standard basis or via option to contain the needed logic boards in the DPS 8 system you wish to configure
3. To show how, by using the information from #1 above, you determine how many logical channels or data paths must be assigned for the quantity of physical I/O channels you wish. We will also explain the role of logical channels, indicate how many may be assigned optionally beyond the quantity required, and how they are physically assigned
4. To show how, by using the information from #3 above, you determine how to assign the scratchpad capabilities furnished by the data rate expansion (DRE) feature. We will also review the role of DRE feature, how it is obtained, and how it is physically assigned to appropriate logical channels

B. Base IOM and Extra IOMs

1. Base IOM included within CPS8XXX identifier has no type number. All IOMs configured for the DPS 8/20/44/44D are integrated and for DPS 8/52/62/70 are freestanding.
 - a. Integrated IOMs may be obtained in three ways --
 - 1) One is included in the base DPS 8/20/44/44D
 - 2) One more may be ordered optionally on the initial DPS 8/44D.

SECTION V
Configuring Within Any IOM

- 3) One more can be ordered optionally as an add on to an installed DPS 8/44D.

All necessary cables and addressing features are automatically included to cross-bar each IOM to each SCU. You must specify cable lengths.

b. Freestanding IOMs may be obtained in 3 ways --

- 1) One is included in base CPS identifier of freestanding systems
- 2) One or more may be ordered optionally on your DPS 8/70 initial order along with the CPS components. Maximum quantity of freestanding IOMs on the DPS 8/52 and DPS 8/62 system is one. The DPS 8/70 can have a maximum of four IOMs
- 3) One or more may be ordered optionally as add-on components to a DPS 8/70 after your system has been installed. Limits are the same as in 2) above

c. Each freestanding IOM, whether optional or included in CPS identifier, has its own power supply

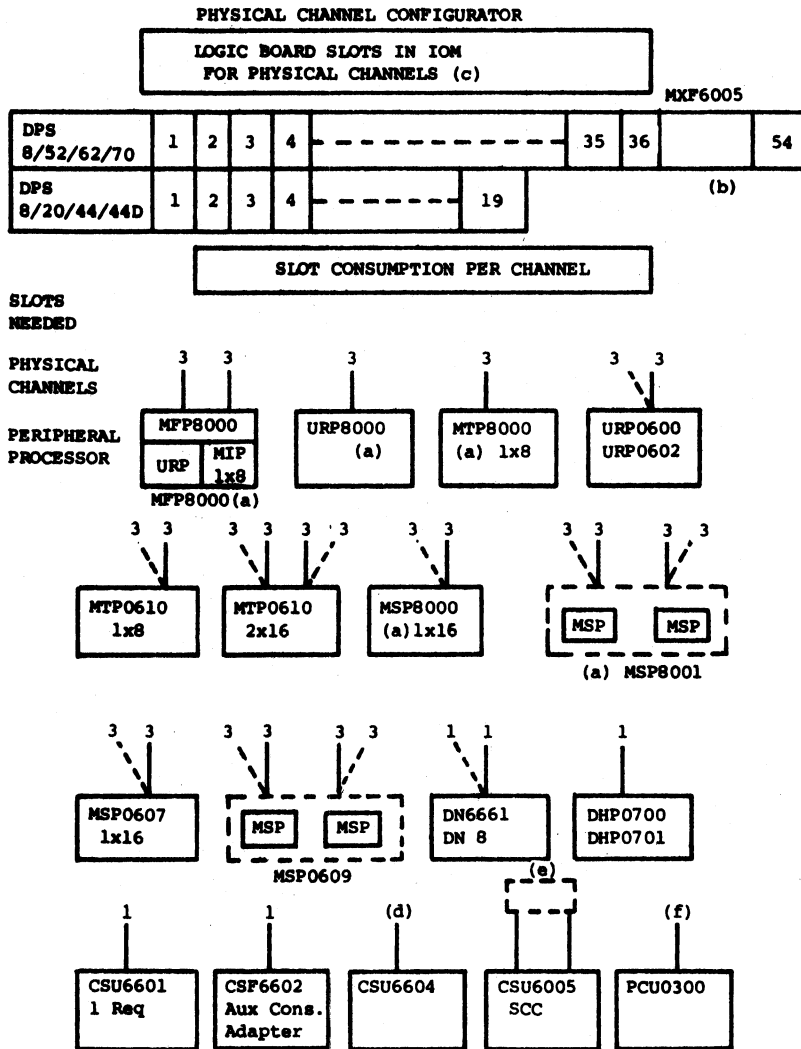
d. For each extra IOM ordered for DPS 8/70 all necessary cables and addressing features are automatically included to cross-bar each IOM to each SCU. You must specify cable lengths

e. When 2 or more IOMs exist in a (DPS 8/70) system it is desirable to split the two channels of dual-channel MTPs and MSPs, one channel to each of two IOMs. This allows the entire MT or disk subsystem to be accessible even if one IOM is lost

SECTION V
Configuring Within Any IOM

C. Determining the quantity of physical channels required, and the number of logic boards (board slots) needed and provided

1. Use the Physical Channel Configurator on next page.



- (a) FOR DPS 8/20/44 ONLY. URP8000, MTP8000, MFP8000 ARE MUTUALLY EXCLUSIVE.
- (b) MXF6005 AND URP0602 (IN IOM) ARE MUTUALLY EXCLUSIVE
- (c) EACH PERIPHERAL PROCESSOR PRICE INCLUDES 1 IOM CHANNEL EXCEPT 2 FOR CSU6605, MSP0609, MSP8001
- (d) ON DPS 8/20/44/44D REQUIRE 4 SLOTS AND ON DPS 8/52/62/70 REQUIRE 2 SLOTS
- (e) ON DPS 8/20/44/44D REQUIRE 6 SLOTS AND ON DPS 8/52/62/70 REQUIRE 3 SLOTS
- (f) ON DPS 8/20/44/44D REQUIRE 4 SLOTS AND ON DPS 8/52/62/70 REQUIRE 2 SLOTS

SECTION V
Configuring Within Any IOM

a. Top portion of Configurator above shows how many slots are provided and can be optionally obtained to hold the logic boards for physical I/O channels in IOM

- 1) DPS 8/20/44/44D IOM provides a fixed complement of 19 slots included in CPS identifier price. No additional slots are available
- 2) DPS 8/52/62/70 IOMs provide a fixed complement of 35 slots included in CPS identifier price. One MXF6005 Channel Expansion option is available for each IOM to provide 19 more board slots. Each additional IOM on DPS 8/70 provides same base complement of 35 slots in its price, and provision for one MXF6005 option in each added IOM

a) NOTE -- URP0602 (contained in freestanding IOM) and MXF6005 option are mutually exclusive in any one IOM

b. Lower portion of Configurator above shows quantity of logic boards (thus board slots) in IOM needed to terminate each I/O cable from a peripheral processor

- 1) Each solid line from a peripheral processor represents the main channel(s) for the processor. CSU6005, MSP8001, MSP0609 peripheral processors include two simultaneous main channels in their price. MTP0610 can be configured with a second simultaneous channel. The second MTP0610 simultaneous channel is required if the MTP0610 is to service 9-16 tape units in its subsystem
- 2) The dotted lines from certain peripheral processors imply the optional switched channel feature applied to a main channel. No switched channel path can have I/O simultaneously with its associated main channel. No dual-channel peripheral processor thus can have more than two data transfers in operation simultaneously, no

SECTION V
Configuring Within Any IOM

matter how many switched channel features are used

- a) Each switched channel feature defines a data transfer path and an IOM channel in its price
 - 3) Total the board slots required for each data path termination required (main channels and switched channels). Compare this to the total slots available
2. If you cannot configure the desired number of peripheral subsystems and their complement of physical channels and switched paths, REGROUP and consider these alternatives --
- a. Bid a second IOM if DPS 8/70 is involved and the prospect will allow it
 - b. Use fewer simultaneous channels and/or switched paths
 - c. Use fewer subsystems of same type
 - d. Use fewer subsystems
 - e. Use different mix of subsystems
 - f. Change from DPS 8/20/44/44D to DPS 8/52/62/70, if possible
 - g. In case of a freestanding IOM use URPO600 (freestanding) instead of URPO602 (in IOM cabinet)
3. Determine next the logical channels or data paths which must be assigned to each physical channel and switched path, and the quantity which may optionally be assigned. The DRE feature must also be assigned to each logical channel serving high transfer rate peripheral devices. See section following
- D. Assigning Logical Channels and Data Rate Expansion (DRE) Feature To Physical IOM Channels
1. Each IOM includes 24 logical channels. No options are available

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Configuring Within Any IOM

2. See Configurator for Logical Channel and DRE (Data Rate Expansion) Assignments below

CONFIGURATOR FOR LOGICAL
CHANNEL AND DRE ASSIGNMENTS

PERIPHERAL PROCESSOR	PHYSICAL CHANNELS REQUIRED (3)	LOGICAL CHANNELS REQUIRED (4)	ADDED USEFUL LOGICAL CHANNELS (5)	DRE ASSIGNMENTS (2)
(1) URP (Plus 1-4/1-8 Devices)	1	1 Per (6) Device	--	--
MSP Sgl - Channel	1	1	1 - 3	1 - 4
MSP Dual - Channel	2	2	1 - 3 Per Phy. Ch.	2 - 8
(1) MTP Sgl - Channel	1	1	0 - 1	1 - 2
MTP Dual - Channel	2	2	0 - 1 Per Phy. Ch.	2 - 4
CSU6005	2	2	--	--
CSU6601/6004	1	1	--	--
DN6641/6651	1	1	--	1
DN6661/DN 8	1	1	--	1
PCU0300	1	1	--	--

- (1) INCLUDING URP AND MTP IN MFP8000 for DPS 8/20/44/44D.
- (2) TOTAL DRE ASSIGNMENT MUST EQUAL TOTAL QUANTITY OF LOGICAL CHANNELS ASSIGNED. 24 ASSIGNMENTS PER IOM.
- (3) EACH PERIPHERAL PROCESSOR INCLUDES ONE PHYSICAL IOM CHANNEL IN ITS PRICE, EXCEPT SCC CSU6005, MSP8001/0608/0609 WHICH INCLUDE 2.
- (4) DON'T FORGET THAT FREESTANDING MTP, MSP ALLOW FOR SWITCHED PATH FEATURES TO BE ADDED TO EACH PHYSICAL CHANNEL. EACH TERMINATION IN IOM IS A PHYSICAL CHANNEL AND MUST BE ALLOTTED SEPARATE LOGICAL CHANNEL(S), THE SAME QUANTITY FOR EACH TERMINATION.
- (5) OPTIONAL BUT VALUABLE IN INCREASING SUBSYSTEM THROUGHPUT.
- (6) CCU0401 CARD READER?PUNCH CONSIDERED ONE DEVICE.

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Configuring Within Any IOM

3. Rules for assignment of IOM logical channels to physical channels
 - a. Every main and switched physical IOM channel must be assigned one logical channel or data path. URP, MTP, MSP may use more than one logical channel per physical channel, as explained below
 - b. Assignment is established on-site by the FE according to the mix of required and optional logical channels specified by you
 - c. A table showing the assignment of logical to physical channels and of physical channels to peripherals is given to GCOS at system startup time. Accordingly, GCOS always knows what logical channels to use (thus physical channels) to reach a given peripheral processor, console, FNP, or document handler processor
 - 1) In effect GCOS "sees" the peripherals it wants to reach via the logical channels
 - 2) The logical channel concept provides a link to slave program buffer areas - their size and locations. Without such a link the transfer path to/from memory could not be established. Review the IOM outline for the principle used, involving secondary mailboxes and connect channel mailbox
4. Why assign more than one IOM logical channel to a physical channel?
 - a. Use of multiple logical channels per physical channel allows multiple places to which GCOS can send or can queue I/O commands

SECTION V
Configuring Within Any IOM

- 1) As long as a logical channel is available GCOS can queue in it the next I/O command for a given subsystem, even though the physical channel is busy with data transfers for a prior operation initiated through another logical channel. Otherwise, with a single logical channel, the physical and logical channel would be tied up during the data transfer and interrupt sequence, preventing the overlapped stacking of the next I/O command by GCOS. GCOS would have to wait for an opportunity to gain access to the single channel
- 2) The effect here is potentially greater subsystem throughput by using the physical channel more efficiently, stacking commands in front of the subsystem at any time as long as a logical channel is available
- 3) Looking at it another way the use of more than one logical channel per physical channel (block multiplexing) allows multiple I/O operations to be in some stage of execution concurrently. There can be as many concurrent stages as logical channels assigned to the subsystem involved. In the URP, e.g., there could be as many as 8 card reading/card punching/line printing operations simultaneously, using one physical channel

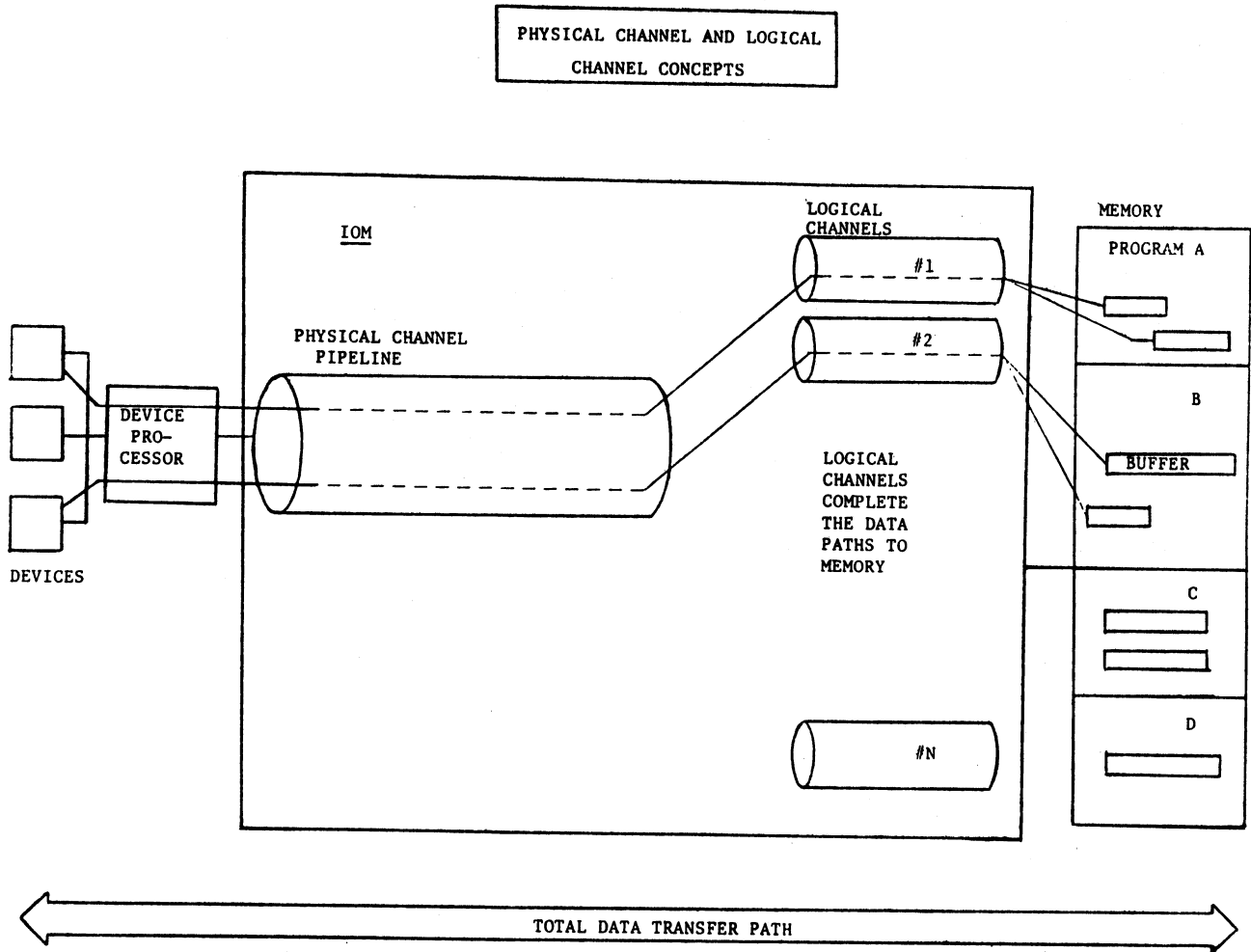
SECTION V
Configuring Within Any IOM

- b. Summary of potential benefits by assigning more than one logical channel to a physical channel:
 - 1) Greater subsystem throughput
 - 2) Use of fewer physical channels
 - 3) Larger number of I/O operations in some stage of execution concurrently
 - 4) Better use of physical channels
 - 5) Combines with rotational position sensing (RPS) in disk subsystems to increase subsystem throughput further
- c. For review see the two charts in Section 5 below on Physical Channel and Logical Channel concepts

SECTION V
Configuring Within Any IOM

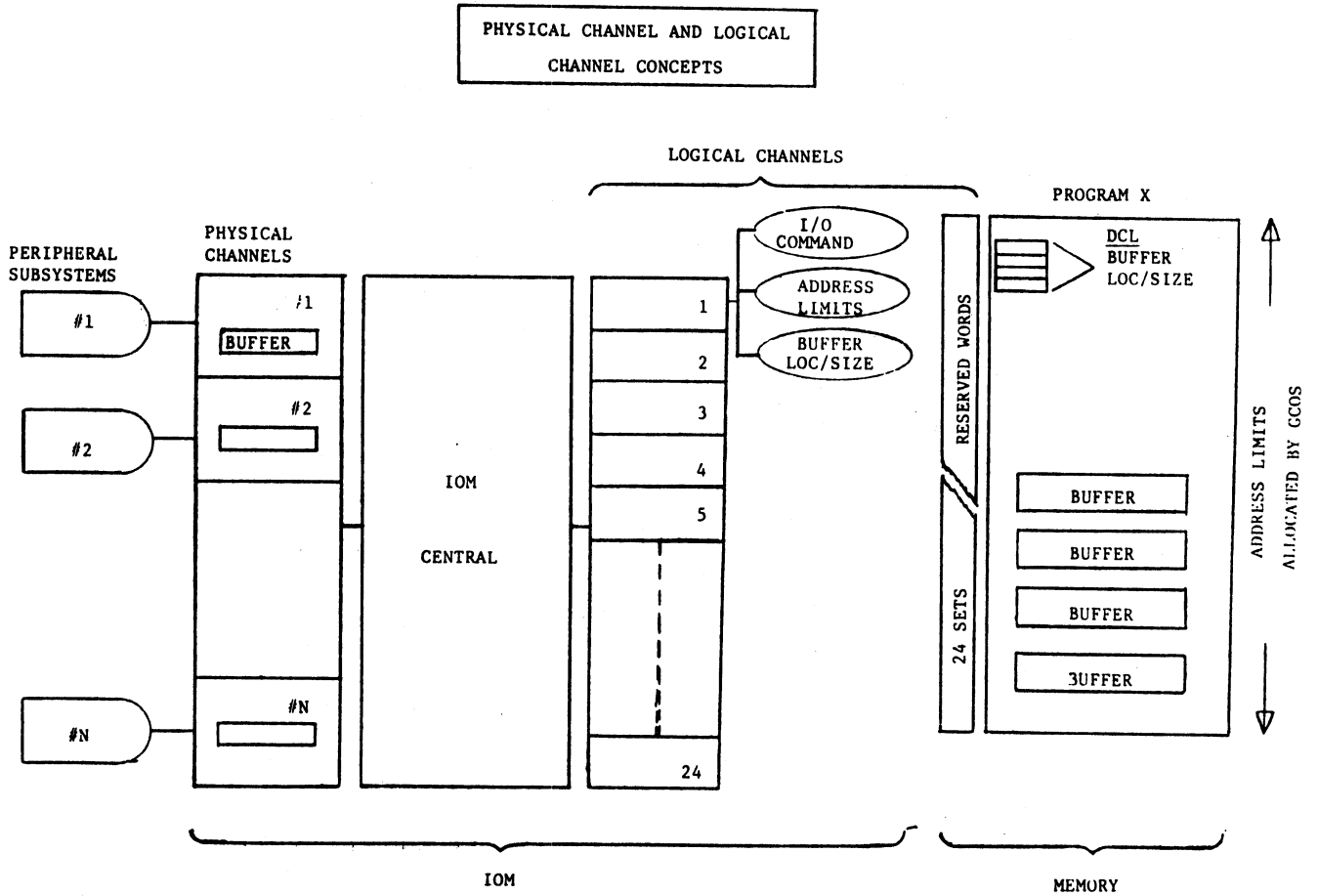
5. Physical/logical channel concepts

- a. Multiple logical channels/paths per physical channel



SECTION V Configuring Within Any IOM

- b. Linkage to slave program to complete the data transfer path



SECTION V
Configuring Within Any IOM

6. Subsystems allowing multiple logical channels per physical channel
 - a. In Unit Record Processor (URP) subsystems there must be one and only one logical channel assigned to each unit record device connected to URP. A specific logical channel is assigned to each device
 - 1) URP can handle up to 8 unit record devices (URP0600/0602/8000), or up to 4 unit record devices (URP in MFP8000)
 - 2) URP, in combination with its channel and 1-8 logical channels in IOM, performs a block (unit record) multiplexing function, allowing up to 8 devices to run simultaneously. URP buffers a full physical record from/for each device and assigns each record to the IOM physical channel as soon as last record has transferred. Each URP unit record device must be permanently preassigned to a logical channel to be used by GCOS in issuing commands for it. The logical channel controls the transfer into memory into/from the proper buffer area for the device concerned
 - b. In Magnetic Tape Processor (MTP) subsystems a second (added) logical channel may optionally be assigned to each physical channel
 - 1) NOTE - the customer may assign more logical channels optionally if he has them available. The figures for added logical channels in the Logical Channel/DRE Configurator above are based on those found sufficient for the usual customer site. Conceivably, a system with a large number of tape drives, a planned high multiprogramming depth (MPD) and heavy tape I/O activity might benefit from assigning more logical channels

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Configuring Within Any IOM

- 2) The value of the second logical channel for each physical channel is that it allows GCOS to send a new command to an open logical channel, even though the physical channel may be transferring data under command of another logical channel assigned to the subsystem. As soon as the first operation terminates a second could be initiated immediately from the command standing by in the second logical channel. GCOS could then send another command to the first logical channel, which is now open again, etc. If only one logical channel is used, GCOS cannot have any next command standing by when a command is already in operation.

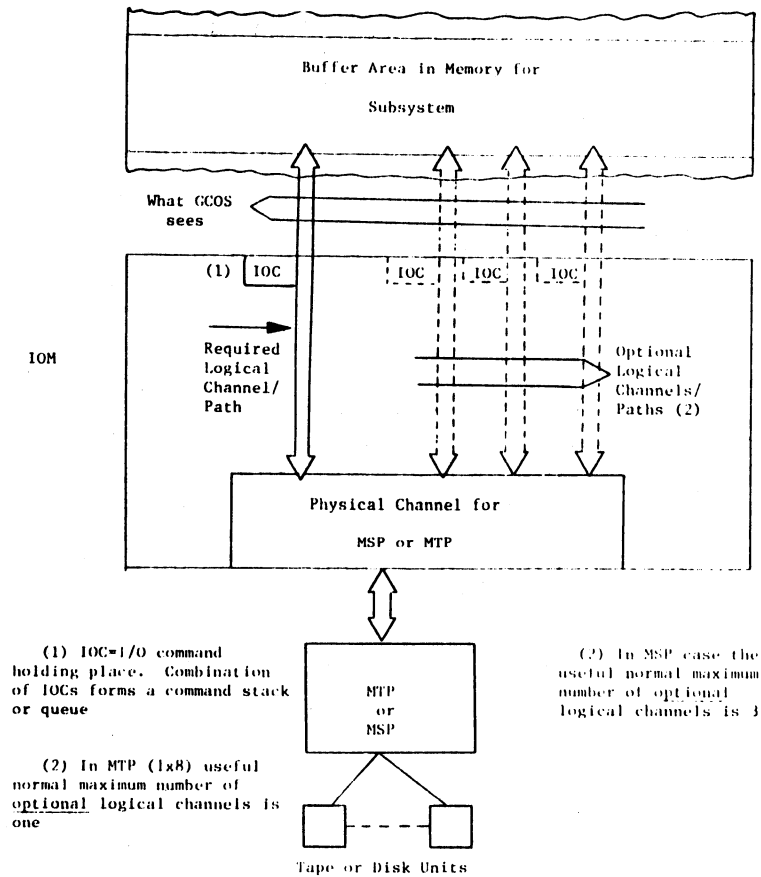
- a) Can potentially increase subsystem throughput appreciably

c. Disk subsystems

- 1) A normal useful maximum of logical channels for each IOM physical channel termination related to a mass store subsystem is four
- 2) MSP and disk spindles obtain automatic latency reduction via rotational position sensing and block multiplexing of the physical channel(s) involved. Both features can increase subsystem throughput and should always be used, at least on single-channel subsystems. They depend on multiple logical channels per subsystem
- 3) The number of logical channels assigned for a subsystem should not normally exceed the number of spindles in the subsystem. There is little or no gain with a greater number of logical channels
- 4) The number of logical channels assigned also should not be greater than the average anticipated multiprogramming depth (MPD). MPD would in general determine the average maximum possible I/O command queue size, thus dictating the usable number of logical channels

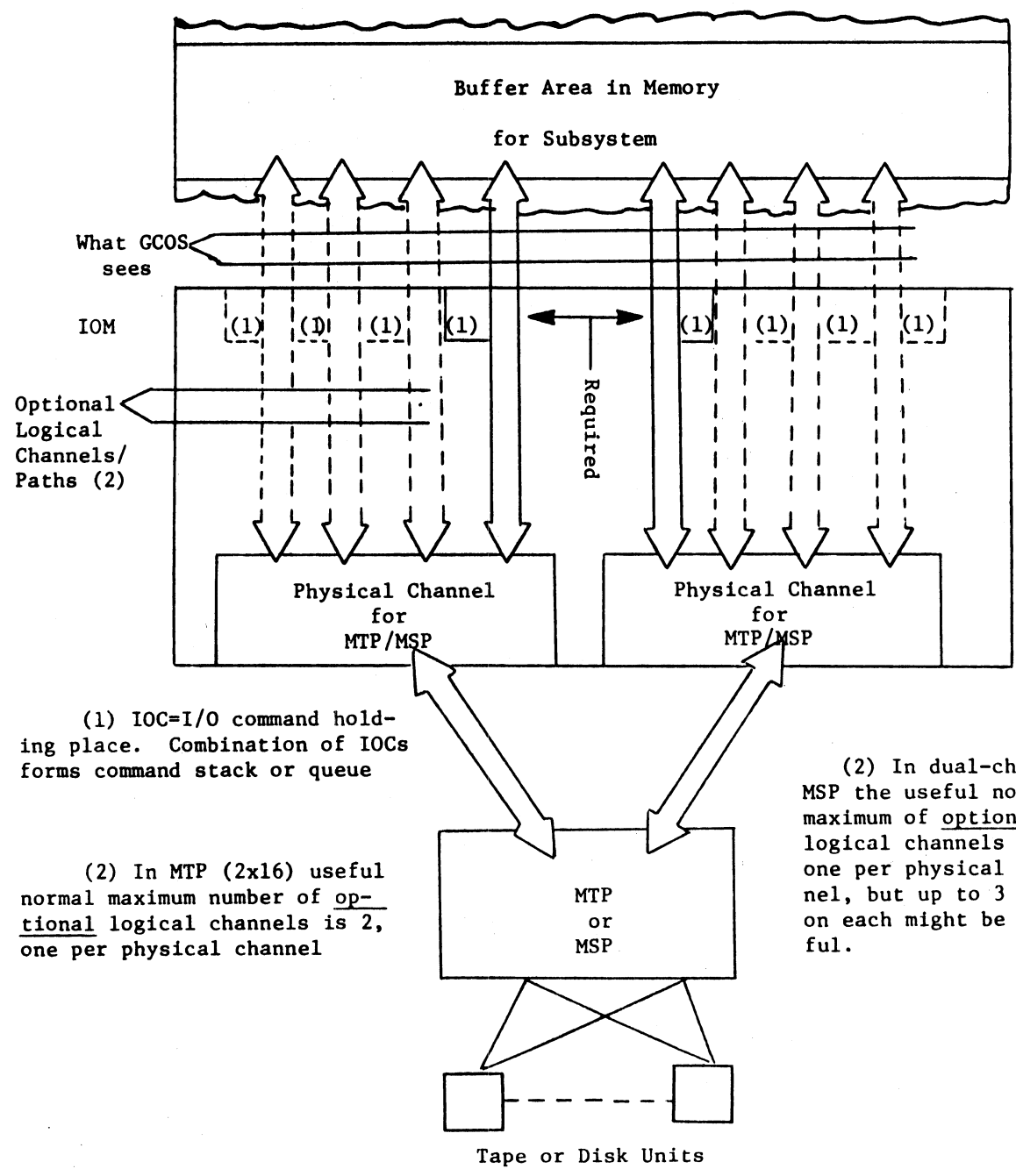
SECTION V
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- 5) The greatest relative benefit from multiple logical channels occurs on single-channel MSP. With two-channel MSP subsystems commands tend to be serviced almost as soon as they are delivered to the subsystem in most cases. As a result there is not as much chance to have command queues build up, thus there is less relative effect from multiple logical channels in a dual-channel subsystem case. Dual-channel subsystems will probably give greater throughput in all cases, especially where the subsystem includes more than four or five disk spindles
7. IOM logical channel/data path assignment - tape and disk subsystems
- a. Single-channel MTP (1x8) or single-channel MSP subsystem



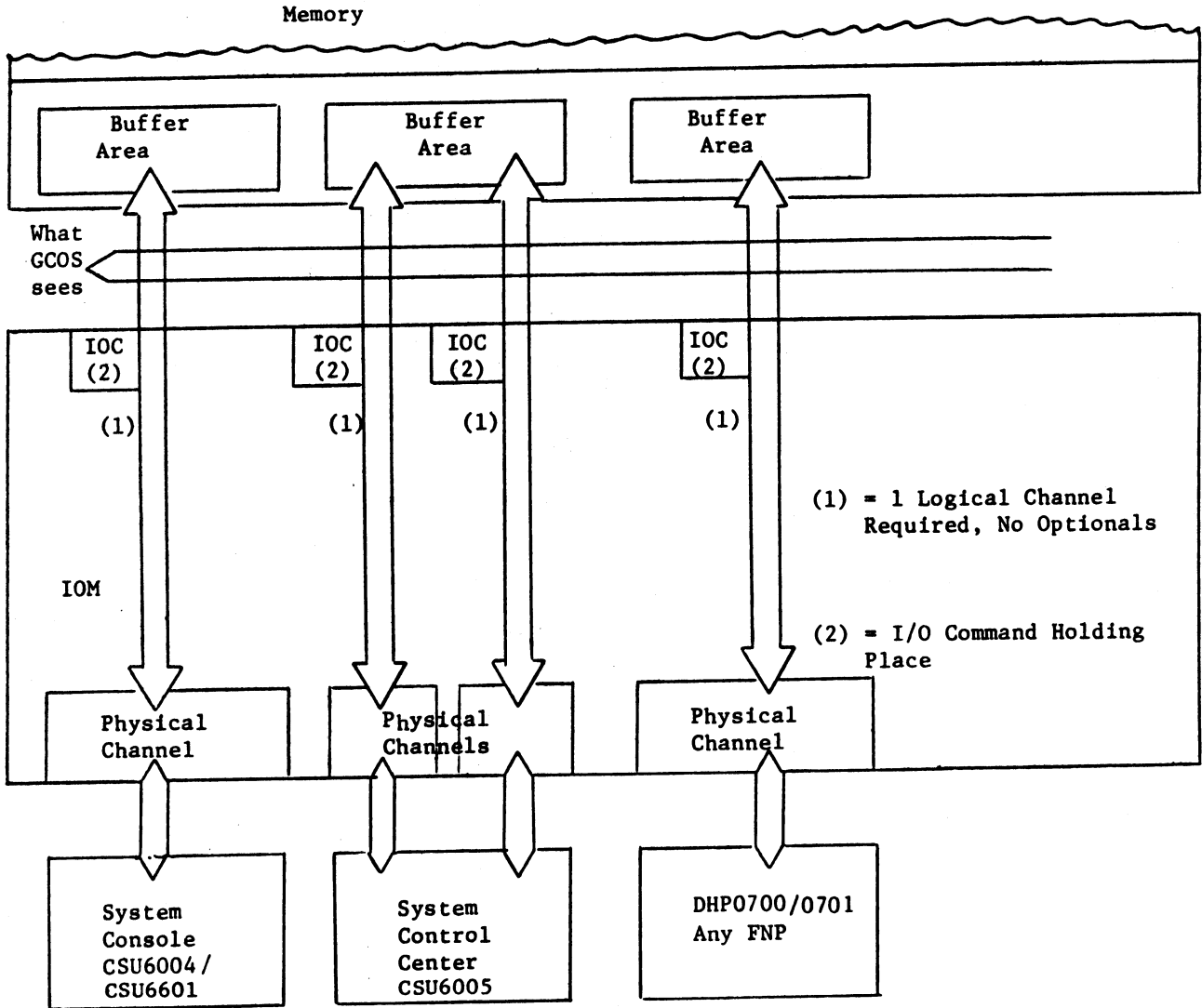
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b. Dual-channel MTP (2x16) or dual-channel MSP subsystem



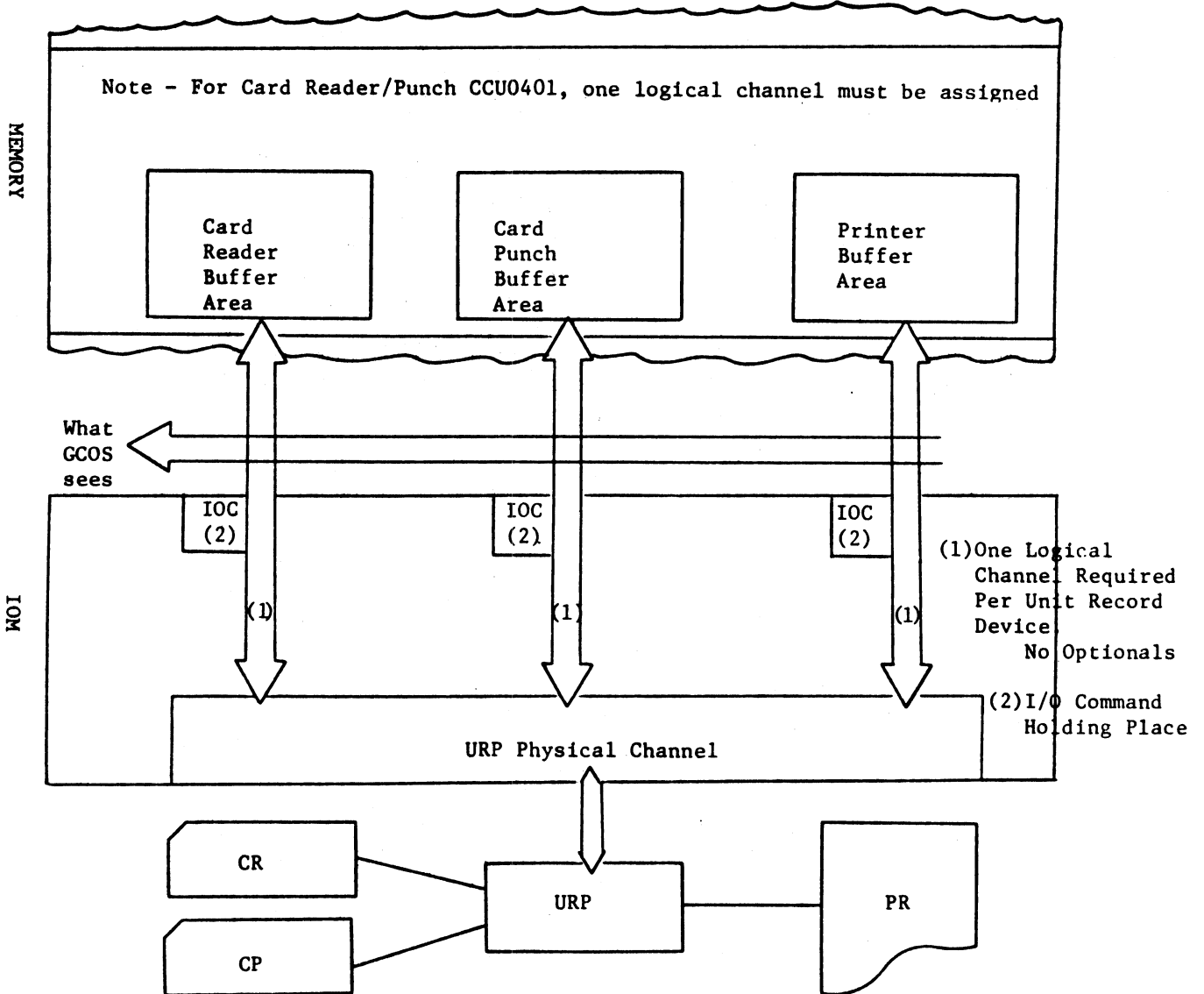
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8. Logical channel assignments for Document Handler Processors/FNPs and Consoles



SECTION V
 Configuring Within Any IOM

9. Logical channel assignments for Unit Record Processor subsystem



SECTION V
Configuring Within Any IOM

10. Determining DRE (Data Rate Expansion) Requirements and Assignments

a. Use of DRE scratchpad storage feature

1) One DRE feature is standard in each base IOM, i.e., the IOM included in base DPS system. Optional IOMs in DPS 8/70 systems also include the DRE feature

a) The DRE feature is assignable by your FE to up to 24 logical channels, based on the assignments that you define to him. There are 24 logical channels per IOM. The DRE feature, when assigned to a logical channel, cuts memory accesses by about 3:1 for data transfers over that channel. This frees memory cycles for use by processor and IOM. The higher the transfer rate involved over the logical channel, the greater the benefit from reduction of memory cycles otherwise needed

2) DRE assignment rules

a) Assign DRE feature to each logical channel in b) below on a basis of transfer rates in descending speed. Each logical channel used for subsystems below must have a DRE facility assigned to it, including logical channels used in switched non-simultaneous physical channel cases

b) Assignment priorities for DRE facilities in descending order are shown below. These are reflected in the Configurator for Logical Channel and DRE Assignments above

- FNP
- DHP
- Disk (or tape if its transfer rate is higher)
- Tape

SECTION VI
Unit Record Subsystems

- A. Configuring unit record processor (URP) subsystems
1. Required configuration elements per unit record subsystem
 - a. URP (unit record processor). MFP8000 for DPS 8/20/44/44D includes URP and MTP
 - b. URA (unit record addressing). For each unit record unit/device, select the specific URA for that unit/device
 - c. Card reader - at least one card reading device must be in each DPS 8 system
 - d. Printer - at least one high-speed printer must be present in each DPS 8 system
 2. Multiple URPs can be used on a DPS 8 system
 3. URPs available for DPS 8 systems
 - a. URP0600 - freestanding, own power supply, usable with any DPS 8 system. Up to 8 devices
 - b. URP0602 - contained in freestanding IOM, thus eligible only for DPS 8/52/62/70 systems. Depends on power supply in IOM. Mutually exclusive with MXF6005 Channel Expansion option. Up to 8 devices
 - c. URP8000 - contained in central system cabinet (CSC) of DPS 8/20/44/44D. Shares power supply in CSC. Mutually exclusive with MTP8000 and MFP8000. Up to 8 devices
 - d. MFP8000 - contained in central system cabinet (CSC) of DPS 8/20/44/44D. Shares power supply in CSC. Up to 4 unit record devices supported by URP portion of MFP8000. MTP also included in MFP8000. MFP8000 is mutually exclusive with URP8000 and MTP8000. URP and MTP portions have individual channels and can operate simultaneously

SECTION VI
Unit Record Subsystems

4. Table of unit record devices

Device	Model	Max Per URP	Speed
Card readers	CRU1050	1-2	1050 cpm
	CRU0501	1-2	500 cpm
Card punches	PCU0120/0121	1-2	100-400 cpm
Card reader/ punch	CCU0401 (1 device)	1-2	CR 400 cpm
			CP 100-400
Printers	PRU1100 (Drum)	1-8	To 1100 lpm
	PRU1200 (Belt)	1-6	To 1200 lpm
	PRU1600 (Belt)	1-6	To 1600 lpm

5. Maximum number of devices is four on MFP8000, eight on other URPs. Maximums may be chosen from these for each type of device:

- a. 2 CRU1050 or 2 CRU0501 or 1 each
- b. 2 PCU0120 or 2 PCU0121 or 1 each
- c. 2 CCU0401 (each counts as 1 CR and 1 CP)
- d. 8 PRU1100 printers or 6 PRU1200/1600 printers.

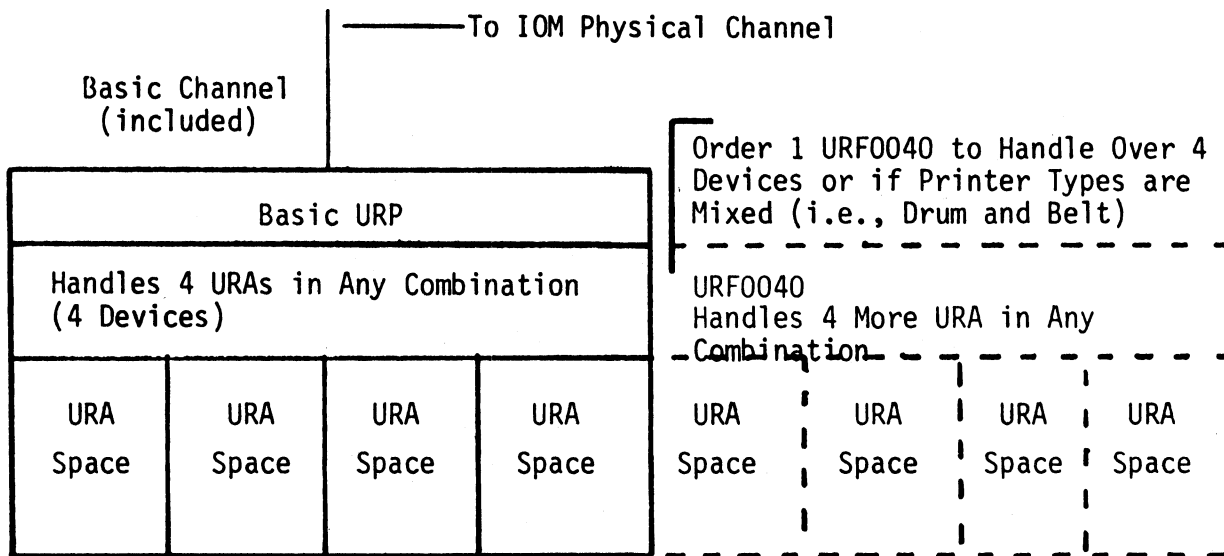
6. URP subsystem configurator

a. Rules for use

- 1) Every unit record device in URP subsystem must be configured with a specific unit record adapter or addressing feature (URA) which is related to the device type
- 2) Options are identified by dotted lines or boxes. In general options are priced features beyond the standard complement included in basic URP or device price
- 3) You must show on your order any pertinent item with a type number

SECTION VI
Unit Record Subsystems

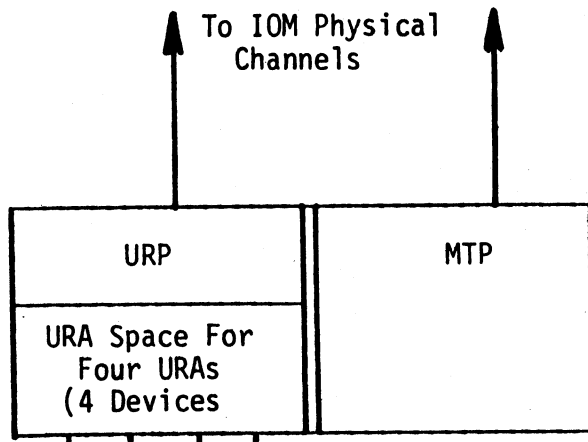
b. Configurator for URP0600/0602/8000



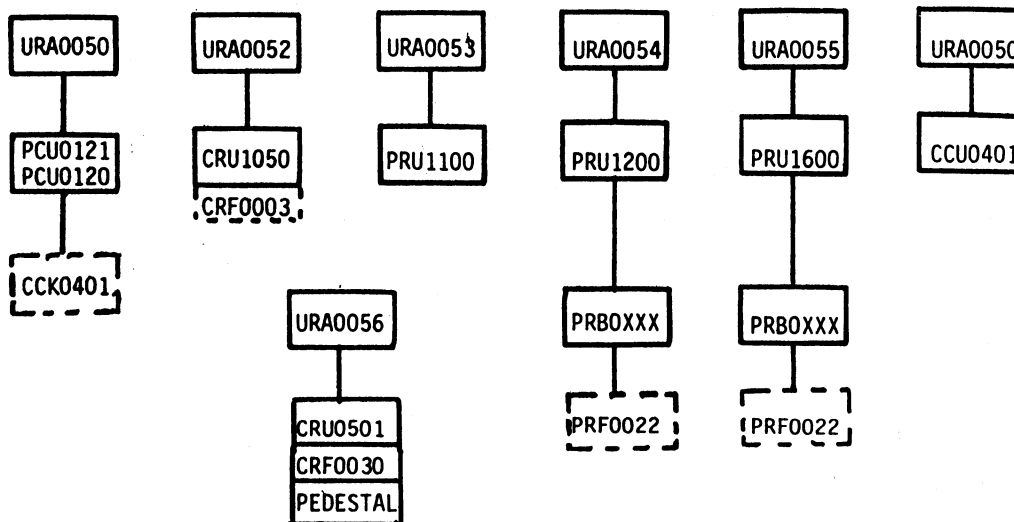
- 1) Order URAs and unit record devices as needed
- 2) URP0600 - freestanding, usable on any DPS 8 system
- 3) URP0602 - in freestanding IOM cabinet, for DPS 8/52/62/70. Excludes MFX6005 Channel Expansion option
- 4) URP8000 - in CSC of DPS 8/20/44/44D. Cannot be used with MTP8000 or MFP8000

SECTION VI
Unit Record Subsystems

c. Configurator for URP in MFP8000



d. Configurator for URAs and associated unit record devices. Each device must have one specific URA associated with it. These URAs relate to all URPs and to URP portion of MFP8000



SECTION VI
Unit Record Subsystems

7. Summary of marketing identifiers (MI) related to URP subsystems

<u>MI</u>	<u>Description</u>	<u>Remarks</u>
URP0600	Freestanding URP (1x8)	All URPs include 1 IOM Channel. Any DPS 8 system
URP0602	URP in Freestanding IOM (1x8)	DPS 8/52/62/70 only. Excludes MXF6005 Channel Expansion
URP8000	URP in Central System Cabinet (1x8)	DPS 8/20/44/44D only. Mutually exclusive with MFP8000 and MTP8000
MFP8000	Contains a URP (1x4) and a MTP (1x8) in Central System Cabinet	DPS 8/20/44/44D. Mutually exclusive with URP8000 and MTP8000
URF0040	Unit Record Addressing (URA) Expansion for URP0600/0602/8000	Handles up to 4 more intermixed URAs beyond standard maximum of 4. Required if more than 4 devices are configured, or if drum and belt printers are mixed
PCU0120	100-400 cpm Card Punch	Optional
PCU0121	100-400 cpm Card Punch	Optional
URA0050	Unit Record Addressing for PCU0121, PCU0120	1 Required Per Punch
CRU1050	1050 cpm Card Reader	1 CRU1050 or CRU0501 required per system
CRU0501	500 cpm Card Reader	
URA0052	Unit Record Addressing for CRU1050	1 Required Per CRU1050
URA0056	Unit Record Addressing for CRU0501	1 Required Per CRU0501

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Unit Record Subsystems

CRF0003	51-Column Card Feature for CRU1050	No software support
CRF0030	Pedestal for CRU0501	Optional
CCU0401	Card Reader/Punch Unit	
CCK0401	Upgrades PCU0121 to CCU0401	
URA0050	Unit Record Addressing for CCU0401	1 Required Per CCU0401
PRU1100	Drum Printer, to 1100 lpm	
URA0053	Unit Record Addressing for PRU1100	1 Required per PRU1100
PRU1200	Belt Printer, to 1200 lpm	
URA0054	Unit Record Addressing for PRU1200	1 Required Per PRU1200
PRK1216	PRU1200 to PRU1600 Upgrade Kit	
PRU1600	Belt Printer, to 1600 lpm	
URA0055	Unit Record Addressing for PRU1600	1 Required Per PRU1600
PRF0022	Expansion of PRU1200/1600 from 136 to 160 Print Columns	
PRB0500	64-character BCD Belt	At least one belt is required per PRU1200/1600
PRB0501	64-character Belt, IBM 1403 print set	
PRB0513	64-character ASCII Belt	See Peripherals
PRB0524	64-character Belt, with OCR-A/B numeric font	
PRB0532	Puerto Rico Belt, 64-characters, 407 font	Outline for belt descriptions

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Unit Record Subsystems

PRB0549 64-character Belt, with
OCR-A alphanumeric font

PRB0600 96-character ASCII Belt

PRB0703 64-character Belt, 200/0
char. set, OCR-B
numeric font

8. Example of URP configuring

- a. Assume you are bidding a DPS 8/44 and that you want a URP subsystem with a card reader, card punch, and two 1600 lpm printers. The 1600 lpm printers are each to have both 64-character (BCD) and 96-character (ASCII) printing capability. The URP and MTP are to be integrated within the CSC
- b. You would order as follows:

<u>Qty</u>	<u>MI</u>	<u>Description</u>
1	MFP8000	MTP and URP Integrated in CSC
1	CRU0501	Card Reader
1	URA0056	Unit Reader Addressing for CRU0501
1	PCU0121	Card Punch
1	URA0050	Unit Record Addressing for PCU0121
2	PRU1600	Belt Printer
2	URA0055	Unit Record Addressing for PRU1600
2	PRB0500	64-Char BCD Belt for PRU1600
2	PRB0600	96-Char ASCII Belt for PRU1600
1	CRF0030	Pedestal for CRU0501 (Optional)

B. Configuring PCU0300 Card Punch Subsystem

1. An older freestanding subsystem with own punch device, own subsystem controller, own power supply
2. Has no connection to any URP or MFP8000
3. Price includes IOM physical channel
4. Requires 4 physical channel slots in 8/20, 8/44 or 8/44D



SECTION VII
Magnetic Tape Subsystems

A. Configuring Magnetic Tape Subsystems

1. Required configuration elements

- a. MTP0610 (magnetic tape processor) or MFP8000 (contains MTP and URP). Each MTP handles any combination of MTUs described below. MTP0610 is freestanding, with own power supply, and can be used on any DPS 8 system. MFP8000 is contained in CSC of DPS 8/20/44/44D and shares CSC power supply
- b. MTU (magnetic tape units)
 - 1) Note - with the announcement of the cluster-priced MTU0412 there is ambiguity in the term "tape unit", since MTU0412 price includes 2 separate cabinets and is simply a price cluster, not a physically packaged cluster. In this tape configuration material the term "tape unit" will be used to mean a single tape cabinet with provisions for reading/writing on one tape reel
 - 2) Multiples of any MTU type number can be used in any combination except for MTU0411, which must be used only with MTU0412
 - 3) MTU0400 is used outside U.S., Mexico and Canada in place of MTU0410/0412/0411. It has same characteristics as MTU0410/0412/0411 in table below except that MTU0400 provides automatic threading of tape reel, push-on reels, and optional tape cartridge feature
 - 4) Must be a minimum of 1-3 tape units per DPS 8 system. Review Section II.B for minimum and maximum peripherals
- c. MTU density feature
 - 1) Every tape unit must be equipped with only one density feature from the MTU features table below. Density features are upgradable on-site by FE

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Magnetic Tape Subsystems

- 2) Each tape unit when equipped with the desired density feature has one 7-track read/write head or one 9-track read/write head, not both
- 3) See table in Section 6.b. below
- d. MTA (magnetic tape addressing) - one per 4 tape units, two for first 8 units in case of dual-channel MTP. See table in Section 5.b. below
- e. Second IOM physical channel (MTF1141) - required if more than 8 tape units will be configured in a tape subsystem. Optional otherwise. Maximum of 16 MTUs per subsystem

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2. Table of tape unit characteristics

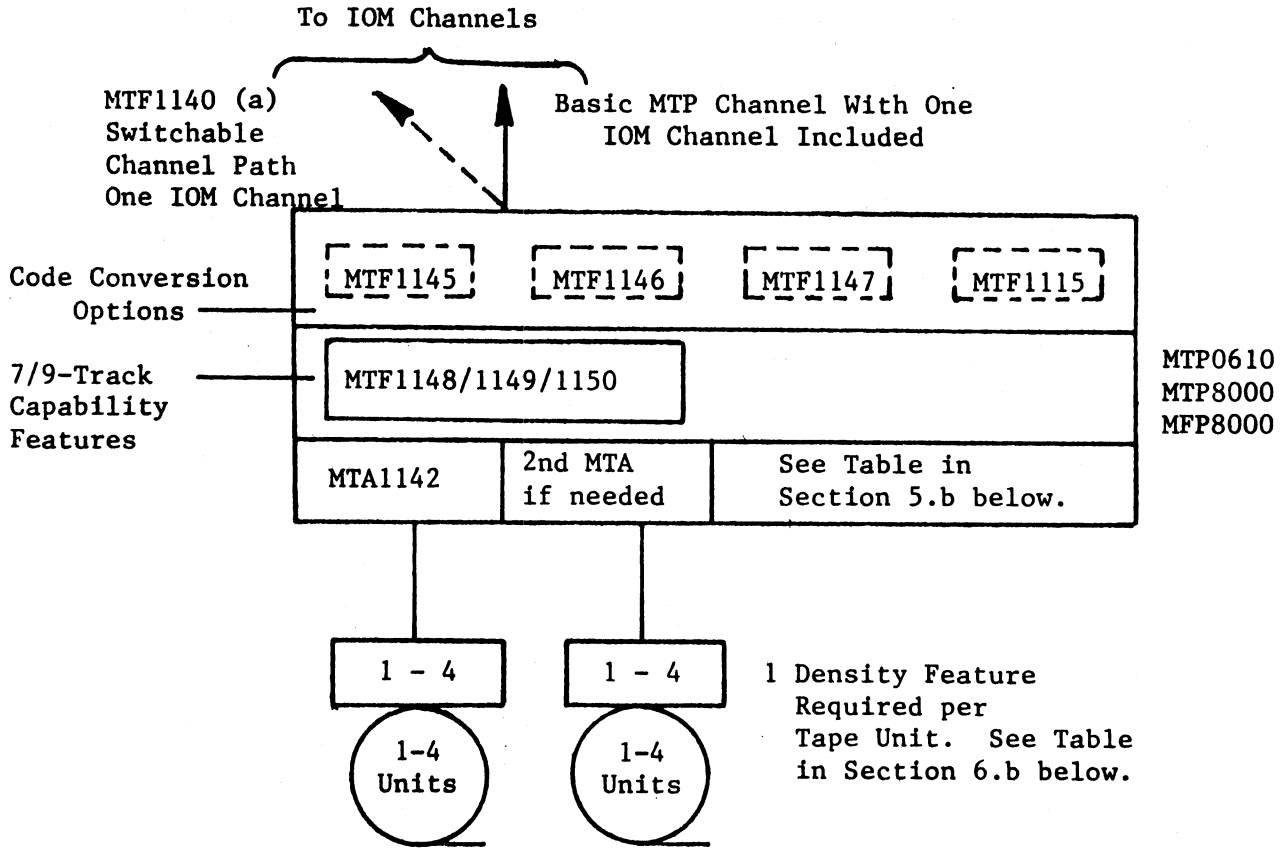
	0400 (Not U.S., Canada, Mexico) 0410		
	MTU 0412 0411	MTU0500	MTU0610
Automatic threading	Semi	Y	Y
Inches/second forward speed	75	125	200
Cartridge load option	N	Y	Y
Rewind speed (inches/second)	450	500	640
Power windows	Y	Y	Y
NRZI or PE recording (PE for 1600 bpi)	Both	Both	Both
7-track operation	Y	Y	N
Inter-record gap	.75 in	.75 in	NA
200 bpi-character rate	15KC	25KC	NA
556 bpi-character rate	41.7KC	69.5KC	NA
800 bpi-character rate	60KC	100KC	NA
9-track operation	Y	Y	Y
Inter-Record Gap	.6 in	.6 in	.6 in (1600 bpi)
			.3 in (6250 bpi)

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Magnetic Tape Subsystems

200 bpi-byte/character rate	15KB/20KC	25KB/33.3KC	NA
556 bpi-byte/character rate	41.7KB/ 55.5KC	69.5KB/ 92.4KC	NA
800 bpi-byte/character rate	60KB/80KC	100KB/130KC	160KB/213KC
1600 bpi-byte/character rate	120KB/ 160KC	200KB/ 266KC	320KB/ 426KC
6250 bpi byte/character rate	NA	NA	1250KB/ 1666KC

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Magnetic Tape Subsystems

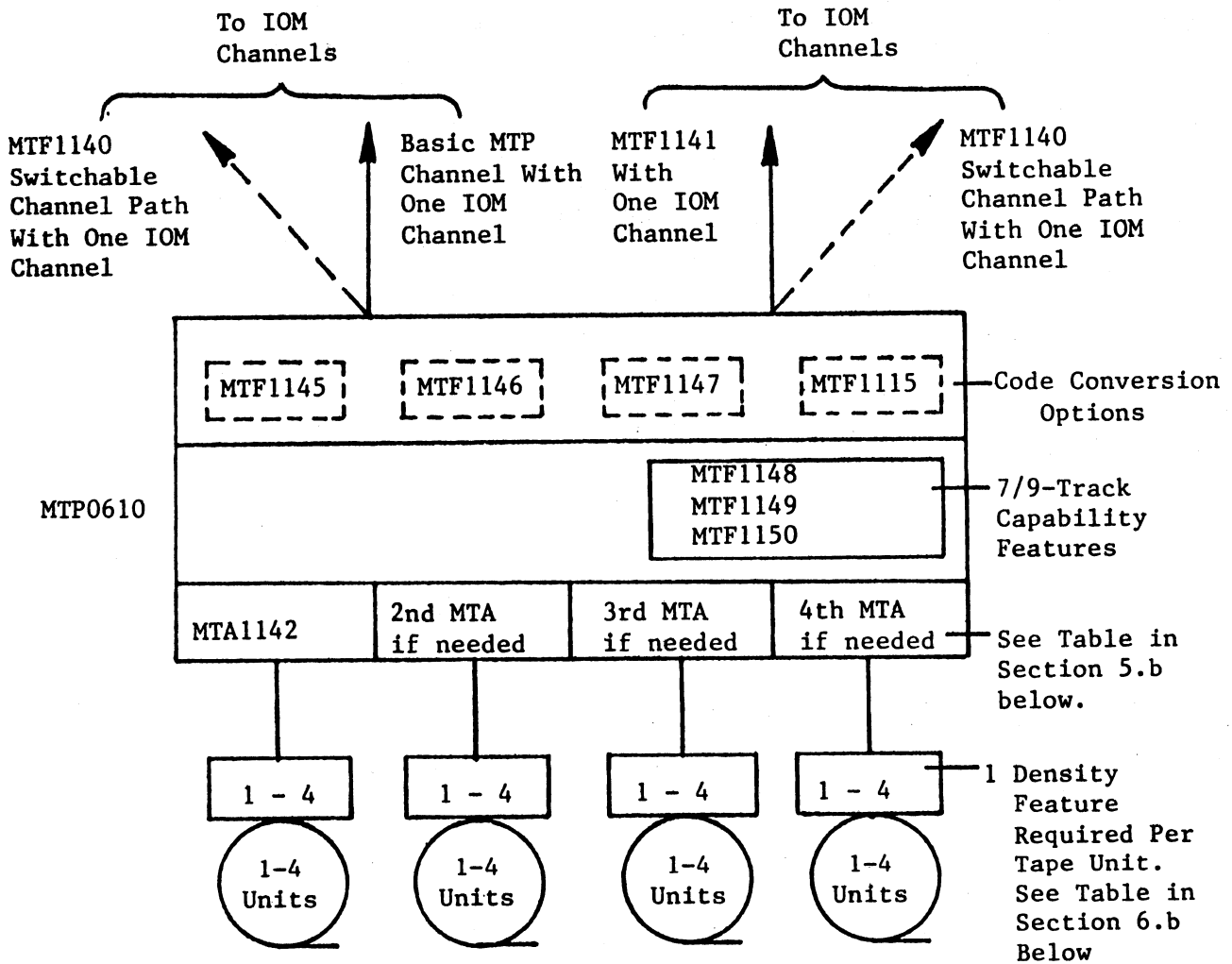
3. Configurator for freestanding single-channel MTP (1x8 subsystem)



a. Not available on MTP8000 or MTF8000.

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Magnetic Tape Subsystems

4. Configurator for freestanding dual-channel MTP (2x16 subsystem)
 - a. Second channel (MTF1141) required if more than 8 units are used in a subsystem
 - b. Each channel is cross-barred to each tape unit



SECTION VII
Magnetic Tape Subsystems

5. Magnetic tape processor (MTP) components

a. List of Device Processor (MTP) Marketing Identifiers (MI)

<u>MI</u>	<u>Description</u>	<u>Remarks</u>
MTP0610	Freestanding Magnetic Tape Processor - Handles to 8 tape units (1x8) or to 16 with MTF1141 (2x16). Includes IOM physical channel. Requires MTF1149 and/or MTF1150 9-track capability feature(s)	Required if MFP8000 or MTP8000 not used
MFP8000	Contained in 8/20/44/44D CSC. Includes 1x8 MTP and MTP IOM physical channel, plus 1x4 URP and its IOM channel. Both URP and MTP operate simultaneously. Cannot be used with MTP8000 or URP8000	Required in DPS 8/20/44/44D if MTP8000 or MTP0610 not used
MTP8000	Contained in DPS 8/20/44/44D CSC. 1x8 MTP, including MTP IOM physical channel. Cannot be used with MFP8000 or URP8000	Required in 8/20/44/44D if MTP0610 or MFP8000 not used
MTF1140	Switchable Non-simultaneous Channel. Makes a MTP channel software-switchable. Includes IOM physical channel for termination of switched channel path	Optional Not available on MTP8000, MFP8000
MTF1141	Dual Simultaneous Channel (device processor channel) for MTP0610. Includes	Required to support more than 8 units.

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	IOM channel	Optional otherwise.
MTA1142	Magnetic Tape Addressing Adapter	1 per 4 MTUs (1)
(3)	MTF1145 ASCII Code in Tape to/from 6-bit BCD Code Translator (9-track tape)	Optional (2)
(3)	MTF1146 Unpacked EBCDIC Code in Tape to/ from 6-bit BCD Code Translator (9-track tape)	Optional (2)
(3)	MTF1147 Unpacked EBCDIC Code in Tape to/ from ASCII Code Translator (9-track tape)	Optional (2)
(3)	MTF1115 Tape Interchange Feature for H200/0 Tapes (7-track/9-track tape). Required to use H200/0 tapes with CM66 (emulator), also to use COBOL-74 UFAS with 200/0 tapes	Optional (2)
MTF1148	7-track support, for 556/800/1600 bpi density. MTF1149 required	Optional (2)
MTF1149	9-track support, for NRZI recording (800 bpi) and PE recording (1600 bpi)	X (2,4)
MTF1150	9-track support, for PE recording (1600 bpi) and GCR recording (6250 bpi)	X (2,4)

SECTION VII
Magnetic Tape Subsystems

Footnotes:

- 1) 2 required for first 8 tape units if MTF1141 is configured, i.e., you are configuring a dual simultaneous channel MTP0610. See MTA table on next page
 - 2) 2 required if you are configuring a dual simultaneous channel MTP0610
 - 3) May all be present in same MTP. No software support for these except MTF1115
 - 4) Either MTF1149 or MTF1150 is required. MTF1148 use requires MTF1149. MTF1148/1149/1150 may all be present in same MTP
- b. Table showing quantities of required magnetic tape unit addressing adapters (MTA1142). Each MTA1142 interfaces to up to 4 tape units and to a device processor channel. Two MTAs are required for the first 8 tape units in a dual simultaneous channel MTP0610

MTA Table

No. of Tape Units on MTP	MTP0610	
	1x8 MTP No. of MTAs	2x16 MTP No. of MTAs
1-4	1	2
5-8	2	2
9-12	-	3
13-16	-	4

SECTION VII
Magnetic Tape Subsystems

6. Magnetic tape unit components

- a. List of tape unit marketing identifiers (MI). After selecting a tape unit you must select a tape density feature from the features table in Section 6.b. below. Density feature establishes transfer rate. KC and KB indicate thousands of 6-bit characters (KC) and 8-bit bytes (KB) per second instantaneous transfer rate

<u>MI</u>	<u>Description</u>
MTU0400	75 ips, 15KC to 160KC, 15KB to 120KB. Not usable in U.S., Canada, Mexico
MTU0410	75 ips, 15KC to 160KC, 15KB to 120KB. More expensive than MTU0412/0411 but with identical characteristics
MTU0412	Same characteristics as MTU0410. MTU0412 is available only as a 2-unit cluster (2 cabinets). Your lowest price per tape unit is provided by MTU0412
MTU0411	Same characteristics as MTU0410 but available only when MTU0412 has also been configured. A single tape unit
MTU0500	125 ips, 25KC to 266KC, 25KB to 200KB
MTU0610	200 ips, 111.2KC to 1666KC, 160KB to 1250KB

- b. Table of MTU density and other features and marketing identifiers

SECTION VII
Magnetic Tape Subsystems

- 1) Every tape unit must have only one density feature. For MTU0412, select two density features since there are two tape units. Density feature establishes transfer rate. In addition to a density feature for each MTU there must also be 7-track and/or 9-track support feature(s) in each MTP. These support features (MTF1148/1149/1150) are identified in the list of marketing identifiers for MTP components shown earlier
- 2) Determining MTU speed in KC and KB
 - a) Multiply the bpi density times the inches per second tape movement speed (ips)
 - b) For 7-track tapes the result is always KC. For 9-track tapes recorded in bytes the result is always KB
 - c) For 9-track tapes recorded in BCD mode (6-bit characters) multiply the bpi times ips times 1.33

SECTION VII
Magnetic Tape Subsystems

Table of MTU Density Features

MTU0410 75 inches per second	MTU0500 125 inches per second	MTU0610 200 inches per second
MTF0113: 7-track density, 200/556/800 bpi	MTF0013: 7-track density, 200/556/800 bpi	MTF0607: 9-track density 800/1600 bpi
MTF0116: 7-track density, 556/800 bpi	MTF0016: 7-track density, 556/800 bpi	
MTF0112: 9-track density, 800/1600 bpi	MTF0012: 9-track density, 800/1600 bpi	MTF0608: 9-track density, 1600/6250 bpi
MTU0412/0411 75 inches per second	MTF0017: 9-track density, 200/556/800/1600 bpi	MTK0678: Kit to upgrade MTF0607 to MTF0608
MTF0117: 9-track density, 800/1600 bpi (Two for MTU0412)	MTF0018: Cartridge Load, factory installed option	
MTF0118: 7-track density, 556/800 bpi (Two for MTU0412)	MTF0019: Cartridge Load, field installed option	
	MTF0020: Optional High Altitude Adapter, for altitudes 4000-7500 ft.	
	MTF0021: Optional High Altitude Adapter, field installed for altitudes 4000-7500 ft.	
	MTF0022: Optional DC Power-On Meter, factory installed only	
	MTF0023: Optional Tape Movement Meter, factory installed only	

SECTION VII
Magnetic Tape Subsystems

7. Magnetic tape subsystem configuring example

- a. A DPS 8/20 prospect wants a tape subsystem with 6 9-track units and 2 7-track 800 bpi units at the lowest possible price. The answer is to use 4 MTU0412 clusters (2 units each). Lowest price occurs by use of MFP8000, which also includes a URP. You would order as follows:

<u>Qty</u>	<u>MI</u>	<u>Description</u>
1	MFP8000	Magnetic tape processor with one IOM channel, plus URP with one IOM channel
1	MTF1148	7-track support
1	MTF1149	9-track PE support
2	MTA1142	Magnetic tape addressing features or ports on MTP. Each handles 4 tape units
3	MTU0412	6 units, 2 units per cluster
6	MTF0117	9-track density feature, 800/1600 bpi, one per tape unit (each MTU0412 includes two tape units)
2	MTF0118	7-track density feature, 556/800 bpi, one per tape unit (each MTU0412 includes two tape units)



SECTION VIII
Mass Storage Subsystems

A. Configuring Mass Storage subsystems for DPS 8 systems

1. Required configuration elements

- a. MSPXXX (mass store processor) - choose one or more MSPs consistent with packaging of DPS 8 mainframe (CSC-oriented or freestanding), with number of simultaneous channels desired and with type of disk spindle used. Every DPS 8 system must include a mass storage subsystem. See Section I.A. for minimum and maximum peripherals complement.
- b. Disk device adapter (MSF10XX) - required with MSU04XX spindles. These features supply the proper "personality" for the MSP to interface to MSU04XX spindles. Device adapters for MSU05XX are standard in each MSP
- c. MSAXXX (device addressing) - choose one for each four MSU04XX (4 spindles) and one for each two MSU05XX (4 spindles)
- d. MSU0XXX (mass store unit) - with announcement of MSU0500 an ambiguity was introduced in use of word "unit". Prior to MSU0500 a unit was equal to a spindle, but a MSU05XX (unit) provides for 2 spindles. In this disk configuration section "spindle" will be used as the unambiguous term for the device which contains one disk reading/writing pack or head disk assembly (HDA)
- e. RPS (rotational position sensing) feature - one MSF000X required per MSU04XX spindle. MSU05XX includes RPS feature for each spindle
- f. Dual access feature - one required per disk unit when two channels are crossbarred in the mass store subsystem. This feature provides an access path to each spindle from each channel. No more than 2 MSP channels can be used to access any given spindle
- g. Two-channel cross-bar feature - included in dual-channel MSPs (MSP8001/0609) to allow each channel to access each spindle when dual access feature is installed in MSU.

SECTION VIII
Mass Storage Subsystems

h. Delta link to FNP

- 1) Switched channel feature required when NPS is used in FNP. Runs non-simultaneously with any other channel path in same single-channel MSP, or in same MSP of dual-channel MSP
- 2) See Section A.8 below for delta configuration considerations

2. MSP components and marketing identifiers (MI) or type numbers (CSC = Central System Cabinet)

<u>MI</u>	<u>Description</u>	<u>Required or Option</u>
MSP8000	Single-channel MSP for DPS 8/20/44/44D. Contained in CSC. Max of one per system. One IOM channel included. Max of 16 spindles in specific combinations of MSU04XX and/or MSU05XX	One MSP of some type required per DPS 8 system
MSP8001	Dual-channel MSP version of MSP8000 for DPS 8/20/44/44D. Max of one per system. consists of two cross-barred MSPs. One MSP is in CSC, one is freestanding. Max of 16 spindles in specific combinations of MSU04XX and/or MSU05XX. Two IOM channels included	
*****	Features for MSP8000/8001	*****
MSF8002	Switched channel to FNP. Runs non-simultaneously with main IOM channel and switched IOM channel feature MSF8003 on same MSP8000 or same MSP in MSP8001. Max of one or two per MSP8000 and one or two per MSP in MSP8001. Max combined quantity of MSF8002	Required to use NPS.

SECTION VIII
Mass Storage Subsystems

and MSF8003 is three per MSP8000
and three per MSP in MSP8001

MSF8003	Switched IOM channel. Runs non-simultaneously with main IOM channel and switched FNP channel MSF8002 on same MSP8000 or same MSP in MSP8001. Max of one to three per MSP8000 and one to three per MSP in MSP8001. See restrictions for use with MSF8002 above	Option
*****	Features for MSP8000	*****
MSF8000	Device adapter for MSU04XX on MSP8000. Max one per MSP8000	Required for MSU04XX
MSA8000	Addressing capability for 4 MSU04XX for MSP8000. Max 4 per MSP8000	1 required per 4 MSU04XX (4 spindles)
MSA8001	Addressing capability for 2 MSU05XX (4 spindles) for MSP8000. Max 4 per MSP8000	1 required per 2 MSU05XX (4 spindles)
MSK8000	Upgrade kit, MSP8000 to MSP8001. Includes freestanding MSP, second IOM channel, and cross-barring of both to each spindle. Note that all disk units must have the dual access feature. In addition, the MSF8000, if present, must be replaced by separately ordered MSF8001, if MSU04XX will be used on upgraded MSP. MSA8000, if present, must be replaced by separately ordered MSA8002, if MSU04XX will be used on upgraded MSP	Option
*****	Features for MSP8001	*****

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Mass Storage Subsystems

MSF8001	Device adapter for MSU04XX on MSP8001. Max one per MSP8001	Required for MSU04XX
MSA8002	Addressing capability for 4 MSU04XX for MSP8001. Max 4 per MSP8001	1 required per 4 MSU04XX (4 spindles)
MSA8003	Addressing capability for 2 MSU05XX (4 spindles) for MSP8001. Max 4 per MSP8001	1 required per 2 MSU05XX (4 spindles)

MSP0607	Freestanding single-channel MSP for any DPS 8 system. One IOM channel included. Max of 16 spindles - 16 MSU04XX or 8 MSU05XX or combinations totaling 16 spindles
MSP0609	Freestanding dual-channel MSP for any DPS 8 system. Consists of two cross-barred MSPs. Includes two IOM channels. Max of 16 MSU04XX or 15 MSU05XX (30 spindles) or 16 MSU04XX and 8 MSU05XX. Use of 9-15 MSU05XX requires MSF1042 MSU05XX Expansion Feature

Features for MSP0607/0609

MSF1043	Switched channel to FNP. Runs non-simultaneously with main IOM channel and switched IOM channel feature MSF1044 on MSP0607 or in same MSP of MSP0609. Max of one per two MSP0607 and two per MSP in MSP0609. Max combined quantity of MSF1043 and	Required to use NPS
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SECTION VIII
Mass Storage Subsystems

MSF1044 is three in MSP0607
and three per MSP in MSP0609

MSF1044	Switched IOM channel. Runs non-simultaneously with main IOM channel and switched FNP channel MSF1043. Max of three per MSP0607 and three per MSP in MSP0609. See MSF1043 above for max quantity combined with MSF1043	Option
***** Features for MSP0607		*****
MSF1040	Device adapter for MSU04XX on MSP0607. Max one per MSP0607	Required to use MSU04XX
MSA1040	Addressing capability for 4 MSU04XX on MSP0607. Max 4 per MSP0607	1 required per 4 MSU04XX (4 spindles)
MSA1041	Addressing capability for 2 MSU05XX on MSP0607. Max 4 per MSP0607	1 required per 2 MSU05XX (4 spindles)
MSK6007	Upgrade kit, MSP0607 to MSP0609. Provides 2nd MSP, second IOM channel and cross-barring of both IOM channels to each spindle. Existing MSF1040, MSA1040, MSA1041 must be replaced by separately ordered MSF1041, MSA1042, MSA1043 according to spindle types used (MSU04XX, MSU05XX)	Option
***** Features for MSP0609		*****
MSF1041	Device adapter for MSU04XX on MSP0609. Max one per MSP0609	Required to use MSU04XX
MSA1042	Addressing capability for 4 MSU04XX on MSP0609. Max 4 on MSP0609	1 required per 4 MSU04XX (4 spindles)

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Mass Storage Subsystems

MSA1043	Addressing capability for 2 MSU05XX on MSP0609. Max 8 on MSP0609	1 required per 2 MSU05XX (4 spindles)
MSF1042	MSU0500 Expansion for MSP0609. Provides support for 9-15 MSU05XX. Max one per MSP0609	Required if 9-15 MSU05XX used, i.e., 18-30 spindles

3. Disk unit/spindle components and marketing identifiers

MSU0500 MSU0501	Disk unit with 2 spindles. Non-removable disk modules. Includes rotational position sensing (RPS) feature per spindle. May be freely intermixed in same subsystem	At least one MSU05XX required if non-removable storage wanted
MSF0011	Dual access feature for MSU05XX	One required for each MSU05XX disk unit (2 spindles) for dual-channel MSPs - MSP8001, MSP0609. Permits each channel to be cross-barred to each spindle
MSK0501	Upgrade for MSU0500 to MSU0501	Option. 1 per MSU0500 affected (2 spindles)
MSF0500	Additional (spare) MSU0500 HDA (disk module). See Note below	Option, purchase only
MSF0501	Additional (spare) MSU0501 HDA (disk module). See Note Below	Option, purchase only
MSK0502	Upgrade MSF0500 spare HDA to MSF0501 spare HDA. See Note below	Option, purchase Only

Note -- title to this HDA or HDA upgrade passes to and vests in HIS when installed on lease or

SECTION VIII
Mass Storage Subsystems

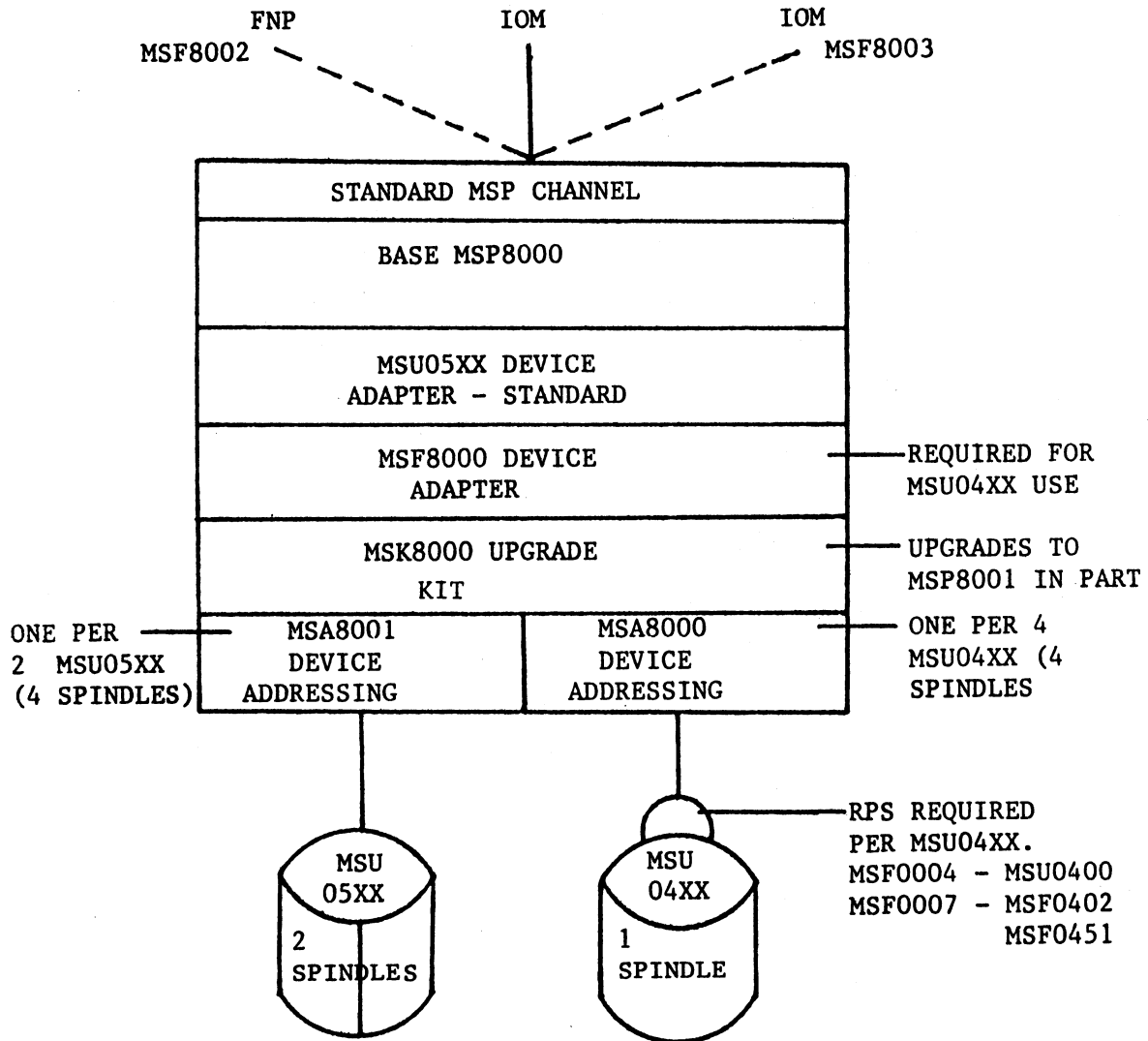
rental MSU05XX. On written request by customer, HIS will pass title to the removed HDA in exchange for receiving title to the previously purchased spare when installed as a permanent substitute

MSU0402	Removable-pack disk unit. 1 spindle. Upgradable on-site to MSU0451 by MSK4025	MSU04XX required if removable storage wanted. MSU04XX mixable in same subsystem
MSU0451	Removable-pack disk unit. 1 spindle. Same essentially as MSU0402 except with double capacity	
MSU0400	Removable-pack disk unit. 1 spindle. Not upgradable. Same capacity and performance as MSU0402	
MSF0007	RPS feature for MSU0451/0402	Required per MSU0402/0451 disk spindle
MSF0004	RPS feature for MSU0400	Required per MSU0400 spindle
MSF0006	Dual access feature for MSU0402/0451	One required per MSU0402/0451 (spindle) for dual-channel MSPs - MSP8001, MSP0609. Permits each channel to be cross-barred to each spindle
MSF0002	Dual access feature for MSU0400	Same as MSF0006 but for each MSU0400 spindle

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Mass Storage Subsystems

4. Configurator for MSP8000 subsystem (single-channel 1x16) - for DPS 8/20/44/44D only

a. Block diagram for MSP8000



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Mass Storage Subsystems

1) Permissible combinations of 16 spindles for MSP8000:

- (1) 16 MSU04XX or
- (2) 8 MSU05XX or
- (3) 12 MSU04XX and 2 MSU05XX or
- (4) 8 MSU04XX and 4 MSU05XX or
- (5) 4 MSU04XX and 6 MSU05XX

b. Configuration table for MSP8000

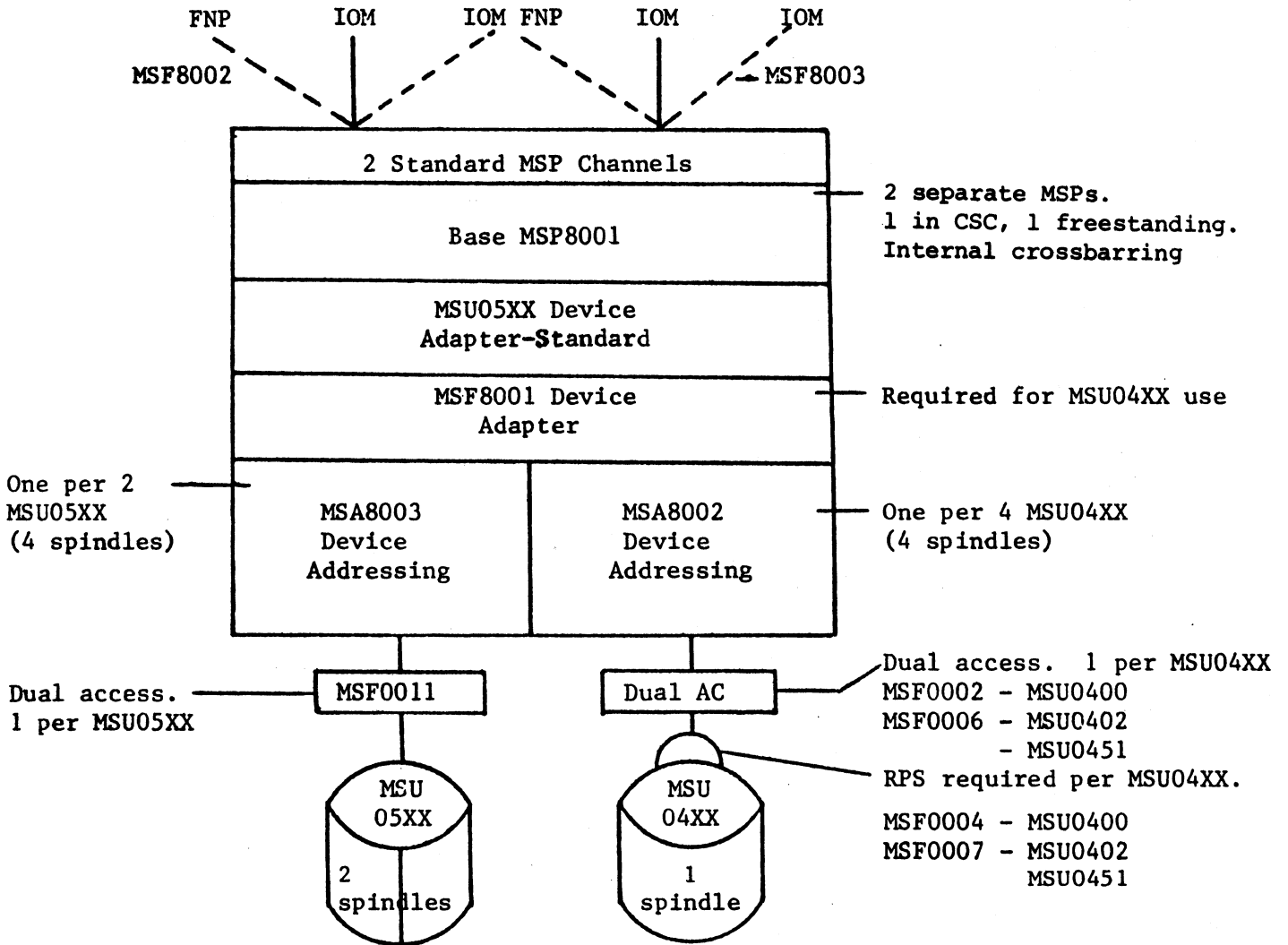
	Com- bina- tion	MSU04XX ITEMS				MSU05XX ITEMS		MSK 8000	MSF 8002 (4)	MSF 8003 (4)	
		MSF8000 Dev. Adapt.	MSU 04XX	MSA 8000 Addr (1)	MSF 0007 RPS (2)	MSU 05XX	MSA 8001 Addr (3)				
DPS	MSP 8000 1x16	1	1	1-16	1-4	1-16	-	-	Optional Kit - Partial upgrade to MSP8001	1-2 Optional FNP switched channels. NPS requires 1	1-3 Optional Switched IOM channels
8/20		2	-	-	-	-	1-8	1-4			
8/44		3	1	1-12	1-3	1-12	1-2	1			
8/44D		4	1	1-8	1-2	1-8	1-4	1-2			
CSC		5	1	1-4	1	1-4	1-6	1-3			

- (1) 1 per 4 MSU04XX (4 spindles)
- (2) 1 per MSU04XX. Use MSF0004 for MSU0400
- (3) 1 per 2 MSU05XX (4 spindles)
- (4) Maximum combined quantity is three with mixed combinations of: up to 1 IOM channel and up to 2 FNP channels, or up to 3 IOM channels and no FNP channels.

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Mass Storage Subsystems

5. Configurator for MSP8001 subsystem (dual channel 2x16) - for DPS 8/20/44/44D only

a. Block diagram for MSP8001



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Mass Storage Subsystems

1) Permissible combinations of 16 spindles per MSP8001:

- (1) 16 MSU04XX or
- (2) 8 MSU05XX or
- (3) 12 MSU04XX and 2 MSU05XX or
- (4) 8 MSU04XX and 4 MSU05XX or
- (5) 4 MSU04XX and 6 MSU05XX

b. Configurator table for MSP8001

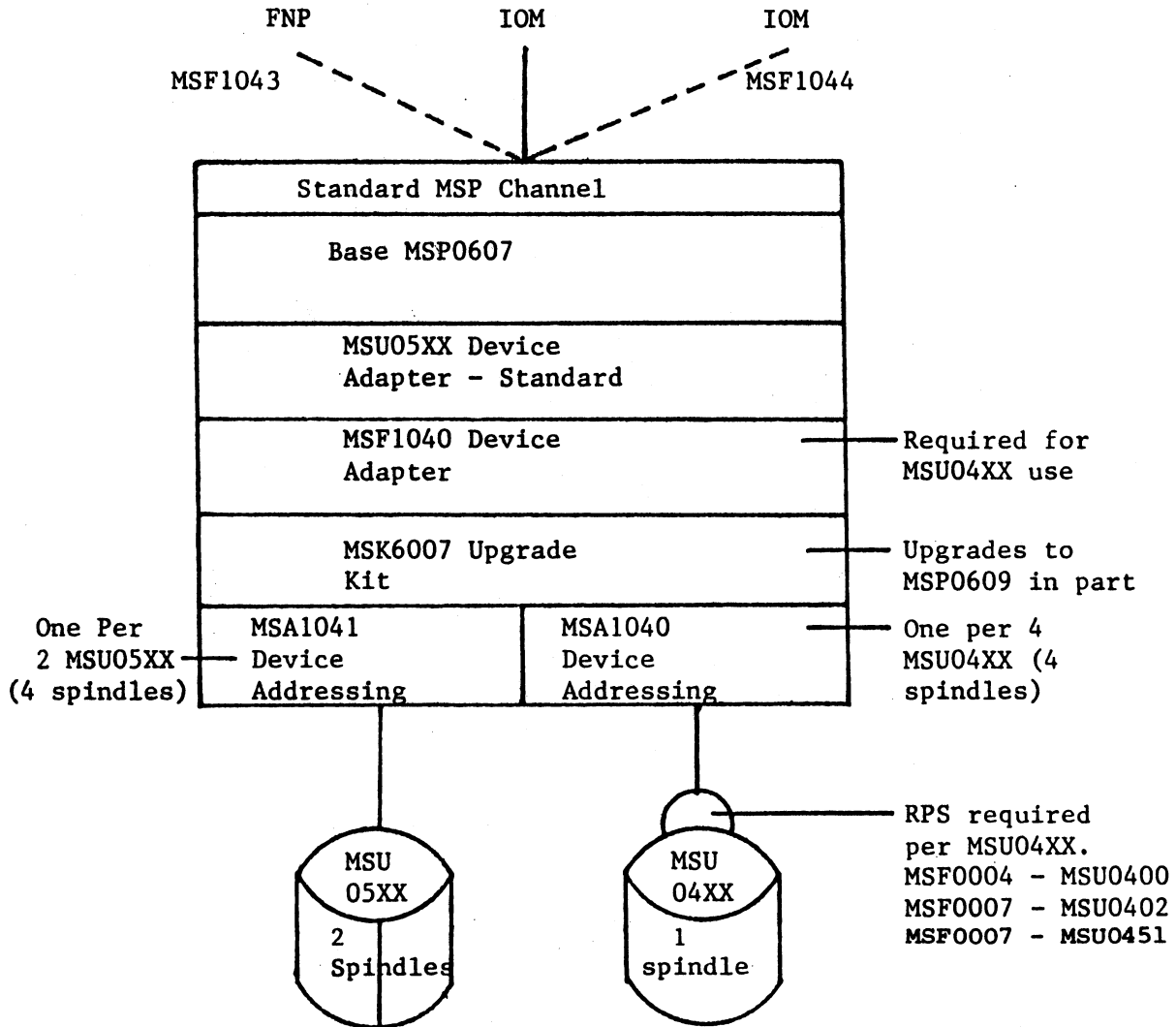
DPS	MSP 8001	Com- bina- tion	MSU04XX Items				MSU05XX Items			MSF 8002 (4)	MSF 8003 (4)	
			MSF8001 Dev. Adpt.	MSU 04XX	MSA 8002 Add (1)	MSF 0007 0004 (2)	MSF 0006 0002 (7)	MSU 05XX	MSA 8003 Add. (3)			MSF 0011 (8)
8/20	2 x 16	1	1	1-16	1-4	1-16	1-16	-	-	-	1-4 Optional FNP switched channels. NPS requires 1 (5)	1-6 Optional switched IOM channels (6)
8/44 8/44D		2	-	-	-	-	1-8	1-4	1-8			
CSC		3	1	1-12	1-3	1-12	1-12	1-2	1	1-2		
		4	1	1-8	1-2	1-8	1-8	1-4	1-2	1-4		
		5	1	1-4	1	1-4	1-4	1-6	1-3	1-6		

- (1) 1 Per 4 MSU04XX (4 spindles)
- (2) RFS feature required. 1 per MSU04XX. Use MSF0004 for MSU0400
- (3) 1 per 2 MSU05XX (4 spindles)
- (4) Maximum combined quantity is six with mixed combinations of:
up to 2 IOM channels and up to 6 IOM channels and no FNP
channels, or up to 4 IOM channels and up to 2 FNP channels.
- (5) 1-2 per MSP in MSP8002
- (6) 1-3 per MSP in MSP8001
- (7) Dual access feature required. 1 per MSU04XX (spindle)
Use MSF0002 for MSU0400
- (8) Dual access feature required. 1 per MSU05XX (2 spindles)

SECTION VIII
Mass Storage Subsystems

6. Configurator for MSP0607 freestanding subsystem
(single-channel 1x16) - for any DPS 8 subsystem

a. Block diagram for MSP0607



SECTION VIII
Mass Storage Subsystems

- 1) Permissible combinations of 16 spindles for MSP0607:
- (1) 16 MSU04XX or
 - (2) 8 MSU05XX or
 - (3) MSU04XX and MSU05XX totaling 16 spindles

b. Configurator table for MSP0607

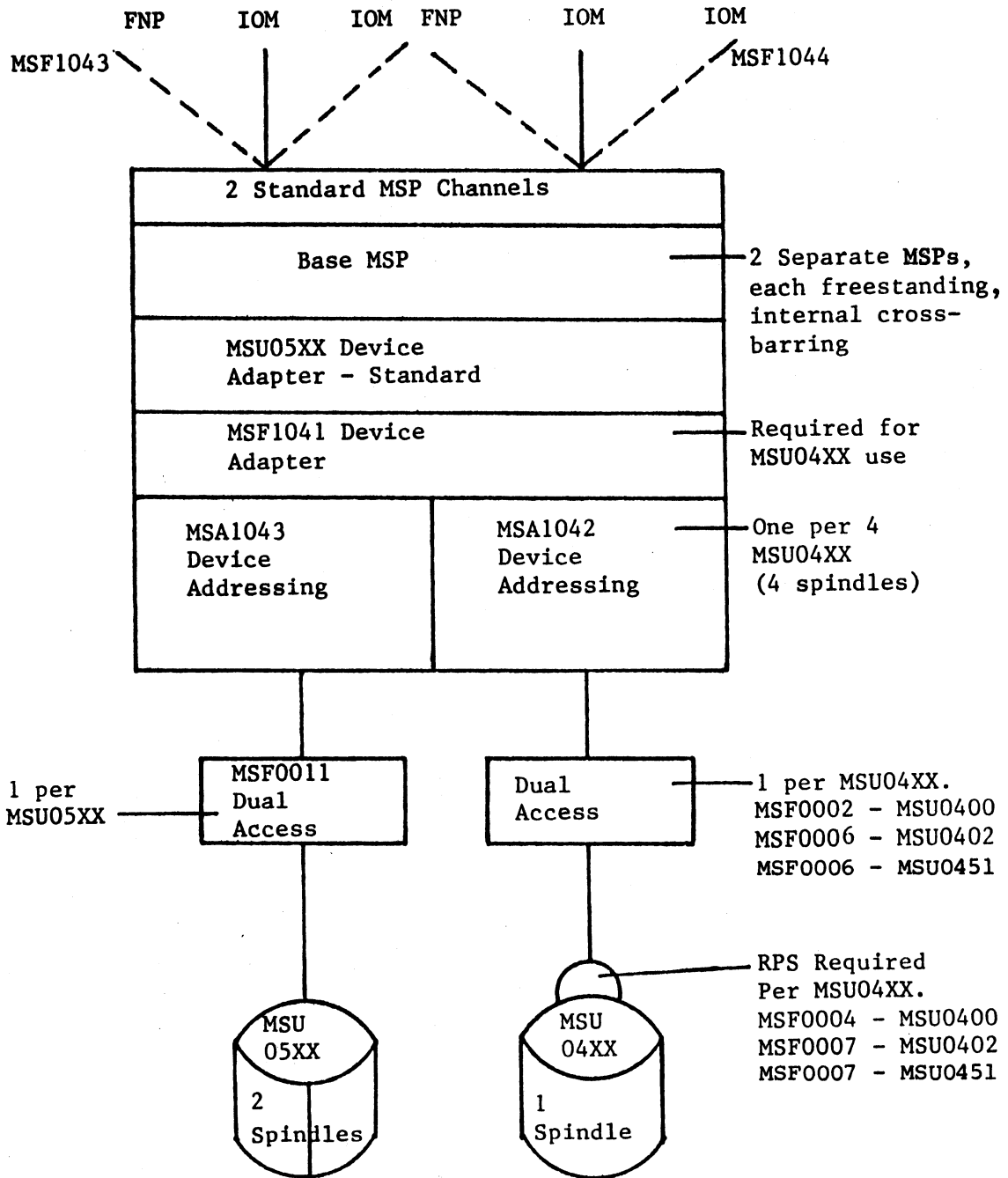
	Com- bina- tion	MSU04XX Items				MSU05XX Items		MSK 6007	MSF 1043 (4)	MSF 1044 (4)	
		MSF1040 Device Adapter	MSU 04XX	MSA 1040 Addr (1)	MSF 0007 RPS (2)	MSU 05XX	MSA 1041 Addr (3)				
Any DPS 8 Model	MSP 0607	1	1	1-16	1-4	1-16	-	-	Optional Kit - Partial upgrade to MSP0609	1-2 Optional FNP switched channels. NPS requires 1	1-3 Optional switched IOM channels
		2	-	-	-	-	1-8	1-4			
		3	1	1-14	1-4	1-14	1-7	1-4			

- (1) 1 per 4 MSU04XX (4 spindles)
- (2) 1 per MSU04XX. Use MSF0004 for MSU0400 or MSF0007 for MSU0402/0451
- (3) 1 per 2 MSU05XX (4 spindles)
- (4) Maximum combined quantity is three with mixed combinations of up to 1 IOM channel and up to 2 FNP channels, or up to 3 IOM channels and no FNP channels.

SECTION VIII
Mass Storage Subsystems

7. Configurator for MSP0609 freestanding subsystem
(2x16, 2x30, 2x32) - for any DPS 8 system

a. Block diagram for MSP0609



SECTION VIII
Mass Storage Subsystems

1) Permissible combinations for MSP0609:

- (1) 2x16 MSU04XX (16 spindles) or
- (2) 2x15 MSU05XX (30 spindles) or
- (3) 2 x 1-16 MSU04XX and 1-8 MSU05XX. Total 32 spindles

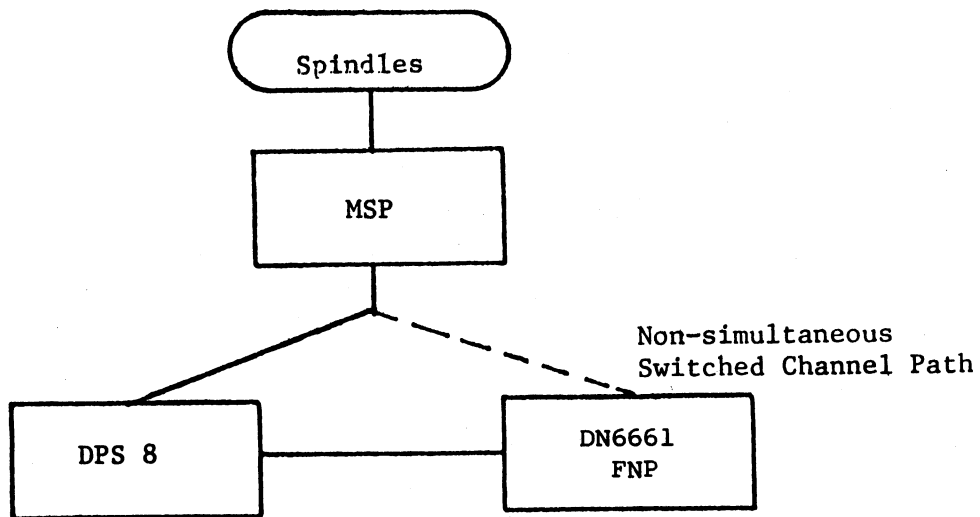
b. Configurator table for MSP0609

Any DPS 8 Model	MSP 0609 2x16 2x30 2x32	Com- bina- tion	MSU04XX Items					MSU05XX Items			MSF 1043 (4)	MSF 1044 (4)
			MSF1041 Device Adapt	MSU 04XX	MSA 1042 Addr (1)	MSF 0007 0004 (2)	MSF 0006 0002 (7)	MSU 05XX	MSA 1043 Addr (3)	MSF 0011 (8)		
		1	1	1-16	1-4	1-16	1-16	-	-	-	1-4 Optional FNP Switched Channels. NPS requires 1 (5)	1-6 Optional switched IOM channels (6)
		2	-	-	-	-	1-15	1-8	1-15			
		3	1	1-16	1-4	1-16	1-16	1-8	1-4	1-8		

- (1) 1 per 4 MSU04XX (4 spindles)
- (2) RPS feature required. Per MSU04XX. Use MSF0004 for MSU0400
- (3) 1 per 2 MSU05XX (4 spindles)
- (4) Maximum combined quantity is six with mixed combinations of:
up to 2 IOM channels and up to 6 IOM channels and no FNP channels,
or up to 4 IOM channels and up to 2 FNP channels.
- (5) 1-2 per MSP in MSP0609
- (6) 1-3 per MSP in MSP0609
- (7) Dual access feature required. 1 per MSU04XX (spindle).
Use MSF0002 for MSU0400 or MSF0007 for MSU0402/0451.
- (8) Dual access feature required. 1 per MSU05XX (2 spindles).

SECTION VIII
Mass Storage Subsystems

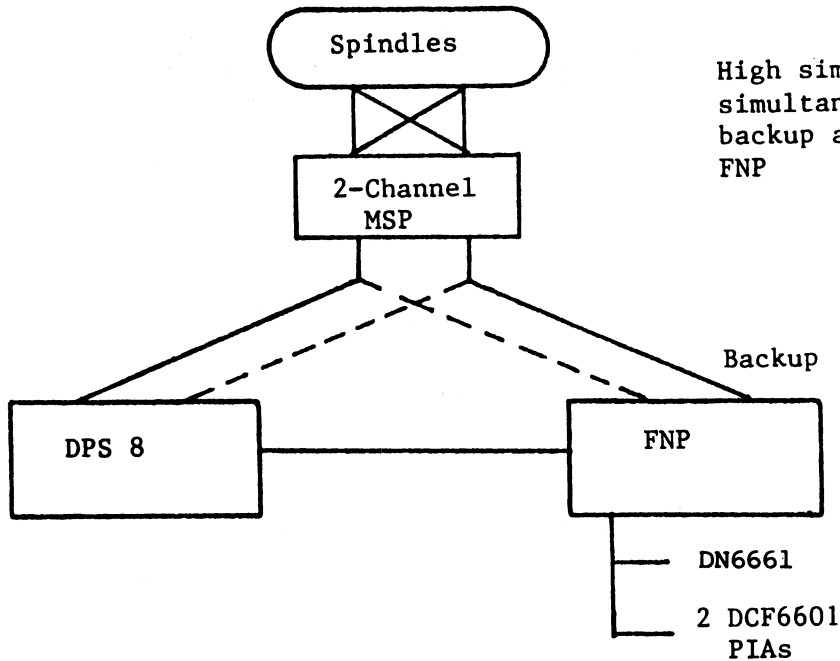
8. Delta link considerations
 - a. Delta link to MSP required in NPS environment
 - b. Possible delta link configurations
 - 1) Single-channel MSP



NOTE: DATANET 8 does not support the delta link or NPS.

SECTION VIII
Mass Storage Subsystems

2) Dual-channel MSP



High simultaneity, higher
simultaneity for GCOS,
backup access to MSP by
FNP

Note - Since NPS cannot support more than one MSP channel at a time, the failure of the one channel declared at NPS bootload time would require a new NPS bootload. In the second bootload the alternate channel would be declared as effective. Bootload time of NPS is about one minute or less.

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Mass Storage Subsystems

9. Configuring example for mass storage

- a. A DPS 8/20 prospect wants a 2-channel (2 MSPs) subsystem. Each MSP is to communicate with a FNP which will be using NPS. Prospect will start with 4 MSU0451 spindles and 3 MSU0501 units (6 spindles)

1	MSP8001	MSP for lowest price
4	MSU0451	4 spindles
4	MSF0007	RPS per MSU0451 spindle
4	MSF0006	Dual access feature per MSU0451 spindle
1	MSF8001	Device adapter for MSU0451
2	MSA8002	Device addressing for MSU0451
3	MSF0501	6 spindles, 3 units
3	MSF0011	Dual access feature per MSU0501 unit (2 spindles)
2	MSA8003	Device addressing for MSU0501
2	MSF8002	Non-simultaneous channel to FNP from each MSP. Only one effective from a given FNP/NPS bootload (starting) operation. See Section 8 above.

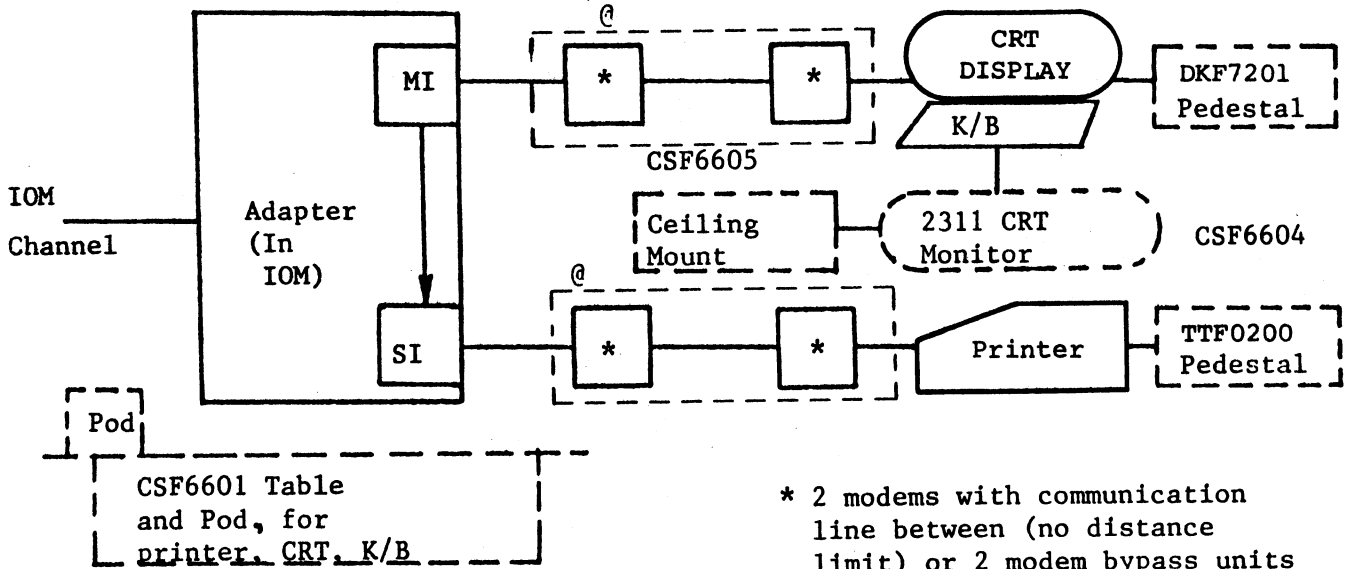
SECTION IX
Configuring Consoles

A. Configuration Rules for Console Subsystems for DPS 8 Systems

1. One System Console CSU6601 is required for each DPS 8 system. CSU6005 and/or CSU6004 may be used in addition as options. See Section 7 below on "Number of Console subsystems per DPS 8 system"
2. System Console subsystem (CSU6601)
 - a. At least one CSU6601 is required in each DPS 8 system. Each base CSU6601 includes an adapter and IOM channel, a 12" CRT screen, keyboard, a 120 cps dot matrix printer, a connection to the DPS 8 system DPU (Diagnostic Processor Unit) and a communication line interface for remote maintenance purposes
 - 1) Display screen (12" CRT) has space for 1920 characters (80 characters times 24 lines)
 - 2) Adapter unit provides two terminal-oriented communication line interfaces of EIARS232C type. This allows the use of modem bypass units or modems to position the console printer, CRT, keyboard remotely to the DPS 8 system, if desired
 - a) Master interface (MI) - prime connection for keyboard, and CRT as part of base CSU6601
 - b) Slave interface (SI) - a connection slaved off the master interface. Base printer of CSU6601 connects to SI.

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Configuring Consoles

b. Block diagram of base CSU6601 and options



* 2 modems with communication line between (no distance limit) or 2 modem bypass units
 @ Optional 50-foot cable is standard for connections to MI, SI

1) Marketing identifiers (MI) and descriptions for base CSU6601 and options

<u>MI</u>	<u>Description</u>
CSU6601	Base system console with power supply, 12" CRT screen, keyboard, 120 cps printer, IOM channel, master interface (MI), slave interface (SI), adapter (in IOM). At least one required per DPS 8 system
CSU6602	Auxiliary console with keyboard and 120 cps printer. For use as additional console used remotely or locally. Includes CSF6602 Auxiliary Console Adapter
CSF6601	Console table for CRT, printer, keyboard. Includes indicator pod with emergency power disconnect switch, initialize switch, bootload switch, processor activity indicator. Adjusts to sitdown or standup heights. An option but strongly recommended

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Configuring Consoles

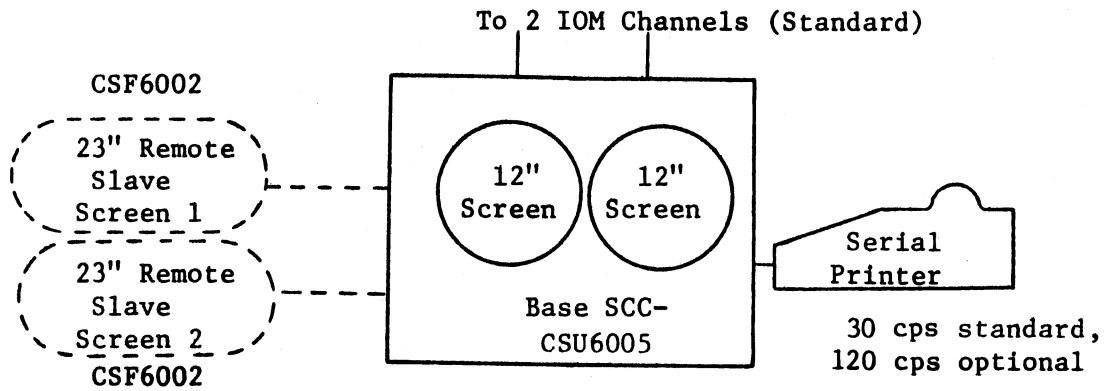
- TTF0200 A sitdown height pedestal option for printer and keyboard
- DKF7201 Pedestal for keyboard display only.
- DKF7201 A sitdown height pedestal for 12" CRT
- CSF6604 23" large screen monitor to be connected to 12" CRT, and displaying what is shown on it. 50-foot cable supplied. Cable length up to 1000 feet can be obtained by ordering the W09-0001C cable assembly in the desired length. Refer to the Terminals Sales Reference Handbook Price Catalog (CG32) Section 4 for configuration and pricing.
- CSF6605 Ceiling mount for CSF6604 to eliminate need for table for 23" monitor

3. System Control Center (SCC) subsystem (CSU6005)

- a. CSU6005 is closely similar to, but replaces, the CSU6002 version previously used. Primary difference is use of our new dot matrix serial printer in place of TN300 printer, and optional print speed increase to 120 cps. CSU6002 can be field modified to provide for an increased printing speed to 120 cps. Two IOM channels are standard with CSU6005, one intended to display the VIDEO program portion of the optional GCOS 8 System Performance Analysis Facility SVP8002, the other intended to display messages to/from system operator. Switches are included to allow switching the two screens between the two IOM channels and the console printer between the two screens. The switching feature, two IOM channels and two screens give backup protection

SECTION IX
Configuring Consoles

b. Block diagram



SECTION IX
Configuring Consoles

- 1) Channels to IOM are not switchable to other IOM channels
- c. Marketing identifier (MI) or type number list for CSU6005

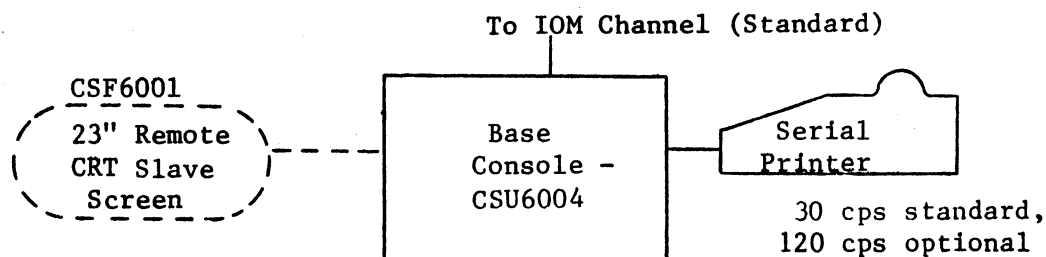
<u>MI</u>	<u>Description</u>	<u>Required or Option</u>
CSU6005	Base System Control Center with power supply, 2 12" CRT screens, 1 30 cps serial printer, 2 IOM channels, operator control/indicator panel, 64-key keyboard	Option
CSF6002	Remote 23" CRT slave screen. Carries same display as 12" screen to which it is cabled. Maximum 2 per CSU6005	Option
CSF6023	Exchange of 30 cps printer for 120 cps printer. Applies to CSU6002, CSU6005	Option
CSK6002	Field modification kit for CSU6002 to permit increase of printer speed to 120 cps. Required use with CSF6023 on SCU6002	

4. System console subsystem (CSU6004)

- a. CSU6004 is closely similar to, but replaces, the CSU6001 version previously used. Primary difference is use of our new dot matrix serial printer in place of TN300 printer, and optional speed increase to 120 cps. CSU6001 can be field modified to provide for an increased printing speed to 120 cps

SECTION IX
Configuring Consoles

b. Block diagram



1) Channel to IOM is not switchable

c. Marketing identifier (MI) or type number list for System Console CSU6004

<u>MI</u>	<u>Description</u>	<u>Required or Option</u>
CSU6004	Base System Console with power supply, 30 cps serial printer, operator control/indicator panel, 64-key keyboard	Option
CSF6001	Remote 23" CRT slave screen. Reflects. line being typed on keyboard and printer. Maximum 1 per CSU6004	Option
CSF6023	Exchange of 30 cps printer for 120 cps printer. Applies to CSU6001, CSU6004	Option
CSK6001	Field modification kit for CSU6001 to permit increase of printer speed to 120 cps. Required use with CSF6023 on CSU6001	

4. System Console subsystem (CSU6601)

- a. At least one CSU6601 is required in each DPS 8 system. Each base CSU6601 includes an adapter and IOM channel, a 12" CRT screen, keyboard, a 120 cps dot matrix printer, a connection to the DPS 8 system DPU (Diagnostic Processor Unit) and a communication line interface for remote maintenance purposes

SECTION IX
Configuring Consoles

- 1) Channel to IOM is not switchable
- c. Marketing identifier (MI) or type number list for System Console CSU6004

<u>MI</u>	<u>Description</u>	<u>Required or Option</u>
CSU6004	Base System Console with power supply, 30 cps serial printer, operator control/indicator panel, 64-key keyboard	Option
CSF6001	Remote 23" CRT slave screen. Reflects. line being typed on keyboard and printer. Maximum 1 per CSU6004	Option
CSF6023	Exchange of 30 cps printer for 120 cps printer. Applies to CSU6001, CSU6004	Option
CSK6001	Field modification kit for CSU6001 to permit increase of printer speed to 120 cps. Required use with CSF6023 on CSU6001	

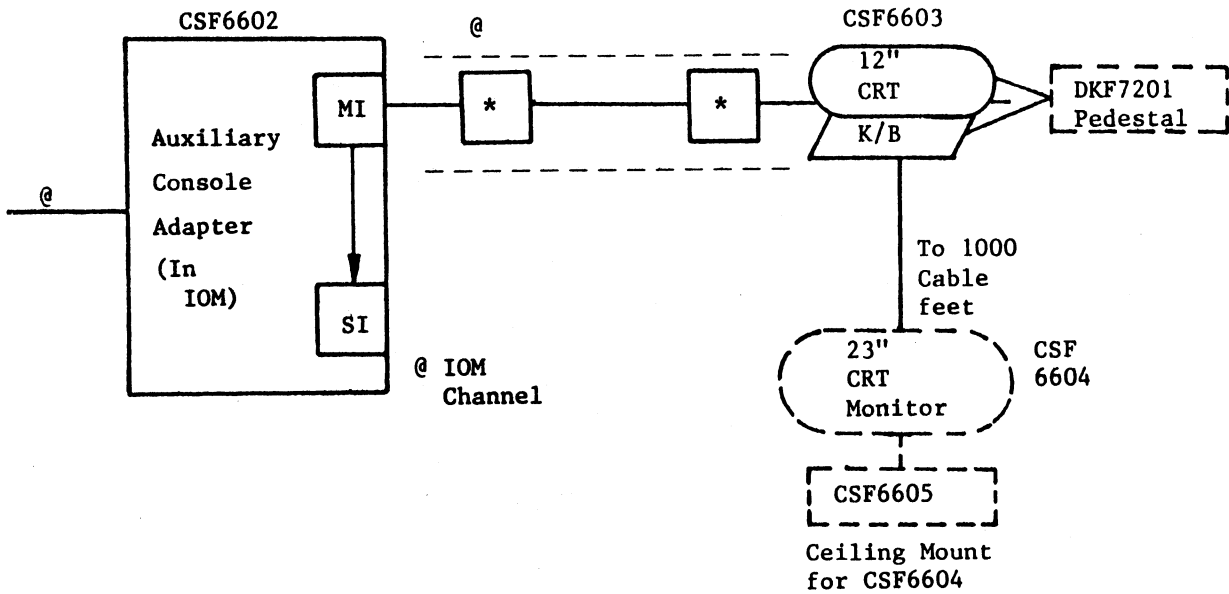
5. Auxiliary Console Adapter - CSF6602

- a. An adapter similar to that for CSU6601, but not necessarily related to CSU6601. Has its own IOM channel. Provides a low cost means for use of a separate CRT and optional 23-inch large screen monitor for the purposes of displaying the optional VIDEO program, part of System Performance Analysis Facility SVP8002. Use of CSF6602 is independent of CSU6601, except when the Extended System Control Feature CSF6606 is used to link CSU6601 Base Console and CSF6602 with its attached CRT and keyboard. CSF6606 is discussed in section 6 below

- 1) NOTE - official title of CSF6602 is Auxiliary Keyboard/Display Attachment Feature

SECTION IX
Configuring Consoles

b. Block diagram of CSF6602 and related features



@ Optional 50-foot cable is standard for connection to MI

*2 modems with communication line between (no distance limit) or 2 modem bypass units with up to 2500 cable feet between them. If no modems or bypasses are used the cable length from Adapter to CRT/KB/printer is 50 feet

- 1) Marketing identifiers (MI) and descriptions for CSF6602 Auxiliary Console Adapter (Auxiliary Keyboard Display Attachment Feature)

<u>MI</u>	<u>Description</u>
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CSF6602	Auxiliary Console Adapter (in IOM) with power supply, IOM channel, master interface (MI), slave interface (SI). Required to use CSF6603 and CSF6604. Included in price of CSU6602 Auxiliary Console.
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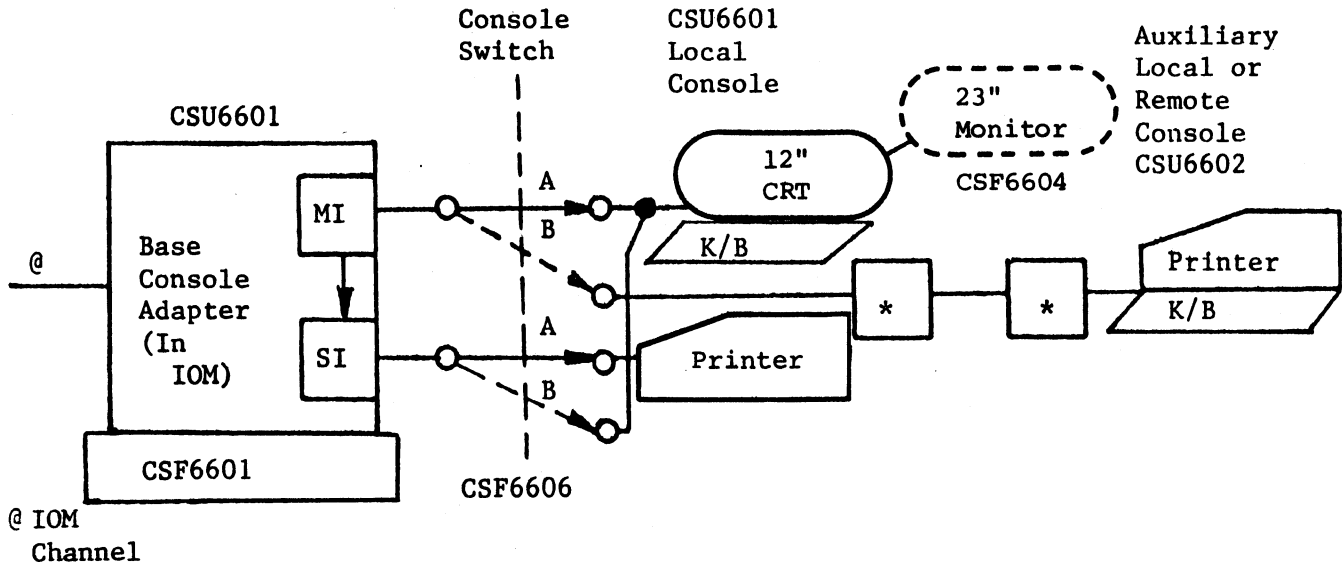
SECTION IX
Configuring Consoles

- CSF6603 12" CRT with keyboard for VIDEO display.
Requires CSF6602
- DFK7201 Sitdown height pedestal for 12" CRT and keyboard.
Option
- CSF6604 23" large screen monitor, slaved off CSF6603
12" CRT. Displays what is shown on CSF6603.
50-foot cable furnished. Cable up to 1000 feet
can be obtained by ordering the W09-0001C
cable assembly in the desired length.
Refer to the Terminals Sales Reference
Handbook Price Catalog (CG32) Section 4
for configuration and pricing.
- CSF6605 Ceiling mount for CSF6604. Eliminates need
for table for 23" monitor

6. Console Switch Feature - CSF6606 (Official title is
Extended System Control Feature)
- a. A switch feature providing a variety of switching
functions for backup purposes
- 1) Where CSU6601 is used by itself but with
local and remote auxiliary console devices
the switch can be used to select which
console device (local or auxiliary) will be
the operational console device. See Case 1
 - 2) Where CSU6601 and Auxiliary Console Adapter
CSF6602 are used, thus two adapters and two
IOM channels, the CSF6606 Console Switch
Feature can be used to switch console devices
between the two adapters. See Case 2
 - 3) Requires CSF6601 Console Table to contain
switch logic.

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Configuring Consoles

- b. Case 1 -- switching between console devices and auxiliary remote console devices on CSU6601

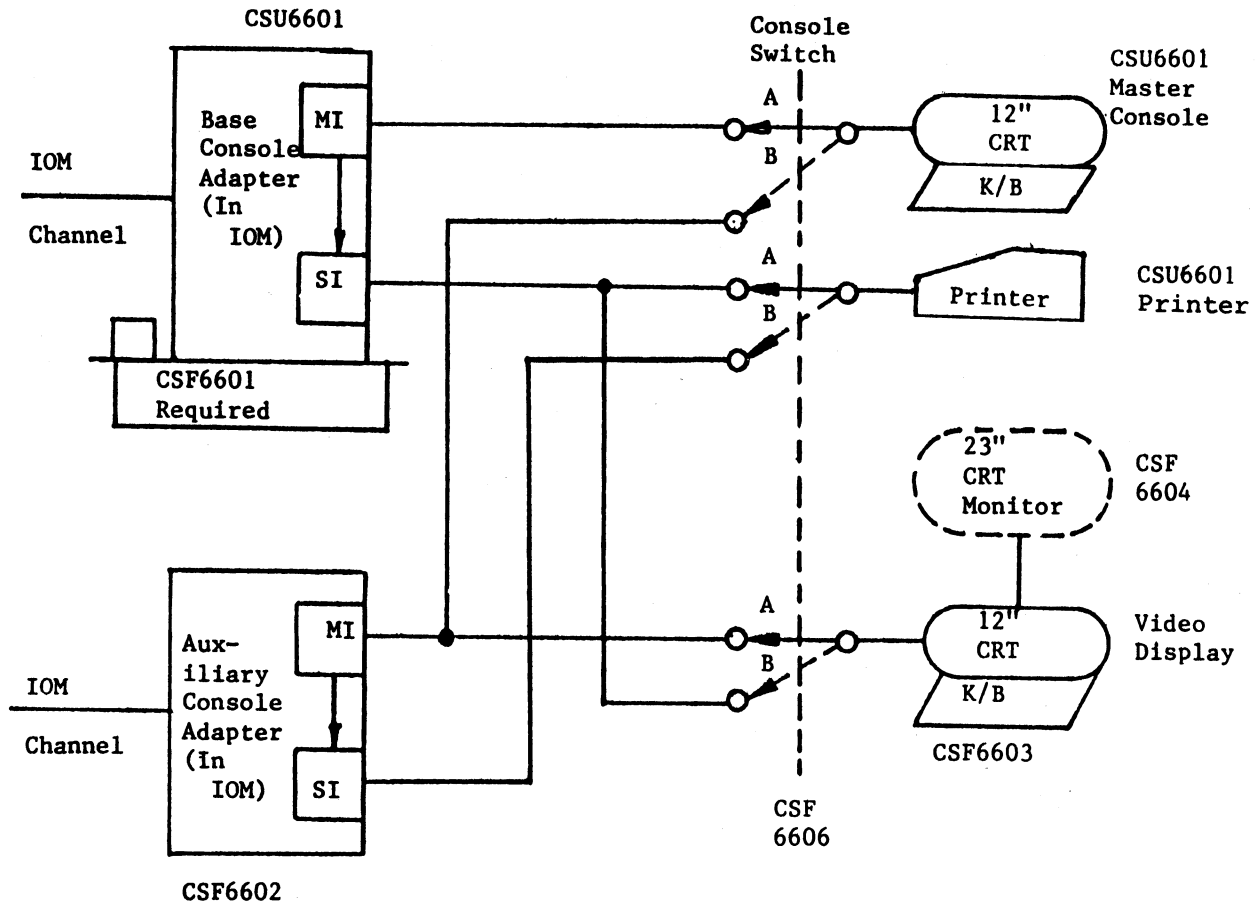


- 1) With CSF6606 switch set at Position A the local console is the master console (connected to MI), the remote console is disconnected, the 12" display CRT would display what is shown on the local console
 - 2) With CSF6606 switch set at Position B the remote console is the master console (connected to MI), the 12" display CRT is disconnected, and the local console printer (if operational), will print what is printed on the remote console printer
- c. Case 2 -- switching between two console adapters (2 IOM channels), providing functionality similar to that for CSU6005 System Control Center. CSU6005 allows for switching the two CRT screens between the two IOM channels and the console printer between the two screens

SECTION IX
Configuring Consoles

- 1) With CSF6606 switch set at Position A the local console is the master console (connected to MI), the remote console is disconnected, the 12" display CRT would display what is shown on the local console
 - 2) With CSF6606 switch set at Position B the remote console is the master console (connected to MI), the console printer is disconnected, and the 12" CRT, will display what is printed on the remote console printer
- c. Case 2 -- switching between two console adapters (2 IOM channels), providing functionality similar to that for CSU6005 System Control Center. CSU6005 allows for switching the two CRT screens between the two IOM channels and the console printer between the two screens

SECTION IX
Configuring Consoles



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Configuring Consoles

- 1) This approach requires the CSF6601 Console Table to contain the CSF6606 Console Switch logic. Required also is the CSF6602 Auxiliary Console Adapter to provide the second IOM channel and a second set of MI and SI connections for backup purposes
 - 2) In the Position A setting of the switch for the configuration above the master console devices, part of base CSU6601, would function through MI of CSU6601 adapter/IOM channel. The 12" CRT/Keyboard device CSF6603 would be connected to SI of CSF6602 Auxiliary Console Adapter/IOM channel, displaying VIDEO
 - 3) In case, e.g., of failure of Base Adapter/IOM channel of CSU6601 the switch could be set manually to Position B. This would connect the CSU6601 12" CRT display to the MI of the auxiliary console adapter, the master printer to the SI of the auxiliary console, adapter, and the VIDEO display screen would go out of operation.
7. Number of console subsystems per DPS 8 system
- a. Maximum of two console subsystems on DPS 8/20/44/44D/52/62, four on DPS 8/70. One console subsystem must be CSU6601; the others can be any combination of CSU6601/6004/6005
 - b. Where 2 console subsystems are used the maximum number of CRT screens is three. If three screens are used one must be for VIDEO
 - c. Where 4 console subsystems are used the maximum number of CRT screens is five. If five screens are used one must be for VIDEO

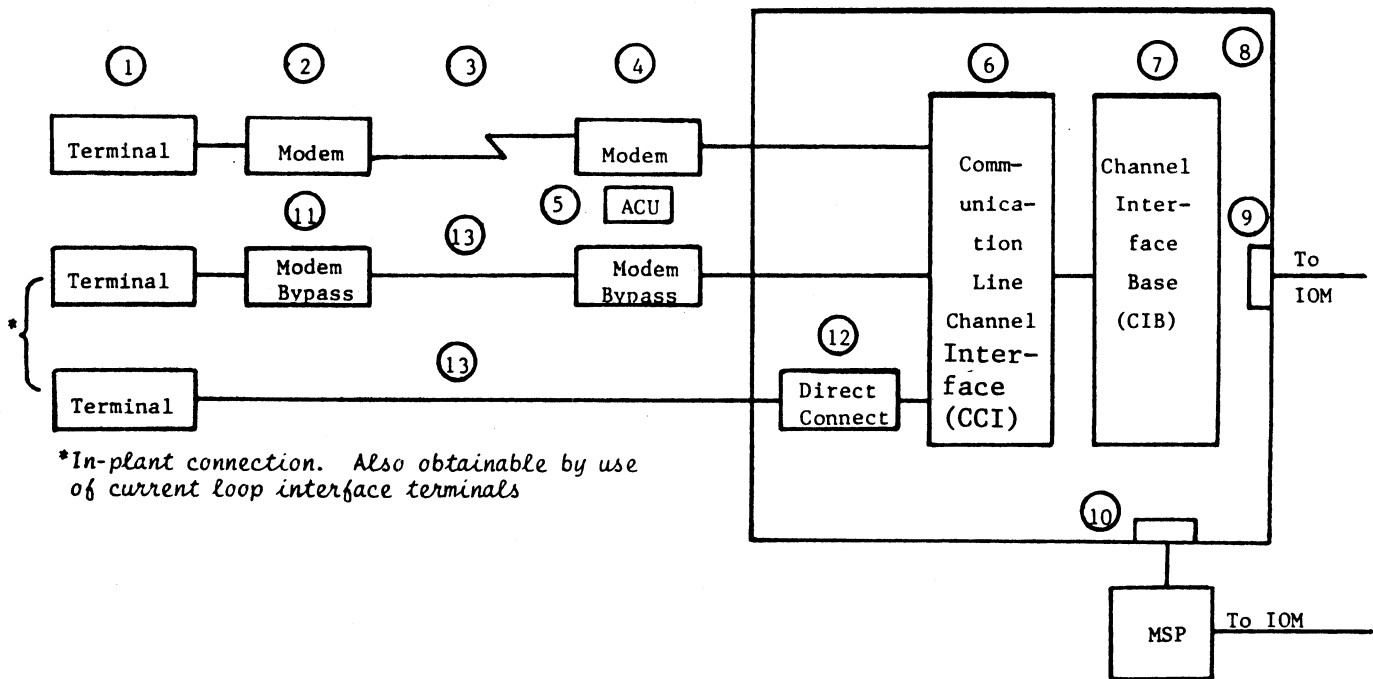
SECTION IX
Configuring Consoles

- d. In large systems which have multiple devices requiring operator file mounting/dismounting, it is desirable to have more than one console subsystem. One would be the master console subsystem for the system operator, at least one more would be placed in the center of the area involving file mount/dismount peripherals (tapes, disks, printers, or perhaps in the tape/disk library, or both
- 1) GCOS automatically separates messages and send only file mount/dismount messages to peripheral area consoles and only system messages to the master console, and tape reel/disk pack requests to library area. Note, the ability of GCOS to send messages which are specific depends on having separate console subsystems. A CSU6601 subsystem equipped with a slave monitor or printer is not two separate subsystems. The slave unit would simply display all information displayed on base console.

SECTION X
 Generics of Data Communications
 Front-End Network Processors (FNPs)

A. Generic data communications world components

1. Block diagram of typical components



2. Summary of functions of generic components and their potential configuration effects.

- a. Based on block diagram above
- b. A conceptual approach at this point. Actual sequence of considerations may vary from that shown on block diagram

SECTION X
Generics of Data Communications
Front-End Network Processors (FNPs)

Terminal selection is one of the fundamental components which exerts a major configuring effect. Some terminal considerations affecting configuring:

- 1) Terminal type - batch, keyboard (CRT or hard copy or both). May affect the choice of communication line channel (CCI) and channel interface base (CIB) used in the FNP
- 2) Terminal operating speed in bits per second or baud rate or characters per second. Determines minimum line speed and modem speed to be selected
- 3) FDX (full-duplex) or HDX (half-duplex) operation of the line and terminal. May affect choice of modem, line type, CCI type
- 4) Synchronous or asynchronous physical transmission technique. Affects modem type, and choice of CCI and communications base (CIB) in FNP
- 5) Code set used. May affect CCI choice in FNP
- 6) Line discipline or link protocol used by terminal. May affect CCI and communications base (CIB) choices in FNP, may determine whether synchronous or asynchronous transmission technique is to be used. BSC (Binary Synchronous Communications) protocol, e.g., requires a specific BSC-oriented CCI if the BSC CRC (Cyclic Redundancy Check) feature is to be used. LHDLC protocol also requires a specific CCI. May affect choice of modem used

Modem selection is directly affected by terminal selection and line speed. Modem stands for modulator-demodulator, a device for transforming signals between the line and the device at the end of the line. Other generic names -- data set, digital subset, subset, coupler

SECTION X
Generics of Data Communications
Front-End Network Processors (FNPs)

- 7) Most commonly there will need to be a modem (or equivalent device), at each end of a line obtained from a public carrier company. Thus modem costs can become significant
- 8) Some terminals use a current loop type of interface. These do not use modems. At the CCI end a special connection is required in the CCI, which we include
- 9) Modems are often either for synchronous or asynchronous transmission. In synchronous operation the modem at each end furnishes timing signals to keep each end of the line in synchronism with the other. If modem used does not provide timing signals in synchronous transmission cases, a timing device must be attached to terminal and also be a feature of the CCI used

Communication line or channel considerations are multiple. A communication line is also referred to as a channel. The connection of a line or channel to our FNP is to a CCI (Communication Channel Interface). This paragraph refers to "line" in the sense of links provided directly or indirectly by public service carriers, such as telephone companies. Such companies are also known as common carriers. In 13 we will show "in-plant" type links or lines which do not involve public service carriers and do not require modems. Some line considerations affecting configuring are:

- 10) Whether 2-wire or 4-wire lines are used. May affect modem choice or whether a modem is used
- 11) Whether public lines are used (also known as dialed, switched or dial-up lines) or private lines are used (also known as leased or direct lines). Private lines do not involve dialing. There is in effect a permanent path established. May affect modem choice and modem attachments such as ACU (automatic calling unit)

SECTION X
Generics of Data Communications
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- 12) If private lines are involved, there are various levels of line conditioning available from the telephone company to regulate line quality - noise level, error probability, etc. Level of conditioning chosen does not affect modem type or other considerations normally

- 13) Whether line is to be used on half duplex (HDX) two-way alternate (TWA) basis, or full-duplex (FDX) basis. FDX lines can be used on either a TWA basis or two-way simultaneous basis (TWS). May affect modem type

- 14) Whether line is used for both data and voice transmission, called DUV (data under voice). Normally the use of such transmission does not affect the modem or CCI choice

Modems when used must normally be used at each end. Modems at ends of a line must be carefully matched in their characteristics. Some modems support ACU (automatic calling unit) feature. This requires a CCI with matching feature. ACU capability allows the FNP NPS software to "dial" the telephone number of a terminal and to send output to the terminal if the terminal is in operational condition. Eliminates need for programmer to keep asking about status of his job as to whether output is ready

Communication line channel (CCI) is contained within a channel interface base (CIB) which in turn is in a FNP.

CCI is a termination point or connection point into our FNP for a line. The path for a given line through a CCI is often called a channel, sometimes a subchannel

There are multiple types of CCIs, some very general, some specialized. Some CCIs interface one line each, some two lines each

SECTION X
Generics of Data Communications
Front-End Network Processors (FNPs)

CCIs are not included in the base FNP price, but must be configured. Every line must terminate at a CCI, regardless of the type of line, whether by common carrier or in-plant connection.

CIB (channel interface base) provides common service logic for a mixture of CCIs, the number of CCIs varying with CCI type

CIB is completely general in its capabilities. Any line speed, code set, link protocol, transmission technique that is supported by our FNP hardware is supported by CIB

Base FNP. Maximum of 2 FNPs per DPS 8/20, DPS 8/44, DPS 8/44D, DPS 8/52, DPS 8/62. Maximum of 8 FNPs per DPS 8/70.

Connection to DPS 8 IOM is provided by a DIA (direct interface adapter) included in base price of every FNP. The DIA also includes a physical channel in the IOM. The link allows FNP use as a front-end (processor) to the information processor (DPS 8)

Link to mass store processor provided by a (Peripheral Interface Adapter) PIA is required in NPS environment. It is available as an option on DN6661 FNP only.

Modem Bypass. Used for in-plant connection. No line furnished by a common carrier. Modem bypass units perform same basic function as modems.

Cable length restrictions exist between two successive bypass units but additional units can be inserted into the line to act as repeaters or signal strengtheners. In-plant connection approach is considerably lower in long-term cost versus use of modems and common carrier lines

Direct Connect. Another way to use in-plant connection. Line or cable length is much

SECTION X
Generics of Data Communications
Front-End Network Processors (FNPs)

shorter than with use of Modem Bypass approach. Direct connect features cannot be repeated in a line. Current loop approach is another form of in-plant connection for distances up to 1000 cable feet

An in-plant line established by a cable. No involvement of a common carrier. Connection line must not, by law, cross a public boundary, otherwise the line must be furnished by a (regulated) common carrier company, directly or indirectly. Advantage -- lower costs. Disadvantage -- no access to telephone network, no way to dial another destination

SECTION XI
Configuring DN6661 and DN8

A. Configuring DN6641/6651 FNP. (See Level 66 and Level 66/DPS Configuration Guide (DH92) Section XIX.)

B. Configuring DN6661 FNP

1. Required configuration components

a. Base FNP

b. Console -- included with base FNP

c. One or more Communication Channel Interfaces (CCIs)

1) Every line (sometimes called a subchannel or channel) must terminate in a CCI from any common carrier or any in-plant connection

2) Every CCI represents electronic logic on circuit boards for which space is provided in "slots" in one or more general purpose channel interface bases (CIBs).

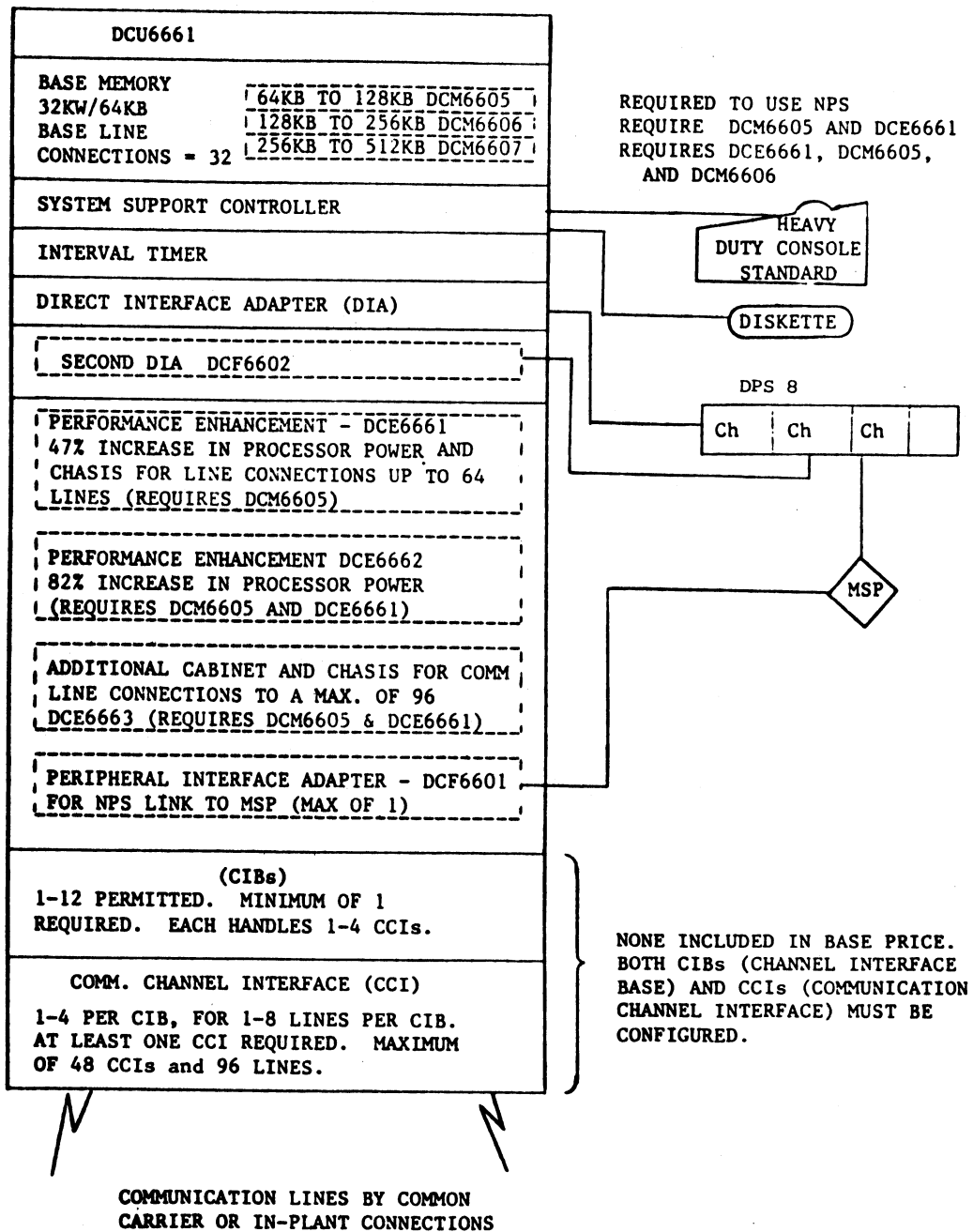
d. Sufficient quantity of CIBs to connect the quantity of CCIs needed to support the desired number of lines. DN6661 does not include any CIBs in base price, but one or more must be configured in order to provide for the CCIs needed to connect the lines to FNP.

e. One or more in-plant connection features if lines are not furnished by common carrier companies. In-plant connection is by use of modem bypass or direct connect features, or by use of terminals of the current loop interface type. Each must connect to an appropriate CCI

SECTION XI
Configuring DN6661 and DN8

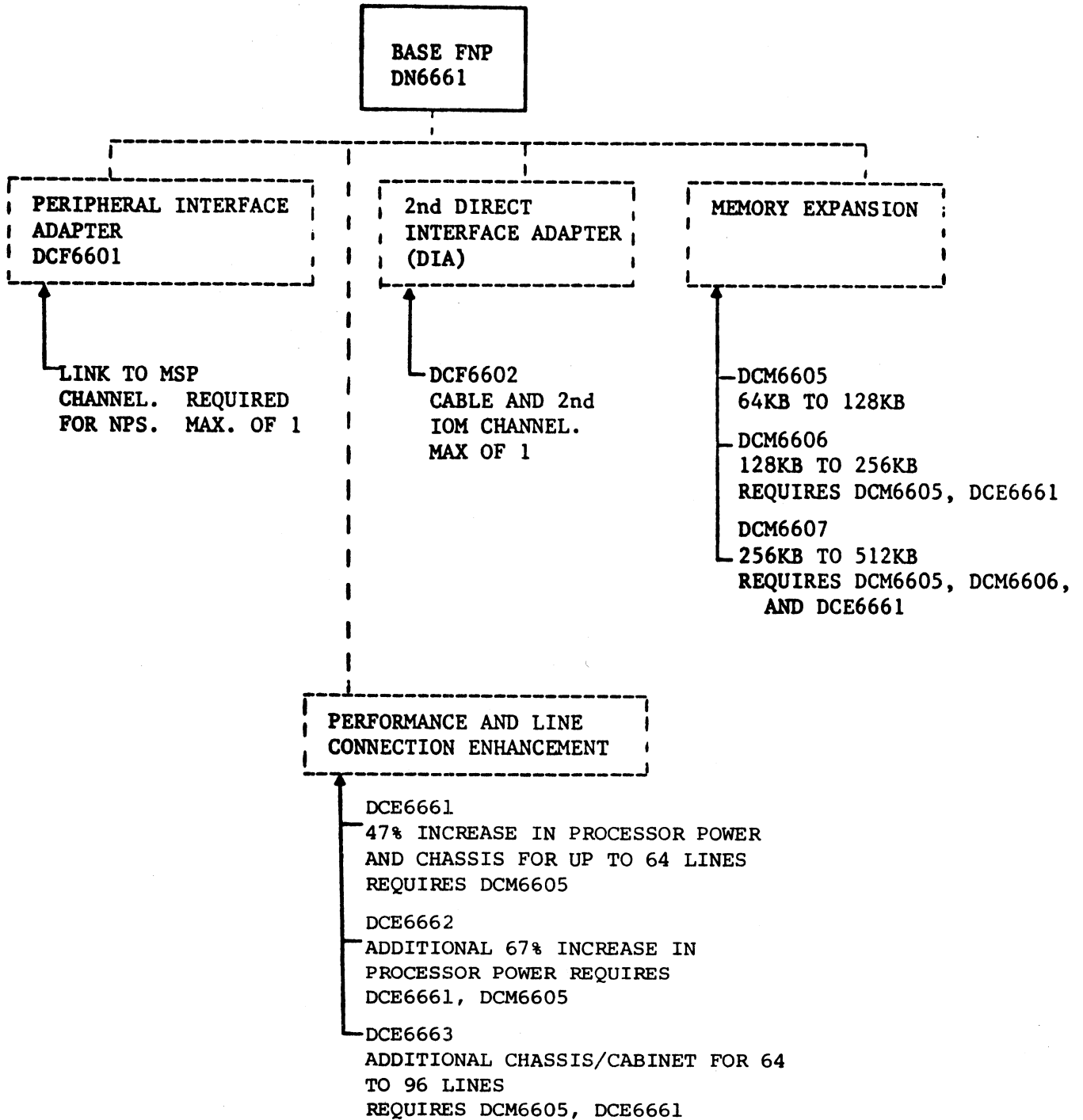
2. Configuring DN6661

- a. Block Diagram GRTS-II, NPS/DP1 (or later release) required.



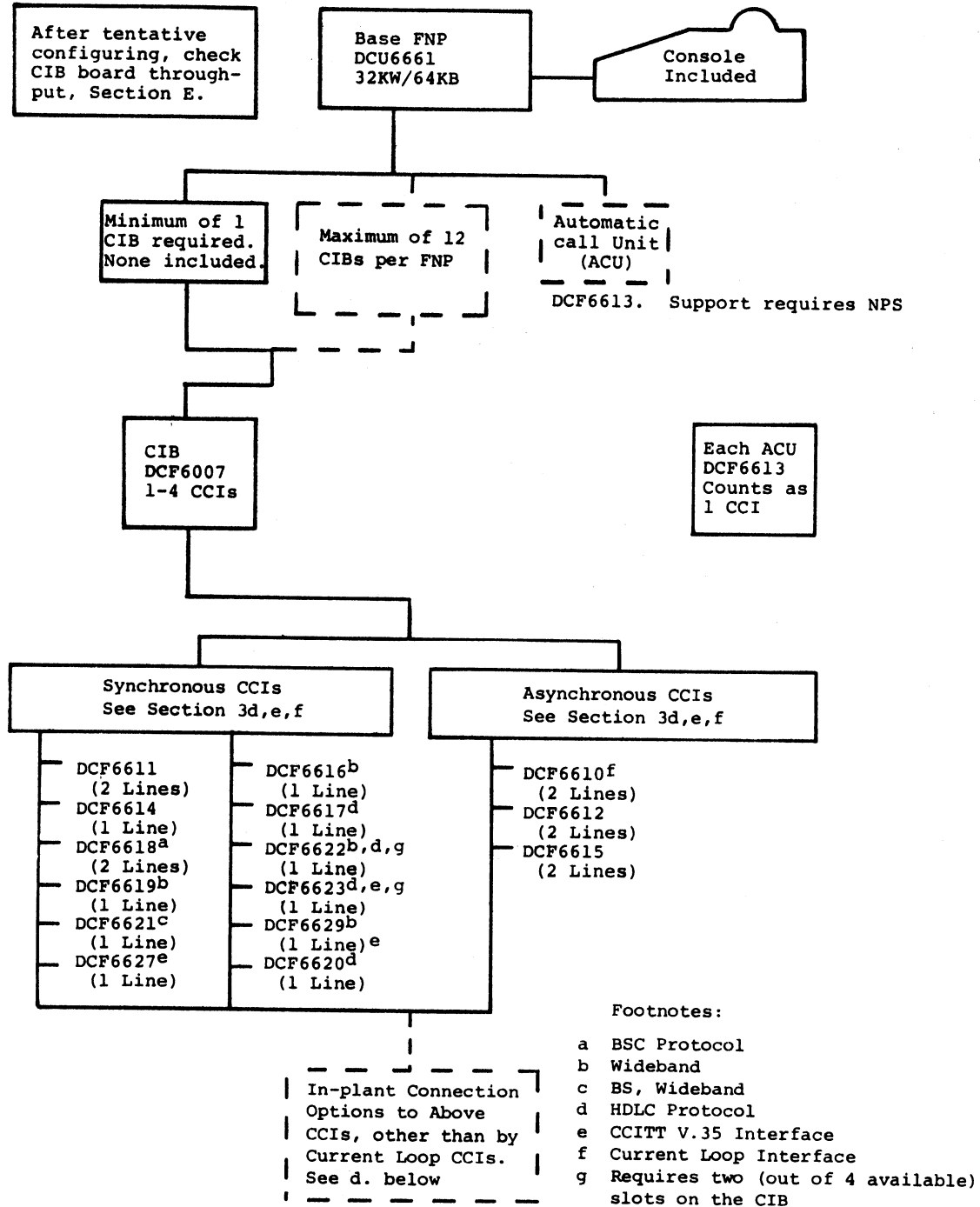
SECTION XI
Configuring DN6661 and DN8

b. Base DN6661 and options other than for communications lines.



SECTION XI
Configuring DN6661 and DN8

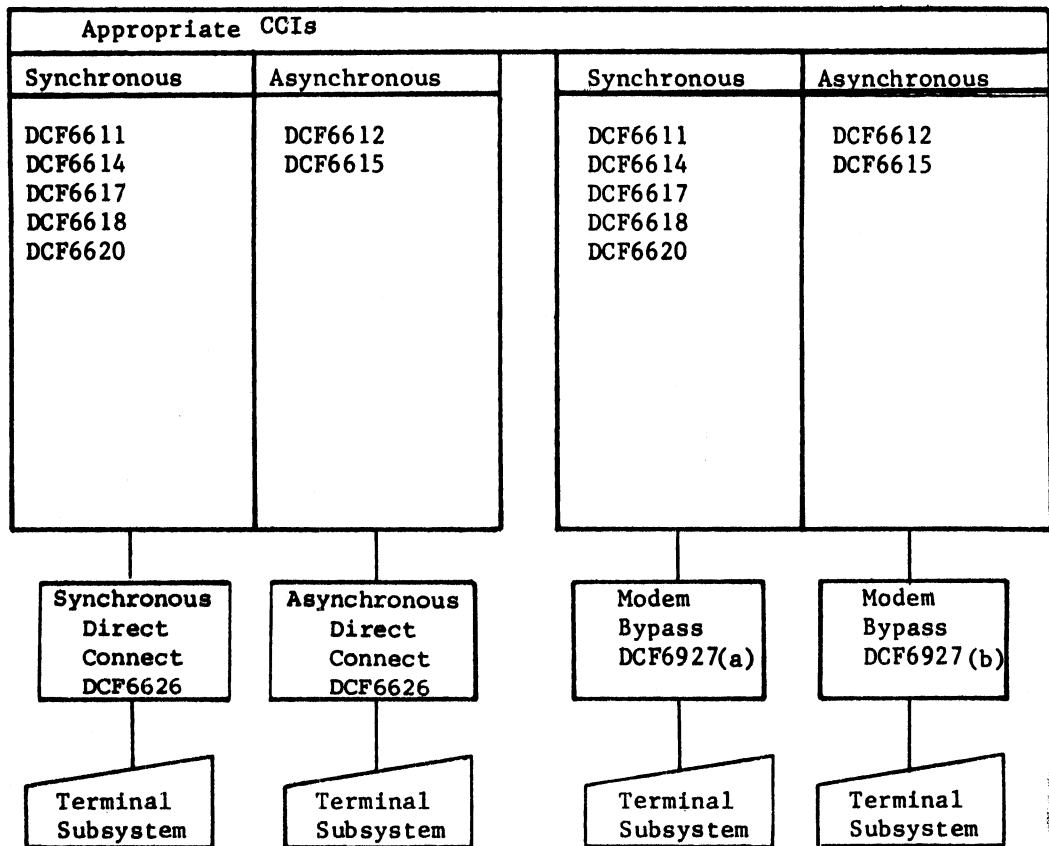
c. For standard and optional configuring of communication lines on DN6661.



SECTION XI
Configuring DN6661 and DN8

d. In-plant connection features (other than current loop interface) for connecting terminals on in-plant cables

- 1) Use this chart for Direct Connect and Modem Bypass features options. It shows the applicable CCIs to which such in-plant connection features can be attached. Identify terminal to be used with each feature on your order
- 2) Terminals using current loop interfaces cable-connect to current loop-oriented CCIs



No support of ACU by in-plant connection features

(a) Maximum speed 9,600 bps, must order in quantities of two

(b) Maximum speed 1,800 bps, must order in quantities of two

SECTION XI
Configuring DN6661 and DN8

3. List of all DN6661 FNP-related marketing identifiers (MI) and their functions

a. Base FNP

MI	Description
DCU6661	A freestanding FNP with 64KB memory and chassis for up to 32 line connections, diskette for FED use, interval timer, DIA link to IOM channel and the IOM channel. No CIB (channel interface base) is included, but at least one must be configured. Maximum of 12 CIBs can be configured. No CCI is included, but at least one must be configured.

b. Line Connection and Performance Enhancements

DCE6661	Performance and line configurability enhancement for the DCU6661 Front-End Network Processor. Increases processor performance up to 47% (Mid-Performance Level) and additional chassis for line configurability to a maximum of 64 lines. Prerequisite is DCM6605.
DCE6662	Cache Memory Performance Enhancement for the DCU6661 Front-End Network Processor. Increases Processor Performance up to additional 67% (High Performance Level). Prerequisites are DCM6605 and DCE6661.
DCE6663	Additional chassis and cabinet for line configurability to a maximum of 96 lines for the DCU6661 Front-End Network Processor. Maximum of one can be configured. Prerequisites are DCM6605 and DCE6661.

c. Memory expansion

DCM6605	Memory Increment for DCU6661 (DN6661). Raises memory from 65,536 Byte to 131,072 Byte for the DCU6661 Front-End Network Processor. Includes Paging Module. Maximum of one can be configured.
DCM6606	Memory Increment for DCU6661 (DN6661). Raises memory from 131,072 Byte to 262,144 Byte for the DCU6661 Front-End Network Processor. Maximum of one can be configured. Prerequisites are DCM6605 and DCE6661.

SECTION XI
Configuring DN6661 and DN8

- DCM6607 Memory Increment for DCU6661 (DN6661). Raises memory from 262,144 Byte to 524,288 Byte for the DCU6641 Front-End Network Processor. Maximum of one can be configured. Prerequisites are DCE6661, DCM6605 and DCM6606.
- d. General purpose channel interface bases (CIBs)
- DCF6607 Handles 1-4 CCIs of any type. ACU DCF6613 counts as one CCI
- e. Asynchronous communication line channels (CCIs)
- DCF6610 Terminates 2 asynchronous lines at up to 9,600 bps each. Current loop interface, 20 milliamps, 4 wire only, for in-plant connections. HDX or FDX. Any code 5-8 bits. No modem used. A 50 foot cable is included with each line termination. A W19-0001C extension cable assembly is to be ordered to connect asynchronous VIP7100, VIP7200, VIP7801 terminals located up to 1000 feet from the FNP. A W24-0001C extension cable assembly is to be ordered to connect asynchronous printer terminals type TWU/PRU1003 or TWU/PRU1005 at distances up to 1000 feet from the FNP. Refer to the Terminals Sales Reference Handbook Price Catalog (CG32), Section 4 for configuration and pricing. Each line can run at different speeds.
- DCF6612 Terminates 2 asynchronous lines at up to 9,600 bps each. Each line can run at different speed. EIA RS232C interface. HDX or FDX. Any code 5-8 bits. 1 or 2 stop bits per character for 6, 7, 8-bit codes; 1 or 1.5 stop bits per character for 5-bit codes. For Dataphone 103, 113, 202, 212A or equivalent modem or modem bypass or direct connect
- DCF6615 Same as DCF6612 above except that interface is Military Standard 188C

SECTION XI
Configuring DN6661 and DN8

f. Synchronous communication line channels (CCIs)

- DCF6611 Terminates 2 synchronous lines at up to 9,600 bps each. Each line can run at different speed. EIA RS232C interface. ASCII code. HDX or FDX. A 50 foot cable is included with each line termination for connecting Dataphone 201, 203, 208, 209, or equivalent MODEMS or DCF6927 MODEM by-pass. For direct connect, the required timing source may be furnished from the connected terminal or the FNP. The W17-0001C extension cable or the W18-0001C interconnecting direct connect cables are provided for Honeywell VIP terminals. Refer to the terminals Sales Reference Handbook Price Catalog (CG32) Section 4 for configuration and pricing.
- DCF6614 Terminates 1 synchronous line at up to 9,600 bps. Military Standard 188C interface. HDX or FDX. ASCII code
- DCF6616 Same as DCF6619 below except that interface is Military Standard 188C
- DCF6617 Same as DCF6620 below except that interface is Military Standard 188C
- DCF6618 Terminates 2 synchronous lines at up to 9,600 bps each, running under BSC protocol. ASCII or EBCDIC code, transparent or non-transparent mode. Each line can run at different speed. EIA RS232C interface. HDX or FDX
- DCF6619 Terminates one line in broadband (wideband) synchronous range, up to 72,000 bps. Telpak interface. Any code 5-8 bits. HDX or FDX. Type 301 or 303 modems or equivalent.
- DCF6620 Terminates one line at up to 9,600 bps. For Honeywell Logical HDLC link protocol. Software support via NPS NT2 or DP1(DPS) or later, or GRTS-II. Any code. Bit-oriented protocol. EIA RS232C interface. HDX or FDX
- DCF6621 Terminates 2 lines running under BSC protocol at up to 72,000 bps. ASCII or EBCDIC code, transparent or non-transparent mode. Any code 5-8 bits. Lines can run at different speeds

SECTION XI
Configuring DN6661 and DN8

- DCF6622 Terminates one line in wideband range at up to 72,000 bps. Honeywell Logical HDLC link protocol. Software support via NPS NT2 or DP1(DPS) or later, or GRTS-II. Any code. Bit-oriented protocol. HDX or FDX
- DCF6623 Terminates one line at up to 72,000 bps. Honeywell Logical HDLC link protocol. Software support via NPS NT2 or DP1(DPS) or later, or GRTS-II. For CCITT V.35 interface, similar to EIARS232C, any code 5-8 bits. HDX or FDX
- DCF6627 Terminates one line in wideband range at up to 72,000 bits per second. For CCITT V.35 interface, similar to EIARS232C interface, any code 5-8 bits. HDX or FDX.
- g. Automatic Call Unit (ACU)
- DCF6613 Provides ability to perform automatic call-out on 2 lines. DCF6613 does not include any line termination capability itself, but it counts as one CCI in the CCI complement allowed on any CIB. Thus when used this feature cuts the line connectivity maximum of a CIB by two lines. The call-out capability of DCF6613 applies to lines terminated by some CCI external to DCF6613. Requires NPS
- h. Delta link mass storage (MSP) required to use NPS
- DCF6601 Peripheral interface adapter for receiving delta link channel/cable from MSP. Maximum 1
- i. Additional channel/cable from FNP to DPS 8 IOM
- DCF6602 Direct interface adapter (DIA). Includes channel in IOM. Maximum of one. Base FNP always includes one DIA in its price. Second DIA cannot run simultaneously with first. A new GCOS warm start is needed to define the second IOM channel as the new path to reach the FNP.
- j. In-plant connection options to connect to CCIs above Refer to the Terminals Sales Reference Handbook Price Catalog (CG32) Section 4 for cabling configuration and pricing of W08-0001C, W17-0001C, W18-0001C, W19-0001C, W24-0001C

SECTION XI
Configuring DN6661 and DN8

special length cables provided for Honeywell terminals in-plant connection options.

DCF6626 Direct connect feature for connection to asynchronous or synchronous CII for one line (cable). Length of cable determined by maximum cable length of terminal subsystem. One per line (cable). Maximum speed 9,600 BPS.

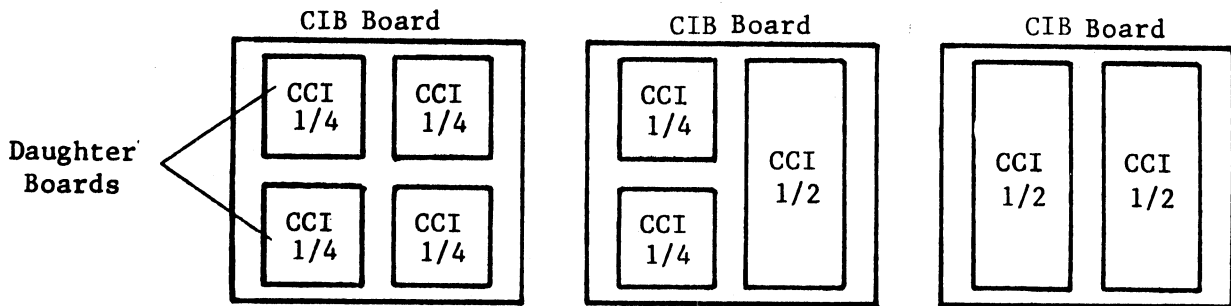
DCF6927 Universal Modem Bypass feature for connection to one synchronous or asynchronous line (cable). A Level 6 feature usable into FNP CCIs. Minimum of two per line, one at FNP end, other at terminal end. Maximum cable length between 2 successive bypass units is 2500 feet. Intermediate bypass units can be used as line signal repeaters or strengtheners. Check your Level 6 technical support people for maximum cable lengths and maximum number of bypass units in a line at satisfactory line noise levels. Cable used between the DCF6927 is customer furnished and is specified as two pair of loosely twisted inside telephone cable equivalent to the Alpha Wire Inc. No. 1302. Speed to 9,600 bps. Cannot be used with current loop CCIs.

Note: Current loop-oriented terminals cable-connect directly to a current loop-oriented CCI. Up to 1000 cable feet

4. Channel Interface Board (CIB) throughput calculations (load factors) and CCI board packaging tables
 - a. Configurability of CCIs is affected by two facts:
 - 1) The first fact is that each CIB is a mother board (IC board) in Level 6 type circuit packaging. Each mother board supplies common power and common logic to 1-4 daughter boards packaged on top of the mother board. Daughter boards represent specific tailored functions, serviced as a group of 1-4 by a mother board (CIB in FNP case).

SECTION XI
Configuring DN6661 and DN8

- a) On the Datamet 6661 FNP the CCIs are daughter boards, either quarter boards or half boards, depending on the specific functionality each CCI supplies
- b) Capacity of each CIB (mother board) is either four quarter-board CCIs, two half-board CCIs, or two quarter-board CCIs and one half-board CCI as illustrated below:



- 2) The second fact is that each CIB (mother board) has a throughput limit (more accurately called load limit) for the bit stream(s) from lines serviced by its cluster of CCI daughter boards. Throughput of a CIB is expressed as the sum of load factors related to its CCI daughter boards

- a) MAXIMUM PERMISSIBLE THROUGHPUT (LOAD) FACTOR FOR ANY CIB (MOTHER BOARD) IS 99. Any combination of CCI daughter boards can be used on a CIB mother board if the CCI daughter boards fit, and if their cumulative throughput factors do not exceed 99.

SECTION XI
Configuring DN6661 and DN8

- b. To determine both the fit and throughput factors use the tables below.
- 1) Note that there is a column for cases where the software will use the Character Control Table (CCT) feature. The table is tied to hardware. Its use exerts some overhead which increases the timing load placed on the affected CIB mother board. If you don't know in your preliminary configuring whether CCT will be used, assume it will to give your worst case protection. It is used in supporting certain link protocols, such as BSC, and for other uses
 - 2) Note that especially where broadband (wideband) speeds are used (second table below) the actual number of CIBs required can be affected by both the half-board CCIs involved and/or the high value of their throughput factors
 - 3) Remember that several of the CCIs interface two lines each. Each line exerts its own throughput factor which must be taken into account
 - 4) Maximum load factor for each CIB is 99
 - 5) Figures in parentheses indicate number of lines terminated by the CCI

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Configuring DN6661 and DN8

DN6661
LOAD FACTOR TABLE 1
SYNCHRONOUS AND ASYNCHRONOUS

THROUGHPUT LOAD FACTORS PER LINE

CCI	CCI DESCRIPTION	TO 2400 BPS		TO 4800 BPS		TO 9600 BPS		CCI BOARD SIZE
		NO CCT	CCT ^b	NO CCT	CCT ^b	NO CCT	CCT ^b	
DCF6612	Dual Asynch, EIA RS232C (2)	1.1	2.0	2.3	4.1	4.5	8.2	1/4
DCF6610	Dual Asynch, Current Interface (2)	1.1	2.0	2.3	4.1	4.5	8.2	1/4
DCF6614	MIL 188C, Synchronous (1)	1.1	2.0	2.3	4.1	4.5	8.2	1/4
DCF6611	Dual Synch, EIA RS232C (2)	1.1	2.0	2.3	4.1	4.5	8.2	1/4
DCF6618	Bisynchronous Channels (2)	2.5	2.5	5.1	5.1	10.1	10.1	1/4
DCF6620	HDLC to 9600 BPS (1)	2.2(FDX) ^a	2.2(FDX)	4.4(FDX) ^a	4.4(FDX)	8.8(FDX) ^a	8.8(FDX) ^a	1/4
DCF6617	MIL 188C, HDLC, to 9600 bps (1)	2.2(FDX) ^a	2.2(FDX)	4.4(FDX) ^a	4.4(FDX)	8.8(FDX) ^a	8.8(FDX) ^a	1/4
DCF6613	ACU for 2 lines. Not a CLC	-	-	-	-	-	-	1/4
DCF6615	Dual Asynch MIL STD (2)	1.1	2.0	2.3	4.1	4.5	8.2	1/4

TOTAL LOAD FACTOR PER CIB ----- 99 OR LESS

NOTES:

- a Factors are for half-duplex or FDX transmission TWA (Two Way Alternate) per line unless otherwise stated.
- b FDX indicated in Table means TWS (Two Way Simultaneous) use of the FDX line. If TWS is not needed, divide the factor shown in half.
- c The Character Control Table is a software table used by both NPS/GRTS-II to distinguish control of, e.g., function key characters. This enables the user of the terminal to specify that certain keys are to perform particular system functions. Example: a control -J might be set to mean "back space the cursor to the beginning of line".
- c CCI Board size refers to the physical space required on the CIB. All CCIs with a board size of one-half requires two of the four available physical connections on the CIB.

SECTION XI Configuring DN6661 and DN8

DN6661
LOAD FACTOR TABLE 2
WIDEBAND/BROADBAND

CCI	CCI DESCRIPTION	THROUGHPUT LOAD FACTORS PER LINE											
		TO 19.2K BPS		TO 40K BPS		TO 56 BPS		TO 72 BPS		CCI BOARD SIZE			
		NO CCT	CCTb	NO CCT	CCTb	NO CCT	CCTb	NO CCT	CCT				
DCF6619	Wideband Channel, 19.2 -56.0 K bps (1)	11.9	18.7	25	39.3	35.0	55.0	45	70.7	1/4			
DCF6616	MIL-188 Wideband Channel (1)	11.9	18.7	25	39.3	35.0	55.0	45	70.7	1/4			
DCF6622	HDLC Wideband Channel (1)	13.6(FDX) ^a	13.6(FDX) ^a	28.6(FDX) ^a	28.6(FDX) ^a	40.0(FDX) ^a	40.0(FDX) ^a	51.5(FDX) ^a	51.5(FDX) ^a	1/2			
DCF6621	Bisynch Wideband Channel (1)	23.8	23.8	50.0	50.0	70.0	70.0	90	90	1/4			
DCF6623	HDLC, V.35 (1)	13.6(FDX) ^a	13.6(FDX) ^a	28.6(FDX) ^a	28.6(FDX) ^a	40.0(FDX) ^a	40.0(FDX) ^a	51.5(FDX) ^a	51.5(FDX) ^a	1/2			
DCF6627	V.35 (1)	11.9	18.7	25	39.3	35.0	55.0	45	70.7	1/4			
DCF6613	ACU for 2 Lines. Not a CLC	-	-	-	-	-	-	-	-	1/4			

TOTAL LOAD FACTOR PER CIB ---- 99 OR LESS

NOTES:

- a Factors are for half-duplex or FDX transmission TWA (Two Way Alternate) per line unless otherwise stated.
- a FDX indicated in Table means TWS (Two Way Simultaneous) use of the FDX line. If TWS is not needed, divide the factor shown in half.
- b The Character Control Table is a software table used by both NPS/GRS-II to distinguish control of, e.g., of the functional key characters. This enables the user of the terminal to specify that certain keys are to perform particular system functions. Example: a control -J might be set to mean "back space the cursor to the beginning of line".
- c CCI Board size refers to the physical space required on the CIB. All CCIs with a board size of one-half requires two of the four available physical connections on the CIB.

SECTION XI
Configuring FNP's

5. DN6661 Configuration Examples:

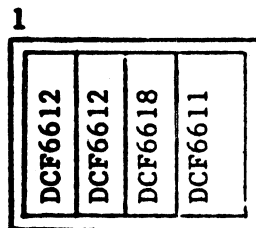
a. The prospect wants the following:

- Datanet 6661 with 64K Bytes of Memory
- Entry level performance processor
- GRTS-II software
- 2 Synchronous RS-232 lines at 2400 BPS
- 4 Asynchronous RS-232 lines at 300 BPS
- 2 Bi-Synchronous lines at 9600 BPS

The resultant order should be as follows:

<u>QUANTITY</u>	<u>MKTG ID</u>	<u>DESCRIPTION</u>
1	DCU6661	Datanet 6661
1	DCF6607	Channel Interface Bases
1	DCF6611	CCI for 2 Synchronous RS-232-C lines
2	DCF6612	CCI for 2 Asynchronous RS-232-C lines
1	DCF6618	CCI for 2 Bi-Synchronous Lines

CIB/CCI LAYOUT WITH LOAD FACTORS



<u>CIB</u>	<u>CCIs</u>	<u>LINES</u>	<u>BOARD SIZE</u>	<u>LOAD FACTOR CALCULATION</u>	<u>TOTAL LOAD FACTOR</u>
1	DCF6612	2	1/4	2 LINES (@ 300 BPS) x 2.0	4.0
	DCF6612	2	1/4	2 LINES (@ 300 BPS) x 2.0	4.0
	DCF6618	2	1/4	2 LINES (@ 9600 BPS) X 10.1	20.2
	DCF6611	2	1/4	2 LINES (@ 2400 BPS) x 2.0	4.0
			<u>1</u>		<u>32.2</u>

TOTAL LOAD FACTOR PER CIB MUST NOT EXCEED 99.0

SECTION XI
Configuring DN6661 and DN8

b. The prospect wants the following:

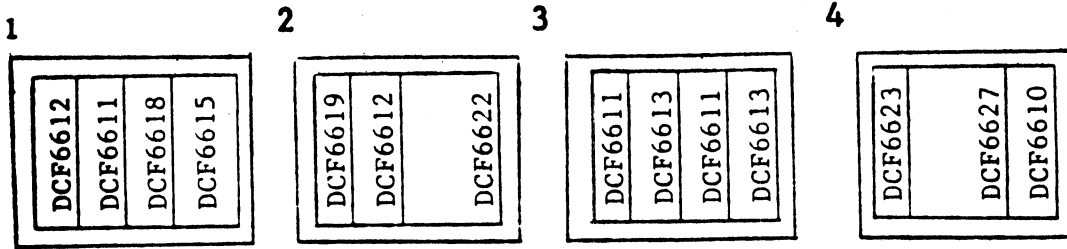
- Datanet 6661 with 256K Bytes of Memory
- Highest performance processor available
- NPS software
- 6 Synchronous RS-232 Lines at 9600 BPS
- 2 Asynchronous RS-232 Lines at 9600 BPS
- 2 Bi-Synchronous lines at 9600 BPS
- 2 Asynchronous Lines MIL 188C at 2400 BPS
- 1 Broadband at 19.2K BPS
- 2 Synchronous RS-232 Lines at 2400 BPS
- 1 Broadband HDLC at 72K BPS
- 1 HDLC CCTI-V.35 at 56K BPS
- 1 Broadband CCIT-V.35 at 40K BPS
- 2 Current Mode Lines at 2400 BPS
- 4 Auto Call Units

The resultant order should be as follows:

<u>QUANTITY</u>	<u>MKTG ID</u>	<u>DESCRIPTION</u>
1	DCU6661	Datanet 6661
1	DCM6605	Additional 64K Bytes of Memory
1	DCM6606	Additional 128K Bytes of Memory
1	DCE6661	Additional Processor Performance and 64 lines Configurability
1	DCE6662	Additional Processor Performance (Cache)
1	DCF6601	MSP Interface for NPS
4	DCF6607	Channel Interface Bases
1	DCF6610	CCI for 2 Current Mode Lines
3	DCF6611	CCI for 2 Synchronous RS-232-C Lines
2	DCF6612	CCI for 2 Asynchronous RS-232-C Lines
2	DCF6613	Auto Call Unit for 2 Lines
1	DCF6615	CCI for 2 Asynchronous MIL 188C Lines
1	DCF6618	CCI for 2 Bi-Synchronous Lines
1	DCF6619	CCI for 1 Broadband Line
1	DCF6622	CCI for 1 Broadband HDLC Line
1	DCF6623	CCI for HDLC CCIT-V.35 Line
1	DCF6627	CCI for 1 Broadband CCIT-V.35 Line

SECTION XI
Configuring DN6661 and DN8

CIB/CCI LAYOUT WITH LOAD FACTORS



<u>CIB</u>	<u>CCIs</u>	<u>LINES</u>	<u>BOARD SIZE</u>	<u>LOAD FACTOR CALCULATION</u>	<u>TOTAL LOAD FACTOR</u>
1	DCF6621	2	1/4	2 LINES (@ 9600 BPS) x 8.2	16.4
	DCF6611	2	1/4	2 LINES (@ 9600 BPS) x 8.2	16.4
	DCF6618	2	1/4	2 LINES (@ 9600 BPS) x 10.1	20.2
	DCF6615	2	1/4	2 LINES (@ 2400 BPS) x 2.0	4.0
			<u>1</u>		<u>57.0</u>
2	DCF6619	1	1/4	1 LINE (@ 19.2K BPS) x 18.7	18.7
	DCF6612	2	1/4	2 LINES (@ 2400 BPS) x 2.0	4.0
	DCF6622	1	1/2	1 LINE (@ 72K BPS) x 70.7	70.7
			<u>1</u>		<u>93.4</u>
3	DCF6611	2	1/4	2 LINES (@ 9600 BPS) x 8.2	16.4
	DCF6611	2	1/4	2 LINES (@ 9600 BPS) x 8.2	16.4
	DCF6613	-	1/4	2 AUTO CALL UNITS	--
	DCF6613	-	1/4	2 AUTO CALL UNITS	--
			<u>1</u>		<u>32.8</u>
4	DCF6623	1	1/2	1 LINE (@ 56K BPS) x 55.0	55.0
	DCF6627	1	1/4	1 LINE (@ 40K BPS) x 39.3	39.3
	DCF6610	2	1/4	2 LINES (@ 2400 BPS) x 2.0	4.0
			<u>1</u>		<u>98.3</u>

NOTE - TOTAL LOAD FACTOR PER CIB MUST NOT EXCEED 99.0.

SECTION XI
Configuring DN6661 and DN8

C. Configuring DATANET 8 FNP.

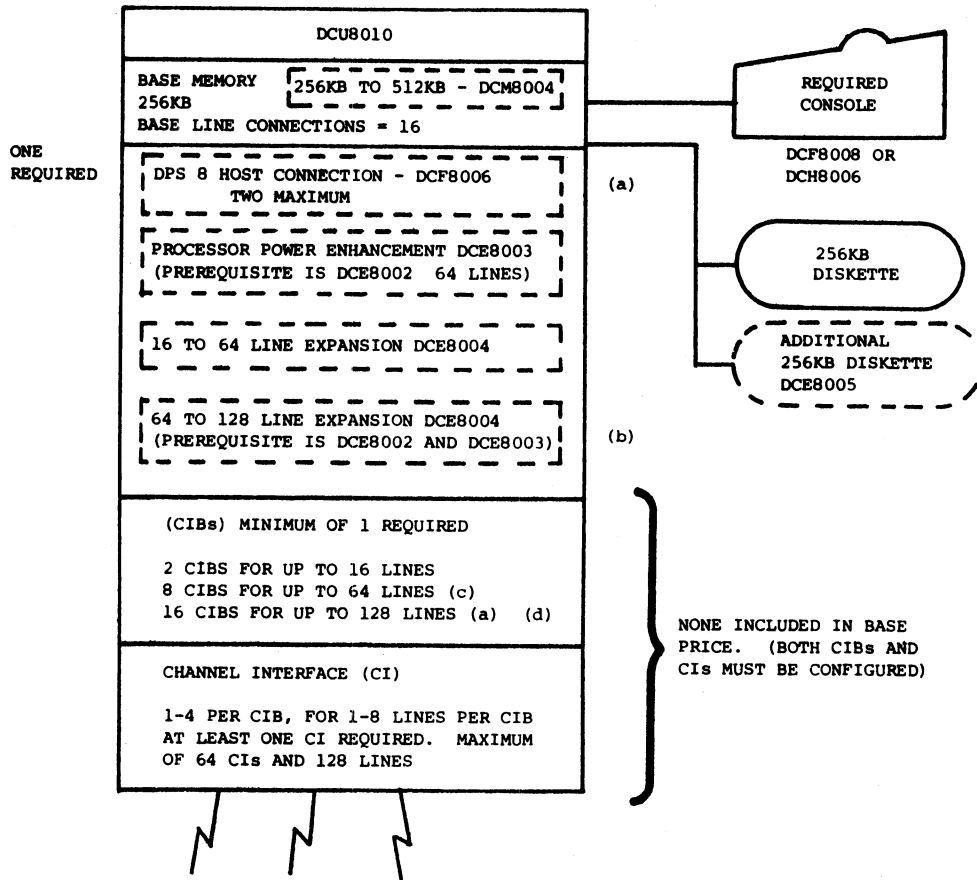
1. Required configuration components.

- a. Base FNP
- b. DPS 8 Host Connection
- c. Console
- d. One or more Communication Channel Interfaces (CCIs)
 - 1) Every line (sometimes called a subchannel or channel) must terminate in a CCI from any common carrier or any in-plant connection.
 - 2) Every CCI represents electronic logic on circuit boards for which space is provided in "slots" in one or more general purpose channel interface bases (CIBs).
- e. Sufficient quantity of CIBs to connect the quantity of CCIs needed to support the desired number of lines. DN 8 does not include any CIBs in base price, but one or more must be configured in order to provide for the CCIs needed to connect the lines to FNP.
- f. One or more in-plant connection features if lines are not furnished by common carrier companies. In-plant connection is by use of modem bypass or direct connect features, or by use of modem bypass or direct connect features, or by use of terminals of the current loop interface type. Each must connect to an appropriate CCI.

SECTION XI
Configuring DN6661 and DN8

2. Configuring the DATANET 8.

- a. Block diagram. GCOS 8 and Distributed Network Supervisor (DNS) is the required software.



NOTES:

- (a) Expansion to 128 lines requires a second cabinet.
- (b) Requires DCE8002 (64 line chassis)
- (c) Requires DCE8002 (64 line chassis), DCE8003 (Processor power enhancement) and DCE8004 (128 line chassis)

SECTION XI
Configuring DN6661 and DN8

3. List of all DN 8 FNP-related marketing identifiers (MI) and their functions.

a. Base FNP

MI	Description
DCU8010	A freestanding FNP with 256KB memory and chassis for up to 16 line connections, and a 256KB diskette. No console, DPS 8 Host Connection, CIBs or CIs are included, however, at least one of each of these items must be configured. Maximum of 16 CIBs may be configured.

b. Required Options

DCE8006	DPS 8 Host Connection from the DCU8010 FNP to the DPS 8 IOM. A maximum of two may be configured.
---------	--

DCF8008	120 CPS Communications Console for the DCU8010. At least one console must be configured, the DCF8008 or the DCF8006.
---------	--

DCF8006	30 CPS Communications Console for the DCU8010. At least one console must be configured, the DCF8006 or the DCF8008.
---------	---

c. Memory Expansion and Performance Enhancement.

DCM8004	Memory increment for the DCU8010 from the base 256KB to 512KB. A maximum of one can be configured.
---------	--

DCE8003	Processor power module enhancement for the DCU8010 FNP. Prerequisite is DCE8002 (64 lines).
---------	---

d. Line Connection Expansion

DCE8002	Additional chassis for line configurability for the DCU8010, from the 16 base connections to a maximum of 64 lines. Maximum of one can be configured.
---------	---

DCE8004	Additional chassis and cabinet for DCU8010 line configurability from 64 lines to a maximum of 128 lines. Prerequisites are DCE8002 (64 lines) and
---------	---

SECTION XI
Configuring DN6661 and DN8

DCE8003 (processor power enhancement). Maximum of one can be configured.

e. Diskette Expansion

DCFE8005 Additional 256KB diskette storage for the DCU8010. Maximum of one can be configured.

f. Channel Interface Base (CIB)

DCF8007 Channel Interface Base (CIB) for the DCU8010 FNP. Maximum of 16 may be configured. Required DCE8002 (64 line connections) if more than 2 CIBs are configured. Requires DCE8002, DCE8003 and DCE8004 if more than 8 CIBs are configured.

One CIB accommodates up to 4 Channel Interface (CIs) with two transmission types per CIB.

g. Channel Interface (CI) options.

DCF8011 Terminates 2 synchronous lines at up to 9,600 bps each. Each line can run at different speed. EIA RS232C interface. ASCII code. HDX or FDX. A 50 foot cable is connecting Dataphone 201, 203, 208, 209, or equivalent MODEMS or DCF8026 MODEM by-pass. For direct connect, the required timing source may be furnished from the connected terminal or the FNP. The W17-0001C extension cable or the W18-0001C interconnecting direct connect cables are provided for Honeywell VIP terminals. Refer to the terminals Sales Reference Handbook Price Catalog (CG32) Section 4 for configuration and pricing.

DCF8012 Terminates 2 asynchronous lines at up to 9,600 bps each. Each line can run at different speed. EIA RS232C interface. HDX or FDX. Any code 5-8 bits. 1 or 2 stop bits per character for 6, 7, 8-bit codes; 1 or 1.5 stop bits per character for 5-bit codes. For Dataphone 103, 113, 202, 212A or equivalent modem or modem bypass or direct connect.

DCF8020 Terminates one line at up to 9,600 bps. For HDLC link protocol. Any code. Bit-oriented protocol. EIA RS232C interface. FDX only.

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Configuring DN6661 and DN8

DCF8022 Terminates one line in broadband (wideband) range at up to 56,000 bps. HDLC link protocol. Any code. Bit-oriented protocol. FDX only.

DCF8023 Terminates one line at up to 56,000 bps. HDLC link protocol. For CCITT V.35 interface, similar to EIA RS232C, any code 5-8 bits. FDX only.

h. Direct Connect and Modem Bypass Options

DCF8024 Direct connect feature for connection to one asynchronous or one synchronous CI for one line (cable). Length of cable determined by maximum cable length of terminal subsystem. One per line (cable). Line speed up to 9,600 bps.

DCF8026 Universal Modem Bypass feature for connection to one synchronous or asynchronous line (cable). Minimum of two per line, one at FNP end, other at terminal end. Maximum cable length between 2 successive bypass units is 2500 feet. Intermediate bypass units can be used as line signal repeaters or strengtheners. Cable used between the DCF8026 is customer furnished and is specified as two pair of lossely twisted inside telephone cable equivalent to the Alpha Wire Inc. No. 1302. Speed to 19.2K bps for synchronous or 1800 bps for asynchronous.

4. Channel Interface Board (CIB) throughout calculations (load factors) and CI board packaging tables.

a. Configurability of CIs is affected by three items:

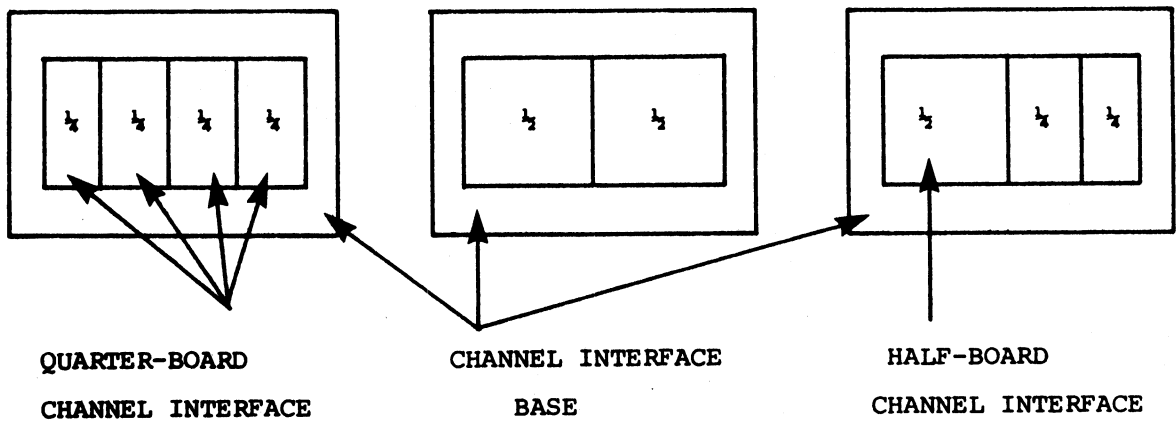
1) Data Transmission Mode -

Channel Interfaces have data transmission modes of either Synchronous, Asynchronous or HDLC. The CIB supports a maximum of two data transmission of either (a) Synchronous and Asynchronous, or (b) Synchronous and HDLC, or (c) Asynchronous and HDLC.

SECTION XI
Configuring DN6661 and DN8

2) Physical board size -

Channel Interfaces are either quarter or half-board sizes depending on their specific functionality. The physical capacity of each CIB is either four quarter-boards, two half-board, or two quarter-boards and one half-board Channel Interfaces as illustrated below:



SECTION XI
Configuring DN6661 and DN8

3) Throughput load factor -

The CIB has a limit to the total communication load it can handle. In order to easily calculate whether this limit has been exceeded, load factors based on transmission mode and bit rate, have been specified for each Channel Interface. The sum of the load factor for all Channel Interfaces connected to a CIB must be less than 150.

b. To determine both the fit and throughput load factors use the following tables:

- 1) Note that especially where broadband (wideband) speeds are used the actual number of CIBs required can be affected by both the half-board CIs involved and/or the high value of their throughput factors.
- 2) Remember that several of the CIs interface two lines each. Each line exerts its own throughput factor which must be taken into account.
- 3) Maximum load factor for each CIB must be less than 150.

SECTION XI

Configuring DN6661 and DN8

DATANET 8 LOAD FACTOR TABLE

SYNCHRONOUS AND ASYNCHRONOUS

CHANNEL INTERFACES

MARKETING IDENTIFIER	CI DESCRIPTION	BOARD SIZE	300 BPS TWA/TWS	1200 BPS TWA/TWS	2400 BPS TWA/TWS	4800 BPS TWA/TWS	9600 BPS TWA/TWS
DCF8011	Dual Sync, EIA RS-232C	1/4	7.5/15.1	9.2/18.3	11.3/22.6	15.6/31.3	24.3/48.6
DCF8012	Dual Async. EIA RS-232C	1/4	7.5/15.1	9.2/18.3	11.3/22.6	15.6/31.3	24.3/48.6
DCF8020	Single HDLC, EIA	1/4	/14.6	/16.4	/18.8	/23.6	/33.2

TOTAL LOAD FACTOR PER CIB (DCF8007) MUST BE LESS THAN 150

NOTES: Board Size refers to the physical space required on the CIB by the Channel Interface. All Channel Interfaces with a board size of one-half require two of the four available physical connections on the CIB.

Load Factors listed are for Two Way Alternate (TWA) and Two Way Simultaneous (TWS) data transmissions for one line. Only TWS is supported with HDLC.

Of the three Transmission Modes, Asynchronous, Synchronous and HDLC, any two may be used on one CIB, but not all three.

The DCF8011/8012 have two lines per Channel Interface, and each line has its own load factor.

DATANET 8 LOAD FACTOR TABLE

HDLC

MARKETING IDENTIFIER	CI DESCRIPTION	BOARD SIZE	10.8K BPS TWA/TWS	19.2K BPS TWA/TWS	40.8K BPS TWA/TWS	50K BPS TWA/TWS	56K BPS TWA/TWS
DCF8022	Single HDLC Wideband Channel	1/2	/35.6	/52.4	/95.6	/114	/126
DCF8023	Single HDLC Wideband	1/2	/35.6	/52.4	/95.6	/114	/126

TOTAL LOAD FACTOR PER CIB (DCF8007) MUST BE LESS THAN 150

NOTES: Board Size refers to the physical space required on the CIB by the Channel Interface. All Channel Interfaces with a board size of one-half require two of the four available physical connections on the CIB.

Load Factors listed are for Two Way Alternate (TWA) and Two Way Simultaneous (TWS) data transmission for one line. Only TWS is supported with HDLC.

Of the three Transmission Modes, Asynchronous, Synchronous and HDLC, any two may be used on one CIB, but not all three.

SECTION XI
Configuring DN6661 and DN8

5. DATANET 8 Configuration Examples

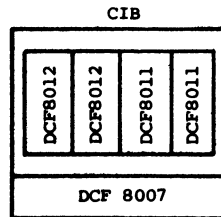
a. The prospect wants the following configuration:

- DATANET 8 with 256K Bytes of Memory
- DNS Software
- 30 CPS Communication Console
- 4 Synchronous Two Way Alternate (TWA) RS-232 Lines at 2400 BPS.
- 4 Asynchronous Two Way Alternate (TWA) RS-232 Lines at 300 BPS

The resultant hardware order should be:

QUANTITY	MKTG ID	DESCRIPTION
1	DCU8010	DATANET 8
1	DCE8006	DPS 8 Host Connection
1	DCF8008	Communication Console (30 CPS)
1	DCF8007	Channel Interface Base
2	DCF8011	Channel Interface for 2 Synchronous RS-232 Lines
2	DCF8012	Channel Interface for 2 Asynchronous RS-232 Lines

CIB/CI LAYOUT WITH LOAD FACTORS



CIs	LINES	BOARD SIZE	LOAD FACTOR CALCULATION	TOTAL LOAD FACTOR
DCF8012	2	1/4	2 Lines (TWA/Async. at 300 BPS) x 7.5	15.0
DCF8012	2	1/4	2 Lines (TWA/Async. at 300 BPS) x 7.5	15.0
DCF8011	2	1/4	2 Lines (TWA/Sync. at 2400 BPS) x 11.3	22.6
DCF8011	2	1/4	2 Lines (TWA/Sync. at 2400 BPS) x 11.3	22.6
1				75.2

Total load factor per CIB must not exceed 150.

SECTION XI
Configuring DN6661 and DN8

b. The prospect wants the following configurations:

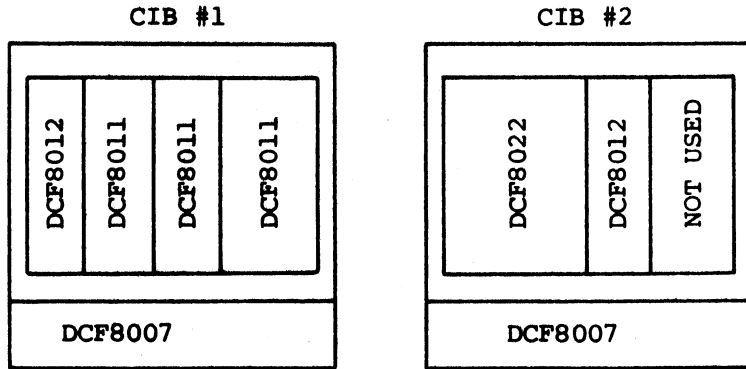
- DATANET 8 with 256K Bytes of Memory
- DNS software
- 30 CPS Communication Console
- 4 Asynchronous Two Way Alternate (TWA)
RS-232 Lines at 1200 BPS

- 4 Synchronous Two Way Alternate (TWA)
RS-232 Lines at 2400 BPS
- 2 Synchronous Two Way Alternate (TWA)
RS-232 Lines at 9600 BPS
- 1 HDLC Wideband Two Way Simultaneous (TWS)
Line at 50K BPS

The resultant hardware order should be:

QUANTITY	MKTG ID	DESCRIPTION
1	DCU8010	DATANET 8
1	DCE8006	DPS 8 Host Connection
1	DCF8008	Communication Console (30 CPS)
2	DCF8007	Channel Interface Base
3	DCF8011	Channel Interface for 2 Synchronous RS-232 Lines
2	DCF8012	Channel Interface for 2 Asynchronous RS-232 Lines
1	DCF8022	Channel Interface for 1 HDLC Wideband Line

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Configuring DN6661 and DN8



<u>CIBs</u>	<u>CIs</u>	<u>LINES</u>	<u>BOARD SIZE</u>	<u>LOAD FACTOR CALCULATION</u>	<u>TOTAL LOAD FACTOR</u>
1	DCF8012	2	1/2	2 Lines (TWA/Async. @ 1200 BPS) x 9.2	18.8
	DCF8011	2	1/2	2 Lines (TWA/Sync. @ 9600 BPS) x 24.3	48.6
	DCF8011	2	1/2	2 Lines (TWA/Sync. @ 2400 BPS) x 11.3	22.6
	DCF8011	2	1/2	2 Lines (TWA/Sync. @ 2400 BPS) x 11.3	22.6
			1		112.6
2	DCF8022	1	1/2	1 Line (TWS/HDLC @ 50K BPS) x 114.0	114.0
	DCF8012	2	1/2	2 Lines (TWA/ASYNC. @ 1200 BPS) x 9.2	18.4
	-	-	1/2	(Not used)	-
			1		132.4

Total load factor per CIB must not exceed 150.

SECTION XI
Configuring DN6661 and DN8

c. The prospect wants the following configuration:

- DATANET 8 with 512K Bytes of Memory
- Processor Power Module
- DNS Software
- 120 CPS Communication Console
- 16 Asynchronous Two Way Alternate (TWA) RS-232 Lines at 1200 BPS
- 4 Synchronous Two Way Alternate (TWA) RS-232 Lines at 2400 BPS
- 4 Synchronous Two way Alternate (TWA) RS-232 Lines at 9600 BPS
- 2 HDLC Two Way Simultaneous (TWS) RS-232 Lines at 1200 BPS
- 2 HDLC two Way Simultaneous (TWS) RS-232 Lines at 2400 BPS
- 4 HDLC Two Way Simultaneous (TWS) RS-232 Lines at 9600 BPS
- 1 HDLC Two Way Simultaneous (TWS) Wideband Line at 40.8K BPS
- 1 HDLC Two Way Simultaneous (TWS) Wideband Line at 56K BPS

The resultant hardware order should be

QUANTITY	MKTG ID	DESCRIPTION
1	DCU8010	DATANET 8
1	DCE8006	DPS 8 Host Connection
1	DCF8006	Communication Console (120 CPS)
1	DCM8004	Additional 256K Bytes of Memory
1	DCE8001	64 Line Configurability Expansion
1	DCE8003	Processor power Module
7	DCF8007	Channel Interface Base
8	DCF8012	Channel Interface for 2 Asynchronous RS-232 Lines
4	DCF8011	Channel Interface for 2 Synchronous RS-232 Lines
8	DCF8020	Channel Interface for 1 HDLC RS-232 Lines
2	DCF8022	Channel Interface for 1 HDLC Wideband line



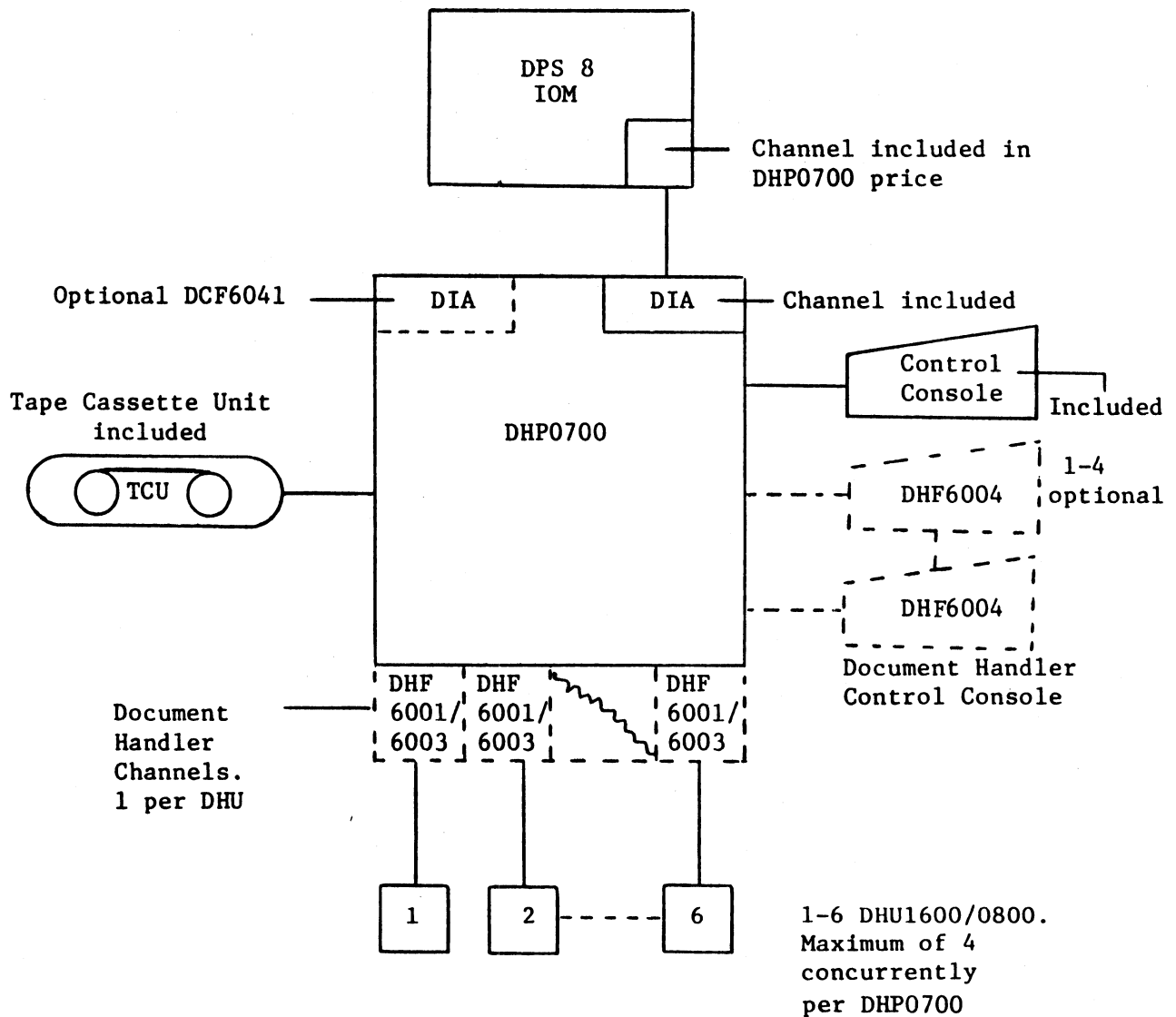
SECTION XII
Document Handler Subsystems

A. Configuring DHP0700/0701 document handling processors (DHPs)

1. Note - DHP0700/0701 DHPs are on as-available basis

2. DHP0700

a. Block diagram



SECTION XII
Document Handler Subsystems

b. List of DHP0700 Marketing Identifiers (MI) and their functions

MI	Description
DHP0700	Base DHP number. Corresponds roughly to base CPS number for DPS 8 mainframe. One must be ordered for each DHP0700 subsystem. Price includes TTY33 type of DHP subsystem control console and its adapter, tape cassette unit and its adapter for off-line test and diagnostic operations by FE, direct interface adapter channel (DIA) for connection to a DPS 8 IOM channel, and the IOM physical channel itself. Maximum of 5 DHP0700 or DHP0701 or combination per DPS 8 system. Maximum 12 document handlers per DPS 8 system. Maximum depends heavily on processing needed per document NOTE - each DHP counts as a FNP in determining the maximum FNPs allowed on a DPS 8 system. Use of one DHP, e.g., means a maximum of 1 FNP on DPS 8/20/44/44D/52/62 or 7 FNPs on DPS 8/70
DHF6003	Document handler channel. One DHF6003 is required for each DHU0803/0814 handler. Maximum of 6 DHF6003 or DHF6001 or combined document handler channels can be configured. Maximum of 4 channels in any combination (4 document handlers) operational concurrently in one DHP
DHF6001	Document handler channel. One DHF6001 is required for each DHU1600 handler. Maximum of 6 DHF6001 or DHF6003 or combined document handler channels can be configured. Maximum of 4 channels in any combination (4 document handlers) operational concurrently in one DHP
DHF6004	Document handler control console and its adapter. At least one required. One is recommended for each one or two document handlers running concurrently. Maximum of four. Used by document handler operator for a variety of purposes, including DES software interfaces - initialization of entry run for a DHU, requesting pertinent pocket selection file from DPS 8, stopping a DHU, taking a DHU off-line, etc.

SECTION XII
Document Handler Subsystems

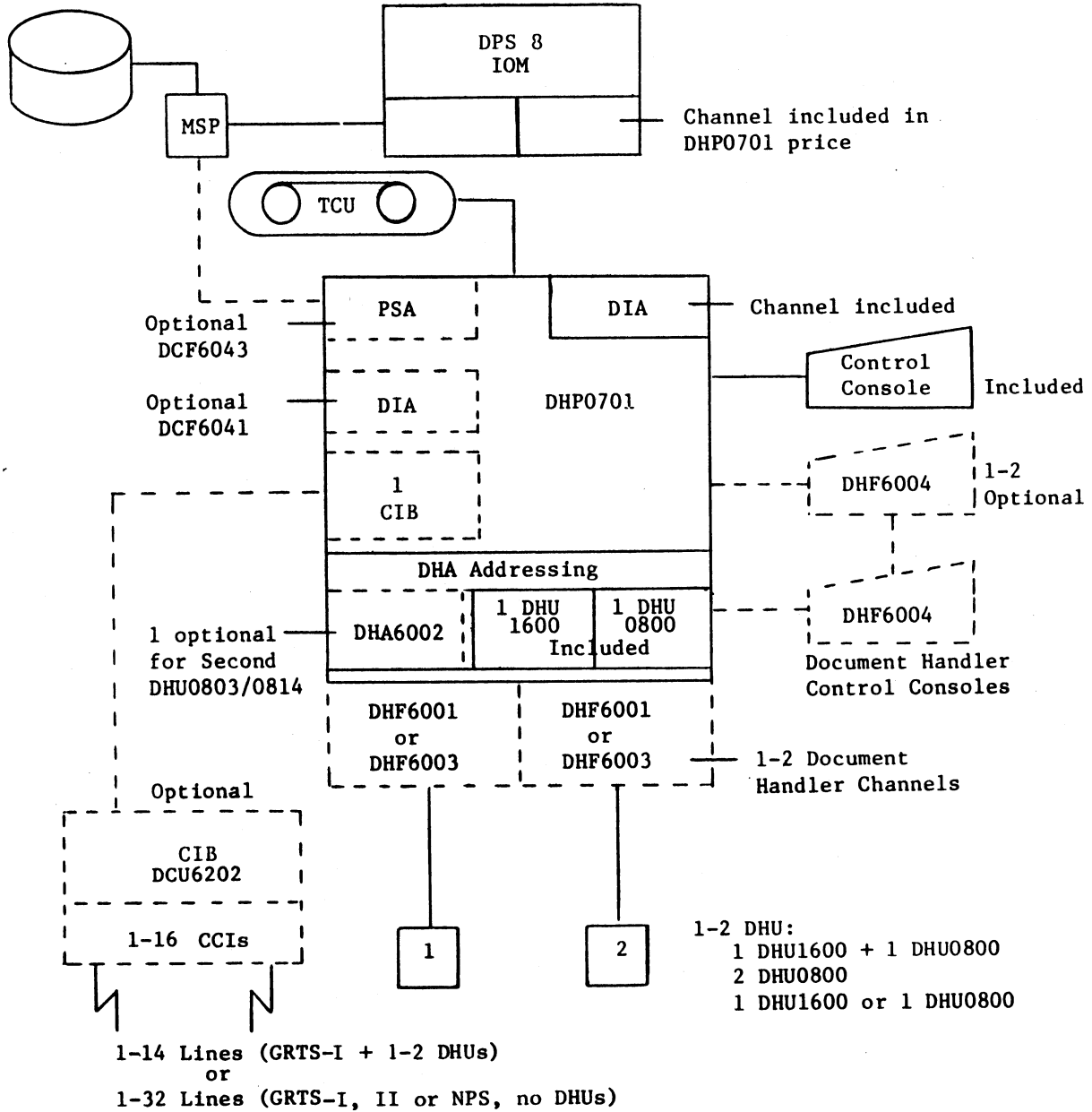
DCF6041

Additional DHP0700 direct interface adapter channel (DIA) and channel in DPS 8 IOM. One DIA is included in DHP0700 price. Second DIA used where it is desired to connect DHP0700 to a second DPS 8 IOM or second channel in first IOM as a backup provision. At startup time one of the two is designated as logically connected and is used for communication between DHP0700 and DPS 8 mainframe

SECTION XII
Document Handler Subsystems

3. DHP0701

a. Block diagram



SECTION XII
Document Handler Subsystems

- b. List of DHP0701 Marketing Identifiers (MI) and their functions

MI	Description
DHP0701	Base DHP number. Corresponds roughly to base CPS number for DPS 8 mainframe. One must be ordered for each DHP0701 subsystem. Price includes TTY33 type of DHP subsystem control console and its adapter, tape cassette unit and its adapter for off-line test and diagnostic operations by FE, direct interface adapter (DIA) for connection to a DPS 8 IOM channel, and the DPS 8 physical IOM channel itself. Maximum of 5 DHP0701 or DHP0700 or combination on one DPS 8 system. Maximum 12 document handlers in one DPS 8 system. Maximum depends heavily on processing needed per document. DHP0701 also includes device addressing features for one DHU1600 and one DHU0803 or DHU0814. NOTE - one DHP counts as a FNP in determining the maximum FNPs allowed on a DPS 8 system. Use of one DHP, e.g., means a maximum of 1 FNP on DPS 8/20/44/44D/52/62, or 7 FNPs on DPS 8/70
DHA6002	Device handler addressing. One must be ordered when no DHU1600 is configured and two DHU0803 or DHU0814 or combination are to be used
DHF6003	Document handler channel. One DHF6003 is required for each DHU0803 or DHU0814. Maximum of two DHUs may be connected and running - 1 DHU1600 plus DHU0803 or DHU0814, or 2 DHU0803 or 2 DHU0814, or one DHU0803 and one DHU0814
DHF6001	Document handler channel. One DHF6001 required for DHU1600. See DHF6003 above for allowed quantities of channel types and DHU types
DHF6004	Document handler control console and its adapter. See description under DHP0700 above
DCF6041	Additional direct interface adapter (DIA). See description under DHP0700
DCF6043	Peripheral subsystem adapter. Provides a DHP channel for terminating a mass store processor

SECTION XII
Document Handler Subsystems

(MSP) channel, to establish a direct link to disk for DHP0701. Required if NPS is to be used in DHP0701. NPS cannot be used during the period when document handler operation is desired. DES (Document Entry System) software interfaces only to GRTS-I, not GRTS-II

DCU6202

Communications Channel Interface Base. Required when DHP0701 is to be used with up to 14 communications lines with GRTS-I. Maximum of one per DHP0701. GRTS-I must be used for concurrent document handling and data communications, not GRTS-II or NPS.

When used for concurrent communications and document handling a maximum of 12 asynchronous lines up to 1,200 bps each and 2 synchronous or asynchronous lines at up to 9,600 bps each can be used. If DHP0701 is used for communications alone, either in NPS or GRTS-I, II mode, up to 32 lines can be configured as if for a CIB in a DN6632 FNP. Usual Communication Line Channels (CLCs) for CIB must be configured for the communication lines. Use the DN6632 FNP configurator portion of Level 66/68 Configuration Guide, DH92. The DHP0700/0701 are based on DN6632 FNPs. Don't forget to configure an asynchronous speed adapter (ASA) (DCF6001 or DCF6002) even though no asynchronous-only CLCs will be used (DCF6010, DCF6011).

B. Configuring DHU1600 and DHU0800 document handlers

1. DHU1600 family (on as-available basis)

- a. Comes in 4 models which differ only in number of pockets included. Any model can be expanded in the field to the maximum of 32 pockets.
- b. List of required marketing identifiers (MI) and their functions --

SECTION XII
Document Handler Subsystems

MI	Description
DHU1604	Base handlers, differing only in numbers of pockets --
DHU1608	4, 8, 12, 16 respectively. No MICR reading capability
DHU1612	is included but must be ordered (DHF1630)
DHU1616	
DHF1630	Multilevel E-13b Recognition. E-13b MICR characters and symbols located along the bottom edge of the documents are read via a multitrack recognition read head. One only must be configured
c. List of options and their functions	
DHF1603	Endorser. Provides the ability to endorse documents on the back side in one of three 3/8-inch bands. A 3-digit consecutive batch number is provided. Band location must be specified on order.
DHF1604	Expansion Unit. Permits the attachment of 1-4 additional 4-pocket expansion modules, DHF1605, on the sixteen-pocket DHU1616
DHF1605	Expansion Module. A single 4-pocket expansion module, for DHU1616 pocket expansion. Maximum of four allowed. Requires DHF1604
DHF1606	Mobile Carrier. Holds one storage document tray
DHF1607	Short Document Read. Enables the handling of 51-column-size MICR documents (applies to sorting in first four pockets). Short documents are handled at the rate of 1700 documents per minute. Presence of this option slows processing of normal size documents
DHF1609	Batch Ticket Detector. Halts the reader upon detection of a 2x5-inch black band and signals for external control

SECTION XII
Document Handler Subsystems

- DHF1610 Resetable Item Counter. A 6-digit resettable counter that totals the number of documents read
- DHF1611 Basic Offline Sort. Provides the ability to process two sort fields with a maximum of 12 digits per field
- DHF1612 Expanded Offline Field Sort. An additional 12-digit field sort. A maximum of six additional field sorts can be added to the basic offline sort configuration
- DHF1613 (1) Digit Override. A rotary switch that allows a document to be sorted to an override pocket if a preselected digit (or two digits) appears in a sorted digit position(s)
- DHF1614 (1) Digit Edit. Document will be sorted to a regular pocket if a preselected digit (or two digits) appears in a sorted digit position. All other documents go to a "designated" pocket
- DHF1615 (1) Zero Kill. Document will be sorted to a designated "zero kill" pocket if the digit position contains a zero and all digits to the left are zeros
- DHF1616 (1) Field Override. Document will be sorted to an override pocket if a preselected 8-digit consecutive code appears in the field.
- DHF1617 (1) Field Edit. Document will be sorted to a regular pocket if an 8-digit preset code appears in the field
- DHF1618 (1) No-Field/No-Digit Outsort. Document will be sorted to a specific pocket if the field being sorted is not present or to another pocket if no digit appears in the sorting position.
- DHF1619 Stacker Overflow. Enables documents which are intended for the last offline pocket (maximum of 16) to be routed to available adjacent overflow pockets
- DHF1620 Valid Character Check. This feature checks the "readability" of each MICR character and symbol in the field that is being sorted

SECTION XII
Document Handler Subsystems

DHF1621 Extended Sort Control. Provides an operator-settable control panel that extends the capability of the edit and override functions.

DHF1622 8-Pocket Offline Sort. Provides capability to fine sort documents on DHU1608.

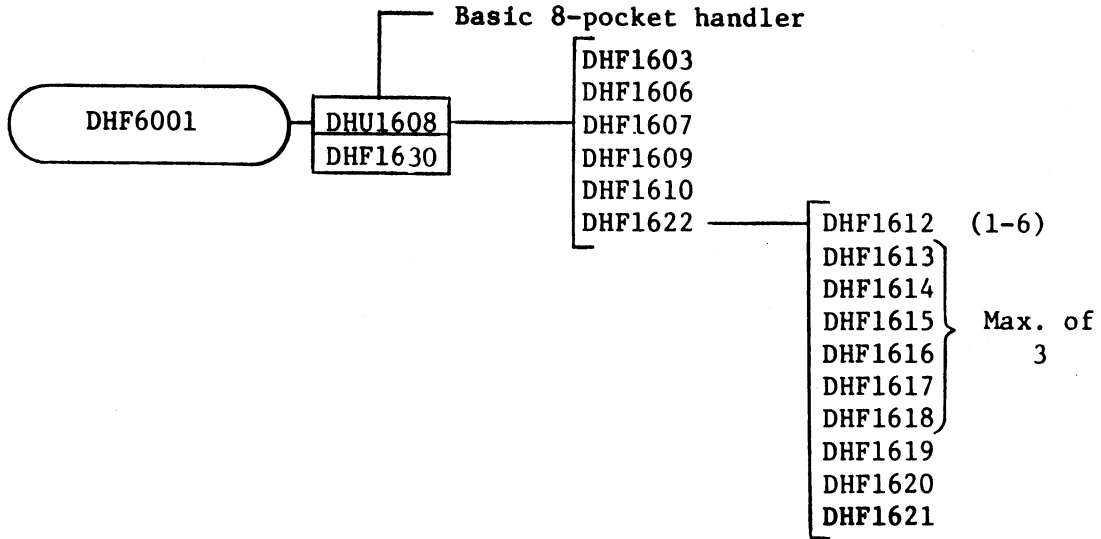
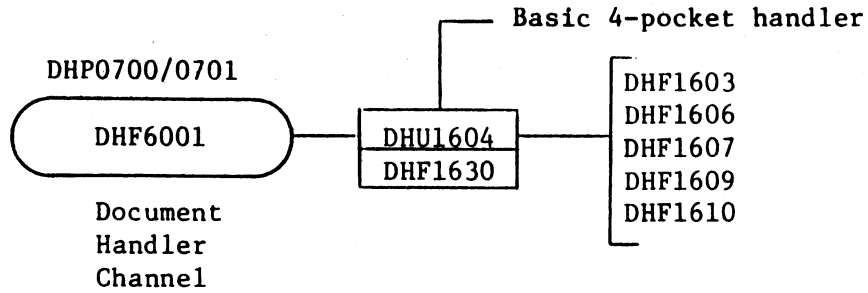
- - - - -

(1) Of these six optional features, up to three can be installed in any one document handler.

d. DHU1600 configurators

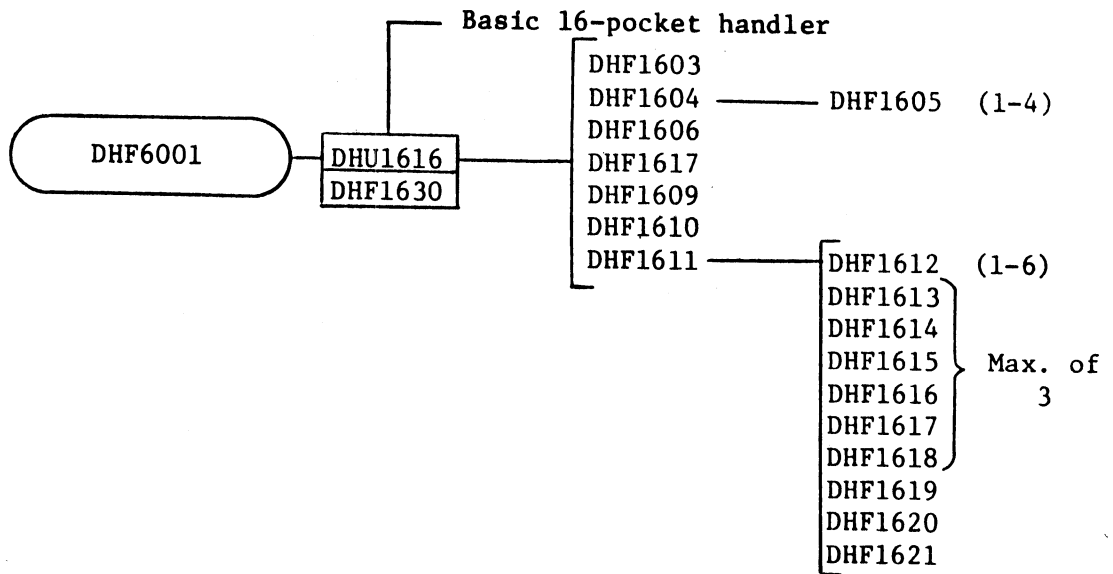
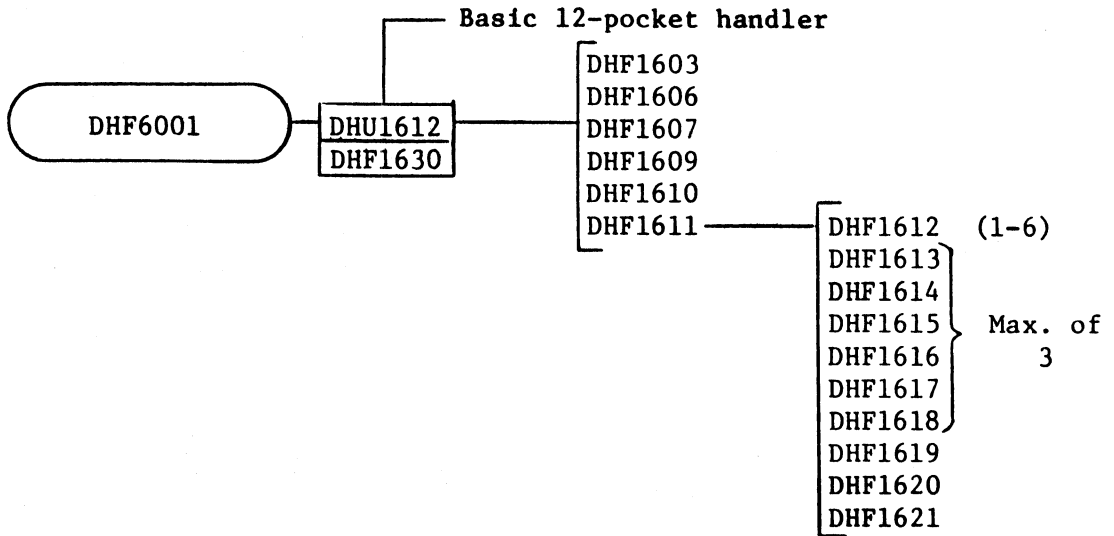
SECTION XII
Document Handler Subsystems

- 1) The items fully enclosed in balloons and boxes must be ordered. Others are optional for the DHU160X models shown



SECTION XII
Document Handler Subsystems

2) DHU1600 configurators (continued)



SECTION XII
Document Handler Subsystems

2. Summary of DHU1600/0800 document sizes and character/mark recognition feature.

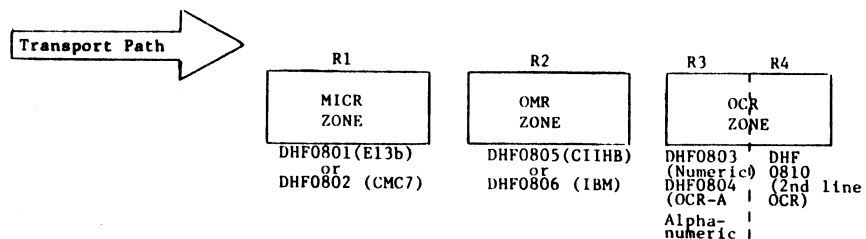
Handler	Pockets	Speed (Documents per minute maximum)	Document Size (inches)			Recognition Features		
			Length	Width	Thickness	E13b/ CMC7	OCR	Mark Read
DHU0803	3	830	4.85- 8.75	2.85- 4.25	0.003- 0.013	DHF0801 (E13b)	DHF0803 or DHF0804	DHF0805 (CIIHB)
DHU0814	14	1400				DHF0802 (CMC7)		DHF0806 (IBM)
DHU1604	4							
DHU1608	8							
DHU1612	12	1620 (5.75" Doc.)	5.75- 9.75	2.5- 4.25	Up to 0.009	DHF1630 (E13b)	NA	NA
DHU1616	16							

3. DHU0800 family

- a. Comes in 2 models which differ only in number of pockets included. Document reading capability is not included but must be ordered.
- b. Each model provides for MICR, OCR (by RPQ) and OMR capability
 - 1) MICR font can be read magnetically and/or optically
 - 2) OCR font can be alphanumeric or numeric, depending upon font type.

SECTION XII
Document Handler Subsystems

- a) Numeric-only OCR documents can have up to 3 numeric fonts on up to 2 lines. In any one pass 2 of the three fonts can be read.
 - b) Documents containing a single line of OCR data can be read on the basis of program-controlled selecting up to two or four separate fields on the line for reading. Selection is made as the program is loaded into the DHP070X and initialized. Applicable feature is called Autoload Data Format Control
 - c) Several types of font support are available
- 3) OMR is obtainable for either 10-level or 12-level marking. 12-level is IBM type, 10-level is CIIHB-type
- c. Read zones per DHU0800
- 1) Each DHU is divided into 3 read zones -- one for MICR font reading (magnetically), one for mark reading or punched hole reading (OMR), one for optical character recognition (OCR)
 - 2) OCR zone provides for two read stations
 - 3) It is considered that there are four read stations along the document transport path, designated R1, R2, R3, R4. Ability for reading at each station depends on whether the pertinent read feature has been configured. The figure below shows the read zones and stations, together with the type numbers configurable to give document reading capability



SECTION XII
Document Handler Subsystems

- 4) Depending on the options configured it is possible to have all four read stations active during the pass of documents in some kinds of operations
 - 5) Up to 72 characters of data can be read from a document. If OMR is used, up to 31 columns of OMR data can be read but each column counts as two characters in the limit of 72 characters. Also, if an MICR-font field is to be read both magnetically and optically the field is counted as two fields in the 72-character limit. The limit of 72 characters read must be carefully considered in designing your applications.
- d. List of DHU0800 required Marketing Identifiers (MI) and their functions

MI	Description
DHU0803	3-pocket document handler. No font reading capability included but at least one font or mark reading feature must be configured. Speed up to 830 documents per minute depending on document size
DHU0814	14-pocket document handler. No font reading capability included but at least one font or mark reading feature must be configured. No off-line document sorting capability is included but is available optionally. Speed up to 1400 documents per minute depending on document speed

Required options -- at least one must be selected. Up to 3 can be configured. OCR by RPQ:

DHF0801	MICR font reading magnetically. For E13b font (U.S.A.). Occupies read zone 1 and read station R1
DHF0802	Same as DHF0801 but applies to CMC7 font
DHF0805	Optical mark/punch reading. Occupies OMR zone as read station R2. For CIIHB 10-level format
DHF0806	Same as DHF0805 but applies to IBM 12-level format

SECTION XII
Document Handler Subsystems

- DHF0803 OCR recognition, numeric only. If configured, DHF0804 cannot be configured. Occupies OCR zone as read station R3. Specify one to three fonts from the following choices:
- DHF0850 OCR-A Numeric, Sizes I, IV
 - DHF0851 OCR-B Numeric and Symbols
 - DHF0852 OCR-B Numeric and Characters
 - DHF0854 7B Numeric
 - DHF0856 12F Numeric
 - DHF0855 E13b Numeric (to allow MICR font to be read optically)
 - DHF0853 407-1 numeric
- DHF0804 OCR-A recognition, alphanumeric font, Size 1. If configured, DHF0803 cannot be configured
- e. List of other DHU0800 options and their functions
- DHF0810 Second Line OCR. Provides ability to read two lines of OCR on a single document pass. Requires DHF0803 or DHF0804. This provides OCR read station R4. It will read only the font selected for R3 (via DHF0803 or DHF0804)
- DHF0820 Offline Fine Sort for MICR font. For use with DHU0814, this option provides the ability to fine sort documents encoded in E13b font per the ABA (American Bankers Association) check format. If sorting is to be of MICR font read magnetically, you must also configure DHF0801. If sorting is to be of E13b font read optically (OCR A or OCR B), you must also configure either DHF0803 or DHF0804. If you wish to sort MICR font on an optical reading basis, DHF0803 must be configured. There is no offline fine sorting for OMR data (R2) or for OCR data read at R4
- DHF0821 Same as DHF0820 but applies to CMC7 font. No optical reading of CMC7 font
- DHF0822 Offline Fine Sort for OCR font. For use with DHU0814. Requires DHF0803 or DHF0804. No offline fine sort for OMR data (R2) or OCR data read at R4
- DHF0830 Multiple Digit Special Outsort. For use with the DHU0814, this option provides the capability of

SECTION XII
Document Handler Subsystems

out-sorting documents with a pre-selected code or range of codes in a given data field. Selection is made on the basis of ten unique digits or two selections can be made on the basis of five unique digits. Requires DHF0820

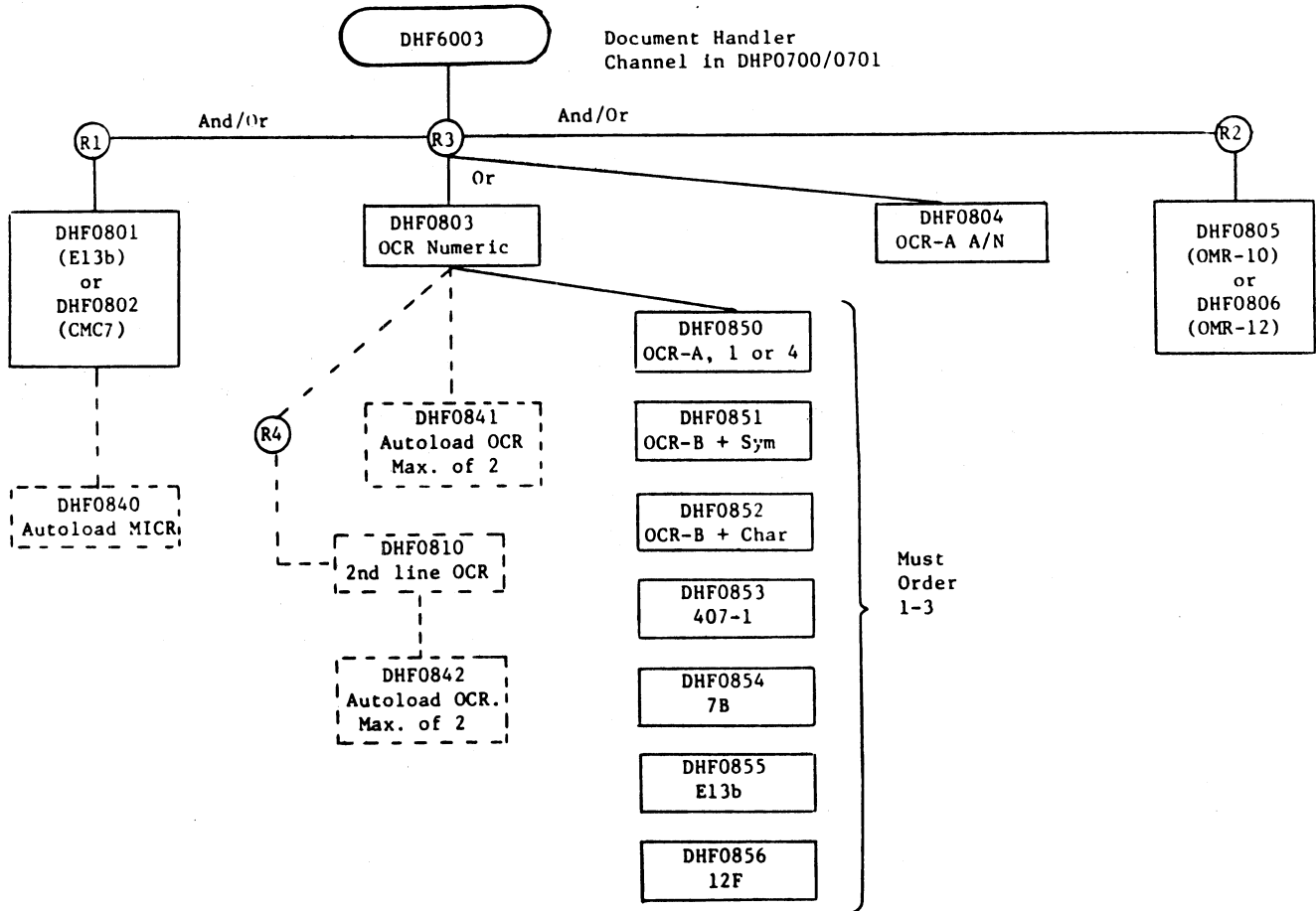
DHF0840 Autoload Data Format Control-MICR. Provides the ability for the DHP program to precondition the DHU0803 or DHU0814 with MICR capability to read up to two separate field locations within a single line of print. Requires DHF0801

DHF0841 Autoload Data Format Control Line 1-OCR. Provides the ability for the DHP program to precondition the DHU0803 or DHU0814 with OCR capability to read up to two separate field locations within a single line of print. Maximum of 2 DHF0841s allowed

DHF0842 Autoload Data Format Control Line 2-OCR. Same function as DHF0841 but for a second OCR line. Requires DHF0810. Maximum of 2 DHF0842s allowed

SECTION XII
Document Handler Subsystems

f. Configurator for DHU0803



SECTION XII
Document Handler Subsystems

g. Configurator for DHU0814

- 1) Use configurator for DHU0803
- 2) Added options for DHU0814

DHF0820	
DHF0821	See Descriptions
DHF0822	on prior pages
DHF0830	

4. DHP0700 configuring example

- a. Prospect is a bank interested in your CHECS software. You plan to bid a DHP0700 supporting two DHU1612s and a DHU0803. Each DHU1612 will read MICR documents only and is to be used also for off-line sorts on 1-2 fields and to have zero-kill capability.

1	DHP0700	Base DHP
1	DHF6003	Document handler channel for DHU0803
2	DHF6001	Document handler channels for 2 DHU0612s
-	-	-
2	DHU1612	2 MICR sorter-reader for CHECS
2	DHF1630	E13b font recognition for 2 DHU1612
2	DHF1611	Basic off-line sort for DHU1612, for 1-2 fields
2	DHF1615	Zero-kill feature for 2 DHU1612
-	-	-
1	DHF6004	Document handler control console

5. DHP0701 configuring example

- a. Prospect is interested in a small DPS 8/20 and wants to run an OCR application and 1 DHU involving sorting of OCR-A size 1 numeric font documents. To minimize costs the prospect plans to use the DHP0701 for communications as well. He will start with two 300 bps asynchronous lines using our dot matrix teleprinter terminals and two 2400 bps synchronous lines for VIP7705R terminals. VIP terminals use ASCII code. See Level 66/68 Configuration Guide DH92 for configuring communications portion, same as DN6632

SECTION XII
Document Handler Subsystems

1	DHP0701	Base DHP
-	-	-
1	DHF6003	DHU0814 channel in DHP
1	DHU0814	Document handler
1	DHF0803	OCR recognition, R3
1	DHF0850	OCR-A size 1 font handling
1	DHF0822	Off-line fine sorting for DHU0814
-	-	-
1	DCU6202	GPCB for communications
1	DCF6001	ASA for 300 bps lines on DCF6010
1	DCF6010	Asynchronous-only LIU for 2 300 bps T-300 lines
1	DCF6013	Synchronous-only LIU for 2 2400 bps VIP lines

NOTE: OCR features are only available via RPQ.



SECTION XIII
Peripheral Switches

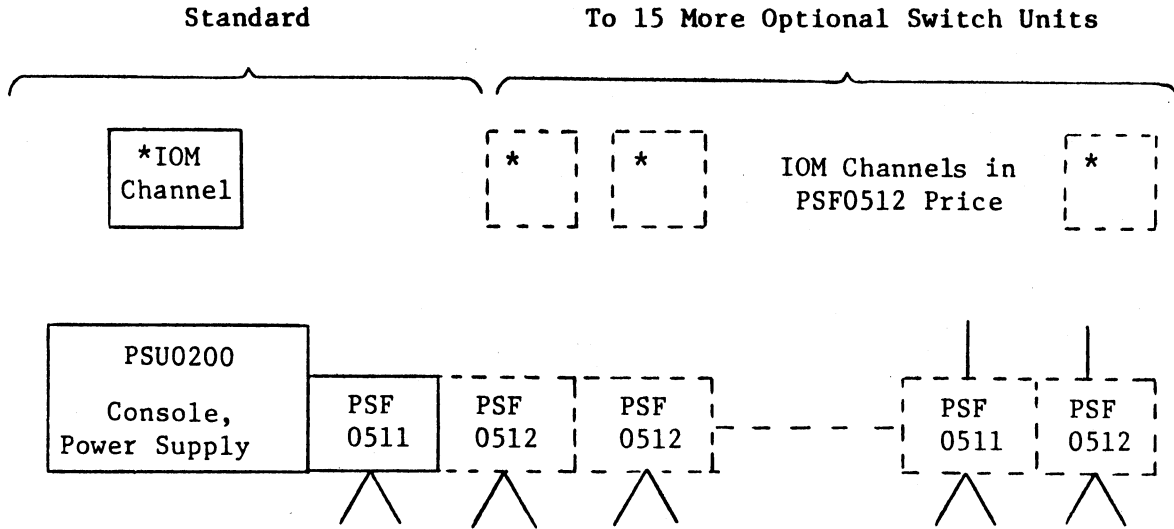
A. Configuring manual peripheral switch subsystems

1. List of Marketing Identifiers (MI) and their functions

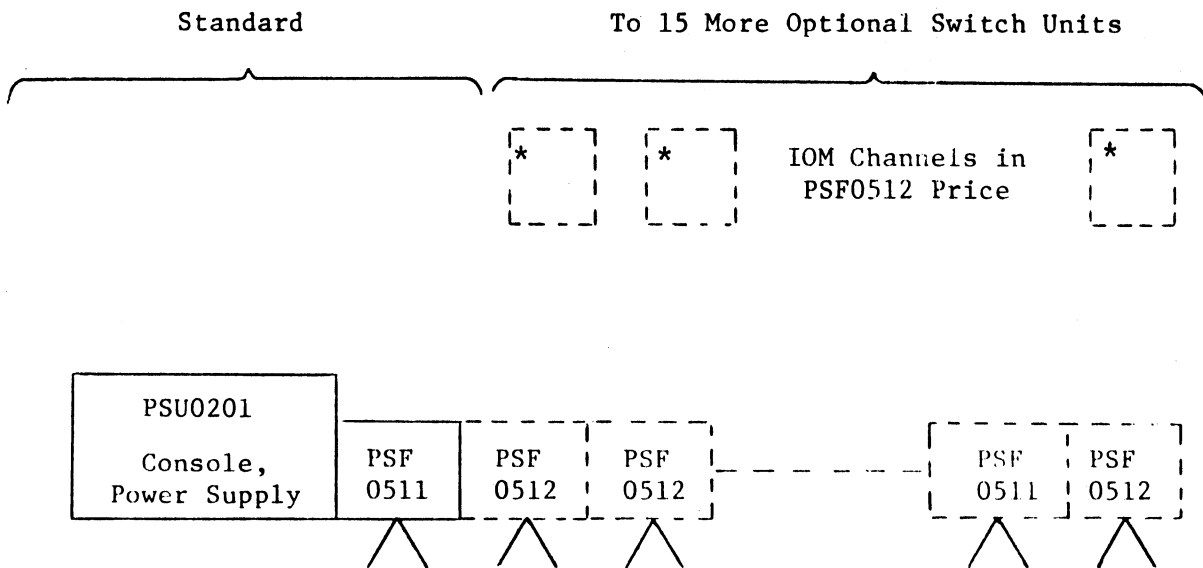
MI	Description	Remarks
PSU0200	Switch console and power supply. Includes one physical PSI channel (URP/MTP/MSP) in IOM and one PSF0511	Every manual switch subsystem must include only one switch console, either PSU0200 or PSU0201. Each console handles up to 16 switch units
PSU0201	Switch console and power supply. Same as PSU0200 except that no IOM channel is included. Includes one PSF0511	
PSF0511	Manual switch unit to switch a device to one of two device processors, or to select one of two devices to switch to a device processor. Does not include a channel in IOM. Usable with URP and MTP devices only. Could also be used to switch a PSI channel in IOM between 2 device processors - URP, MTP or MSP	Each console includes one. May be mixed with PSF0512 to maximum of 16 switch units per console
PSF0512	Manual switch unit to switch a device processor to one of two IOM PSI type physical channels. Includes one IOM PSI channel. Usable with URP, MTP, MSP only	May be mixed with PSF0511 to maximum of 16 switch units per console

SECTION XIII
Peripheral Switches

2. Configurator for PSU0200 manual peripheral switch subsystem



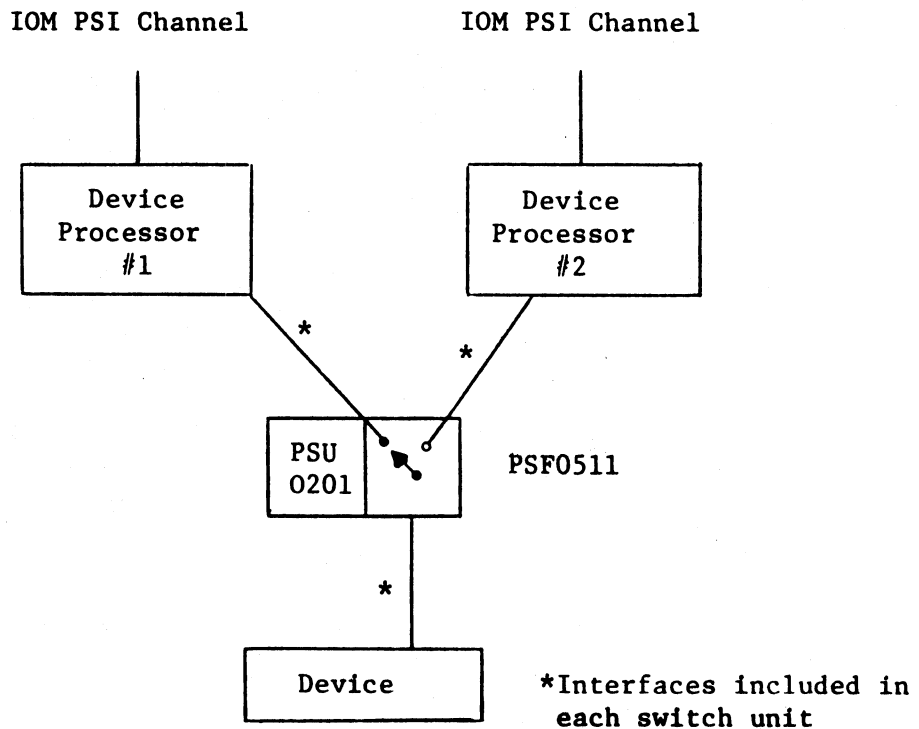
3. Configurator for PSU0201 manual peripheral switch subsystem



*3 channel spaces (board slots) required in the IOM.

SECTION XIII
Peripheral Switches

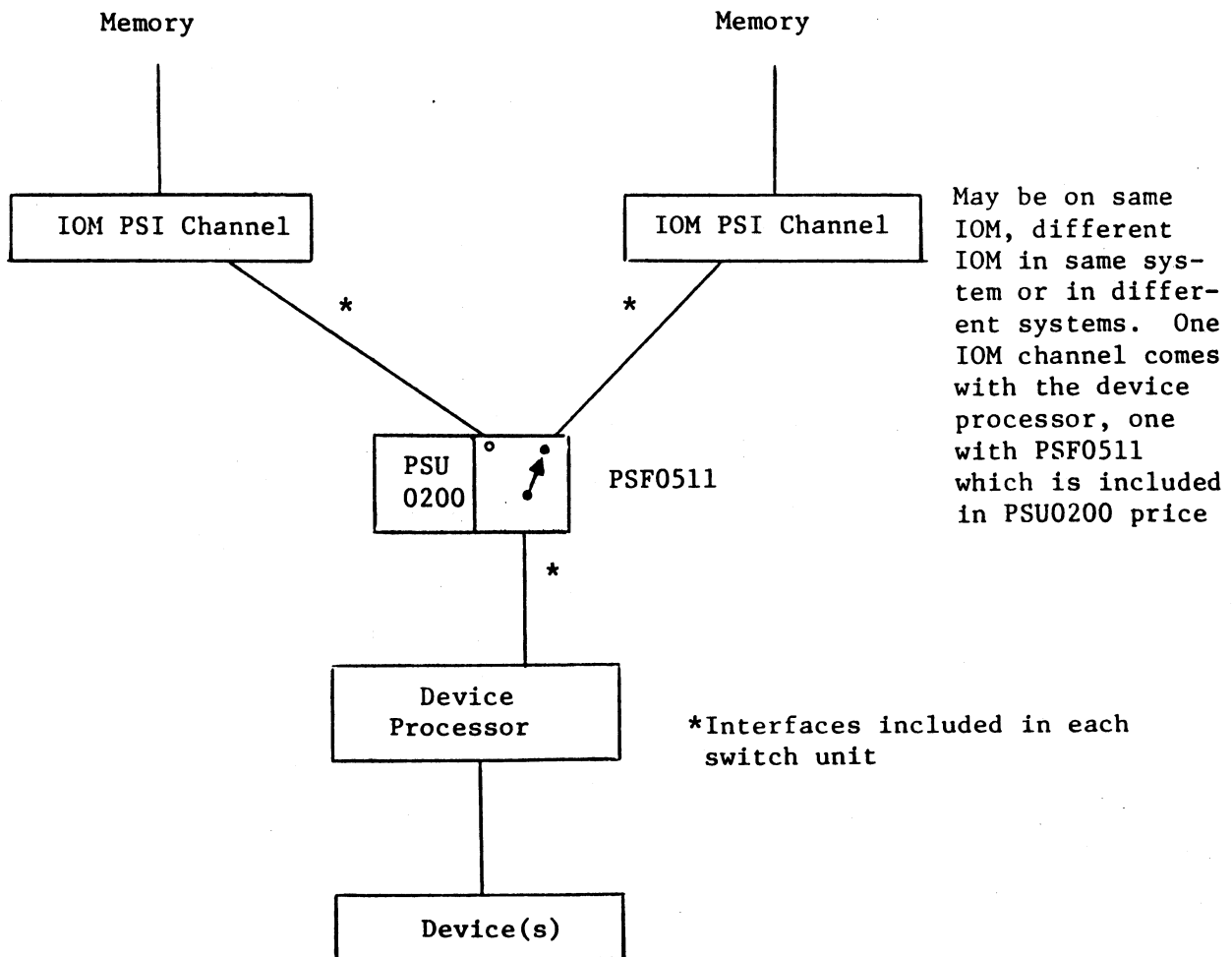
4. Examples of use of manual peripheral switches
- a. Example 1 - to switch a peripheral device between two device processors. Could use, for example, to switch a tape unit between two MTPs or a card reader between two URPs
- 1) The reverse approach could also be used, i.e., to select one of two devices to connect a device processor



SECTION XIII
Peripheral Switches

b. Example 2 - to switch a device processor between two physical IOM PSI channels. Could use, for example, to switch a MTP between two physical IOM PSI channels

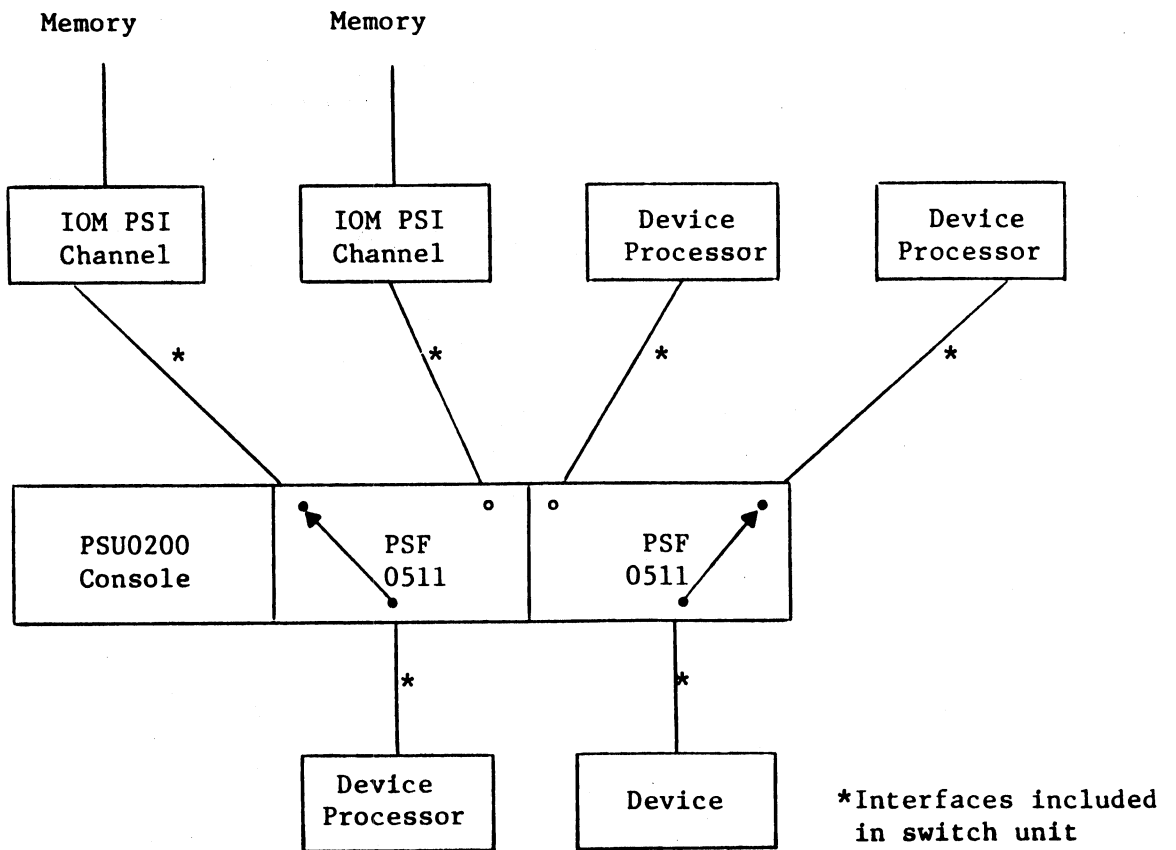
- 1) The reverse approach could also be used, i.e., to select one of two device processors to connect to an IOM PSI channel. Since only one IOM channel is required, and one each would have been included in the prices of the device processors, PSU0201 would be the lower priced approach. PSU0201 price does not include an IOM channel, which would be superfluous in this case.



SECTION XIII
Peripheral Switches

c. Example 3 - to switch a device between two device processors and to switch a device processor between two IOM physical channels

- 1) In this example you would order one PSF0511 switch unit in addition to the PSU0200 console, which includes one PSF0511. Note that this example could be handled by configuring a PSU0201 console and one PSF0512 switch unit at a slightly higher cost





SECTION XIV
Configuring Motor-Generator and Control Sets

A. Motor-Generator and Control Set Considerations

1. Marketing identifiers -- MGS6001, 6002, 6004, 6005
 - a.

MGS6001	Motor-Generator and Control Unit 31.1 KVA, 60 Hz, 208/440 Vac Input
MGS6002	Motor-Generator and Control Unit 62.6 KVA, 60 Hz, 440/480 Vac Input
MGS6003	Motor-Generator and Control Unit 62.6 KVA, 50 Hz, 380 Vac Input
MGS6004	Motor-Generator and Control Unit 62.6 KVA, 60 Hz, 208 Vac Input

2. At least one set must be ordered for each DPS 8/52/62/70 system. In some cases two may be desirable, depending on electrical supply quality, and size of system. If two are ordered, typical use would be to have one for the mainframe, one for the peripherals. The DPS 8/20/44/44D include a built-in power ride-through of 100ms, i.e, the ability to continue operation through a power interruption of up to 100ms. For components contained in the DPS 8/20/44/44D CSC it may not be necessary to use a motor-generator set (MGS). The need or desirability of a MGS should always be carefully evaluated by the customer, in conjunction with HIS FE representative

To be more competitive in bidding new systems, you may choose not to include the price of the motor-generator and control set as part of the system proposal. The motor-generator ride-through and electrical noise reduction capabilities would be beneficial to any computer system; therefore, it should be considered a site preparational item and included in the site prep section of your proposals, but denoted as "to be provided separately" or "not included in proposal pricing" so as to help avoid any confusion or claim. The customer may purchase the motor-generator and control set from Honeywell or an approved equivalent product from an outside vendor. If an outside vendor's product is to be used, approval is required via RPQ with complete specifications attached.

SECTION XIV
Configuring Motor-Generator and Control Sets

3. These are used in applying power in an orderly fashion and in regulating the electrical quality fed to the hardware. They level out voltage variations and compensate for power interruptions for a brief period. The length of period is affected by the load imposed by your configuration. Check your FE for specific figures
4. You determine which model to order in the following way
 - a. Decide on your complete system configuration - mainframe and peripherals, and FNPs, DHPs, consoles
 - b. Refer your configuration to your pertinent branch FE. He will use his data on the KVA load applied by each component in your configuration. Adding the individual KVA loads gives a total figure which determines which MGS type number to order. Do not skimp on the MGS to use. Talk over with your FE the need or desirability of using two units in the specific customer case. The price of these units is often insignificant in the typical total system price but they serve a very important function in helping maintain the DPS 8 system in an available condition
 - 1) If you find the DPS 8 Automated Marketing Configurator is satisfactory for your purpose, it will provide you with the KVA load for the system you have specified
 - c. The sets are heavy, bulky, noisy and unattractive. They do not require the same air conditioning levels as the DPS 8 systems themselves. Frequently they are installed away from people in order to avoid noise and appearance problems. For this reason it can be undesirable to bid a minimal MGS. Your customer will grow. Where practicable discuss the alternatives and costs with your customer and suggest some growth leeway before a MGS swap would be involved.
5. While electric utility power systems are reliable, they serve many loads of varying characteristics. The loads are switched off and on continuously.

SECTION XIV
Configuring Motor-Generator and Control Sets

Frequently, voltage transients can and often do, upset modern computer systems. By using a fly-wheel type motor-generator set to supply power to critical devices, the effects of voltage transients and short duration voltage dips can be reduced.

Another benefit, incorporated into the motor-generator control set, is the emergency-off capability. This allows the entire computer system -- central computer devices, peripheral equipment, air conditioner and/or blowers -- to be shut down by pressing any one of the several push buttons located at strategic points in the computer room.



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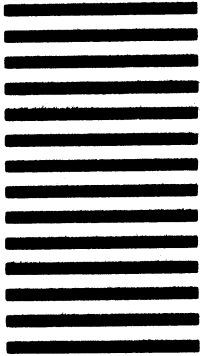
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