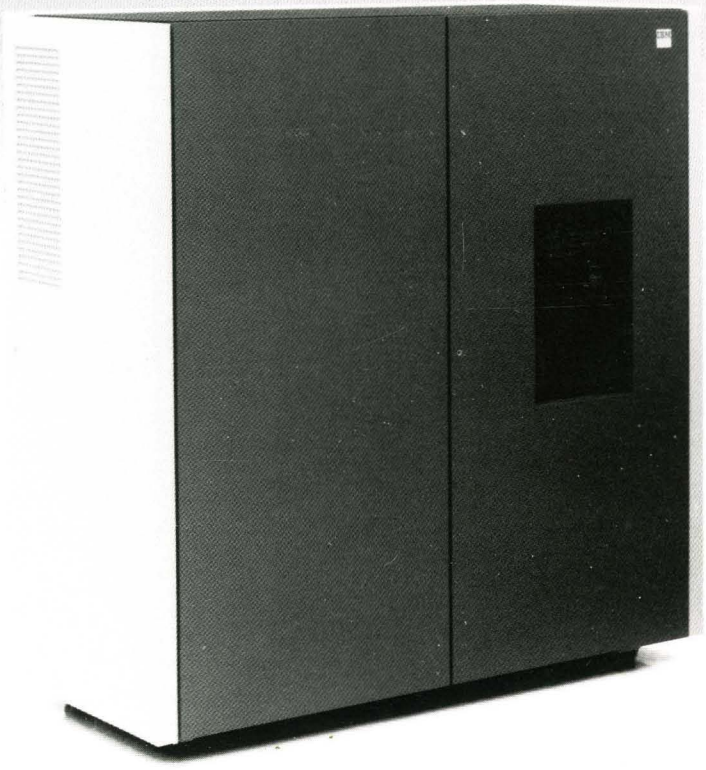
IBM

4381 Processor Input/Output Configuration Program User's Guide and Reference



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4381 Processor Input/Output Configuration Program User's Guide and Reference

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Fourth Edition (February 1986)

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Technical Newsletter

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Prerequisite Newsletters None

IBM 4381 Processor
Input/Output
Configuration
Program User's
Guide and Reference

This Technical Newsletter provides additional pages for the subject publication. These additional pages remain in effect for subsequent versions unless specifically altered. Pages to be inserted and/or removed are:

iii, iv
2-15, 2-16
4-3, 4-4
A-3, A-4
B-3, B-4
B-7 to B-10
C-1 to C-8
D-1 to D-4

If you are inserting pages from different Newsletters and *identical* page numbers are involved, always use the page with the latest date (shown in the change-page notice at the top of the page). The page with the latest date contains the most complete information.

A change to the text or to an illustration is indicated by a vertical line to the left of the change.

Summary of Amendments

This TNL corrects reference document form numbers, I/O macro definition parameters, machine printout examples, and updates the device/control unit tables.

Note: Please file this cover letter at the back of the manual to provide a record of changes.

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Technical Newsletter

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Prerequisite Newsletters GN24-1012

IBM 4381 Processor
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Program User's
Guide and Reference

This Technical Newsletter provides replacement pages for the subject publication. These replacement pages remain in effect for subsequent versions unless specifically altered. Pages to be inserted and/or removed are:

iii, iv
2-11 to 2-20
4-9, 4-10
C-1 to C-8
X-1, X-2

If you are inserting pages from different Newsletters and *identical* page numbers are involved, always use the page with the latest date (shown in the change-page notice at the top of the page). The page with the latest date contains the most complete information.

Summary of Changes

This Technical Newsletter applies to IBM 4381 Processor Model Groups as specified. It includes information related to the Model Groups 91E and 92E, an update on the application of the STADET parameter used in the generation of the IOCDS, and miscellaneous corrections and additions.

A change to the text or to an illustration is indicated by a vertical line to the left of the change.

Note: Please file this cover letter at the back of the manual to provide a record of changes.

IBM Corporation, Department K11, P.O. Box 6, Endicott, N.Y. 13760

Printed in U. S. A.

Preface

The IBM 4381 Processor has thirteen models. Model Groups 1, 2, 11, 12, 13, 21, 22, 23 and 91E are uniprocessors; Model Groups 3, 14, 24, and 92E are dual processors. References, in this manual, will be generic wherever possible.

This publication is intended for personnel who are responsible for defining and configuring the channels, control units, and I/O devices for the IBM 4381 Processor when operating in 370-XA (extended architecture) mode. The reader should have knowledge of the IBM 4381 Processor and its I/O capability.

The Input/Output Configuration Program (IOCP) converts a user-specified I/O configuration description into the internal form required by the processor to control the I/O subsystem during 370-XA (extended architecture) mode operation.

Information needed to describe the input for IOCP is presented here:

Chapter 1 gives an overview of the Input/Output Configuration Program (IOCP) for the IBM 4381 Processor.

Chapter 2 describes how IOCP operates.

Chapter 3 describes the information you must provide for IOCP.

Chapter 4 explains the reports and messages produced by IOCP.

Appendix A shows a sample listing of IOCP input for uniprocessors.

Appendix B shows a sample listing of IOCP input for dual processors.

Appendix C shows the IOCP parameter values that you specify in the IODEVICE and CNTLUNIT macros.

Appendix D highlights the differences between 4381 and 308x IOCP instructions.

For detailed IOCP operating information, see *IBM 4381 Processor Operations Manual*, GA24-3949.

Related Publications

The following publications contain information on topics related to IOCP:

IBM System/370 Input/Output Configurator, GA22-7002, lists the devices available on the System/370 processor.

IBM 4381 Uniprocessor Functional Characteristics, GA24-3947, provides an overview of the IBM 4381 Processor Model Groups 1, 2, 11, 12, 13, 21, 22, 23 and 91E.

IBM 4381 Dual Processor Functional Characteristics, GA24-4021, provides an overview of the IBM 4381 Processor Model Groups 3, 14, 24 and 92E.

IBM 4381 Processor Model Groups 91E and 92E General Information Manual, GA24-4175, describes how to operate the IBM 4381 Processor Model Groups 91E and 92E.

IBM 4381 Processor Serial OEM Interface (SOEMI) Description and Programmer's Reference, GA24-4015.

IBM 4381 Processor Operations Manual, GA24-3949, describes how to operate the IBM 4381 Processor.

IBM 370-XA Principles of Operation, SA22-7085, describes S/370 extended architecture.

MVS/Extended Architecture System Generation Reference, GC26-4009, describes MVS/XA system generation procedures.

MVS System Product General Information Manual, GC20-1118.

VM System Product General Information Manual, GC20-1838.

Input/Output Configuration Program User's Guide and Reference, GC28-1027, contains IOCP input information for 308x Processors.

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Chapter 1. IOCP for the IBM 4381 Processor

The IBM 4381 channel subsystem, which controls channel operations, requires specific data about the system I/O configuration. The Input/Output Configuration Program (IOCP) converts a user-specified I/O configuration description into the internal form required by the processor to control the I/O subsystem during 370-XA mode operation. This description must contain:

- Channel path definitions
- Control unit definitions
- I/O device definitions.

To meet your changing I/O requirements, you can replace an existing I/O configuration description with a new description by executing IOCP.

Figure 1-1 is an example of the channel paths, control units, and I/O devices that make up the channel subsystem. All components of the I/O subsystem must be defined by the IOCP macro instructions described in this manual.

For the control units and I/O devices available, see the *IBM System/370 Input/Output Configurator*, GA22-7002, and Appendix C, "List of I/O Devices and Control Units" on page C-1.

Note: All devices that are supported by IOCP are not necessarily supported by your operating system.

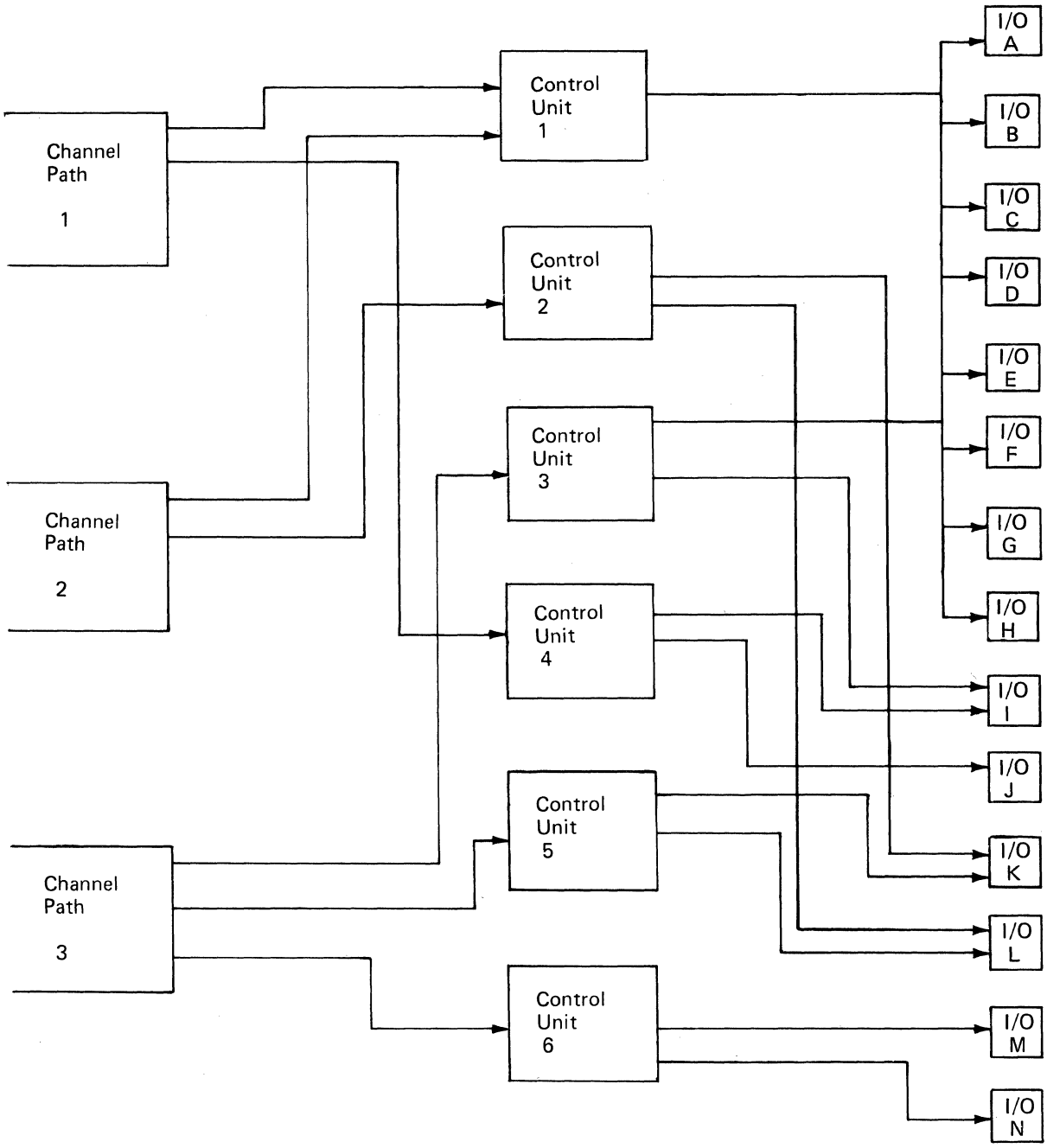


Figure 1-1. Example of 4381 Processor Channel Subsystem

An Overview of the Input/Output Configuration Program

The Input/Output Configuration Program (IOCP) for the IBM 4381 Processor is a stand-alone, 370 mode only, program written in IBM's 370 Assembler Language. IOCP resides on the second functional diskette and is initiated by using configuration screens and menus provided by the 4381 Processor.

For more information about running IOCP on the IBM 4381, see the *IBM 4381 Processor Operations Manual.*

IOCP Input

You describe an I/O configuration to IOCP by coding the description in 80-column card images that are read from a card reader or a magnetic tape device. These images are known as macro instructions.

You use the following macro instructions to describe I/O configuration to IOCP:

CHPID Defines the channel paths (using channel path identifiers) in the configuration. This is a *required* macro instruction.

CNTLUNIT Defines the control units being described for the configuration. This is a *required* macro instruction.

ID Allows you to specify the information you want included in the headings of I/O configuration reports. This macro instruction is *optional.*

IODEVICE Defines the actual I/O devices to be included in the I/O configuration. This is a *required* macro instruction.

The IOCP macro instructions are fully described in Chapter 2, "IOCP Input" on page 2-1.

IOCP Used with MVS/XA

You may keep IOCP input as a separate data set or you may combine it with Stage I input to the Multiple Virtual Systems/Extended Architecture (MVS/XA) system generation (SYSGEN) procedure. The MVS/XA SYSGEN procedures ignore macros and macro parameters for IOCP, and IOCP ignores the macros and macro parameters for the generation of the MVS/XA operating system.

Combining the two sets of macros in a common data set allows you to create and maintain one data set that describes the system to both the channel subsystem and the operating system. A combined data set can also reduce or eliminate any inconsistencies in the description.

Note: If you are configuring your system for use with any operating system other than MVS/XA, you must keep the IOCP input separate.

IOCP Operation

IOCP reads an entire system configuration description and verifies that you have specified the data correctly. During operation, IOCP generates informational and error messages as appropriate and displays them on the console. If you have a printer available and assigned, reports showing the channel subsystem's view of the I/O configuration are printed.

If IOCP detects no errors in the description or if the errors that were detected are not severe, an internal form of the description called the I/O Configuration Data Set (IOCDS) is generated and the program asks you if you want to save it. The saved IOCDS is used later when you load the processor for operation in 370-XA mode to describe the I/O configuration to the channel subsystem. In 370 mode, the IOCDS is ignored.

For detailed IOCP operating information, see *IBM 4381 Processor Operations Manual*, GA24-3949.

IOCP Output

IOCP for the 4381 Processor produces:

- I/O configuration data set (IOCDS)
- Configuration reports
- Messages.

The IOCDS created by IOCP is in an internal format for use by the channel subsystem. If the input checking phase has determined that you have defined at least one valid device and one path to that device, you are given the choice of saving the IOCDS.

Configuration reports generated by IOCP can be printed if there is a printer available. They graphically show you the internal I/O configuration description that IOCP has generated. You can use these reports to determine if the description is correct and is what you desire.

The messages that IOCP generates inform you of the status of operation and of errors occurring with the configuration description. If any problems arise while IOCP runs, messages display informing you of the condition.

Additional Information about 4381 IOCP

Device Number

In 370-XA (extended architecture) mode, a device number uniquely identifies an I/O device. The device number consists of four hexadecimal digits (as can be specified in the IODEVICE macro instruction).

Channel Subsystem Monitoring

The T-Bit (present in the subchannel definition) implements the extended architecture channel subsystem monitoring facility. This bit is set by IOCP for all devices not on byte multiplexer channels. Devices on byte multiplexer channels are not monitored because of performance considerations.

Internal Data Generated by IOCP

Logical Control Units

IOCP for the 4381 Processor creates an entity called a logical control unit (LCU).

An LCU for the 4381 Processor is defined as that set of devices sharing one or more physical control units and those shared control units. Each device will be on only one LCU, but control unit definitions may be part of more than one LCU. There can be up to 2048 LCU's numbered 000 through 7FF.

Information about the performance of an LCU's components is gathered by the channel subsystem and may be requested by programs running in the processor. Examination of this data by an analysis program, such as the MVS Resource Measurement Facility (RMF), may point out control unit and I/O device interaction and contention that is detrimental to the performance of the entire system.

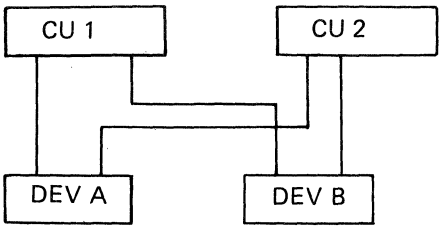
Logical Control Units are created by scanning the devices in the order they were defined. The control units that the device has been specified as being attached to are checked to see if they are the same as those in any LCU already defined. To be considered the same:

1. There must be the same number of control units

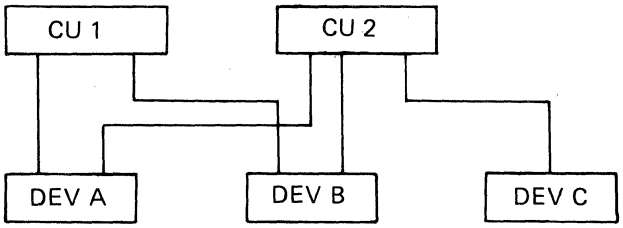
2. The control unit numbers must be the same, but they may appear in any order.

If the control unit criteria are met, the device is assigned to the LCU. If the control units do not match, a new LCU is generated and the device is assigned to this new LCU. This processing continues with each device until all of them have been assigned to Logical Control Units.

Figure 1-2 on page 1-6 illustrates IOCP's logical control unit grouping.

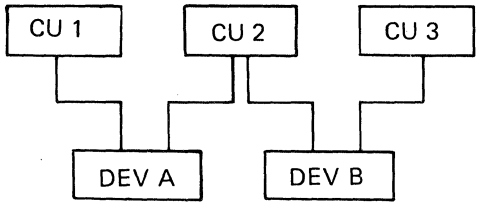


LCU # : 000
Control Units : CU1, CU2
Devices : DEV A, DEV B



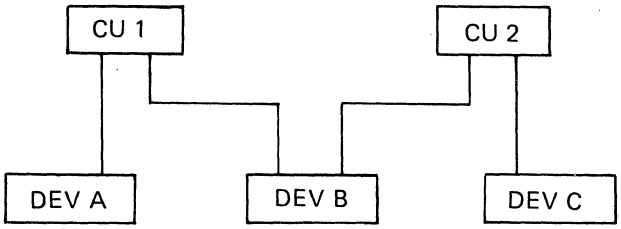
LCU # : 000
Control Units : CU1, CU2
Devices : DEV A, DEV B

LCU # : 001
Control Units : CU2
Devices : DEV C



LCU # : 000
Control Units : CU1, CU2
Devices : DEV A

LCU # : 001
Control Units : CU2, CU3
Devices : DEV B



LCU # : 000
Control Units : CU1
Devices : DEV A

LCU # : 001
Control Units : CU1, CU2
Devices : DEV B

LCU # : 002
Control Units : CU2
Devices : DEV C

Figure 1-2. Examples of Logical Control Units

Physical Control Unit Numbers

When IOCP processes valid CNTLUNIT macros in the configuration description, the program assigns them sequential, contiguous numbers for internal identification and for use by the channel subsystem. These numbers start at 001 and increment by 1 for each valid specified control unit up to the maximum of 256 control units. If the physical control unit number is 001, then it is the first valid CNTLUNIT specification found in the input.

Note: The control unit number and the physical control unit number should not be confused with one another. They do not have to be the same number. The physical control unit number reflects the order of valid CNTLUNIT macros in the input. The control unit number is the number you supplied as the CUNUMBR= parameter value.

Subchannel IDs

An IODEVICE's subchannel ID is implied by IOCP. It reflects the order in which you defined devices in the input deck. If the subchannel number is 001, it represents the first valid IODEVICE specification found in the input. These numbers are used by programs for communicating with the I/O devices in the configuration.

Control Unit Types

Control units are classified according to their ability to concurrently operate and control the activity of attached I/O devices without causing loss of control or data.

Type-1 Control Unit

This type of control unit can control the activity of only one I/O device at a time. If an I/O operation or chain of I/O operations is in execution, the control unit is unable to handle the initiation of additional activity associated with any attached I/O device.

If an error occurs during I/O operation and the associated sense information has been generated, the control unit can preserve the sense data for the I/O device as long as no other activity is initiated with *any attached I/O device.*

Type-2 Control Unit

This control unit type is capable of controlling the activity of more than one I/O device at a time without losing pending sense information or the control of any other I/O operations.

If the control unit must limit the amount of concurrent activity, a busy condition is signalled when an attempt is made to initiate activity for I/O devices attached to the control unit.

Note: IOCP only defines control unit types 1 and 2.

IOCP and MVS/XA System Generation (SYSGEN)

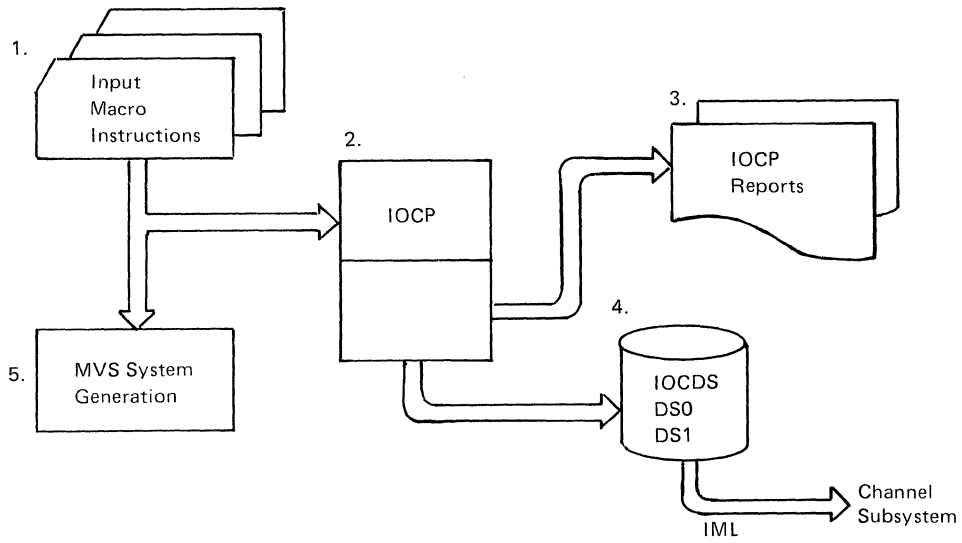
For MVS/XA SYSGEN (system generation), you should combine the IOCP macros with the MVS/XA SYSGEN macros to produce one input file. By using one input file you make sure that definitions of the I/O configurations provided for your software and hardware are identical.

IOCP processes only the IOCP macros (ID, CHPID, and CNTLUNIT) and the IOCP-related parameters in the IODEVICE macro to define the hardware I/O configuration. IOCP ignores MVS/XA SYSGEN macros.

MVS/XA SYSGEN ignores the IOCP-related parameter CUNUMBR in the IODEVICE macro, and processes the remaining IODEVICE parameters. MVS/XA SYSGEN also ignores the IOCP CHPID, CNTLUNIT, and ID macros.

For a full description of the IOCP macros and the IOCP-related parameters in the IODEVICE macro, see "IOCP Macro Instructions" on page 2-4. For a full description of MVS/XA SYSGEN macros, see *MVS/Extended Architecture System Generation Reference,* GC26-4009.

Figure 1-3 shows an overview of how the 4381 processes a combined IOCP and MVS/XA SYSGEN input file.



1. The input file contains both MVS/XA SYSGEN and IOCP macro instructions.
2. IOCP processes the IOCP macro instructions, generates an IOCDS in storage, produces reports, and, when requested, saves the generated IOCDS.
3. The configuration reports allow you to check the I/O configuration as defined in the IOCDS.
4. When 370-XA mode is initiated, the IOCDS is loaded for use by the channel subsystem.
5. MVS/XA SYSGEN processes the SYSGEN macro instructions and creates the MVS/XA system.

Figure 1-3. An Overview of IOCP and MVS/XA System Generation

Chapter 2. IOCP Input

IOCP has four macro instructions:

CHPID
CNTLUNIT
IODEVICE
ID.

These instructions define the channel paths (CHPID), control units (CNTLUNIT), and I/O devices (IODEVICE) in your configuration. The ID macro instruction is optional. It enables you to specify information to be printed in the heading of IOCP configuration reports.

The rules for coding IOCP macros are basically the same as the rules for coding MVS SYSGEN macros.

Rules for Coding IOCP Macro Instructions

You use assembler language rules to code the IOCP macros. The following paragraphs summarize these rules detailed in *OS/VS-DOS/VS-VM/370 Assembler Language*, GC33-4010, and *Assembler H Version 2 Application Programming Language Reference*, GC26-4037.

All IOCP macros contain these four fields:

Name	Operation	Operand	Comments

Name
is a symbol from one to forty alphanumeric characters that helps you identify the IOCP macro. It is optional, but if you choose to use it, you must begin **Name** in the first position of the macro instruction and you must leave at least one blank after it. IOCP ignores this macro field.

Operation
identifies the macro (CHPID, CNTLUNIT, ID, IODEVICE) to the IOCP. You must leave one blank before it and one blank after it. You can place the **Operation** at the second position of the input record if you do not use **Name**.

Operand
contains the parameters you code. These parameters can be in any order, but you must separate them with commas. You must leave a space after the last parameter to tell IOCP you are finished coding.

A parameter consists of a keyword (such as PATH, TYPE, PROTOCL, or UNIT) followed immediately by an equal sign (=) and the keyword value (such as address, chpid number, or type). The keyword value can be a single value or subfield or a list of values or subfields. If it is a list of values, the values must be separated by commas and the list must be enclosed in parentheses. When a keyword consists of more than one keyword value, these subparameters are positional and must be coded in the order shown.

Comments
can be written in an IOCP macro, but you must separate them from the last parameter of the operand field by one or more blanks. If you want to use an entire record as a comment, place an asterisk in the first position.

Continuation

You code the IOCP macros in positions 1 through 71 of each record. You can continue a macro instruction that exceeds 71 positions onto one or more additional records by placing a nonblank character in position 72. You can interrupt the macro instruction at position 71 or after any comma that separates parameters. You may begin the continued portion at any position in the following record except position 1. Comments can also appear on continued records. You can use positions 73 through 80 to code any identification and/or sequence characters you wish. IOCP prints, but does not examine positions 73 through 80.

You can use up to ten continuation records.

Notes:

1. *If you do not end the last parameter on a record with a comma and code a nonblank character in position 72, IOCP processes the information in the following record as a separate macro instruction. You should also check your I/O configuration reports to ensure that all channel paths, control units, and I/O devices are defined correctly.*

2. *When you use a device to generate input records for IOCP that has "null" (generally X'00') characters in unused positions, you must make sure that you put a blank in position 72; otherwise, IOCP will assume that the record specifies continuation.*

Format and Coding Conventions

The conventions used in this publication to illustrate the format and coding of IOCP macros are:

- You *must* code *uppercase letters, numbers, and punctuation marks* exactly as shown in this manual.

  Exceptions to this convention are brackets, [ ]; braces, { }; and ellipses, ...; which you never code.

- Lowercase letters represent variables that need specific information you must supply.

- Items enclosed in braces, { }, represent alternative items. You can only code one of these items.

- Items enclosed in brackets, [ ], are optional. You can omit these. Conversely, you must code items not enclosed in brackets.

- An ellipsis, ..., indicates that you can code the previous item or group of items two or more times in succession.

- The "or" sign, |, separates alternative items.

- If an alternative item is underlined, it is the default value. IOCP assumes the default value if you do not specify the keyword.

- Single parentheses must enclose subfields or multiple value keyword values. If you only specify a single value for the keyword value, you may omit the parentheses.

- Use double parentheses to enclose multiple subfield values.

- You must use commas to separate parameters, subfields and multiple keyword, and subfield values.

Examples:

single value	CUNUMBER=(530) or CUNUMBER=530
single subfield	ADDRESS=(120,8)
multiple values	CUNUMBR=(030,142,364)
multiple subfields	ADDRESS=((420),(360,16),(0F2,4))

A typical macro instruction might appear as:

```
CU10A CNTLUNIT CUNUMPR=10A,PATH=(06),SHARED=N,          X
               UNIT=2821,UNITADD=((0A,3))      Plan 3
```

CU10A is the symbolic name of the macro.

CNTLUNIT identifies the macro to the system.

CUNUMBR=10A, PATH=(06), and SHARED=N are required parameters, separated by commas, containing keywords and keyword values. Because this macro instruction is continued, a comma follows SHARED=N and a nonblank character (X) is placed in position 72.

UNIT=2821, and UNITADD=((0A,3)) are also required parameters that appear in the continued macro instruction. Because UNITADD=((0A,3)) is the last parameter, it is followed by a blank to indicate the end of the operand field.

"Plan 3" is your comment; IOCP does not interpret it.

IOCP Macro Instructions

Information regarding differences from 308x instructions is in "Instruction Differences" on page D-1.

CHPID Macro

CHPID is a required macro instruction that describes:

- Channel path/4381 channel number relationship
- Characteristics of channel paths.

You must specify all channel paths in your I/O configuration in the CHPID macro(s) in order to use them. You can specify up to eight channel paths in one CHPID macro.

The format of the CHPID macro instruction is:

[symbol]	CHPID	PATH=((chpid number,channel number, channel set),...), TYPE=BL|BY

PATH=((chpid number,channel number,channel set),...),
specifies one or more channel path identifiers. You can assign any number of channel paths to a channel, but a channel path must have a unique channel number.

Note: You must begin and end a PATH parameter with double parentheses if you specify more than one chpid number. If you only specify one chpid number, the outer parentheses are optional.

chpid number
specifies the 4381 channel path identifier referred to in the PATH parameter of the CNTLUNIT macro. You must specify two hexadecimal digits from 00 to FF. (See "CHPID Interpretation Differences" on page D-3 for more information on the meaning of the channel path identifier in the 4381 processors.)

channel number
specifies the 4381 channel number that corresponds to the channel path. Specify one hexadecimal digit (from 0 to 5 for the standard channels and 6 to B for the optional channels) for a 4381 uniprocessor; 0 to 8 for a 4381 dual processor.

channel set
specifies the processor on which the chpid is to be defined. Valid selections are 0 (Processor 0) and 1 (Processor 1 for a 4381 dual processor). The channel set is a single hexadecimal value of 0 or 1. If the channel set is omitted, the chpid is defined on processor 0.

TYPE={BL | BY}
specifies the mode of I/O operation for the channel path. If you specify more than one channel path in the macro, all channel paths will have the same TYPE characteristic. If you specify more than one channel path on a 4381 channel with separate macros, you must make sure the TYPE parameters match.

BL
specifies a block multiplexer channel path that operates in burst mode only and allows multiplexing between blocks. You can specify TYPE=BL for all channel paths except channel 0.

BY
specifies a byte multiplexer channel path that operates in either burst mode or byte-interleave mode, depending on the attached control unit. You can specify TYPE=BY for channel 5; you must specify TYPE=BY for channel 0.

The following macro instruction (named CHPEX1) defines two channel paths identified by chpid (hex 15 and 16) and their corresponding channel numbers (hex 8 and 9). These channel paths will operate in block multiplexer mode.

```
CHPEX1 CHPID PATH=((15,8),(16,9)),TYPE=BL
```

In the following example, the macro instruction (named CHPEX2) defines channel paths 03 and 05 with their corresponding channel number 6, and channel path 4 with its corresponding channel number 7. Channel path 02 is defined on processor 1 and its corresponding channel number is 2. These channel paths will operate in block multiplex mode. Note that the channel path numbers and channel numbers do not have to be in sequence.

```
CHPEX2 CHPID PATH=((05,6),(04,7),(03,6),(02,2,1)),TYPE=BL
```

CNTLUNIT Macro

CNTLUNIT is a required macro instruction that describes:

- Control unit characteristics
- The channel paths attached to the control unit
- The unit addresses the control unit recognizes.

You must specify each control unit in your I/O configuration as a separate CNTLUNIT macro, including discrete control units and other control units that reside in the same physical unit as the I/O device.

See Appendix C, "List of I/O Devices and Control Units" on page C-1 for a list of some control unit types and their characteristics. For a complete description of the UNIT= and MODEL= parameter values for the CNTLUNIT and IODEVICE macros as they pertain to the MVS/SYSGEN procedure, see *MVS/Extended Architecture System Generation Reference.*

You can:

- Attach a control unit to a maximum of four channel paths
- Define a maximum of 256 control units in a configuration
- Assign a maximum of 256 control units to one channel path.

IOCP also establishes a rotation order for the channel paths associated with each control unit. When initiating I/O requests queued to the control unit, the channel subsystem uses this rotation order to determine the sequence for selecting channel paths. You can affect this sequence by the order in which you specify the chpid numbers. "Path Selection" on page 3-2 describes how IOCP establishes the rotation order of the channel paths.

The format of the CNTLUNIT macro instruction is:

[symbol]	CNTLUNIT	CUNUMBR=number, PATH=(chpid number,...), [PROTOCL={D|S},] SHARED={Y|YB|N}, UNIT=machine type, UNITADD=((address[,count]),...)

CUNUMBR=number
specifies the hexadecimal number assigned to the control unit. You must assign each control unit a unique three-digit hexadecimal number between 000 and FFF. The IODEVICE macro refers to this number to define the control unit to which the device is attached.

PATH=(chpid number,...)
specifies the channel path(s) to which the control unit is attached. You specify one to four channel path identifiers for the control unit; these identifiers must be two hexadecimal digits for each channel path. If you specify only one PATH parameter, the parentheses are optional.

Note: If you specify the control unit as shared (SHARED=Y), then it should not be attached to channel paths that operate in byte multiplexer mode.

[PROTOCL={D | S}]

specifies the interface protocol the control unit uses to operate with the channel paths specified in the PATH parameter. This is an optional parameter and defaults to PROTOCL=D if it is not specified.

A control unit may function under two methods of operation:

- Direct control interlock (DCI)
- Data streaming.

D

specifies direct control interlock (DCI) protocol. This protocol is the standard I/O interface. IOCP defaults to D if you do not code PROTOCL.

S

specifies the data streaming protocol.

DCI is used for relatively slow devices and requires that the control unit respond to a channel command and wait for a response from the channel before proceeding with data transfer. The DCI protocol can be used with channels operating in byte, block or selector mode.

The data streaming protocol does not require a response from the channel. When a signal is received from the channel, the control unit immediately begins data transfer, without waiting for additional response commands. This protocol is only available on block multiplex channels operating in either block or selector mode.

Note: If you do not specify the PROTOCL parameter correctly, unpredictable results may occur. For example, if you specify data streaming (PROTOCL=S) for a control unit that supports only the DCI protocol, I/O requests can result in detected errors (data overruns, interface control checks) or undetected errors. See Appendix C, "List of I/O Devices and Control Units" on page C-1 for some proper protocol specifications.

SHARED={Y | YB | N}

specifies how many concurrent levels of I/O requests the channel allows for the control unit. IOCP automatically sets the control unit type (1 or 2) based on the SHARED parameter you specify.

Y

specifies that the control unit has one or both of the following attributes:

- The control unit supports only one I/O request at a time, regardless of the number of I/O devices attached.
- The control unit clears pending sense information for an I/O device if the channel initiates an I/O request for another attached I/O device.

IOCP assigns the control unit as type 1.

You should not specify SHARED=Y for control units that attach to a byte multiplexer channel path.

When SHARED=Y is specified for a control unit attached to a block multiplex channel, the devices attached to that control unit operate in selector mode.

YB

specifies that the control unit has one or both of the SHARED=Y attributes, and that it supports Disconnect Command Chaining (DCC) operations.

IOCP assigns the control unit as type 1.

N

specifies that the control unit supports concurrent I/O requests; one for each attached I/O device. The channel operates in either block or byte multiplexer mode, depending on how you specify the attached channel path.

IOCP assigns the control unit as type 2.

If you assign native consoles, you must specify them as SHARED=N in the CNTLUNIT macro.

See "Control Unit Types" on page 1-7 and Appendix C, "List of I/O Devices and Control Units" on page C-1 for more information on specifying the SHARED parameter.

UNIT=machine type

specifies the machine type of the control unit. You can specify up to five alphameric characters to identify the control unit. IOCP only checks for alphameric characters; it does not validate the machine type.

Note: MVS/XA SYSGEN procedures check this value. If a combined IOCP-MVS/XA SYSGEN deck is being used, make sure the value specified satisfies the SYSGEN procedure.

You must specify a machine type for every control unit in your I/O configuration. You can specify the machine type in the UNIT parameter in one of two ways:

- For devices that do not have a separately assigned control unit machine type (if the control unit function is built into the same physical unit as the device), you can specify the ***device*** type in the UNIT parameter, for example: UNIT=2501.

- For devices that do have a separately assigned control unit type, you should specify the ***control unit*** machine type in the UNIT parameter, for example: UNIT=3830.

UNITADD=((address[,count])...)

address
specifies the unit addresses recognized by the control unit. You must specify two hexadecimal digits from 00 to FF. You must specify at least one unit address. A unit address does not have to represent an attached device.

Note: On channel set 0, channel 0, addresses F0 through FF are reserved for the natively attached devices.

count
specifies the number of sequential unit addresses recognized by the control unit. This is a one-, two-, or three-digit decimal value from 1 to 256. For example: UNITADD=((0A,3)) specifies that unit addresses 0A, 0B, and 0C are recognized by the control unit. The unit address and the number of addresses must not exceed a hexadecimal address of EF for channel 0 on channel set 0 (this does not apply to natively attached console displays) and FF for all other channels. If you do not assign a number, 1 is the default.

A maximum of 140 addresses and/or sets of address and counts can be specified. The unit addresses defined in the CNTLUNIT macro must include all device addresses specified in the ADDRESS parameter of the IODEVICE macro that references this control unit definition.

When you specify a single unit address, parentheses are optional.

When a single unit address and count is specified, the outer parentheses are optional.

In the following example, all of the entries provide the same result.

```
UNITADD=((40,1))
UNITADD=(40,1)
UNITADD=((40))
UNITADD=(40)
UNITADD=40
```

See Appendix C, "List of I/O Devices and Control Units" on page C-1 for exceptions and recommendations that apply to some specific device types. For a complete description of the UNIT= and MODEL= parameter values for the CNTLUNIT and IODEVICE macros as they pertain to the MVS/SYSGEN procedure, see *MVS/Extended Architecture System Generation Reference.*

The full range of unit addresses recognized by the control unit should be specified, even if they are not attached. Failure to specify any of the unit addresses recognized by the control unit can result in missed interrupts.

The following macro instruction:

```
CU126 CNTLUNIT CUNUMBR=126,PATH=06,SHARED=N,PROTOCL=D,    X
               UNIT=2821,UNITADD=((0C,3))
```

- Assigns the control unit number of 126 to an IBM 2821 Control Unit
- Names channel path 06 to which the control unit is attached
- Specifies DCI protocol
- Defines unit addresses 0C, 0D, and 0E to be recognized by the control unit
- Defines a type-2 control unit.

The following macro instruction:

```
TAPES CNTLUNIT CUNUMBR=032,PATH=05,PROTOCL=D,             X
               SHARED=Y,UNIT=3803,UNITADD=((80,16))
```

- Assigns the control unit number of 032 to a 3803 Tape Control
- Names channel path 05 to which the control unit is attached
- Specifies DCI protocol
- Defines unit addresses 80 through 8F to be recognized by the control unit
- Defines a type-1 control unit.

The following macro instruction:

```
DUMMYCU CNTLUNIT CUNUMBR=11A,PATH=(06,07),PROTOCL=S,      X
                 SHARED=Y,UNIT=DUMMY,                     X
                 UNITADD=((90,16),(A0,16))
```

- Assigns the control unit number 11A to a control unit
- Names two channel paths 06 and 07 to which the control unit is attached
- Specifies data streaming protocol
- Defines unit addresses 90 through 9F and A0 through AF to be recognized by the control unit
- Defines a type-1 control unit.

The following macro instruction:

```
3277  CNTLUNIT CUNUMBR=031,PATH=04,                       X
               SHARED=YB,UNIT=3272,                       X
               UNITADD=((20,16))
```

- Assigns the control unit number of 031 to an IBM 3272 Control Unit
- Names channel path 04 to which the control unit is attached
- Defaults to DCI protocol since PROTOCL= is not specified
- Defines unit addresses 20 through 2F to be recognized by the control unit
- Defines a type-1 control unit.

ID Macro

ID is an optional macro instruction that allows you to specify information you want printed in the heading of IOCP configuration reports.

See "IOCP Configuration Reports" on page 4-1 for examples of the headings used on the reports.

To specify ID information, follow these guidelines:

- The parameter MSG1 must precede the parameter MSG2. You may define them in the same or separate ID macros.
- You can specify the ID macro any number of times. However, the messages appearing on the output reports are the last valid MSG1 and MSG2 that you specify.
- You can place the ID macro anywhere in your input.
- The double quotation mark (") indicates an apostrophe imbedded in the message text. Note that the quotation mark is not the same as two single apostrophes ('').
- If the ID macro is not supplied, the "*ID*" fields on the configuration reports are blank.

The format of the ID macro instruction is:

[symbol]	ID	{MSG1='message',MSG2='message'} {MSG1='message' }, [MSG2='message']

MSG1=
specifies the ID information you want IOCP to print on the ID1 line.

MSG2=
specifies the ID information you want IOCP to print on the ID2 line.

'message'
specifies a string of 1 to 64 alphameric characters IOCP interprets as ID information. You must enclose the string within apostrophes. A double quotation mark (") indicates an apostrophe within the string. For example, ID MSG1='John"s I/O Report' would print **John's I/O Report.**

The following macro instruction defines the ID information to be printed on lines ID1 and ID2 in the heading of the IOCP configuration reports.

```
IDEX1 ID MSG1='TPCONFIG Configuration for Processor ',       X
              MSG2='Revised by Plan 3'
```

IODEVICE Macro

IODEVICE is a required macro instruction that describes:

- The I/O device number
- The device characteristics
- The control units to which the device is attached.

In order to use the I/O devices for I/O requests, you:

- Must specify each addressable I/O device in the IODEVICE macro
- Can specify up to 2048 devices on a 4381 Processor
- Can assign a maximum of 256 devices to one channel path
- Can assign one device to a maximum of four control units (Although a control unit can be attached to a maximum of four channel paths, a device can only be attached to a combined maximum of four channel paths.)
- Must assign each I/O device a unique device number within the I/O configuration.

See Appendix C, "List of I/O Devices and Control Units" on page C-1 for a list of some I/O device types and their characteristics. For a complete description of the UNIT= and MODEL= parameter values for the CNTLUNIT and IODEVICE macros as they pertain to the MVS/SYSGEN procedure, see *MVS/Extended Architecture System Generation Reference.*

The format of the IODEVICE macro instruction is:

[symbol]	IODEVICE	ADDRESS=(address[,count]), CUNUMBR=(number[,number]...), UNIT=device, [MODEL=model,] [TIMEOUT=NO,] [DEVNUMBR=device number| UNITADD=unit address] [STADET={Y|N},]

Note: If you code the IODEVICE macro for use with an MVS SYSGEN, use the IODEVICE macro instructions found in MVS/Extended Architecture System Generation Reference, GC26-4009. The parameters that IOCP uses are a subset of the IODEVICE parameters used by SYSGEN. (The CUNUMBR parameter is used only by IOCP.)

ADDRESS=(address[,count])

address
specifies the device address. *You must use three hexadecimal digits between 000 and FFF.* The first digit does not have to correspond to the 370 channel number, unless you are using MVS SYSGEN. Then the first digit must be the same for each device on a single control unit or for each DASD on a single string. In all cases, specify a hexadecimal digit in the range of 0 through F.

The second and third digits of ADDRESS specify the unit address used by the channel to select the device. In this case, you specify two

digits within the range of 00 to FF. These two digits must match one of the unit addresses specified in the UNITADD parameter of the CNTLUNIT macro.

If the optional DEVNUMBR parameter is not specified, the ADDRESS parameter value is also used as the device number.

count
specifies the number of sequential device numbers you will assign. You specify a one-, two-, or three-digit decimal value from 1 to 256. The unit address plus the number of addresses must not exceed a hexadecimal address of EF for channel 0 on Processor 0 (except natively attached console displays and printers), or FF for all other channels. If you do not assign a number, 1 is the default.

Each device number specified must be unique within the I/O configuration.

See Appendix C, "List of I/O Devices and Control Units" on page C-1 for exceptions and recommendations that apply to some specific device types. For a complete description of the UNIT= and MODEL= parameter values for the CNTLUNIT and IODEVICE macros as they pertain to the MVS/SYSGEN procedure, see *MVS/Extended Architecture System Generation Reference.*

CUNUMBR=(number[,number]...)
specifies the numbers you assign to the control unit in the CUNUMBR parameter of the CNTLUNIT macro. *You may specify three hexadecimal digits between 000 and FFF for each control unit.*

If a device is attached to more than one control unit, then all control units to which the device is attached must:

- Use the same address to access the device
- Have the same SHARED characteristic (Y, YB, or N)
- Use the same interface protocol, either direct control interlock or data streaming
- Attach to a different channel path.

UNIT=device
specifies the device type. You can specify up to five alphameric characters to define the device type. IOCP only checks for alphameric characters; it does not validate the device value.

Note: MVS/XA SYSGEN procedures check this value. If a combined IOCP-MVS/XA SYSGEN deck is being used, make sure the value specified satisfies the SYSGEN procedure.

[MODEL=model]
specifies the model number, if any, for the device. You must specify one or two alphameric characters that represent the model number of the device. IOCP only checks for alphameric characters; it does not validate the model value. This is an optional parameter and there is no default if it is not specified.

[TIMEOUT=NO]
specifies the timeout value for the device. It is an optional parameter and if you code it, you must specify it as NO because 4381 Processors do not support the timeout function. (See "Instruction Differences" item 10 on page D-1.)

[DEVNUMBR=device number|UNITADD=unit address]
the device number is a four hexadecimal digit number that **logically** identifies an I/O device. The device number is what the system operator must specify to identify the IPL device.

The unit address is a two hexadecimal digit number in the range of 00 through FF that specifies the unit addresses recognized by the control unit; it **physically** identifies an I/O device. (See "Instruction Differences" item 9 on page D-1.)

Notes:

1. *The DEVNUMBR= and UNITADD= parameters are optional and mutually exclusive and the presence of either affects the meaning of the ADDRESS= parameter.*

   This multiple usage of the parameters means that the values must be coded in different ways, depending on how the parameters are used.

   The interrelationships are as follows:

   a. *ADDRESS= specified by itself*

      For this case, the three digit value specified for the parameter is expanded to four digits and used as the device number. The two low order digits are assumed to contain the unit address for the device.

      In this occurrence, the value for the ADDRESS= parameter may or may not, be enclosed in parentheses. The following two examples will produce the same result.

```
IODEVICE ADDRESS=190,CUNUMBR=001,UNIT=3480
IODEVICE ADDRESS=(190,1),CUNUMBR=001,UNIT=3480
```

   b. *ADDRESS= and DEVNUMBR= parameters both specified*

      When these two parameters are supplied together, IOCP uses the value specified for DEVNUMBR= as the device number and uses the two low order digits of the ADDRESS= value as the unit address.

      The device number is a "non-parenthesized" value and the ADDRESS= parameter value is coded the same as specified above, that is it may or may not be parenthesized. These examples will all yield the same result.

```
IODEVICE ADDRESS=380,CUNUMBR=002,UNIT=3480,DEVNUMBR=A90
IODEVICE ADDRESS=(380),CUNUMBR=002,UNIT=3480,DEVNUMBR=A90
IODEVICE ADDRESS=(380,1),CUNUMBR=002,UNIT=3480,DEVNUMBR=A90
```

c. *ADDRESS= and UNITADD= parameters both specified*

If the UNITADD= parameter is specified with ADDRESS=, IOCP takes the device unit address value from the UNITADD= parameter value. The ADDRESS= parameter value is expanded to four digits by prefixing it with a hexadecimal zero "0" and uses it as the device number.

In this case the value ***MUST NOT*** *be enclosed in parentheses.*

Also note that since, in this case, the ADDRESS= parameter value is not parenthesized, you cannot specify a replication factor with it.

```
IODEVICE ADDRESS=4A0,CUNUMBR=001,UNIT=3480,UNITADD=(90)
```

2. *The DEVNUMBR parameter is* **NOT** *supported by MVS/SYSGEN and causes errors in configuration decks that are processed by that procedure.*

[STADET={*Y*|N},]
specifies whether or not the illegal status posted by the I/O device being configured should be detected by the channel subsystem and reported to the operating system. This operand is only valid for 4381 Processor Model Groups 13 and upward. This is an optional parameter; if not specified, it defaults to **Y** on Model Groups 13 and 14, and to **N** on Model Groups 21 and upward.

Note: Exercise care when you code STADET. 370-XA mode of operation permits the detection of channel conditions, or "status", that either go undetected in System/370 mode, or cause a general I/O hardware error condition.

The operation of some devices generates a large number of such conditions. Detection and repeated presentation of these "illegal status" conditions to the operating system, and its processing of them, can result in apparent suspension of system operation. It is therefore recommended that this STADET facility be explicitly disabled for **ALL** *devices. This is accomplished by coding "NO" for the STADET parameter on the IODEVICE macro as* **STADET=N** *for every device. This action will disable "illegal status detection" for each device.*

You can then code the STADET parameter as "YES" **(STADET=Y)** *for only those devices that you want to permit notification of illegal status.*

These examples will help you in defining the IODEVICE macro:

The following macro instruction defines a 2540 Card Reader Punch Model 1 with an address of 00D. It is attached to a control unit that has a control unit number of 126.

```
DEV00D IODEVICE ADDRESS=00D,CUNUMBR=126,MODEL=1,          X
               UNIT=2540P
```

The following macro instruction defines eight 3330 Disk Storage Model 1 devices. They are attached to control unit number 11B that recognizes the device numbers of 210 through 217.

```
DEV2DD IODEVICE ADDRESS=(210,8),CUNUMBR=11B,              X
               MODEL=1,UNIT=3330
```

The following macro instruction defines eight 3420 Magnetic Tape Units. They are attached to control unit number 032 and are assigned device numbers of 180 through 187.

```
DEVDTT IODEVICE ADDRESS=(180,8),CUNUMBR=032,              X
               MODEL=3,UNIT=3420
```

The following macro instruction defines eight 3420 Magnetic Tape Units attached to two tape control units. The control units are numbered 01B and 01C. Both control unit definitions must recognize the unit addresses of 40 through 47.

```
DEVTUU IODEVICE ADDRESS=(240,8),CUNUMBR=(01B,01C),        X
               MODEL=3,UNIT=3420
```

Note: In this case the control units must be attached to different channel paths to ensure that unit addresses are not duplicated on one channel path.

A Summary of I/O Configuration Rules

The rules and restrictions for coding IOCP macros are summarized below:

For channel paths:

- The 4381 uniprocessors have six standard channels (0 through 5) and six optional channels (6 through B).

  The 4381 dual processors have six standard channels (0 through 5) and three optional channels (6 through 8) for each processing unit. The Model Groups 24 and 92E can also have a second set of three optional channels (9-B) for each processor. The channel sets are numbered 0 and 1.

- You must specify Channel(s) 0 as byte multiplex.
- You may specify Channel(s) 5 as either byte or block multiplex.
- You must specify all other installed channels as block multiplex.

For control units:

- You can attach a control unit to a maximum of four channel paths per system.
- You can assign a maximum of 256 control units to one channel path.
- The maximum number of control units you can specify for a 4381 Processor is 256.
- For selector mode devices specify SHARED=Y for a control unit attached to a block multiplex channel.
- Up to eight control units can be physically attached to a channel cable. See *IBM System/360 and System/370 Interface Channel to Control Unit OEMI* (GA22-6974), for more information.
- You can use data streaming interface protocol only if you attach the control unit to a block multiplexer channel path. If PROTOCL=S is specified by the CNTLUNIT macro, the channel path(s) to which the control unit is attached must have TYPE=BL specified in the CHPID macro.
- To use native consoles, you must:
  - Define a control unit to which only the native console(s) may be attached
  - Assign this unit to a path on channel 0
  - Specify SHARED=N in the CNTLUNIT macro.

For I/O devices:

- You can specify a maximum of 2048 I/O devices for a 4381 Processor.
- You can assign a maximum of 256 I/O devices to one channel path.
- Each device on a channel path must have a unique unit address.
- You can assign a device to a maximum of four control units.
- If you assign a device to more than one control unit, each control unit must:
  - Use the same unit address for the device
  - Have the same characteristics (shared, shared block, or nonshared)
  - Have the same protocol
  - Attach to a different channel path
  - Attach to channel paths of the same channel type (block).
- Devices that are attached to a byte multiplex channel may have only one path specified to them. When channel 5 is configured as a second byte multiplex channel, make sure the attached devices meet this requirement.

- You can assign a device to a combined maximum of four channel paths.
- You must assign each I/O device a unique device number within the I/O configuration.
- Addresses F0-FF are reserved on channel set 0, channel 0.
- Addresses 0F2-0F5 of channel set 0 are used to communicate with native console devices. These addresses must be specified on a single control unit.
- The STADET parameter should always be explicitly set to **NO** for **ALL** devices with the exception of those few for which you want to detect illegal status.
- No device can have the TIMEOUT function activated. The TIMEOUT parameter, if specified, must be NO. (See Appendix D, "308x IOCP Differences" item 10 on page D-1.)

In general, if you have made no major error when specifying the I/O device, IOCP generates a device entry in the output.

Specifying Native Console Devices

- **If you use any native console devices in 370-XA mode, you *must* define them using the CHPID, CNTLUNIT, and IODEVICE macros.**

  Even if you do not plan to use the native console devices as operating consoles, they may be needed for other purposes (i.e., service) and will have to be defined before that is possible. Failure to define the consoles and attempting to use them will cause your system to hang up.

- When you assign these devices, they occupy the fixed reserved addresses 0F2, 0F3, 0F4, and 0F5 on channel set 0. You can use only these addresses to define the four console ports P0, P1, P2, and P3 respectively.

  Address 0FF on channel set 0 is also reserved. If you define a console address, you must define address 0FF. If not, IOCP terminates.

- To use native consoles, you must:
  - Define a control unit to which only the native console(s) may be attached
  - Assign this unit to a path on channel 0
  - Specify SHARED=N in the CNTLUNIT macro.

Here is an example of native console device specification:

```
CHPID       PATH=((00,0)),TYPE=BY

CNTLUNIT    CUNUMBR=001,PATH=(00),UNITADD=((F2,4),(FF,1)),    X
                UNIT=LCA,SHARED=N

IODEVICE    ADDRESS=(0F2,4),CUNUMBR=001,UNIT=3279

IODEVICE    ADDRESS=(0FF,1),CUNUMBR=001,UNIT=3278
```

The CHPID instruction defines the byte channel path as '00' on real channel 0.

The CNTLUNIT instruction defines '001' as the control unit that connects to path '00'. The control unit recognizes the unit addresses 'F2', 'F3', 'F4', 'F5', and 'FF'.

The IODEVICE macro defines '0F2', '0F3', '0F4', '0F5', and '0FF' as devices attached to control unit '001'. This example gives the operating system access to ports P0, P1, P2 and P3.

The LCA is the Local Channel Adapter of the 4381 which provides the connection of the natively attached consoles.

Chapter 3. IOCP Operation

The Input/Output Configuration Program (IOCP) for the IBM 4381 Processor is a stand-alone, 370 mode only, program written in IBM's 370 Assembler Language. IOCP resides on the second functional diskette and is initiated by using configuration screens and menus provided by the 4381 Processor.

The 4381 IOCP does not generate the UCWs necessary for 370 mode operation.

IOCP must be run on the 4381 to configure the I/O subsystem for **370-XA mode** operation.

For information about running IOCP on the IBM 4381, see the *IBM 4381 Processor Operations Manual.*

IOCP reads an entire system I/O configuration description into the processor's memory. The description consists of IOCP macro instructions that you supply, specifying each of the channel paths, control units and I/O devices that you want to be able to use while your system operates in 370-XA mode. The macro instructions may be read from a card reader or a magnetic tape device.

Note: If a magnetic tape is used, the format must be UNLABELED and UNBLOCKED with fixed length 80-character format records.

If a printer is available and has been assigned for the run, a report showing each record and record number is produced. This report may be used later for a cross-reference of macro instruction numbers for IOCP-generated error messages.

Note: The I/O devices that are to be used by IOCP for reading the configuration definition and printing the configuration reports must be defined before IML'ing 370 mode. For more information, see "UCW Directory Update (QFOIU) Screen" in the IBM 4381 Processor Operations Manual.

IOCP then performs a complete syntax check of the input configuration description macro instructions. This check ensures that all required fields on each of the macro instructions is present and that every field's value conforms to the proper type and range as required. If any errors are detected in the macro instruction, IOCP generates messages informing you of the problem and also tells you the record number of the statement containing the error.

This stage of processing of the configuration program builds an intermediate description of each path, control unit and I/O device that it determines to be valid.

Once the syntax check of the macro instructions has been completed, IOCP performs a context analysis of the intermediate description. This context analysis, called path validation, first correlates information specified on the CHPID macro

instructions with that on the CNTLUNIT macro instructions. (Each channel path ID specified in the CNTLUNIT macro instructions that you supplied must be defined by a CHPID macro instruction.) Other tests determine that if more than one channel path has been specified by a CNTLUNIT macro instruction, each path is of the same type, and so forth.

Path validation proceeds to correlate the IODEVICE specifications with the CNTLUNIT specifications. Some of these checks make sure that the control units you defined specify the unit addresses of those I/O devices that you have selected to be attached to those control units. Further checks determine that each of the control units you want an I/O device to be connected to all have the same characteristics. Another test makes sure that you have not attempted to connect an I/O device to more than the maximum of four channel paths.

Path validation includes many contextual tests to ensure the validity of the configuration description. Error messages resulting from path validation do not contain the *record numbers* of incorrect statements because the problem is often the result of incompatibilities between several macro instructions. Error messages contain the information that IOCP has determined does not correlate. This information, with the explanatory text of the message, enables you to determine what is wrong with the configuration description.

After path validation is complete, IOCP analyzes the control unit, and I/O device connections and generates logical control units (LCU). Each I/O device is "tagged" as belonging to a particular LCU.

Following the error checking and LCU generation, IOCP generates a set of configuration reports if you have assigned an available output listing device. The IOCP configuration reports are intended to show you what your I/O configuration will be if you save the IOCDS and IML 370-XA mode selecting that saved data set. The four reports present the configuration from four different aspects to allow you to gain a complete understanding of the total configuration.

Finally, if the IOCP run was free of severe and terminal errors, the configuration is converted from the intermediate description created for IOCP's processing to the format that the channel subsystem requires. The option of saving or not saving that IOCDS is presented to you on the last of the menu screens. If you elect to save it, you are then given the choice between two data set save areas in which to store the new configuration description. Any configuration description previously saved in the selected area is overlaid and lost.

Once this process has been completed, you must select the saved data set and load the processor for 370-XA mode operation for the configuration description to be in effect.

Path Selection

Operations to an I/O device in XA mode take place along a "path." You may specify up to four paths to each device. Each control unit can be defined as being attached to one to four channel paths. Each I/O device can be defined as being attached to up to four control units. The maximum of the combined number of paths permitted to a device is four. IOCP establishes the order in which the paths for 370-XA mode I/O requests are selected.

You can affect the path rotation order by changing the sequence of:

- The channel path identifiers in the CNTLUNIT macro instructions
- The control unit numbers in the IODEVICE macro instructions.

To establish the path order for a control unit, the CHPIDs are first placed on the control unit in the order that they are specified on the CNTLUNIT macro. If all the paths are on the same channel set, then no further processing is performed. If the control unit contains a mixture of paths on the two permissible channel sets (on the 4381 dual processor), then a sort is performed. This sort first places all the paths on channel set zero on the control unit in the order that they were specified. Then, all the paths on channel set one are placed on the control unit in the order that they were specified.

The net result of this is that all paths on CPU A, if any, appear on the control unit first, followed by any paths on CPU B. See Example 2 for an illustration of the affects of this sorting.

To establish the path order for an I/O device, IOCP must correlate channel path specification order in the CNTLUNIT macro with the control unit specification order in the IODEVICE macro.

All of the control units specified by the IODEVICE macro are checked to make sure that they specify no more than the maximum of four channel paths. IOCP selects the first control unit from the sorted control units specified in the IODEVICE macro. The channel path(s) enumerated in the CNTLUNIT macro are then taken, in the order specified, as the first channel path(s) for the device. Any subsequently identified control units specified for attachment to this device are then checked in the order specified, to determine if they contain the same combination of channel paths.

- If each control unit indicates the same combination of channel paths, no additional channel paths connect to the device.
- If any of the control units specify all of the same channel paths, but in a different order, no change is made to the order of channel paths established by the first connected control unit.
- If any of the control units specify channel paths not already connected to the I/O device, then the additional channel paths connect to the device until a maximum of four channel paths are connected.
- If an attempt is made to connect more than four channel paths to the I/O device, IOCP displays an error message indicating the problem and does not add any more channel paths to the device.

After the paths have been selected according to the above rules, the order is sorted in the same fashion as it was for the control units. Paths on channel set zero are positioned first, and paths on channel set one are positioned last. See Example 3.

The following examples illustrate how IOCP establishes the rotation order.

Example 1:

The IOCP macro instructions

```
CHPID PATH=((01,1),(02,2),(04,4),(07,7)),TYPE=BL
CNTLUNIT CUNUMBR=033,PATH=(01,07),UNITADD=10,                    X
      SHARED=Y,UNIT=3380
CNTLUNIT CUNUMBR=041,PATH=(04,02),UNITADD=10,                    X
      SHARED=Y,UNIT=3380
IODEVICE ADDRESS=510,CUNUMBR=(041,033),UNIT=3350
```

yield a path order of 04,02,01,07 for device 510.

Example 2:

The IOCP macro instructions

```
CHPID PATH=((02,2,0),(14,4,1)),TYPE=BL
CNTLUNIT CUNUMBR=022,PATH=(14,02),UNITADD=22,                    X
      SHARED=Y,UNIT=3380
IODEVICE ADDRESS=122,CUNUMBR=(022),UNIT=3350
```

yield the order 02,14 for device 122.

Example 3:

The IOCP macro instructions

```
CHPID PATH=((02,2,0),(03,3,0),(14,4,1),(15,5,1)),TYPE=BL
CNTLUNIT CUNUMBR=022,PATH=(02,14),UNITADD=45,                    X
      SHARED=Y,UNIT=3380
CNTLUNIT CUNUMBR=023,PATH=(03,15),UNITADD=45,                    X
      SHARED=Y,UNIT=3380
IODEVICE ADDRESS=345,CUNUMBR=(022,023),UNIT=3350
```

produce the path order 02,03,14,15 for device 345.

Rotation Algorithm

In 370-XA mode, the channel subsystem uses a "rotation algorithm" to determine the path selection sequence when communicating with an I/O device or control unit. When the channel subsystem attempts the first access to a device in response to an I/O request, access to the device follows the path as defined above. An indicator is set in the Last Path Used Mask (LPUM) indicating which path was used.

Subsequent accesses check the LPUM and attempt to use that path. If the last path used is not available, then the first path in the rotation order is attempted. Subsequent paths in the rotation order (except for the last path used) are attempted until an available path is found. This path is marked in the LPUM as the last path used. If no path is found to be available, the processor waits until a path becomes available.

Chapter 4. IOCP Output

IOCP Configuration Reports

One of the products of the configuration process that IOCP performs is a set of four reports. They show the internal I/O configuration description that IOCP has generated. The reports are generated after all error checking is complete and contains only those channel paths, control units, and I/O devices that are valid for the configuration. They can be used to determine if the generated description is correct and is what you desire.

The four reports are:

CHPID Summary Report
Device I/O Configuration Report
CHPID Configuration Report
Logical Control Unit Report

Following is a description and an example of each report. The descriptions use the actual field names from the reports so that the user can easily see which part of the report is being described. The reports from which the examples were extracted were generated by IOCP using the starter deck. An input listing of the starter deck appears in Appendix A, "4381 Uniprocessor Input Example Listing" on page A-1.

Note: *To accommodate printer paper with different widths, IOCP allows two output report widths, 72 or 100 columns.*

To permit the maximum amount of information to be presented in either width mode, the width of the UNIT field is reduced to four columns. This may result in the elimination of the fifth character of a model specification. There is no effect on the operation or the specification; the column is not printed.

(For more information on how to specify the report width, see the *IBM 4381 Processor Operations Manual.*)

CHPID Summary Report

The information in this report is listed in ascending order by channel path ID.

```
IOCP VERSION 001              LEVEL 000              CHPID SUMMARY REPORT
IOCP RUN ON 12-07-83 AT 11.30                          PAGE NUMBER      1

ID1=THIS IS A SAMPLE CONFIGURATION FOR A 4381 UNIPROCESSOR
ID2=


    CHANNEL            CHANNEL            CHANNEL
     CHPID               SET              NUMBER              MODE
    *******            *******            *******             ****

      00                  0                  0                BYTE
      01                  0                  1                BLOCK
      02                  0                  2                BLOCK
      03                  0                  3                BLOCK
      04                  0                  4                BLOCK
      05                  0                  5                BLOCK
      06                  0                  6                BLOCK
      07                  0                  7                BLOCK
      08                  0                  8                BLOCK
      09                  0                  9                BLOCK
      0A                  0                  A                BLOCK
      0B                  0                  B                BLOCK

          ***** END OF CHPID SUMMARY REPORT *****
```

Figure 4-1. Example of a CHPID Summary Report

The CHPID Summary report lists the valid channel path identifiers (CHPIDs) defined by the user on CHPID macros.

The fields in this report and their explanations are as follows:

CHANNEL CHPID: will be the valid CHPID numbers specified on the CHPID macros in the input.

CHANNEL SET: this field indicates the processor on which the chpid was defined (0 or 1).

CHANNEL NUMBER: is the number of the 4381 Processor's physical channel to which the CHPID in the first field of the entry is mapped. This data is taken from the input information.

MODE: is the type of channel path/channel operation specified. It is either BYTE, indicating byte multiplex mode or BLOCK, indicating that the channel operates in block multiplex mode.

Device I/O Configuration Report

This report is produced in ascending device number order.

```
IOCP VERSION 001                    LEVEL 000                    DEVICE I/O CONFIGURATION REPORT
IOCP RUN ON 12-07-83 AT 11.30                                              PAGE NUMBER      1

ID1=THIS IS A SAMPLE CONFIGURATION FOR A 4381 UNIPROCESSOR
ID2=

DEVICE  UNIT SUB-CHANNEL      CONTROL       CONTROL  DEVICE                              CHANNEL   LCU
NUMBER  ADDR    NUMBER      UNIT NUMBER    UNIT TYPE  TYPE  MODEL TIMEOUT PROTOCOL    PATH ID   GRP
******  **** ***********  ---*----*---*---  ********* ****** ***** ******* ******** --*--*--*-- ***
0
 000A    0A      006       001                 2       2501          YES     DCI     00           001
 000C    0C      007       002                 2       2540          YES     DCI     00           002
 000D    0D      008       002                 2       2540          YES     DCI     00           002
 000E    0E      009       002                 2       1403          YES     DCI     00           002
 0020    20      00A       003                 2       3705          YES     DCI     00           003
 0030    30      00B       004                 2       3278          YES     DCI     00           004
 0031    31      00C       004                 2       3278          YES     DCI     00           004
 0032    32      00D       004                 2       3278          YES     DCI     00           004
 0033    33      00E       004                 2       3278          YES     DCI     00           004
 0034    34      00F       004                 2       3278          YES     DCI     00           004
 0035    35      010       004                 2       3278          YES     DCI     00           004
 0036    36      011       004                 2       3278          YES     DCI     00           004
 0037    37      012       004                 2       3278          YES     DCI     00           004
 0038    38      013       004                 2       3278          YES     DCI     00           004
 0039    39      014       004                 2       3278          YES     DCI     00           004
oooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooo
oooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooo
 0BB2    B2      195       058                 2       3350          YES     DCI     0B           032
 0BB3    B3      196       058                 2       3350          YES     DCI     0B           032
 0BB4    B4      197       058                 2       3350          YES     DCI     0B           032
 0BB5    B5      198       058                 2       3350          YES     DCI     0B           032
 0BB6    B6      199       058                 2       3350          YES     DCI     0B           032
 0BB7    B7      19A       058                 2       3350          YES     DCI     0B           032
 0BC0    C0      19B       059                 2       3344          YES     DCI     0B           033
 0BC1    C1      19C       059                 2       3344          YES     DCI     0B           033
 0BC2    C2      19D       059                 2       3344          YES     DCI     0B           033
 0BC3    C3      19E       059                 2       3344          YES     DCI     0B           033
 0BC4    C4      19F       059                 2       3344          YES     DCI     0B           033
 0BC5    C5      1A0       059                 2       3344          YES     DCI     0B           033
 0BC6    C6      1A1       059                 2       3344          YES     DCI     0B           033
 0BC7    C7      1A2       059                 2       3344          YES     DCI     0B           033

                    ***** END OF DEVICE I/O CONFIGURATION REPORT *****
```

Figure 4-2. Example of a Device I/O Configuration Report

The Device I/O Configuration report lists all the devices that were validly defined as part of the I/O configuration for a particular 4381 Processor.

The fields in this report and their explanations are as follows:

DEVICE NUMBER: is specified by the user on the IODEVICE macro in the ADDRESS= parameter (or optionally by the DEVNUMBR= parameter). If several sequential addresses are defined in the ADDRESS= parameter by specifying a replication factor, each device has its own entry in this report.

For example, the IODEVICE macro statement

```
IODEVICE ADDRESS=(060,4),CUNUMBR=(004),UNIT=3277
```

generates entries in the Device I/O Configuration report for device numbers 0060, 0061, 0062 and 0063.

UNIT ADDR: is the address that the control unit recognizes when it is sent out on the channel. This data is derived from the last two digits of the address specified by the ADDRESS= parameter value on the IODEVICE macro. The same unit address may appear in the report more than once, but each two-digit unit address is a unique address for a channel.

SUB-CHANNEL NUMBER: is a number generated by IOCP. It reflects the order in which devices were defined in the input deck. If the subchannel number is 001, then it is the first valid IODEVICE specification found in the input. The subchannel number or subchannel ID is used by *programs* running in 370-XA mode to address a device.

CONTROL UNIT NUMBER: is the number specified on the IODEVICE macro. There are four positions for the numbers of the control units to which this device may be attached. For each device, the first control unit number represents the control unit that is attached to the first channel path in the Channel Path ID column of this report. The second control unit number corresponds to the second channel path, and so forth.

CONTROL UNIT TYPE: always contains a 1 or a 2. The value is determined by the specification of the SHARED= parameter of the first valid control unit to which this device is attached. Specification of "SHARED=Y" and "SHARED=YB" result in a type-1 control unit. "SHARED=N" yields a type-2 control unit. For specific information on control unit types for specific devices, see to Appendix C, "List of I/O Devices and Control Units" on page C-1.

DEVICE TYPE: is the parameter value from the UNIT= parameter of the IODEVICE macro specification for this device.

MODEL: is a user-supplied device model number.

TIMEOUT: is always NO with the 4381 Processor.

PROTOCOL: always contains either DCI or STREAM, indicating the type of operation used by the device's control unit for communicating with the channel subsystem. This information is taken from the PROTOCL= parameter of the first CNTLUNIT macro to which this I/O device has been defined as being attached.

CHANNEL PATH ID: is the number of the 4381 channel that this device is attached to through its control unit. This data is taken from the PATH= parameter of the control unit specifications to which this device is defined as being attached. Each device may be attached from one to four channel paths.

LCU GRP: is the logical control unit group to which the device is assigned.

CHPID Configuration Report

```
IOCP VERSION 001                          LEVEL 000                    CHPID CONFIGURATION REPORT
IOCP RUN ON 12-07-83 AT 11.30                                                 PAGE NUMBER     1

ID1=THIS IS A SAMPLE CONFIGURATION FOR A 4381 UNIPROCESSOR
ID2=


-
         CHANNEL                    CONTROL UNIT      CONTROL    PHY CU   LCU                  UNIT     DEVICE
CHPID    SET   NUMBER   MODE    NUMBER  TYPE-MODEL   UNIT TYPE  NUMBER   GRP   PROTOCOL       ADDR   TYPE-MODEL
*****    **-*****-**    ****    **---------------**  *********  ******   *****  ********       ****   **********
 00       0      0     BYTE      0FF       3274         2         01     000     DCI           F2       3278
                                                                        000     DCI           F3       3278
                                                                        000     DCI           F4       3278
                                                                        000     DCI           F5       3286
                                                                        000     DCI           FF       3274

                               001       2501         2         02     001     DCI           0A       2501
                               002       2821         2         03     002     DCI           0C       2540
                                                                        002     DCI           0D       2540
                                                                        002     DCI           0E       1403

                               003       3705         2         04     003     DCI           20       3705
                               004       3274         2         05     004     DCI           30       3278
                                                                        004     DCI           31       3278
                                                                        004     DCI           32       3278
                                                                        004     DCI           33       3278
                                                                        004     DCI           34       3278
                                                                        004     DCI           35       3278
                                                                        004     DCI           36       3278
                                                                        004     DCI           37       3278
                                                                        004     DCI           38       3278
                                                                        004     DCI           39       3278
                                                                        004     DCI           3A       3278
                                                                        004     DCI           3B       3278
                                                                        004     DCI           3C       3278
                                                                        004     DCI           3D       3278
                                                                        004     DCI           3E       3278
                                                                        004     DCI           3F       3278
oooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooo
oooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooo

 0B       0      B     BLOCK     058       3880         2         33     032     DCI           B6       3350
                                                                        032     DCI           B7       3350

                               059       3830         2         34     033     DCI           C0       3344
                                                                        033     DCI           C1       3344
                                                                        033     DCI           C2       3344
                                                                        033     DCI           C3       3344
                                                                        033     DCI           C4       3344
                                                                        033     DCI           C5       3344
                                                                        033     DCI           C6       3344
                                                                        033     DCI           C7       3344


                                  ***** END OF CHPID CONFIGURATION REPORT *****
```

Figure 4-3. Example of a CHPID Configuration Report

The CHPID Configuration report presents the I/O configuration from the viewpoint of the processor, down the channel, through each control unit to every I/O device connected on the path.

To accomplish this, the report lists CHPIDs in ascending order in the left-most column. To the right of CHPID, the characteristics of that channel path are given. Next are listed, in order by control unit number, all of the control units that properly attach to this channel path. To the right of each control unit number are the characteristics of the control unit. Beside every control unit entry is listed, also in ascending order, the unit addresses of each device that is attached to that control unit and the device's type and model.

The fields of the report are defined as follows:

CHPID: is the valid CHPID number specified on the CHPID macros in the input.

CHANNEL SET: indicates the processor on which the chpid was defined (0 or 1).

CHANNEL NUMBER: is the number of the 4381 Processor's physical channel to which the CHPID is mapped. This data is taken from the information supplied by the user in the input.

MODE: is the type of channel path/channel operation, as specified by the user. It is either BYTE, indicating byte multiplex mode or BLOCK, indicating that the channel operates in block multiplex mode.

CONTROL UNIT NUMBER: is the number specified by the user on the defining macro.

CONTROL UNIT TYPE-MODEL: contains a user-supplied control unit type-model number.

CONTROL UNIT TYPE: always contains a 1 or a 2. The value is determined by the specification of the SHARED= parameter on the CNTLUNIT macro.

PHY CU NUMBER: means physical control unit number. This is a number generated by IOCP. It reflects the order in which the control units were defined by the user in the input deck. If the physical control unit number is 01, then it represents the first valid CNTLUNIT specification found in the input. This physical control unit number is only used by the channel subsystem.

Note: The physical control unit number and the control unit number should not be confused and do not have to be the same number.

"PHY CU NUMBER" reflects the order of valid CNTLUNIT macros in the input and "CONTROL UNIT NUMBER" is that number supplied by the user as the CUNMBR= parameter value.

LCU GRP: is the logical control unit group to which the control unit has been assigned.

PROTOCOL: always contains either DCI or STREAM, indicating the type of operation used by this control unit for communicating with the channel subsystem.

UNIT ADDR: is the address that is broadcast on the channel for control units to recognize and respond. The same unit address may appear in the report more than once, but each two-digit unit address is a unique address for a channel. It is important to note that in this report, since only the unit address of the device is printed, the same device may actually appear on more than one channel path if it has been defined to be attached to multiple paths.

DEVICE TYPE-MODEL: The device type is the parameter value from the UNIT= parameter of the IODEVICE macro specification for this device. The model field contains the user-supplied device model designation.

Logical Control Unit Report

The Logical Control Unit report displays the I/O devices and control units that IOCP has grouped together based on the sharing of the control units. Following is the list of fields contained in the Logical Control Unit Report and a brief description of each.

LOG CNTL UNIT NUM: is the number generated by IOCP as the group identifier for the array of control units and I/O devices.

CHPID NUM: are the user-supplied CHPID numbers indicating to which channels a particular logical control unit group is attached. There is a possibility of having from one to four CHPIDs associated with a logical control unit group.

CONTROL UNIT NUM: contains the control unit numbers of the valid control units that are a part of this logical control unit group. These numbers are the ones specified by the user on the CNTLUNIT macro statements. There may be any number of control units as part of a logical control unit group. Each entry in this field of the report has a direct correspondence to each entry in the field to the right. The first control unit number in this CONTROL UNIT NUM field has a physical control unit number and that number is printed in the first entry position of the PHYSICAL CNTL UNIT NUM field, and so forth.

PHYSICAL CNTRL UNIT NUM: contains the physical control unit numbers of the valid control units which are a part of this logical control unit. A physical control unit number is a number generated by IOCP. It reflects the order in which the control units were defined by the user in the input deck. If the physical control unit number is 01, then it is the first valid CNTLUNIT specification found in the input.

Note: The physical control unit number and the control unit number do not have to be the same. The physical control unit number reflects the order of valid CNTLUNIT macros in the input and the control unit number is that number supplied by the user as the CUNMBR= parameter value.

ATTACHED DEV NUM: is the number of the device attached to this logical control unit group. This number is taken from the ADDRESS= parameter value or the optional DEVNUMBR= parameter in the IODEVICE macro that was used to define the device.

SUBCHAN NUM: is the subchannel ID of the device. The subchannel ID is a number generated by IOCP. It reflects the order in which devices were defined by the user in the input deck. If the subchannel number is 001, then it represents the first valid IODEVICE specification found in the input.

This report is printed in ascending order by logical control unit group number.

```
IOCP VERSION 001              LEVEL 000     LOGICAL CONTROL UNIT REPORT
IOCP RUN ON 12-07-83 AT 11.30                       PAGE NUMBER     1

| ID1=THIS IS A SAMPLE CONFIGURATION FOR A 4381 UNIPROCESSOR
  ID2=


LOG CNTL                      CONTROL       PHYSICAL CNTL  ATTACHED SUBCHAN
UNIT NUM  CHPID NUM         UNIT NUM         UNIT NUM      DEV NUM    NUM
******** --*--*--*--  ---*---*---*---  ---*---*---*--- ******** *******
0
  000     00            0FF              001              00F2     001
                                                         00F3     002
                                                         00F4     003
                                                         00F5     004
                                                         00FF     005
  001     00            001              002              000A     006
  002     00            002              003              000C     007
                                                         000D     008
                                                         000E     009
  003     00            003              004              0020     00A
  004     00            004              005              0030     00B
                                                         0031     00C
oooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooo
oooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooo
                                                         0B47     192
  032     0B            058              033              0BB0     193
                                                         0BB1     194
                                                         0BB2     195
                                                         0BB3     196
                                                         0BB4     197
                                                         0BB5     198
                                                         0BB6     199
                                                         0BB7     19A
  033     0B            059              034              0BC0     19B
                                                         0BC1     19C
                                                         0BC2     19D
                                                         0BC3     19E
                                                         0BC4     19F
                                                         0BC5     1A0
oooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooo
oooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooo
                                                         0324     1A7
                                                         0325     1A8
                                                         0326     1A9
                                                         0327     1AA
  035     03            061              036              0302     1AB

            **** END OF LOGICAL CONTROL UNIT REPORT ****
```

Figure 4-4. Example of a Logical Control Unit Report

Using the IOCP Reports

This section shows you how to correlate the information in the four IOCP reports. The following two examples help you to fully understand the configuration description that the channel subsystem uses to access devices during XA mode operation. Also, the examples help you to make sure that the description is the one you want and that you utilize your devices as desired.

The total resulting configuration is presented in the CHPID Configuration Report. Because of paper width limitations, some of the information is given in an abbreviated form. It is easy to check the entries in this report with the other reports so that you can get a complete picture.

Let's start by looking at the path to a 3350 DASD (the device with a unit address of B7). Refer to the "DEVICE TYPE-MODEL" column in the example of a CHPID Configuration Report, Figure 4-3 on page 4-5. The path to the 3350 first goes through channel B on processing unit 0, which is a block multiplex channel. Then it goes through a 3880 Control Unit (which has been given the control unit number 058 by the person setting up the configuration description). This control unit has been defined as a type-2 control unit and has a physical control unit number of 33. The device and its control unit have been assigned to the Logical Control Unit group number 32.

Example 1: Checking I/O Devices -

Because it is possible to have more than one I/O device in a configuration (though not on the same channel) with the same unit address, you may want to know which device is really being referenced in the CHPID Configuration Report.

Go to the example of a Device I/O Configuration Report, Figure 4-2 on page 4-3. Find a unit address of B7 in the second column of that report. An entry there shows a device with the desired unit address. Check the "CHANNEL PATH ID" column on this report to see if it matches the channel path ID of the device on the example of a CHPID Configuration Report. You can see that the channel path ID is 0B on both reports; this shows that you have the device you are interested in.

You will also be able to see that the other information (such as the control unit numbers and types, the protocol, etc.) correlates.

Example 2: Checking Control Units -

To get more information about the control unit of device B7 from the previous example, use the example of a logical Control Unit Report (Figure 4-4 on page 4-8), and the example of a Device I/O Configuration Report (Figure 4-2 on page 4-3).

Obtain the logical control unit number from the example of a CHPID Configuration Report. You will find that it is 032. In the first column on the example of a Logical Control Unit Report, Figure 4-4 on page 4-8, you will find LCU number 032. In the "ATTACHED DEV NUM" column, the last entry for logical control unit 032 is 0BB7, the device number for the unit address B7.

Note: The I/O device with the device number of 0BB7 can be verified as the proper one by using the Device I/O Configuration Report as outlined in the previous example.

This shows you all of the control units and I/O devices assigned to this logical control unit group. In this instance the logical control unit consists of eight devices (0BB0 through 0BB7), but only one control unit 058 (physical control unit number 033).

I/O Configuration Data Set (IOCDS)

Considerations for Saving the IOCDS

Carefully consider saving the IOCDS from a run that has produced errors. If your run produced errors, but you did not seriously violate channel operating rules and have valid paths, control units, and devices that permit you to operate your system effectively, then saving the IOCDS may enable you to get your system operating more quickly.

However, if you do not make sure that the IOCDS conforms to channel operating rules, whether the IOCP run was error free or not, saving and using the data set may result in unpredictable errors. Some of these errors can be difficult to diagnose:

- Native consoles are not defined. (Warning messages are generated).
- The full range of addresses for control units that require full ranges are not defined. An example is the 3830 Control Unit. For specific information on these requirements, refer to the System Library publications for the control units.

  The error may be the result of not defining all of the required addresses, or IOCP may have dropped some devices because of the detection of syntax or path validation errors.
- More control units were specified on a channel interface than can be accommodated within a channel specification. For specific information on these types of restrictions, refer to *IBM S/360 and S/370 I/O Interface Channel to Control Unit Original Equipment Manufacturer's Information*, GA22-6974.

IOCP permits more than the normal maximum of eight control units to be defined for each channel because you may not have them all attached at any one time, but you may wish to alter the attachments without having to reconfigure the channel subsystem.

Selecting IOCDS Configuration

Two IOCDS configurations are kept at one time. These configurations are labeled D0 and D1. When saving the IOCDS, a warning message tells you that the new IOCDS overlays any existing D0 or D1 configuration. The configuration to run the processor in 370-XA mode is selected for loading at IML time.

Chapter 5. IOCP Messages

Note: Do not use Problem Analysis to resolve IOCP-generated error messages. Use the "IOCP Message List" on page 5-3.

Message Format

Messages are listed numerically by a three-digit message number corresponding to the message number displayed on the screen. This number is followed directly by a single letter indicating severity of the message, then the text of the message.

Each message description tells in which of the three areas of the screen it is displayed. Next is a brief explanation of the circumstances causing the message to be displayed. The last field of each description indicates what recovery actions (if any) should be taken to correct the situation.

IOCP messages are composed in the following manner:

nnnt text

nnn is the three-digit message number uniquely associated with each message.

t is one of these message types

R = Response required
I = Informational
W = Warning
E = Error
S = Severe Error
T = Terminal.

text is the text of the message.

The text of a message describes the condition detected by IOCP. Certain messages contain variable data. Variable fields are noted in a message as *vvvvv*; note that they are always *lowercase italics*. The number of characters present in the variable represent how many characters are reserved in that message for the variable, even though all of the characters may not be present for any one display of the message.

Examples of variables and their meanings:

cccc is the number of the card being processed when IOCP detected the error. This field will only be found and displayed for syntax errors.

nnnn represents numeric variables, and may be from one to eight digits in length.

xxxx these fields will be replaced by character

yyyy strings and are generally eight characters in length.

Message Display Areas

An IOCP message may be displayed in any one of three areas on the console screen:

STATUS message field

ERROR message field

INFORMATION message field.

The status and error fields are areas enclosed with asterisks on the status screen. The information area is on line 20 of the screen, to the right of the rightmost arrow. The display area used depends on the message being displayed.

When a printer has been assigned for use by IOCP, many of the error messages will be printed as well as displayed on the system console. The format of the printed messages is identical to those displayed, except that the printed message is prefixed by the module name that generated the message.

IOCP Message List

001E CLEAR RESET REQUIRED

Display Area: INFORMATION

Meaning: This message displays when the system has been IPL'd. You need only to IML the 4381 to run IOCP.

Recovery: Perform a QCLEAR reset so that the system is not in an IPL state. You can now read the IOCP SYSGEN records into the 4381 Processors.

002E DISKETTE 2 NOT READY

Display Area: INFORMATION

Meaning: This message displays if the functional 2 diskette is not in drive 2 and ready.

Recovery: Make sure that the functional 2 diskette is in drive 2.

003E INVALID PAGE LENGTH

Display Area: INFORMATION

Meaning: The page length parameter is not between the specified line values of 40 and 160.

Recovery: Enter a valid page length using the QFOID screen.

004E INVALID CHANNEL ADDR

Display Area: INFORMATION

Meaning: The channel address of the input or output device assigned to IOCP is not valid. The processor does not assign an I/O device for IOCP.

Recovery: Key the correct I/O device assignment on the QFOID screen.

005E INVALID DEVICE NUMBR

Display Area: INFORMATION

Meaning: The device number assigned to IOCP has already been reserved.

Recovery: Assign a correct device for IOCP input or output on the QFOID screen.

006E INVALID HEX CHARACTR

Display Area: INFORMATION

Meaning: IOCP checks for valid hexadecimal I/O device assignments. This message states that the entered data contains invalid hexadecimal characters.

Recovery: Assign the correct device address for IOCP input or output on the QFOID screen.

007E INVALID INPUT

Display Area: INFORMATION

Meaning: You entered an invalid option for the QFOID screen.

Recovery: Check what you entered against the valid options for the QFOID screen and enter the correct option. See the QFOID screen description in the "Programmer" section of the *IBM 4381 Processors Operations Manual,* GA24-3949.

008E INVALID PRINTER TYPE

Display Area: INFORMATION

Meaning: The printer type you entered on the QFOID screen is not valid in IOCP.

Recovery: Check the printer type you entered against the valid options for the QFOID screen and enter the correct option. See the QFOID screen description in the "Programmer" section of the *IBM 4381 Processors Operations Manual,* GA24-3949.

009E INVALID PRINTER TRAIN

Display Area: INFORMATION

Meaning: The printer train selection you entered on the QFOID screen is not valid for the selected printer type.

Recovery: Check the printer train you entered against the valid options for the QFOID screen and enter the correct option. See the QFOID screen description in the "Programmer" section of the *IBM 4381 Processors Operations Manual,* GA24-3949.

011E S370 IML REQUIRED

Display Area: INFORMATION

Meaning: IOCP cannot be run unless the processor is in System/370 mode.

Recovery: IML the processor in System/370 mode. Do not IPL the processor. Restart IOCP.

012E INVALID PAGE WIDTH

Display Area: INFORMATION

Meaning: The page width selection is an invalid value. IOCP only accepts two values: 72 or 100 characters.

Recovery: Enter a valid page width on the QFOID screen.

013E PU IS NOT INSTR STOP

Display Area: INFORMATION

Meaning: The processor is not in instruction-stop state. Before IOCP can be run, the processor must be instruction-stopped.

Recovery: Put the processor in the instruction-stop state. Restart IOCP.

014E INPUT EQUALS OUTPUT

Display Area: INFORMATION

Meaning: The I/O device you selected has the same address as another I/O device.

Recovery: Key the correct I/O device assignment on the QFOID screen.

015E NOT NORMAL OPER RATE

Display Area: INFORMATION

Meaning: The 4381 Processor is in the instruction-step state; it can only execute one instruction.

Recovery: Key normal mode (N) on the QO screen. Begin IOCP.

018E INVALID MODEL NUMBER

Display Area: INFORMATION

Meaning: The model group number you entered on the QFOID screen is not a valid selection.

Recovery: Key a valid model group number on the QFOID screen.

019E NOT ON TARGET SYSTEM

Display Area: INFORMATION

Meaning: The target model group number selected on the QFOID screen does not equal the model group number of the system running IOCP.

Recovery: To save the generated data set, the target model group number on the QFOID screen must equal the model group number of the system on which IOCP is running.

020I DATA SET *n* SAVED

Display Area: INFORMATION

Meaning: The support processor has written the generated IOCDS on the diskette as *n*; *n* can be either 0 or 1.

Recovery: This is an information message; no recovery necessary.

021T IOCP FAILURE

Display Area: STATUS

Meaning: IOCP must respond to the support processor within four minutes. This message states that this time has elapsed, and IOCP must be rerun.

Recovery: Make sure that the I/O is operational. If no hardware problems are detected, an internal IOCP failure has occurred. There is no user-recovery procedure. IOCP is terminated. Contact your local hardware service representative.

022I IOCP PROGRAM STARTED

Display Area: STATUS

Meaning: IOCP has started processing your input.

Recovery: This is an information message; no recovery necessary.

023I LOADING IOCP PROGRAM

Display Area: STATUS

Meaning: The support processor is now loading the IOCP program into the system.

Recovery: This is an information message; no recovery necessary.

030I DATA SET NOT SAVED

Display Area: INFORMATION

Meaning: You have chosen not to save the the data set generated by IOCP.

Recovery: This is an information message; no recovery necessary.

031R SAVE DATA SET (Y/N)

Display Area: INFORMATION

Meaning: IOCP has generated a data set and you must decide whether or not to save it.

Recovery: To save the data set, enter **Y** where indicated. If you do not want to save it, enter **N** where indicated.

032R ENTER KEY - SCROLL/PAGE UP - 1 PAGE

Display Area: STATUS

Meaning: The error message area on the screen is full.

Recovery: Press the Page Up key to display the next page of error messages. To scroll messages, press ENTER.

033E TARGET PU NOT CONFIG

Display Area: INFORMATION

Meaning: The processor on which IOCP has been targeted to run is not configured. IOCP cannot run.

Recovery: Check the QFO screen and configure the processor on which you want IOCP to run, or target the configured processor. Restart IOCP.

034E TARGET PU0 OR PU1

Display Area: INFORMATION

Meaning: IOCP cannot run. Either Processor 0 or Processor 1 must be targeted, but not both.

Recovery: Target either Processor 0 or Processor 1. Restart IOCP.

050T TERMINAL ERROR(S) DETECTED

Display Area: ERROR

Meaning: IOCP has determined that a device or control unit configured to IOCP has invalid status or cannot be recovered from the error state.

Recovery: IOCP is terminated. Contact your local hardware service representative.

051I ... ATTENTION BIT ON

Display Area: ERROR

Meaning: IOCP has detected invalid status from a device.

Recovery: A message defining the device with the invalid ATTENTION request is displayed. Determine the device in error and correct the invalid condition. IOCP is terminated and must be restarted.

052I ... STATUS MODIFIER BIT ON

Display Area: ERROR

Meaning: IOCP detects invalid status from a device.

Recovery: A message defining the device having the invalid STATUS MODIFIER condition is displayed. From these messages, determine the device in error and correct the invalid condition. With this message, IOCP is terminated and must be restarted.

053T PROG. ERR.: CONFLICTING I/O STATUS

Display Area: ERROR

Meaning: The device or control unit you configured for IOCP function has changed status during processing.

Recovery: IOCP is terminated. Contact your local hardware service representative.

054T DEVICE SENSING WAS UNSUCCESSFUL

Display Area: ERROR

Meaning: The 4381 has received a UNIT CHECK from a device assigned to IOCP and repeated attempts to sense that device have been unsuccessful.

Recovery: IOCP is terminated. Contact your local hardware service representative.

055I ... SENSE NORMAL, IOCP CONTINUES

Display Area: ERROR

Meaning: The 4381 has received a UNIT CHECK from an IOCP device and the sense information contains all zero values.

Recovery: IOCP continues to run at the point prior to the UNIT CHECK interruption.

058T DEVICE PROBLEM IS NOT RECOVERABLE

Display Area: ERROR

Meaning: A device assigned to IOCP has a UNIT CHECK condition. The sense information indicates that the malfunction cannot be manually recovered.

Recovery: The device malfunction is displayed in the sense data for the device. IOCP is terminated.

059I ... PROGRAM CONTROL CHECK

Display Area: ERROR

Meaning: A channel you assigned to IOCP contains a PROGRAM CONTROL CHECK condition in the channel status field.

Recovery: IOCP program is terminated. Contact your local hardware service representative.

060I ... INCORRECT LENGTH

Display Area: ERROR

Meaning: A channel or device you assigned to IOCP contains an INCORRECT LENGTH condition in the channel status field.

Recovery: IOCP is terminated. Contact your local hardware service representative.

061I ... PROGRAM CHECK

Display Area: ERROR

Meaning: A channel or device you assigned to the IOCP contains a PROGRAM CHECK condition in the channel status field.

Recovery: IOCP is terminated. Contact your local hardware service representative.

062I ... PROTECTION CHECK

Display Area: ERROR

Meaning: A channel or device you assigned to IOCP contains a PROTECTION CHECK condition in the channel status field.

Recovery: IOCP is terminated. Contact your local hardware service representative.

063I ... CHANNEL DATA CHECK

Display Area: ERROR

Meaning: A channel you assigned to the IOCP function contains a CHANNEL DATA CHECK condition in the channel status field.

Recovery: IOCP is terminated. Contact your local hardware service representative.

064I ... CHANNEL CONTROL CHECK

Display Area: ERROR

Meaning: A channel you assigned to the IOCP function contains a CHANNEL CONTROL CHECK condition in the channel status field.

Recovery: IOCP is terminated. Contact your local hardware service representative.

065I ... INTERFACE CONTROL CHECK

Display Area: ERROR

Meaning: A channel you assigned to the IOCP function contains an INTERFACE CONTROL CHECK condition in the channel status field.

Recovery: IOCP is terminated. Contact your local hardware service representative.

066I ... CHAINING CHECK

Display Area: ERROR

Meaning: A channel assigned to the IOCP function contains a CHAINING CHECK condition in the channel status field.

Recovery: IOCP is terminated. Contact your local hardware service representative.

091T IOCP PROGRAM CHECK

Display Area: ERROR

Meaning: A PROGRAM CHECK has occurred during IOCP execution.

Recovery: An internal IOCP failure has occurred; there is no user-recovery procedure. IOCP is terminated. Contact your local hardware service representative.

092T UNRECOVERABLE MACH CHECK IOCP ENDED

Display Area: ERROR

Meaning: IOCP detected an unrecoverable machine check condition during IOCP execution.

Recovery: IOCP is terminated. Contact your local hardware service representative.

093T USER REQUESTED PROGRAM TERMINATION

Display Area: STATUS

Meaning: The operator has pressed the Console Interrupt key; this terminates IOCP.

Recovery: User initiated termination. There is no recovery.

100T IOCP UNABLE TO CONTINUE

Display Area: STATUS

Meaning: A terminal error has occurred and has been displayed or printed. All processing for this IOCP generation is terminated.

Recovery: Take recovery procedures indicated by other messages.

101I DEVICE *nnnn* CHANNEL STATUS =

Display Area: ERROR

Meaning: An interrupting device contains channel status bits in the channel status word.

Recovery: IOCP is terminated. Contact your local hardware service representative.

102I DEVICE *nnnn* INVALID STATUS =

Display Area: ERROR

Meaning: The STATUS of a device at address *nnnn* contains invalid status bits.

Recovery: IOCP is terminated. Contact your local hardware service representative.

103I DEVICE *nnnn* UNIT CHECK

Display Area: ERROR

Meaning: A UNIT CHECK has occurred at device address *nnnn*.

Recovery: In addition to this message, other IOCP messages applying to this malfunction are displayed. Depending on the nature of the problem, IOCP may be terminated, or it may wait for you to intervene to continue the operation.

104T DEVICE *nnnn* IS NOT OPERATIONAL

Display Area: ERROR

Meaning: IOCP has detected that device at address *nnnn* is not operational.

Recovery: IOCP is terminated. Correct the state of the device and restart IOCP.

105I DEVICE *nnnn* SENSE DATA =

Display Area: ERROR

Meaning: The device at address *nnnn* went through a UNIT CHECK and has returned sense data.

Recovery: The sense data returned by the device is displayed in hexadecimal. IOCP is terminated.

106I DEVICE *nnnn* INTERVENTION REQUIRED

Display Area: ERROR

Meaning: The device at address *nnnn* went through a UNIT CHECK and has returned sense data.

Recovery: Other explanatory messages are displayed. IOCP waits for the operator to correct this device problem, then IOCP continues.

107I DEVICE *nnnn* EQUIPMENT CHECK

Display Area: ERROR

Meaning: The device at address *nnnn* went through a UNIT CHECK and has returned sense data. IOCP has determined that the operator may be able to correct the EQUIPMENT CHECK.

Recovery: Other explanatory messages are displayed. IOCP waits for the operator to correct the device problem, then IOCP continues.

108I DEVICE *nnnn* READIED

Display Area: STATUS

Meaning: IOCP has received an interrupt from device *nnnn*, which previously required operator intervention.

Recovery: If the condition that caused the UNIT CHECK on device *nnnn* has been corrected, IOCP will continue to operate. The operator can terminate IOCP by using the console interrupt key if the problem cannot be corrected.

110I *nnnnnnnn nnnnnnnn nnnnnnnn*

Display Area: ERROR

Meaning: This is the sense data returned by a device that just went through a UNIT CHECK. IOCP displays this message in 24 hexadecimal digits.

Recovery: Other messages are displayed that apply to this malfunction. You can take appropriate recovery procedures from the device address and sense information displayed in the sequence of messages. Depending on the nature of the problem, IOCP may be terminated, or it may wait for you to intervene. If you intervene, IOCP continues.

111T DEVICE *nnnn* UNRECOVERABLE DATA CHK

Display Area: ERROR

Meaning: A data check has occurred and the error recovery procedure has failed.

Recovery: This is an unrecoverable error and IOCP is terminated. Clean the input tape and retry the operation. If the error persists, you must generate a new input file.

150T INVALID 1403 PRINT TRAIN

Display Area: ERROR

Meaning: An invalid or unsupported 1403 printing element has been specified on the QFOID screen.

Recovery: An internal IOCP failure has occurred; there is no user-recovery procedure. IOCP is terminated. Contact your local hardware service representative.

151T INVALID 3203 PRINT TRAIN

Display Area: ERROR

Meaning: An invalid or unsupported 3203 printing element was specified on the QFOID screen.

Recovery: An internal IOCP failure has occurred; there is no user-recovery procedure. IOCP is terminated. Contact your local hardware service representative.

152T INVALID 3211 PRINT TRAIN

Display Area: ERROR

Meaning: An invalid or unsupported 3211 print train element was specified on the QFOID screen.

Recovery: An internal IOCP failure has occurred; there is no user-recovery procedure. IOCP is terminated. Contact your local hardware service representative.

153T INVALID PRINTER TYPE

Display Area: ERROR

Meaning: An invalid or unsupported printer type was specified on the QFOID screen.

Recovery: An internal IOCP failure has occurred; there is no user-recovery procedure. IOCP is terminated. Contact your local hardware service representative.

200S ERROR READING INPUT

Display Area: ERROR

Meaning: IOCP has encountered an error while reading the source input record data set.

Recovery: The IOCP operation is terminated. Refer to message number 301I. Using message number 301I, check the source input record data set for invalid input. Restart the IOCP operation by reloading the source input record data set in the IOCP assigned reader device.

300E *cccc* **INVALID VERB:** *xxxxxxxx*

Display Area: ERROR

Meaning: An unrecognizable macro, *xxxxxxxx*, was found in the input data set at record number *cccc*. This often happens when new, previously unknown SYSGEN macros and control statements are encountered in the input.

Recovery: Review the input record data set for incorrect macro specifications and, if necessary, correct and resubmit the input for processing.

301I *nnnn* **RECORDS READ**

Display Area: STATUS

Meaning: This message helps you determine errors by supplying a count of the valid input data records read from the input record data set.

Recovery: This is an information message; no recovery necessary.

305E *cccc* **IODEVICE INVALID PARM** *mmmmmmmm*

Display Area: ERROR

Meaning: A parameter (*mmmmmmmm*) that is not known to the IODEVICE macro was found on an IODEVICE card. *cccc* is the number of the record that had the bad IODEVICE parameter.

Recovery: Review the input record data set for valid parameter specification and, if necessary, resubmit for processing.

314E *cccc* **NO PARMS FOUND ON DEVICE VERB**

Display Area: ERROR

Meaning: An IODEVICE macro card was processed, but it was found to not specify any parameters. *cccc* is the record number where IOCP detected the error.

Recovery: Review the input record data set for valid parameter specification and, if necessary, resubmit for processing.

315I PROCESSING STARTED

Display Area: STATUS

Meaning: This message tells you that the IOCP input has been completely "read" and that the syntax check and path validation has started. If a hard-copy printer is available, reports have been printed.

Recovery: This is an information message; no recovery necessary.

355T SCAN CURSOR EXCEEDED CARD END

Display Area: ERROR

Meaning: Because of an internal error, the cursor used for scanning input records has exceeded the end of a single record.

Recovery: An internal IOCP failure has occurred; there is no user-recovery procedure. IOCP is terminated. Contact your local hardware service representative.

405E *cccc xxxxxx* **INVALID PARM** *yyyyyy*

Display Area: ERROR

Meaning: An invalid parameter (*yyyyyy*) has been specified for the verb (*xxxxxx*) at input record *cccc*. If the parameter value is in error, IOCP assumes a default value appropriate for that parameter. If the parameter name specified is invalid, IOCP ignores the statement. IOCP then continues processing the source input record data set, starting with the next record that contains a valid verb.

Recovery: If necessary, correct the parameter term in the source input record data set and resubmit for processing.

406W *cccc* **PATH NOT SUPPORTED, IGNORED**

Display Area: ERROR

Meaning: IOCP has detected a PATH= parameter on an IODEVICE input data record.

Recovery: Preferred path processing is not supported on the 4381 Processors. This message is for your information only. No recovery is necessary.

407E *cccc* **DEV #***mmmm* **PREVIOUSLY DEFINED**

Display Area: ERROR

Meaning: An IODEVICE entry was found that had the same device number as a previous IODEVICE. This device was found on record *cccc* and the device number is *mmmm*.

Recovery: IOCP continues, using the first IODEVICE entry with the device number assigned and ignoring all others. Make sure that you selected the proper value.

408E *cccc* **CNTLUNIT DUAL RANGES** *yyyyyyyy*

Display Area: ERROR

Meaning: The CNTLUNIT macro contains overlapping device number ranges in the *yyyyyyyy* parameter on input record *cccc*.

Recovery: IOCP ignores the statement specifying this parameter and continues processing the input record data set, starting with the next statement containing a valid parameter. Supply the proper parameters and, if necessary, restart IOCP.

409E *cccc xxxxx* **CH 5 MODE MIX** *yyyy*

Display Area: ERROR

Meaning: IOCP has detected a mixture of byte and block mode specifications on channel 5 on input record number *cccc* of the *xxxxx* macro statement for the *yyyy* parameter.

Recovery: Supply the proper mode specification and resubmit the deck for processing, if necessary.

410T **UNKNOWN MODEL -** *nnnnnnnn*

Display Area: ERROR

Meaning: An unknown model group number was detected. *nnnnnnnn* is the unknown model group number.

Recovery: An internal IOCP failure occurred; there is no user-recovery procedure. IOCP is terminated. Contact your local hardware service representative.

415E *cccc xxxxxx* **MISSING PARM** *yyyyyy*

Display Area: ERROR

Meaning: The IOCP function has detected that the source input did not supply the parameter *yyyyyy* for verb *xxxxxx* at input record *cccc*. IOCP continues, but the resulting IOCDS will contain incomplete specifications.

Recovery: Correct the input record data set and restart IOCP.

419E **NATIVE DEV ADDR** *nnnn* **IS RESERVED**

Display Area: ERROR

Meaning: A native device with a unit address other than F2, F3, F4, F5, or FF was defined. Device number *nnnn* is invalidated.

Recovery: Review the input record data set for valid parameter assignment and, if necessary, resubmit the input data record set.

421W *cccc* **I/O DEVICE "TIMEOUT=N" IGNORED**

Display Area: ERROR

Meaning: IOCP processed an I/O device verb on input record *cccc*, and an attempt was made to disable the device timeout. This parameter is ignored on the 4381 Processors.

Recovery: This parameter is ignored on the 4381 Processors. This is an information message; no recovery necessary.

422E *cccc* **ADDRESS + CNT EXCEEDS X'FF'**

Display Area: ERROR

Meaning: The IOCP function processed an I/O device verb at input record *cccc* on which an initial address and number of desired devices were specified, in a combination which would cause the resulting generated address to exceed the physical maximum unit address of X'FF'.

Recovery: Devices are generated up through address X'FF' and processing continues. This message is for information only; no recovery is necessary.

423E *cccc* **UNITADD SUPERSEDED BY DEVNUMBR**

Display Area: ERROR

Meaning: An IODEVICE macro (card number cccc) was found to contain both a UNITADD parameter and a DEVNUMBR parameter. These parameters are mutually exclusive; the UNITADD parameter will be ignored. Processing continues using the DEVNUMBR parameter.

Recovery: Review the input record data set for valid parameter specification and, if necessary, resubmit for processing.

424E *cccc* **DUPLICATE DEVICE PARM** *mmmmmmmm*

Display Area: ERROR

Meaning: An IODEVICE macro (card number *cccc*) was found to contain more than one occurrence of the same parameter specification (*mmmmmmmm*). The first valid specification of the parameter, if any, will be used.

Recovery: Review the input record data set for valid parameter specification and, if necessary, resubmit for processing.

425E *cccc* **DUPLICATE CU #** *nnn*

Display Area: ERROR

Meaning: An IODEVICE macro card (number *cccc*) was processed, and found to specify the same control unit (*nnn*) more than once in the CUNUMBR argument. The second, or later occurrences of this control unit will be ignored.

Recovery: Review the input record data set for valid argument specification and, if necessary, resubmit for processing.

426W *cccc* **DEV NUMBER WRAPPED to '0000'X**

Display Area: ERROR

Meaning: An IODEVICE macro card (number *cccc*) was processed, which caused the device number to be incremented past 'FFFF'. The next device number generated was '0000'. If the count field specified that more devices are to be generated from this macro, the next device number after '0000' will be '0001', and so fourth.

Recovery: Review the input record data set for valid specification and, if necessary, resubmit for processing.

427E *cccc* **TOO MANY CHARACTERS FOR A CU**

Display Area: ERROR

Meaning: An IODEVICE macro card (number *cccc*) was processed, and the CUNUMBR section was found to contain a series of four or more characters where a control unit specification should have been. As control units are specified by at most three characters, this cannot be a control unit. Scanning of the CUNUMBR argument is halted, and only those control units that were specified before this error are retained. Processing of any remaining parameters on this card continues.

Recovery: Review the input record data set for valid argument specification and, if necessary, resubmit for processing.

428W *cccc* **EXTRANEOUS TEXT WITH** *xxxxxxxx*

Display Area: ERROR

Meaning: The IODEVICE card (number *cccc*) specified parameter *xxxxxxxx*, and that parameter contained text beyond the valid field positions. For example:

```
'...,CUNUMBR=(002)XYZ,...'
```

Recovery: IOCP processes all data within the valid value field; all other data is ignored. Make sure you specified the proper values.

430I *cccc* **CNTLUNIT 2ND** *xxxxxxxx* **IGNORED**

Display Area: ERROR

Meaning: Parameter *xxxxxxxx* on a CNTLUNIT data record at *cccc* has been defined more than once.

Recovery: IOCP accepts the first valid parameter entry; the second is ignored. Make sure that you selected the proper value.

431I *cccc* **CNTLUNIT XTRA TEXT W/** *xxxxxxxx*

Display Area: ERROR

Meaning: Parameter *xxxxxxxx* on a CNTLUNIT data record at *cccc* has data specified beyond the valid value field.

Recovery: IOCP processes all data within the valid value field; all other data is ignored. Make sure you selected the proper value.

432E *cccc* **CNTLUNIT PREVIOUSLY SPECIFIED**

Display Area: ERROR

Meaning: The control unit specified at input record *cccc* has already been specified on a previous data record.

Recovery: IOCP accepts the first valid input record for the control unit; all others are ignored. Make sure you selected the proper value.

433E *cccc* **CNTLUNIT CARDS EXCEED 256**

Display Area: ERROR

Meaning: More than the maximum number of control units have been specified at input record *cccc*.

Recovery: IOCP flags all subsequent control unit data records. Remove any additional control unit data records and, if necessary, resubmit for processing.

434E *cccc* **UNITADD + CNT EXCEEDS X'FF'**

Display Area: ERROR

Meaning: An invalid unit address has been defined; this resulted in a unit address greater than the maximum acceptable X'FF'.

Recovery: IOCP flags the UNITADD parameter as invalid, and IOCP does not process the specified control unit. Make sure you assigned the proper UNITADD value, and if necessary, resubmit the data record.

443E *cccc* **NMBR OF IODEVICES EXCEEDS 2048**

Display Area: ERROR

Meaning: More than 2048 devices were specified by the input deck. Only 2048 devices are allowed.

Recovery: Processing continues with IOCP using only the first 2048 device definitions. Review the input record data set for the correct number of device assignments and, if necessary, resubmit for processing.

480S UNABLE TO BUILD DATA SET

Display Area: ERROR

Meaning: IOCP is unable to generate an IOCDS on the support processor storage because of previously reported errors that occurred during data set generation.

Recovery: If possible, correct the flagged errors and resubmit the input record data set.

499I NO ERRORS DETECTED

Display Area: Printer Assigned for IOCP

Meaning: IOCP detected no errors during syntax checking and path validation. This message appears only on the hard-copy printer assigned to IOCP.

Recovery: This is an information message; no recovery necessary.

500R GOOD COMPLETION, SAVE DATA SET?

Display Area: STATUS

Meaning: IOCP detected no errors during input processing.

Recovery: You can now transfer the IOCDS from support processor to the diskette. IOCP waits for your action.

501R ERRORS DETECTED, SAVE DATA SET?

Display Area: STATUS

Meaning: IOCP detected errors during processing, but continues to store the IOCDs in support processor storage.

Recovery: IOCP will ask you if you want to save the data set. Examine the error messages and available configuration reports to make sure that the data set in support processor storage is valid.

502T EMPTY DATA SET, CANNOT BE SAVED

Display Area: STATUS

Meaning: IOCP has detected severe errors during processing. The resulting data set either has no valid control units or I/O devices specified, or a portion of the data set is empty or null.

Recovery: An internal IOCP failure occurred; there is no user-recovery procedure. IOCP is terminated. Contact your local hardware service representative.

504T DATA SET CANNOT BE SAVED

Display Area: STATUS

Meaning: A severe error has occurred during path validation, and as a result, the data set cannot be saved.

Recovery: Review the input data set to determine the cause of the severe errors. Then correct and resubmit the input data set.

550E *cccc* **ZERO LENGTH ARGUMENT**

Display Area: ERROR

Meaning: A parameter specified an argument with the equals sign (=), but IOCP found no argument. IOCP continues processing without an argument for this parameter; *cccc* is the record number where IOCP detected the error.

Recovery: Review the input data set record for valid argument assignment and, if necessary, resubmit the data set for processing.

551W *cccc* **WARNING: PARM** *mmmmmmmm* **HAS NO ARGUMENT**

Display Area: ERROR

Meaning: IOCP detected a parameter that did not specify an argument. IOCP continues processing without an argument for this parameter; *cccc* is the record number where IOCP detected the error. *mmmmmmmm* is the parameter with no argument.

Recovery: Review the input data set record for valid argument assignment and if, necessary, resubmit the data set.

552E *cccc* **UNCLOSED QUOTE OR PAREN**

Display Area: ERROR

Meaning: An opening quote or parenthesis was not closed before the logical end of record; *cccc* is the record number where IOCP detected the error.

Recovery: Review the input data set record for valid argument assignment and, if necessary, resubmit the data set.

553E *cccc* **TOO MANY RIGHT PARENTHESES**

Display Area: ERROR

Meaning: IOCP detected too many closing parentheses for the number of opening parentheses specified. IOCP terminates scanning the record; *cccc* is the record number where IOCP detected the error.

Recovery: Review the input data set record for valid argument assignment and, if necessary, resubmit the data set.

554E *cccc* **UNCLOSED LEFT PARENTHESIS**

Display Area: ERROR

Meaning: An argument was ended before all opening parentheses were closed. IOCP terminates scanning; *cccc* is the record number where IOCP detected the error.

Recovery: Review the input data set record for valid argument assignment and, if necessary, resubmit the data set.

555E *cccc* **UNEXPECTED END OF SOURCE**

Display Area: ERROR

Meaning: IOCP could not find a record following continuation specification; *cccc* is the record number with the continuation character.

Recovery: Review the input data set for proper continuation specification and, if necessary, resubmit the data set.

556E *cccc* **PARAMETER HAS ZERO LENGTH**

Display Area: ERROR

Meaning: IOCP has detected a parameter with zero length (successive commas). Scanning continues; *cccc* is the record number where IOCP detected the condition.

Recovery: Review the input data set record for valid parameter specification and, if necessary, resubmit the data set.

557W *cccc* **PARM TRUNCATED TO 8 CHARS**

Display Area: ERROR

Meaning: IOCP detected a parameter containing more than eight characters. IOCP continues scanning, using only the first eight characters; *cccc* is the record number where the error was detected.

Recovery: Review the input data set record for valid parameter specification and, if necessary, resubmit the data set.

558W *cccc* **DANGLING COMMA FOUND**

Display Area: ERROR

Meaning: The last character in the parameter list was a comma. This condition may indicate a missing parameter; *cccc* is the record number where the error was detected.

Recovery: Review the input record data set for valid parameter assignment and, if necessary, resubmit the data set.

559E *cccc* **TOO MANY CONTINUATION CARDS**

Display Area: ERROR

Meaning: IOCP allows you to code only ten continuation records per statement. IOCP processes a maximum of eleven records for each statement. Processing of the next statement starts with the next non-continuation record; *cccc* is the record number of the current statement.

Recovery: Review the input data set record for valid continuation specification and, if necessary, resubmit the data set.

560E *cccc* **ARGUMENT LENGTH OVER 720 CHARS**

Display Area: ERROR

Meaning: An argument on a parameter exceeded 720 characters. IOCP will process the first 720 characters, then continue scanning; *cccc* is the record number.

Recovery: Review the input data set record for valid argument assignment and, if necessary, resubmit the data set.

561W *cccc* **ONLY FIRST TEN PARMS SCANNED**

Display Area: ERROR

Meaning: IOCP encountered a statement with more than ten parameters. IOCP continues to scan, using the first ten parameters; the remainder are ignored. *cccc* is the record number.

Recovery: Review the input data set record for the proper number of parameters and, if necessary, resubmit the data set.

562E *cccc* **INVALID CONTINUATION CARD**

Display Area: ERROR

Meaning: IOCP found a record that contained a continuation character, but the record text did not extend to column 71 and the record text did not end with a comma. IOCP will not treat this record as a continuation record. IOCP treats the next record as the start of a new statement. *cccc* is the record number.

Recovery: Review the input data set record for proper continuation specification and, if necessary, resubmit the data set.

602E **CHPID** *nn* **IS MULTIPLY DEFINED**

Display Area: ERROR

Meaning: IOCP detected a CHPID number (nn) that was repeated in the input record data set.

Recovery: IOCP uses the parameters of the first definition found for this CHPID. Examine the error messages and any available configuration reports to ensure that the data set in support processor storage is valid.

603E CU '*nnn*': BAD PROTOCL FOR BYTE CHAN

Display Area: ERROR

Meaning: A BYTE CHPID was found in the input record data set on a control unit that is not specified as PROTOCL=D.

Recovery: IOCP invalidates the control unit. Examine the error messages and any available configuration reports to ensure that the data set in support processor storage valid.

604E CHPID *nn* IS NOT ALONE ON CU '*mmm*'

Display Area: ERROR

Meaning: IOCP has detected CHPID 00 or CHPID 05 in byte mode that was specified on a control unit with other CHPIDs. *nn* is the CHPID and *mmm* is the control unit number.

Recovery: IOCP invalidates the control unit. Examine the error messages and any available configuration reports to ensure that the data set in support processor storage is valid.

605E BLOCK/BYTE MISMATCH ON CU '*nnn*'

Display Area: ERROR

Meaning: IOCP has detected that all CHPIDS in a control unit entry were not specified as all block or all byte. *nnn* is the control unit number.

Recovery: IOCP invalidates the control unit. Examine the error messages and any available configuration reports to ensure that the data set in support processor storage is valid.

606T DEV *nn* ALREADY HAS 256 CUS:CU '*mmm*'

Display Area: ERROR

Meaning: IOCP has detected that more than 256 control units have specified a unit address of *nn*. *mmm* is the control unit number of the 257th control unit specified at unit address *nn*.

Recovery: An internal IOCP failure has occurred; there is no user-recovery procedure. IOCP is terminated. Contact your local hardware service representative.

607W WARNING: CHPID *nn* IS UNREFERENCED

Display Area: ERROR

Meaning: CHPID *nn* was defined, but never referenced by a control unit.

Recovery: This message is for information only; no recovery necessary.

608T PROTOCOL '*nnnn*'X BAD FOR CU #*mmmm*

Display Area: ERROR

Meaning: The protocol field for CU entry number *mmmm* was neither '0001'X nor '0002'X. Its value was '*nnnn*'X.

Recovery: An internal IOCP failure has occurred; there is no user-recovery procedure. IOCP is terminated. Contact your local hardware service representative.

609T NO CHPIDS FOUND ON CU #*nnnn*

Display Area: ERROR

Meaning: A control unit entry did not specify any CHPIDS. *nnnn* is the number of the control unit entry.

Recovery: An internal IOCP failure has occurred; there is no user-recovery procedure. IOCP is terminated. Contact your local hardware service representative.

610E UNKNOWN CHPID *nn* ON CU '*mmm*'

Display Area: ERROR

Meaning: The control unit entry for control unit number *mmm* has specified an unknown CHPID number *nn*. IOCP invalidates this CHPID. If all the CHPIDS on this control unit are invalidated, IOCP invalidates the control unit.

Recovery: Examine the error messages and available configuration reports to ensure that the data set in support processor storage is valid.

611T CU OF '*nnnnnn*'X IS BAD FOR CU #*mmmm*

Display Area: ERROR

Meaning: The control unit number field in the control unit pool table is in error. '*nnnnnn*'X is the hexadecimal value of the control unit number field in error. *mmmm* is the entry number with this value.

Recovery: An internal IOCP failure has occurred; there is no user-recovery procedure. IOCP is terminated. Contact your local hardware service representative.

612T VPM OF '*nn*'X IS BAD FOR CU #*mmmm*

Display Area: ERROR

Meaning: The VPM field on a control unit pool entry is in error. '*nn*'X is the hexadecimal value of the VPM field and *mmmm* is the number of the control unit pool entry.

Recovery: An internal IOCP failure has occurred; there is no user-recovery procedure. IOCP is terminated. Contact your local hardware service representative.

613T BAD CHPID REF '*nnnn*'X ON CU #*mmmm*

Display Area: ERROR

Meaning: A CHPID field on a control unit pool entry is invalid. '*nnnn*'X is the invalid hex value of the CHPID field and *mmmm* is the number of the control unit pool entry.

Recovery: An internal IOCP failure has occurred; there is no user-recovery procedure. IOCP is terminated. Contact your local hardware service representative.

614T BAD CHPID REF *nnnn* ON CU #*mmmm-ss*

Display Area: ERROR

Meaning: A CHPID field on a control unit pool entry points beyond the end of the CHPID table. *nnnn* is the value of the CHPID field; *mmmm* is the number of the control unit pool entry; *ss* indicates which of the four CHPID fields had this reference.

Recovery: An internal IOCP failure has occurred; there is no user-recovery procedure. IOCP is terminated. Contact your local hardware service representative.

615T BAD VAL OF '*nnnn*'X FOR CHPID #*mmmm*

Display Area: ERROR

Meaning: A CHPID field specified a CHPID with a value that does not match the corresponding entry in the CHPID table. '*nnnn*'X is the hexadecimal value of the invalid CHPID table entry and *mmmm* is the entry number in the CHPID table.

Recovery: An internal IOCP failure has occurred; there is no user-recovery procedure. IOCP is terminated. Contact your local hardware service representative.

616T LOGICAL ENTRY MISSING FOR CU #*mmmm*

Display Area: ERROR

Meaning: IOCP could not find control unit pool entry *mmmm*.

Recovery: An internal IOCP failure has occurred; there is no user-recovery procedure. IOCP is terminated. Contact your local hardware service representative.

617T BAD VAL '*nnnn*'X IN UL:CU=*mmmm* #*sss*

Display Area: ERROR

Meaning: IOCP found an invalid value in the unit list. '*nnnn*'X is the hexadecimal value of the invalid unit in the list; *mmmm* is the number of the control unit pool entry; *sss* is the number of the entry in the unit list.

Recovery: An internal IOCP failure has occurred; there is no user-recovery procedure. IOCP is terminated. Contact your local hardware service representative.

618T BAD TABLE LEN. OF *nnnn* FOR CU=*mmmm*

Display Area: ERROR

Meaning: The length specified for the unit list table is invalid. *nnnn* is the invalid length specified and *mmmm* is the number of the control unit pool entry.

Recovery: An internal IOCP failure has occurred; there is no user-recovery procedure. IOCP is terminated. Contact your local hardware service representative.

619T USP IN ERROR ON CU #*nnnn*

Display Area: ERROR

Meaning: IOCP found the unit-string pointer of a control unit pool entry not initialized. *nnnn* is the number of the control unit pool entry.

Recovery: An internal IOCP failure has occurred; there is no user-recovery procedure. IOCP is terminated. Contact your local hardware service representative.

620T BAD REF TO CU=*nnnn* FROM SUBC #*mmmm*

Display Area: ERROR

Meaning: A reference to an out of range control unit entry was made from an entry in device pool entry. *nnnn* is the out of range reference and *mmmm* is the number of the device pool entry.

Recovery: An internal IOCP failure occurred; there is no user-recovery procedure. IOCP is terminated. Contact your local hardware service representative.

621E DEVICE *nnnn* SPECIFIES CU '*mmm*', BUT C.U. DOES NOT SPECIFY DEVICE

Display Area: ERROR

Meaning: A device specifies a control unit, but the control unit does not specify that device in its list of units. *nnnn* is the device number and *mmm* is the number of the specified control unit. The control unit will not be connected to this I/O device.

Recovery: Examine the error messages and any available configuration reports to ensure that the data set in support processor storage is valid.

622E MORE THAN 4 CHPIDS ON *nnnn*:CU '*mmm*'

Display Area: ERROR

Meaning: More than four CHPIDS are specified for device *nnnn* with *mmm* being the control unit number that specified the additional CHPIDs. All CHPIDs from control unit *mmm* will be ignored.

Recovery: Examine the error messages and any available configuration reports to ensure that the data set in support processor storage is valid.

623T BAD UNIT '*nnnn*'X ON SUBCTBL #*mmmm*

Display Area: ERROR

Meaning: The unit address field on a device pool entry is invalid. '*nnnn*'X is the hexadecimal value of the invalid unit address field and *mmmm* is the number of the device pool entry. IOCP is halted.

Recovery: An internal IOCP failure occurred; there is no user-recovery procedure. IOCP is terminated. Contact your local hardware service representative.

624E PROTOCOL MISMATCH FOR DEVICE *nnnn*

Display Area: ERROR

Meaning: A device has several control unit entries but the control units do not specify the same protocol. IOCP uses only those control units that match the first valid control unit's characteristics. *nnnn* is the device number.

Recovery: Examine the error messages and any available configuration reports to ensure that the data set in support processor storage is valid.

625E UNITADD '*nn*' ON CU '*mmm*' NOT DEFINED

Display Area: ERROR

Meaning: A control unit specified a unit address *nn* that was not defined. *mmm* is the control unit number.

Recovery: Examine the error messages and any available configuration reports to ensure that the data set is valid.

627T CU SEQ '*nn*'X IS BAD ON SUBC #*mmmm*

Display Area: ERROR

Meaning: A device pool entry contains an invalid sequence of valid control units. '*nn*'X is the hexadecimal value of the invalid sequence and *mmmm* is the number of the device pool entry.

Recovery: An internal IOCP failure occurred; there is no user-recovery procedure. IOCP is terminated. Contact your local hardware service representative.

628E **CU '*nnn*' SPECIFIES UNITADD *mm*, BUT UNITADD DOES NOT SPECIFY CU**

Display Area: ERROR

Meaning: A control unit (*nnn*) specified a unit address (*mm*), but no devices with that unit address specify this control unit.

Recovery: Examine the error messages and any available configuration reports to ensure that the data set in support processor storage is valid.

629E **CU TYPE MISMATCH ON DEVICE *mmmm***

Display Area: ERROR

Meaning: The control units on an I/O device entry were not all matched regarding the SHARED parameter. IOCP uses only the control units that match the first valid control unit's characteristics. *mmmm* is the device number.

Recovery: Examine the error messages and any available configuration reports to ensure the data set is valid.

630E **MULTIPLE REFERENCES TO UNITADD *nn*: FROM CHANNEL *mm* ; CHPID *ss* ON CONTROL UNIT '*ttt*' ON DEVICE *rrrr***

Display Area: ERROR

Meaning: Duplicate device address found on a channel path. *nn* is the unit address of the device; *ss* is the CHPID; and *mm* is the channel that corresponds to it. *ttt* is the control unit specifying CHPID *ss*, and *rrrr* is the device number. IOCP ignores the CHPID for this IODEVICE entry and all other CHPIDs on control unit '*ttt*'.

Recovery: Examine the error messages and any available configuration reports to ensure that the data set in support processor storage is valid.

631T **DEV '*nnnnnnnn*'X IS BAD:SUBC #*mmmm***

Display Area: ERROR

Meaning: The device number field of a device pool entry contains invalid characters. '*nnnnnnnn*'X is the hexadecimal value of the invalid field and *mmmm* is the number of the device pool entry field.

Recovery: An internal IOCP failure occurred; there is no user-recovery procedure. IOCP is terminated. Contact your local hardware service representative.

632E UNKNOWN CU '*nnn*' ON DEVICE *mmmm*

Display Area: ERROR

Meaning: A device entry specified an undefined control unit. '*nnn*' is the number of the missing control unit and *mmmm* is the device number. IOCP ignores this control unit entry.

Recovery: Examine the error messages and any available configuration reports to ensure that the data set in support processor storage is valid.

633W WARNING: CU '*nnn*' IS UNREFERENCED

Display Area: ERROR

Meaning: A control unit (*nnn*) was defined that was not referenced by any device entry.

Recovery: Examine the error messages and any available configuration reports to ensure that the data set in support processor storage is valid.

634W WARNING: DEVICE #00FF NOT DEFINED

Display Area: ERROR

Meaning: The unit address 'FF' was not defined on channel zero. It must be defined if F2, F3, F4, or F5 are defined for native consoles.

Recovery: This message is for information only; no recovery necessary.

635W WARNING: NO CONSOLES ARE DEFINED

Display Area: ERROR

Meaning: A console has not been defined. One of these addresses (F2, F3, F4, or F5) on channel zero must be assigned if the native console devices are to be used.

Recovery: This message is for information only; no recovery necessary.

636E CHPID *nn* IS NOT ALONE ON DEV #*mmmm*

Display Area: ERROR

Meaning: A CHPID representing byte channel 0 (or 5 if assigned) is not the only CHPID specified on an IODEVICE entry. *mmmm* is the number of the input record where the error was detected. IOCP will ignore this CHPID.

Recovery: Examine the error messages and any available configuration reports to ensure that the data set in support processor storage is valid.

637E IGNORING CHPID *nn* ON DEVICE #*mmmm*

Display Area: ERROR

Meaning: A CHPID representing byte channel 0 (or channel 5 if assigned) was already assigned as the first CHPID on an IODEVICE entry. This CHPID should be the only one assigned; IOCP will ignore all other CHPIDs. *nn* is the CHPID IOCP will ignore and *mmmm* is the device number where the error was found.

Recovery: This message is for information only; no recovery necessary.

638E BLOCK/BYTE MISMATCH ON DEV #*mmmm*

Display Area: ERROR

Meaning: Both BLOCK and BYTE CHPIDs are specified on device *mmmm*. IOCP will only use the CHPID that matches the first valid control unit's CHPID type.

Recovery: Review the input record data set for valid parameter assignment and, if necessary, resubmit the data set for processing.

639E WRONG CU TYPE FOR NATIVE DEV *nnnn*

Display Area: ERROR

Meaning: A native device was defined on other than a type-1 control unit. *nnnn* is the device number where the error was found. The device is deleted.

Recovery: Review the input record data set for valid parameter assignment and, if necessary, resubmit the data set for processing.

640E CU '*nnn*' USE IS RESERVED; DEV *mmmm*

Display Area: ERROR

Meaning: A non-native device was assigned to a control unit previously assigned as a native device control unit. *nnn* is the control unit number and *mmmm* is the device number. IOCP ignores the control unit for this device.

Recovery: Review the input record data set for valid parameter assignment and, if necessary, resubmit the data set for processing.

641E NATIVE DEV *nnnn* NOT ON CU '*mmm*'

Display Area: ERROR

Meaning: A native device assignment was found on a different control unit than one previously assigned for native devices. *nnnn* is the device number of the invalid native device. The device is deleted.

Recovery: Review the input record data set for valid parameter assignment and, if necessary, resubmit the data set for processing.

642E CU '*nnn*' ALREADY USED, NATIVE DEV *mmmm*

Display Area: ERROR

Meaning: A native device was assigned to a control unit that was previously assigned as a non-native device control unit. *nnn* is the control unit number and *mmmm* is the device number. The device is deleted.

Recovery: Review the input record data set for valid parameter assignment and, if necessary, resubmit the data set for processing.

643S DEV #00FF NOT DEFINED WITH CONSOLES

Display Area: ERROR

Meaning: Although consoles were defined, a unit address of **FF** was not defined on channel zero.

Recovery: IOCP continues processing and will report any other errors but will not permit the user to save the data set. Correct the input record data set, and rerun IOCP.

700T MEMORY OVERFLOW!

Display Area: ERROR

Meaning: More memory was needed than was allocated for logical control unit group processing.

Recovery: An internal IOCP failure has occurred; there is no user-recovery procedure. IOCP is terminated. Contact your local hardware service representative.

701T LCU *nnnn* HAS OVER 256 DEVICES; DEV *mmmm*

Display Area: ERROR

Meaning: More than 256 devices were assigned to logical control unit group *nnnn*. Device number *mmmm* was the 257th device that was attempted to be added to the group.

Recovery: An internal IOCP failure has occurred; there is no user-recovery procedure. IOCP is terminated. Contact your local hardware service representative.

702T OVER 2048 LCU'S DETECTED

Display Area: ERROR

Meaning: More than 2048 logical control unit groups were generated.

Recovery: An internal IOCP failure has occurred; there is no user-recovery procedure. IOCP is terminated. Contact your local hardware service representative.

800I CHPID SUMMARY REPORT STARTED

Display Area: STATUS

Meaning: The channel path identifier report is printing on the IOCP assigned printer.

Recovery: This is an information message; no recovery necessary.

801I DEVICE I/O CONFIG. REPORT STARTED

Display Area: STATUS

Meaning: The input/output configuration report is printing on the IOCP assigned printer.

Recovery: This is an information message; no recovery necessary.

802I CHPID CONFIGURATION REPORT STARTED

Display Area: STATUS

Meaning: The channel path ID configuration report is printing on the IOCP assigned printer.

Recovery: This is an information message; no recovery necessary.

804T PRINTER IS NOT OPERATIONAL

Display Area: ERROR

Meaning: The IOCP assigned printer is not in operation.

Recovery: IOCP is terminated. You must clear the cause of the non-operational status at the printer, reload the input data records, and have the printer made ready before you can restart IOCP.

810I INPUT IMAGE REPORT STARTED

Display Area: STATUS

Meaning: IOCP displays this message when the program begins to compile the configuration report.

Recovery: This is an information message; no recovery necessary.

811I LOGICAL CONTROL UNIT REPORT STARTED

Display Area: STATUS

Meaning: The logical control unit report is printing on the IOCP assigned printer.

Recovery: This is an information message; no recovery necessary.

900I PAGE NUMBER *nnnn* IS NOW PRINTING

Display Area: STATUS

Meaning: This message tells you the page number (*nnnn*) of the report that is currently being printed. It is displayed for each five pages of the report.

Recovery: This is an information message; no recovery necessary.

999I UNKNOWN MSG #'*nnn*'

Display Area: STATUS

Meaning: An invalid message number *nnn* has been passed to the IOCP message handler.

Recovery: An internal IOCP failure occurred; there is no user-recovery procedure. IOCP is terminated. Contact your local hardware service representative.

Appendix A. 4381 Uniprocessor Input Example Listing

The following listing is an example of a valid I/O configuration for 4381 uniprocessors. The report examples in Chapter 4, "IOCP Output" were extracted from a run of this deck.

Note: *See Chapter 4, "IOCP Output" on page 4-1 for examples of the other reports that IOCP produces.*

```
IOCP VERSION 001              LEVEL 000                  INPUT RECORDS
IOCP RUN ON 12-07-83 AT 11.30                        PAGE NUMBER     1

NUMBR| RECORD
_____|....+....1....+....2....+....3....+....4....+....5....+....6....+....7.C..+....8
    1|* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
    2|*
    3•         ID    MSG1='THIS IS A SAMPLE CONFIGURATION FOR A 4381 UNIPROCESSOR'
    4|
    5|* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
    6|*
    7|CH0       CHPID PATH=((00,0)),TYPE=BY
    8|CH1       CHPID PATH=((01,1)),TYPE=BL
    9|CH2       CHPID PATH=((02,2)),TYPE=BL
   10|CH3       CHPID PATH=((03,3)),TYPE=BL
   11|CH4       CHPID PATH=((04,4)),TYPE=BL
   12|CH5       CHPID PATH=((05,5)),TYPE=BL
   13|CH6       CHPID PATH=((06,6)),TYPE=BL
   14|CH7       CHPID PATH=((07,7)),TYPE=BL
   15|CH8       CHPID PATH=((08,8)),TYPE=BL
   16|CH9       CHPID PATH=((09,9)),TYPE=BL
   17|CHA       CHPID PATH=((0A,A)),TYPE=BL
   18|CHB       CHPID PATH=((0B,B)),TYPE=BL
   19|
   20|* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
   21|*
   22|* ---- SYSTEM CONSOLE   ---------------------------------------------
   23|*
   24|CU0FF     CNTLUNIT CUNUMBR=0FF,PATH=(00),PROTOCL=D,SHARED=N,            X
   25|               UNITADD=((F2,4),(FF,1)),UNIT=3274
   26|D0F2-4 IODEVICE ADDRESS=(0F2,3),CUNUMBR=(0FF),UNIT=3278,DEVNUMBR=00F2
   27|D0F5   IODEVICE ADDRESS=(0F5,1),CUNUMBR=(0FF),UNIT=3286,DEVNUMBR=00F5
   28|D0FF   IODEVICE ADDRESS=(0FF,1),CUNUMBR=(0FF),UNIT=3274,DEVNUMBR=00FF
   29|
   30|* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
   31|*
   32|* ---- 2501 CARD READER ----------------------------------------------
   33|CU001     CNTLUNIT CUNUMBR=001,PATH=(00),PROTOCL=D,SHARED=N,            X
   34|               UNITADD=((0A,1)),UNIT=2501
   35|D00A   IODEVICE ADDRESS=(00A,1),CUNUMBR=(001),UNIT=2501,DEVNUMBR=000A
   36|
   37|* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
   38|*
   39|* ---- 2821 - 2540 - 1403 -----------------------------------------
   40|CU002     CNTLUNIT CUNUMBR=002,PATH=(00),PROTOCL=D,SHARED=N,            X
   41|               UNITADD=((0C,3)),UNIT=2821
   42|D00C   IODEVICE ADDRESS=(00C,1),CUNUMBR=(002),UNIT=2540R,DEVNUMBR=000C
   43|D00D   IODEVICE ADDRESS=(00D,1),CUNUMBR=(002),UNIT=2540P,DEVNUMBR=000D
   44|D00E   IODEVICE ADDRESS=(00E,1),CUNUMBR=(002),UNIT=1403,DEVNUMBR=000E
   45|
   46|* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
   47|*
   48|* ---- 3705            ---------------------------------------------
   49|CU003     CNTLUNIT CUNUMBR=003,PATH=(00),PROTOCL=D,SHARED=N,            X
   50|               UNITADD=((20,1)),UNIT=3705
   51|D020   IODEVICE ADDRESS=(020,1),CUNUMBR=(003),UNIT=3705,DEVNUMBR=0020
   52|
   53|* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
   54|*
   55|* ---- LOCAL TERMINALS  ---------------------------------------------
```

Figure A-1 (Part 1 of 8). 4381 Uniprocessor Input Example Listing

```
IOCP VERSION 001              LEVEL 000                 INPUT RECORDS
IOCP RUN ON 12-07-83 AT 11.30                        PAGE NUMBER     2

NUMBR| RECORD
_____|....+....1....+....2....+....3....+....4....+....5....+....6....+....7.C..+....8
   56|CU004    CNTLUNIT CUNUMBR=004,PATH=(00),PROTOCL=D,SHARED=N,            X
   57|               UNITADD=(30,16),UNIT=3274
   58|D030S  IODEVICE ADDRESS=(030,16),CUNUMBR=(004),UNIT=3278,DEVNUMBR=0030
   59|
   60|* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
   61|*
   62|* ---- CH01 TAPES       ------------------------------------------
   63|CU005    CNTLUNIT CUNUMBR=005,PATH=(01),PROTOCL=D,SHARED=Y,            X
   64|               UNITADD=((80,8)),UNIT=3803
   65|D180   IODEVICE ADDRESS=(180,1),CUNUMBR=(005),UNIT=8809,DEVNUMBR=0180
   66|D181   IODEVICE ADDRESS=(181,1),CUNUMBR=(005),UNIT=3420,DEVNUMBR=0181
   67|D182-7 IODEVICE ADDRESS=(182,6),CUNUMBR=(005),UNIT=3420,DEVNUMBR=0182
   68|
   69|* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
   70|*
   71|* ---- CH02 TAPES       ------------------------------------------
   72|CU006    CNTLUNIT CUNUMBR=006,PATH=(02),PROTOCL=D,SHARED=Y,            X
   73|               UNITADD=((80,8)),UNIT=3803
   74|D280   IODEVICE ADDRESS=(280,1),CUNUMBR=(006),UNIT=8809,DEVNUMBR=0280
   75|D281   IODEVICE ADDRESS=(281,1),CUNUMBR=(006),UNIT=3420,DEVNUMBR=0281
   76|D282-7 IODEVICE ADDRESS=(282,6),CUNUMBR=(006),UNIT=3420,DEVNUMBR=0282
   77|
   78|* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
   79|*
   80|* ---- CH03 TAPES       ------------------------------------------
   81|CU007    CNTLUNIT CUNUMBR=007,PATH=(03),PROTOCL=D,SHARED=Y,            X
   82|               UNITADD=((80,8)),UNIT=3803
   83|D380   IODEVICE ADDRESS=(380,1),CUNUMBR=(007),UNIT=8809,DEVNUMBR=0380
   84|D381   IODEVICE ADDRESS=(381,1),CUNUMBR=(007),UNIT=3420,DEVNUMBR=0381
   85|D382-7 IODEVICE ADDRESS=(382,6),CUNUMBR=(007),UNIT=3420,DEVNUMBR=0382
   86|
   87|* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
   88|*
   89|* ---- CH04 TAPES       ------------------------------------------
   90|CU008    CNTLUNIT CUNUMBR=008,PATH=(04),PROTOCL=D,SHARED=Y,            X
   91|               UNITADD=((80,8)),UNIT=3803
   92|D480   IODEVICE ADDRESS=(480,1),CUNUMBR=(008),UNIT=8809,DEVNUMBR=0480
   93|D481   IODEVICE ADDRESS=(481,1),CUNUMBR=(008),UNIT=3420,DEVNUMBR=0481
   94|D482-7 IODEVICE ADDRESS=(482,6),CUNUMBR=(008),UNIT=3420,DEVNUMBR=0482
   95|
   96|* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
   97|*
   98|* ---- CH05 TAPES       ------------------------------------------
   99|CU009    CNTLUNIT CUNUMBR=009,PATH=(05),PROTOCL=D,SHARED=Y,            X
  100|               UNITADD=((80,8)),UNIT=3803
  101|D580   IODEVICE ADDRESS=(580,1),CUNUMBR=(009),UNIT=8809,DEVNUMBR=0580
  102|D581   IODEVICE ADDRESS=(581,1),CUNUMBR=(009),UNIT=3420,DEVNUMBR=0581
  103|D582-7 IODEVICE ADDRESS=(582,6),CUNUMBR=(009),UNIT=3420,DEVNUMBR=0582
  104|
  105|* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
  106|*
  107|* ---- CH06 TAPES       ------------------------------------------
  108|CU010    CNTLUNIT CUNUMBR=010,PATH=(06),PROTOCL=D,SHARED=Y,            X
  109|               UNITADD=((80,8)),UNIT=3803
  110|D680   IODEVICE ADDRESS=(680,1),CUNUMBR=(010),UNIT=8809,DEVNUMBR=0680
```

Figure A-1 (Part 2 of 8). 4381 Uniprocessor Input Example Listing

```
IOCP VERSION 001              LEVEL 000                  INPUT RECORDS
IOCP RUN ON 12-07-83 AT 11.30                        PAGE NUMBER     3

NUMBR| RECORD
_____|....+....1....+....2....+....3....+....4....+....5....+....6....+....7.C..+....8
  111|D681    IODEVICE ADDRESS=(681,1),CUNUMBR=(010),UNIT=3420,DEVNUMBR=0681
  112|D682-7  IODEVICE ADDRESS=(682,6),CUNUMBR=(010),UNIT=3420,DEVNUMBR=0682
  113|
  114|* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
  115|*
  116|* ---- CH07 TAPES       ---------------------------------------------
  117|CU011     CNTLUNIT CUNUMBR=011,PATH=(07),PROTOCL=D,SHARED=Y,            X
  118|                UNITADD=((80,8)),UNIT=3803
  119|D780    IODEVICE ADDRESS=(780,1),CUNUMBR=(011),UNIT=8809,DEVNUMBR=0780
  120|D781    IODEVICE ADDRESS=(781,1),CUNUMBR=(011),UNIT=3420,DEVNUMBR=0781
  121|D782-7  IODEVICE ADDRESS=(782,6),CUNUMBR=(011),UNIT=3420,DEVNUMBR=0782
  122|
  123|* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
  124|*
  125|* ---- CH08 TAPES       ---------------------------------------------
  126|CU012     CNTLUNIT CUNUMBR=012,PATH=(08),PROTOCL=D,SHARED=Y,            X
  127|                UNITADD=((80,8)),UNIT=3803
  128|D880    IODEVICE ADDRESS=(880,1),CUNUMBR=(012),UNIT=8809,DEVNUMBR=0880
  129|D881    IODEVICE ADDRESS=(881,1),CUNUMBR=(012),UNIT=3420,DEVNUMBR=0881
  130|D882-7  IODEVICE ADDRESS=(882,6),CUNUMBR=(012),UNIT=3420,DEVNUMBR=0882
  131|
  132|* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
  133|*
  134|* ---- CH9 TAPES        ---------------------------------------------
  135|CU13      CNTLUNIT CUNUMBR=013,PATH=(09),PROTOCL=D,SHARED=Y,            X
  136|                UNITADD=((80,8)),UNIT=3803
  137|D980    IODEVICE ADDRESS=(980,1),CUNUMBR=(013),UNIT=8809,DEVNUMBR=0980
  138|D981    IODEVICE ADDRESS=(981,1),CUNUMBR=(013),UNIT=3420,DEVNUMBR=0981
  139|D982-7  IODEVICE ADDRESS=(982,6),CUNUMBR=(013),UNIT=3420,DEVNUMBR=0982
  140|
  141|* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
  142|*
  143|* ---- CHA TAPES        ---------------------------------------------
  144|CU14      CNTLUNIT CUNUMBR=014,PATH=(0A),PROTOCL=D,SHARED=Y,            X
  145|                UNITADD=((80,8)),UNIT=3803
  146|DA80    IODEVICE ADDRESS=(A80,1),CUNUMBR=(014),UNIT=8809,DEVNUMBR=0A80
  147|DA81    IODEVICE ADDRESS=(A81,1),CUNUMBR=(014),UNIT=3420,DEVNUMBR=0A81
  148|DA82-7  IODEVICE ADDRESS=(A82,6),CUNUMBR=(014),UNIT=3420,DEVNUMBR=0A82
  149|
  150|* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
  151|*
  152|* ---- CHB TAPES        ---------------------------------------------
  153|CU15      CNTLUNIT CUNUMBR=015,PATH=(0B),PROTOCL=D,SHARED=Y,            X
  154|                UNITADD=((80,8)),UNIT=3803
  155|DB80    IODEVICE ADDRESS=(B80,1),CUNUMBR=(015),UNIT=8809,DEVNUMBR=0B80
  156|DB81    IODEVICE ADDRESS=(B81,1),CUNUMBR=(015),UNIT=3420,DEVNUMBR=0B81
  157|DB82-7  IODEVICE ADDRESS=(B82,6),CUNUMBR=(015),UNIT=3420,DEVNUMBR=0B82
  158|
  159|* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
  160|*
  161|* ---- CH01 DASD        ---------------------------------------------
  162|*
  163|* ---- 3880 - 3370 ----------------------------------------------------
  164|CU016     CNTLUNIT CUNUMBR=016,PATH=(01),PROTOCL=D,SHARED=N,            X
  165|                UNITADD=((40,8)),UNIT=3880
```

Figure A-1 (Part 3 of 8). 4381 Uniprocessor Input Example Listing

```
IOCP VERSION 001              LEVEL 000                  INPUT RECORDS
IOCP RUN ON 12-07-83 AT 11.30                       PAGE NUMBER     4

NUMBR| RECORD
_____|....+....1....+....2....+....3....+....4....+....5....+....6....+....7.C..+....8
  166|D140-8 IODEVICE ADDRESS=(140,8),CUNUMBR=(016),UNIT=3370,DEVNUMBR=0140
  167|*
  168|* ---- 3880 - 3380 ------------------------------------------------
  169|CU017    CNTLUNIT CUNUMBR=017,PATH=(01),PROTOCL=S,SHARED=N,           X
  170|               UNITADD=((A0,8)),UNIT=3880
  171|D1A0-8 IODEVICE ADDRESS=(1A0,8),CUNUMBR=(017),UNIT=3380,DEVNUMBR=01A0
  172|*
  173|* ---- 3880 - 3350 ------------------------------------------------
  174|CU018    CNTLUNIT CUNUMBR=018,PATH=(01),PROTOCL=D,SHARED=N,           X
  175|               UNITADD=((B0,8)),UNIT=3880
  176|D1B0-8 IODEVICE ADDRESS=(1B0,8),CUNUMBR=(018),UNIT=3350,DEVNUMBR=01B0
  177|*
  178|* ---- 3830 - 3344 ------------------------------------------------
  179|CU019    CNTLUNIT CUNUMBR=019,PATH=(01),PROTOCL=D,SHARED=N,           X
  180|               UNITADD=((C0,8)),UNIT=3830
  181|D1C0-8 IODEVICE ADDRESS=(1C0,8),CUNUMBR=(019),UNIT=3344,DEVNUMBR=01C0
  182|
  183|* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
  184|*
  185|* ---- CH02 DASD       ---------------------------------------------
  186|*
  187|* ---- 3880 - 3370 ------------------------------------------------
  188|CU020    CNTLUNIT CUNUMBR=020,PATH=(02),PROTOCL=D,SHARED=N,           X
  189|               UNITADD=((40,8)),UNIT=3880
  190|D240-8 IODEVICE ADDRESS=(240,8),CUNUMBR=(020),UNIT=3370,DEVNUMBR=0240
  191|*
  192|* ---- 3880 - 3380 ------------------------------------------------
  193|CU021    CNTLUNIT CUNUMBR=021,PATH=(02),PROTOCL=S,SHARED=N,           X
  194|               UNITADD=((A0,8)),UNIT=3880
  195|D2A0-8 IODEVICE ADDRESS=(2A0,8),CUNUMBR=(021),UNIT=3380,DEVNUMBR=02A0
  196|*
  197|* ---- 3880 - 3350 ------------------------------------------------
  198|CU022    CNTLUNIT CUNUMBR=022,PATH=(02),PROTOCL=D,SHARED=N,           X
  199|               UNITADD=((B0,8)),UNIT=3880
  200|D2B0-8 IODEVICE ADDRESS=(2B0,8),CUNUMBR=(022),UNIT=3350,DEVNUMBR=02B0
  201|*
  202|* ---- 3830 - 3344 ------------------------------------------------
  203|CU023    CNTLUNIT CUNUMBR=023,PATH=(02),PROTOCL=D,SHARED=N,           X
  204|               UNITADD=((C0,8)),UNIT=3830
  205|D2C0-8 IODEVICE ADDRESS=(2C0,8),CUNUMBR=(023),UNIT=3344,DEVNUMBR=02C0
  206|
  207|* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
  208|*
  209|* ---- CH03 DASD       ---------------------------------------------
  210|*
  211|* ---- 3880 - 3370 ------------------------------------------------
  212|CU024    CNTLUNIT CUNUMBR=024,PATH=(03),PROTOCL=D,SHARED=N,           X
  213|               UNITADD=((40,8)),UNIT=3880
  214|D340-8 IODEVICE ADDRESS=(340,8),CUNUMBR=(024),UNIT=3370,DEVNUMBR=0340
  215|*
  216|* ---- 3880 - 3380 ------------------------------------------------
  217|CU025    CNTLUNIT CUNUMBR=025,PATH=(03),PROTOCL=S,SHARED=N,           X
  218|               UNITADD=((A0,8)),UNIT=3880
  219|D3A0-8 IODEVICE ADDRESS=(3A0,8),CUNUMBR=(025),UNIT=3380,DEVNUMBR=03A0
  220|*
```

Figure A-1 (Part 4 of 8). 4381 Uniprocessor Input Example Listing

```
IOCP VERSION 001              LEVEL 000                INPUT RECORDS
IOCP RUN ON 12-07-83 AT 11.30                        PAGE NUMBER     5

NUMBR| RECORD
_____|....+....1....+....2....+....3....+....4....+....5....+....6....+....7.C..+....8
  221|* ---- 3880 - 3350 ------------------------------------------------------
  222|CU026    CNTLUNIT CUNUMBR=026,PATH=(03),PROTOCL=D,SHARED=N,            X
  223|               UNITADD=((B0,8)),UNIT=3880
  224|D3B0-8 IODEVICE ADDRESS=(3B0,8),CUNUMBR=(026),UNIT=3350,DEVNUMBR=03B0
  225|*
  226|* ---- 3830 - 3344 ------------------------------------------------------
  227|CU027    CNTLUNIT CUNUMBR=027,PATH=(03),PROTOCL=D,SHARED=N,            X
  228|               UNITADD=((C0,8)),UNIT=3830
  229|D3C0-8 IODEVICE ADDRESS=(3C0,8),CUNUMBR=(027),UNIT=3344,DEVNUMBR=03C0
  230|
  231|* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
  232|*
  233|* ---- CH04 DASD        ------------------------------------------------
  234|*
  235|* ---- 3880 - 3370 ------------------------------------------------------
  236|CU028    CNTLUNIT CUNUMBR=028,PATH=(04),PROTOCL=D,SHARED=N,            X
  237|               UNITADD=((40,8)),UNIT=3880
  238|D440-8 IODEVICE ADDRESS=(440,8),CUNUMBR=(028),UNIT=3370,DEVNUMBR=0440
  239|*
  240|* ---- 3880 - 3350 ------------------------------------------------------
  241|CU030    CNTLUNIT CUNUMBR=030,PATH=(04),PROTOCL=D,SHARED=N,            X
  242|               UNITADD=((B0,8)),UNIT=3880
  243|D4B0-8 IODEVICE ADDRESS=(4B0,8),CUNUMBR=(030),UNIT=3350,DEVNUMBR=04B0
  244|*
  245|* ---- 3830 - 3344 ------------------------------------------------------
  246|CU031    CNTLUNIT CUNUMBR=031,PATH=(04),PROTOCL=D,SHARED=N,            X
  247|               UNITADD=((C0,8)),UNIT=3830
  248|D4C0-8 IODEVICE ADDRESS=(4C0,8),CUNUMBR=(031),UNIT=3344,DEVNUMBR=04C0
  249|
  250|* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
  251|*
  252|* ---- CH05 DASD        ------------------------------------------------
  253|*
  254|* ---- 3880 - 3370 ------------------------------------------------------
  255|CU032    CNTLUNIT CUNUMBR=032,PATH=(05),PROTOCL=D,SHARED=N,            X
  256|               UNITADD=((40,8)),UNIT=3880
  257|D540-8 IODEVICE ADDRESS=(540,8),CUNUMBR=(032),UNIT=3370,DEVNUMBR=0540
  258|*
  259|* ---- 3880 - 3350 ------------------------------------------------------
  260|CU034    CNTLUNIT CUNUMBR=034,PATH=(05),PROTOCL=D,SHARED=N,            X
  261|               UNITADD=((B0,8)),UNIT=3880
  262|D5B0-8 IODEVICE ADDRESS=(5B0,8),CUNUMBR=(034),UNIT=3350,DEVNUMBR=05B0
  263|*
  264|* ---- 3830 - 3344 ------------------------------------------------------
  265|CU035    CNTLUNIT CUNUMBR=035,PATH=(05),PROTOCL=D,SHARED=N,            X
  266|               UNITADD=((C0,8)),UNIT=3830
  267|D5C0-8 IODEVICE ADDRESS=(5C0,8),CUNUMBR=(035),UNIT=3344,DEVNUMBR=05C0
  268|
  269|* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
  270|*
  271|* ---- CH06 DASD        ------------------------------------------------
  272|*
  273|* ---- 3880 - 3370 ------------------------------------------------------
  274|CU036    CNTLUNIT CUNUMBR=036,PATH=(06),PROTOCL=D,SHARED=N,            X
  275|               UNITADD=((40,8)),UNIT=3880
```

Figure A-1 (Part 5 of 8). 4381 Uniprocessor Input Example Listing

```
NUMBR| RECORD
_____|....+....1....+....2....+....3....+....4....+....5....+....6....+....7.C..+....8
  276|D640-8 IODEVICE ADDRESS=(640,8),CUNUMBR=(036),UNIT=3370,DEVNUMBR=0640
  277|*
  278|* ---- 3880 - 3350 ----------------------------------------------------
  279|CU038    CNTLUNIT CUNUMBR=038,PATH=(06),PROTOCL=D,SHARED=N,            X
  280|               UNITADD=((B0,8)),UNIT=3880
  281|D6B0-8 IODEVICE ADDRESS=(6B0,8),CUNUMBR=(038),UNIT=3350,DEVNUMBR=06B0
  282|*
  283|* ---- 3830 - 3344 ----------------------------------------------------
  284|CU039    CNTLUNIT CUNUMBR=039,PATH=(06),PROTOCL=D,SHARED=N,            X
  285|               UNITADD=((C0,8)),UNIT=3830
  286|D6C0-8 IODEVICE ADDRESS=(6C0,8),CUNUMBR=(039),UNIT=3344,DEVNUMBR=06C0
  287|
  288|* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
  289|*
  290|* ---- CH07 DASD        ------------------------------------------
  291|*
  292|* ---- 3880 - 3370 ----------------------------------------------------
  293|CU040    CNTLUNIT CUNUMBR=040,PATH=(07),PROTOCL=D,SHARED=N,            X
  294|               UNITADD=((40,8)),UNIT=3880
  295|D740-8 IODEVICE ADDRESS=(740,8),CUNUMBR=(040),UNIT=3370,DEVNUMBR=0740
  296|*
  297|* ---- 3880 - 3350 ----------------------------------------------------
  298|CU042    CNTLUNIT CUNUMBR=042,PATH=(07),PROTOCL=D,SHARED=N,            X
  299|               UNITADD=((B0,8)),UNIT=3880
  300|D7B0-8 IODEVICE ADDRESS=(7B0,8),CUNUMBR=(042),UNIT=3350,DEVNUMBR=07B0
  301|*
  302|* ---- 3830 - 3344 ----------------------------------------------------
  303|CU043    CNTLUNIT CUNUMBR=043,PATH=(07),PROTOCL=D,SHARED=N,            X
  304|               UNITADD=((C0,8)),UNIT=3830
  305|D7C0-8 IODEVICE ADDRESS=(7C0,8),CUNUMBR=(043),UNIT=3344,DEVNUMBR=07C0
  306|
  307|* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
  308|*
  309|* ---- CH08 DASD        ------------------------------------------
  310|*
  311|* ---- 3880 - 3370 ----------------------------------------------------
  312|CU044    CNTLUNIT CUNUMBR=044,PATH=(08),PROTOCL=D,SHARED=N,            X
  313|               UNITADD=((40,8)),UNIT=3880
  314|D840-8 IODEVICE ADDRESS=(840,8),CUNUMBR=(044),UNIT=3370,DEVNUMBR=0840
  315|*
  316|* ---- 3880 - 3350 ----------------------------------------------------
  317|CU046    CNTLUNIT CUNUMBR=046,PATH=(08),PROTOCL=D,SHARED=N,            X
  318|               UNITADD=((B0,8)),UNIT=3880
  319|D8B0-8 IODEVICE ADDRESS=(8B0,8),CUNUMBR=(046),UNIT=3350,DEVNUMBR=08B0
  320|*
  321|* ---- 3830 - 3344 ----------------------------------------------------
  322|CU047    CNTLUNIT CUNUMBR=047,PATH=(08),PROTOCL=D,SHARED=N,            X
  323|               UNITADD=((C0,8)),UNIT=3830
  324|D8C0-8 IODEVICE ADDRESS=(8C0,8),CUNUMBR=(047),UNIT=3344,DEVNUMBR=08C0
  325|
  326|* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
  327|*
  328|* ---- CH9 DASD         ------------------------------------------
  329|*
  330|* ---- 3880 - 3370 ----------------------------------------------------
```

Figure A-1 (Part 6 of 8). 4381 Uniprocessor Input Example Listing

```
IOCP VERSION 001              LEVEL 000                  INPUT RECORDS
IOCP RUN ON 12-07-83 AT 11.30                          PAGE NUMBER     7

NUMBR| RECORD
_____|....+....1....+....2....+....3....+....4....+....5....+....6....+....7.C..+....8
  331|CU48     CNTLUNIT CUNUMBR=048,PATH=(09),PROTOCL=D,SHARED=N,            X
  332|               UNITADD=((40,8)),UNIT=3880
  333|D940-8 IODEVICE ADDRESS=(940,8),CUNUMBR=(048),UNIT=3370,DEVNUMBR=0940
  334|*
  335|* ---- 3880 - 3350 ----------------------------------------------------
  336|CU50     CNTLUNIT CUNUMBR=050,PATH=(09),PROTOCL=D,SHARED=N,            X
  337|               UNITADD=((B0,8)),UNIT=3880
  338|D9B0-8 IODEVICE ADDRESS=(9B0,8),CUNUMBR=(050),UNIT=3350,DEVNUMBR=09B0
  339|*
  340|* ---- 3830 - 3344 ----------------------------------------------------
  341|CU51     CNTLUNIT CUNUMBR=051,PATH=(09),PROTOCL=D,SHARED=N,            X
  342|               UNITADD=((C0,8)),UNIT=3830
  343|D9C0-8 IODEVICE ADDRESS=(9C0,8),CUNUMBR=(051),UNIT=3344,DEVNUMBR=09C0
  344|
  345|* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
  346|*
  347|* ---- CHA DASD        ------------------------------------------------
  348|*
  349|* ---- 3880 - 3370 ----------------------------------------------------
  350|CU52     CNTLUNIT CUNUMBR=052,PATH=(0A),PROTOCL=D,SHARED=N,            X
  351|               UNITADD=((40,8)),UNIT=3880
  352|DA40-8 IODEVICE ADDRESS=(A40,8),CUNUMBR=(052),UNIT=3370,DEVNUMBR=0A00
  353|*
  354|* ---- 3880 - 3350 ----------------------------------------------------
  355|CU54     CNTLUNIT CUNUMBR=054,PATH=(0A),PROTOCL=D,SHARED=N,            X
  356|               UNITADD=((B0,8)),UNIT=3880
  357|DAB0-8 IODEVICE ADDRESS=(AB0,8),CUNUMBR=(054),UNIT=3350,DEVNUMBR=0AB0
  358|*
  359|* ---- 3830 - 3344 ----------------------------------------------------
  360|CU55     CNTLUNIT CUNUMBR=055,PATH=(0A),PROTOCL=D,SHARED=N,            X
  361|               UNITADD=((C0,8)),UNIT=3830
  362|DAC0-8 IODEVICE ADDRESS=(AC0,8),CUNUMBR=(055),UNIT=3344,DEVNUMBR=0AC0
  363|
  364|* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
  365|*
  366|* ---- CHB DASD        ------------------------------------------------
  367|*
  368|* ---- 3880 - 3370 ----------------------------------------------------
  369|CU56     CNTLUNIT CUNUMBR=056,PATH=(0B),PROTOCL=D,SHARED=N,            X
  370|               UNITADD=((40,8)),UNIT=3880
  371|DB40-8 IODEVICE ADDRESS=(B40,8),CUNUMBR=(056),UNIT=3370,DEVNUMBR=0B40
  372|*
  373|* ---- 3880 - 3350 ----------------------------------------------------
  374|CU58     CNTLUNIT CUNUMBR=058,PATH=(0B),PROTOCL=D,SHARED=N,            X
  375|               UNITADD=((B0,8)),UNIT=3880
  376|DBB0-8 IODEVICE ADDRESS=(BB0,8),CUNUMBR=(058),UNIT=3350,DEVNUMBR=0BB0
  377|*
  378|* ---- 3830 - 3344 ----------------------------------------------------
  379|CU59     CNTLUNIT CUNUMBR=059,PATH=(0B),PROTOCL=D,SHARED=N,            X
  380|               UNITADD=((C0,8)),UNIT=3830
  381|DBC0-8 IODEVICE ADDRESS=(BC0,8),CUNUMBR=(059),UNIT=3344,DEVNUMBR=0BC0
  382|*
  383|* ---- 3274 3278       ------------------------------------------------
  384|CU60     CNTLUNIT CUNUMBR=060,PATH=(03),PROTOCL=D,SHARED=N,            X
  385|               UNITADD=((20,8)),UNIT=3274
```

Figure A-1 (Part 7 of 8). 4381 Uniprocessor Input Example Listing

```
IOCP VERSION 001              LEVEL 000                 INPUT RECORDS
IOCP RUN ON 12-07-83 AT 11.30                        PAGE NUMBER     8

NUMBR| RECORD
_____|....+....1....+....2....+....3....+....4....+....5....+....6....+....7.C..+....8
  386|D320-8 IODEVICE ADDRESS=(320,8),CUNUMBR=(060),UNIT=3278,DEVNUMBR=0320
  387|
  388|* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
  389|*
  390|* ---- CTC             ---------------------------------------------
  391|*
  392|CU061    CNTLUNIT CUNUMBR=061,PATH=(03),PROTOCL=D,SHARED=N,            X
  393|               UNITADD=((02,1)),UNIT=CTC
  394|D302   IODEVICE ADDRESS=(302,1),CUNUMBR=(061),UNIT=CTC
  395|
  396|
  397|*
  398•*            END OF THE SAMPLE CONFIGURATION FOR A 4381 UNIPROCESSOR
  399|*
  400|* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
```

Figure A-1 (Part 8 of 8). 4381 Uniprocessor Input Example Listing

Appendix B. 4381 Dual Processor Input Example Listing

The following listing is an example of a valid I/O configuration for 4381 dual processors.

```
IOCP VERSION 001              LEVEL 000                  INPUT RECORDS
IOCP RUN ON 06-22-84 AT 14.25                          PAGE NUMBER     1
NUMBR| RECORD
_____|....+....1....+....2....+....3....+....4....+....5....+....6....+....7.C..+....8
    1|
    2|* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
    3|*
    4•         ID    MSG1='THIS IS A SAMPLE CONFIGURATION FOR A 4381 DUAL PROCESSOR'
    5|
    6|* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
    7|*
    8|CH00     CHPID PATH=((00,0,0)),TYPE=BY
    9|CH01     CHPID PATH=((01,1,0)),TYPE=BL
   10|CH02     CHPID PATH=((02,2,0)),TYPE=BL
   11|CH03     CHPID PATH=((03,3,0)),TYPE=BL
   12|CH04     CHPID PATH=((04,4,0)),TYPE=BL
   13|CH05     CHPID PATH=((05,5,0)),TYPE=BL
   14|CH06     CHPID PATH=((06,6,0)),TYPE=BL
   15|CH07     CHPID PATH=((07,7,0)),TYPE=BL
   16|CH08     CHPID PATH=((08,8,0)),TYPE=BL
   17|CH10     CHPID PATH=((10,0,1)),TYPE=BY
   18|CH11     CHPID PATH=((11,1,1)),TYPE=BL
   19|CH12     CHPID PATH=((12,2,1)),TYPE=BL
   20|CH13     CHPID PATH=((13,3,1)),TYPE=BL
   21|CH14     CHPID PATH=((14,4,1)),TYPE=BL
   22|CH15     CHPID PATH=((15,5,1)),TYPE=BL
   23|CH16     CHPID PATH=((16,6,1)),TYPE=BL
   24|CH17     CHPID PATH=((17,7,1)),TYPE=BL
   25|CH18     CHPID PATH=((18,8,1)),TYPE=BL
   26|
   27|* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
   28|*
   29|* ---- SYSTEM CONSOLE   ------------------------------------------
   30|*
   31|CU0FF    CNTLUNIT CUNUMBR=0FF,PATH=(00),PROTOCL=D,SHARED=N,            X
   32|              UNITADD=((F2,4),(FF,1)),UNIT=3274
   33|D0F2-4 IODEVICE ADDRESS=(0F2,3),CUNUMBR=(0FF),UNIT=3278,DEVNUMBR=00F2
   34|D0F5   IODEVICE ADDRESS=(0F5,1),CUNUMBR=(0FF),UNIT=3286,DEVNUMBR=00F5
   35|D0FF   IODEVICE ADDRESS=(0FF,1),CUNUMBR=(0FF),UNIT=3274,DEVNUMBR=00FF
   36|
   37|* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
   38|*
   39|*
   40|*  DEVICES FOR PU0
   41|*
   42|*
   43|* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
   44|
   45|* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
   46|*
   47|* ---- 2501 CARD READER ------------------------------------------
   48|CU001    CNTLUNIT CUNUMBR=001,PATH=(00),PROTOCL=D,SHARED=N,            X
   49|              UNITADD=((0A,1)),UNIT=2501
   50|D00A   IODEVICE ADDRESS=(00A,1),CUNUMBR=(001),UNIT=2501,DEVNUMBR=000A
   51|
   52|* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
   53|*
   54|* ---- 2821 - 2540 - 1403 -------------------------------------------
   55|CU002    CNTLUNIT CUNUMBR=002,PATH=(00),PROTOCL=D,SHARED=N,            X
```

Figure B-1 (Part 1 of 12). 4381 Dual Processor Input Example Listing

```
IOCP VERSION 001              LEVEL 000                  INPUT RECORDS
IOCP RUN ON 06-22-84 AT 14.25                          PAGE NUMBER     2
NUMBR| RECORD
_____|....+....1....+....2....+....3....+....4....+....5....+....6....+....7.C..+....8
   56|               UNITADD=((0C,3)),UNIT=2821
   57|D00C   IODEVICE ADDRESS=(00C,1),CUNUMBR=(002),UNIT=2540R,DEVNUMBR=000C
   58|D00D   IODEVICE ADDRESS=(00D,1),CUNUMBR=(002),UNIT=2540P,DEVNUMBR=000D
   59|D00E   IODEVICE ADDRESS=(00E,1),CUNUMBR=(002),UNIT=1403,DEVNUMBR=000E
   60|
   61|* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
   62|*
   63|* ---- 3705             ------------------------------------------
   64|CU003    CNTLUNIT CUNUMBR=003,PATH=(00),PROTOCL=D,SHARED=N,            X
   65|               UNITADD=((20,1)),UNIT=3705
   66|D020   IODEVICE ADDRESS=(020,1),CUNUMBR=(003),UNIT=3705,DEVNUMBR=0020
   67|
   68|* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
   69|*
   70|* ---- LOCAL TERMINALS  ------------------------------------------
   71|
   72|CU004    CNTLUNIT CUNUMBR=004,PATH=(00),PROTOCL=D,SHARED=N,            X
   73|               UNITADD=(30,16),UNIT=3274
   74|D030S  IODEVICE ADDRESS=(030,16),CUNUMBR=(004),UNIT=3278,DEVNUMBR=0030
   75|
   76|* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
   77|*
   78|* ---- CH01 TAPES       ------------------------------------------
   79|CU005    CNTLUNIT CUNUMBR=005,PATH=(01),PROTOCL=D,SHARED=Y,            X
   80|               UNITADD=((80,8)),UNIT=3803
   81|D180   IODEVICE ADDRESS=(180,1),CUNUMBR=(005),UNIT=8809,DEVNUMBR=0180
   82|D181   IODEVICE ADDRESS=(181,1),CUNUMBR=(005),UNIT=3420,DEVNUMBR=0181
   83|D182-7 IODEVICE ADDRESS=(182,6),CUNUMBR=(005),UNIT=3420,DEVNUMBR=0182
   84|
   85|* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
   86|*
   87|* ---- CH02 TAPES       ------------------------------------------
   88|CU006    CNTLUNIT CUNUMBR=006,PATH=(02),PROTOCL=D,SHARED=Y,            X
   89|               UNITADD=((80,8)),UNIT=3803
   90|D280   IODEVICE ADDRESS=(280,1),CUNUMBR=(006),UNIT=8809,DEVNUMBR=0280
   91|D281   IODEVICE ADDRESS=(281,1),CUNUMBR=(006),UNIT=3420,DEVNUMBR=0281
   92|D282-7 IODEVICE ADDRESS=(282,6),CUNUMBR=(006),UNIT=3420,DEVNUMBR=0282
   93|
   94|* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
   95|*
   96|* ---- CH03 TAPES       ------------------------------------------
   97|CU007    CNTLUNIT CUNUMBR=007,PATH=(03),PROTOCL=D,SHARED=Y,            X
   98|               UNITADD=((80,8)),UNIT=3803
   99|D380   IODEVICE ADDRESS=(380,1),CUNUMBR=(007),UNIT=8809,DEVNUMBR=0380
  100|D381   IODEVICE ADDRESS=(381,1),CUNUMBR=(007),UNIT=3420,DEVNUMBR=0381
  101|D382-7 IODEVICE ADDRESS=(382,6),CUNUMBR=(007),UNIT=3420,DEVNUMBR=0382
  102|
  103|* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
  104|*
  105|* ---- CH04 TAPES       ------------------------------------------
  106|CU008    CNTLUNIT CUNUMBR=008,PATH=(04),PROTOCL=D,SHARED=Y,            X
  107|               UNITADD=((80,8)),UNIT=3803
  108|D480   IODEVICE ADDRESS=(480,1),CUNUMBR=(008),UNIT=8809,DEVNUMBR=0480
  109|D481   IODEVICE ADDRESS=(481,1),CUNUMBR=(008),UNIT=3420,DEVNUMBR=0481
  110|D482-7 IODEVICE ADDRESS=(482,6),CUNUMBR=(008),UNIT=3420,DEVNUMBR=0482
```

Figure B-1 (Part 2 of 12). 4381 Dual Processor Input Example Listing

```
IOCP VERSION 001              LEVEL 000                  INPUT RECORDS
IOCP RUN ON 06-22-84 AT 14.25                       PAGE NUMBER     3
NUMBR| RECORD
_____|....+....1....+....2....+....3....+....4....+....5....+....6....+....7.C..+....8
  111|
  112|* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
  113|*
  114|* ---- CH05 TAPES       ---------------------------------------------
  115|CU009    CNTLUNIT CUNUMBR=009,PATH=(05),PROTOCL=D,SHARED=Y,            X
  116|               UNITADD=((80,8)),UNIT=3803
  117|D580   IODEVICE ADDRESS=(580,1),CUNUMBR=(009),UNIT=8809,DEVNUMBR=0580
  118|D581   IODEVICE ADDRESS=(581,1),CUNUMBR=(009),UNIT=3420,DEVNUMBR=0581
  119|D582-7 IODEVICE ADDRESS=(582,6),CUNUMBR=(009),UNIT=3420,DEVNUMBR=0582
  120|
  121|* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
  122|*
  123|* ---- CH06 TAPES       ---------------------------------------------
  124|CU010    CNTLUNIT CUNUMBR=010,PATH=(06),PROTOCL=D,SHARED=Y,            X
  125|               UNITADD=((80,8)),UNIT=3803
  126|D680   IODEVICE ADDRESS=(680,1),CUNUMBR=(010),UNIT=8809,DEVNUMBR=0680
  127|
  128|D681   IODEVICE ADDRESS=(681,1),CUNUMBR=(010),UNIT=3420,DEVNUMBR=0681
  129|D682-7 IODEVICE ADDRESS=(682,6),CUNUMBR=(010),UNIT=3420,DEVNUMBR=0682
  130|
  131|* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
  132|*
  133|* ---- CH07 TAPES       ---------------------------------------------
  134|CU011    CNTLUNIT CUNUMBR=011,PATH=(07),PROTOCL=D,SHARED=Y,            X
  135|               UNITADD=((80,8)),UNIT=3803
  136|D780   IODEVICE ADDRESS=(780,1),CUNUMBR=(011),UNIT=8809,DEVNUMBR=0780
  137|D781   IODEVICE ADDRESS=(781,1),CUNUMBR=(011),UNIT=3420,DEVNUMBR=0781
  138|D782-7 IODEVICE ADDRESS=(782,6),CUNUMBR=(011),UNIT=3420,DEVNUMBR=0782
  139|
  140|* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
  141|*
  142|* ---- CH08 TAPES       ---------------------------------------------
  143|CU012    CNTLUNIT CUNUMBR=012,PATH=(08),PROTOCL=D,SHARED=Y,            X
  144|               UNITADD=((80,8)),UNIT=3803
  145|D880   IODEVICE ADDRESS=(880,1),CUNUMBR=(012),UNIT=8809,DEVNUMBR=0880
  146|D881   IODEVICE ADDRESS=(881,1),CUNUMBR=(012),UNIT=3420,DEVNUMBR=0881
  147|D882-7 IODEVICE ADDRESS=(882,6),CUNUMBR=(012),UNIT=3420,DEVNUMBR=0882
  148|
  149|
  150|* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
  151|*
  152|* ---- CH01 DASD        ---------------------------------------------
  153|*
  154|* ---- 3880 - 3370 ----------------------------------------------------
  155|CU016    CNTLUNIT CUNUMBR=016,PATH=(01),PROTOCL=D,SHARED=N,            X
  156|               UNITADD=((40,8)),UNIT=3880
  157|
  158|D140-8 IODEVICE ADDRESS=(140,8),CUNUMBR=(016),UNIT=3370,DEVNUMBR=0140
  159|*
  160|* ---- 3880 - 3380 ----------------------------------------------------
  161|CU017    CNTLUNIT CUNUMBR=017,PATH=(01),PROTOCL=S,SHARED=N,            X
  162|               UNITADD=((A0,8)),UNIT=3880
  163|D1A0-8 IODEVICE ADDRESS=(1A0,8),CUNUMBR=(017),UNIT=3380,DEVNUMBR=01A0
  164|*
  165|* ---- 3880 - 3350 ----------------------------------------------------
```

Figure B-1 (Part 3 of 12). 4381 Dual Processor Input Example Listing

```
IOCP VERSION 001              LEVEL 000                  INPUT RECORDS
IOCP RUN ON 06-22-84 AT 14.25                       PAGE NUMBER     4
NUMBR| RECORD
_____|....+....1....+....2....+....3....+....4....+....5....+....6....+....7.C..+....8
  166|CU018    CNTLUNIT CUNUMBR=018,PATH=(01),PROTOCL=D,SHARED=N,             X
  167|               UNITADD=((B0,8)),UNIT=3880
  168|D1B0-8 IODEVICE ADDRESS=(1B0,8),CUNUMBR=(018),UNIT=3350,DEVNUMBR=01B0
  169|*
  170|* ---- 3830 - 3344 ----------------------------------------------------
  171|CU019    CNTLUNIT CUNUMBR=019,PATH=(01),PROTOCL=D,SHARED=N,             X
  172|               UNITADD=((C0,8)),UNIT=3830
  173|D1C0-8 IODEVICE ADDRESS=(1C0,8),CUNUMBR=(019),UNIT=3344,DEVNUMBR=01C0
  174|
  175|* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
  176|*
  177|* ---- CH02 DASD        ----------------------------------------------
  178|*
  179|* ---- 3880 - 3370 ----------------------------------------------------
  180|CU020    CNTLUNIT CUNUMBR=020,PATH=(02),PROTOCL=D,SHARED=N,             X
  181|               UNITADD=((40,8)),UNIT=3880
  182|D240-8 IODEVICE ADDRESS=(240,8),CUNUMBR=(020),UNIT=3370,DEVNUMBR=0240
  183|*
  184|* ---- 3880 - 3380 ----------------------------------------------------
  185|CU021    CNTLUNIT CUNUMBR=021,PATH=(02),PROTOCL=S,SHARED=N,             X
  186|               UNITADD=((A0,8)),UNIT=3880
  187|D2A0-8 IODEVICE ADDRESS=(2A0,8),CUNUMBR=(021),UNIT=3380,DEVNUMBR=02A0
  188|*
  189|* ---- 3880 - 3350 ----------------------------------------------------
  190|CU022    CNTLUNIT CUNUMBR=022,PATH=(02),PROTOCL=D,SHARED=N,             X
  191|               UNITADD=((B0,8)),UNIT=3880
  192|D2B0-8 IODEVICE ADDRESS=(2B0,8),CUNUMBR=(022),UNIT=3350,DEVNUMBR=02B0
  193|*
  194|* ---- 3830 - 3344 ----------------------------------------------------
  195|CU023    CNTLUNIT CUNUMBR=023,PATH=(02),PROTOCL=D,SHARED=N,             X
  196|               UNITADD=((C0,8)),UNIT=3830
  197|D2C0-8 IODEVICE ADDRESS=(2C0,8),CUNUMBR=(023),UNIT=3344,DEVNUMBR=02C0
  198|
  199|* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
  200|*
  201|* ---- CH03 DASD        ----------------------------------------------
  202|*
  203|* ---- 3880 - 3370 ----------------------------------------------------
  204|CU024    CNTLUNIT CUNUMBR=024,PATH=(03),PROTOCL=D,SHARED=N,             X
  205|               UNITADD=((40,8)),UNIT=3880
  206|D340-8 IODEVICE ADDRESS=(340,8),CUNUMBR=(024),UNIT=3370,DEVNUMBR=0340
  207|*
  208|* ---- 3880 - 3380 ----------------------------------------------------
  209|CU025    CNTLUNIT CUNUMBR=025,PATH=(03),PROTOCL=S,SHARED=N,             X
  210|               UNITADD=((A0,8)),UNIT=3880
  211|D3A0-8 IODEVICE ADDRESS=(3A0,8),CUNUMBR=(025),UNIT=3380,DEVNUMBR=03A0
  212|*
  213|
  214|* ---- 3880 - 3350 ----------------------------------------------------
  215|CU026    CNTLUNIT CUNUMBR=026,PATH=(03),PROTOCL=D,SHARED=N,             X
  216|               UNITADD=((B0,8)),UNIT=3880
  217|D3B0-8 IODEVICE ADDRESS=(3B0,8),CUNUMBR=(026),UNIT=3350,DEVNUMBR=03B0
  218|*
  219|* ---- 3830 - 3344 ----------------------------------------------------
  220|CU027    CNTLUNIT CUNUMBR=027,PATH=(03),PROTOCL=D,SHARED=N,             X
```

Figure B-1 (Part 4 of 12). 4381 Dual Processor Input Example Listing

```
IOCP VERSION 001              LEVEL 000                    INPUT RECORDS
IOCP RUN ON 06-22-84 AT 14.25                          PAGE NUMBER     5
NUMBR| RECORD
_____|....+....1....+....2....+....3....+....4....+....5....+....6....+....7.C..+....8
  221|               UNITADD=((C0,8)),UNIT=3830
  222|D3C0-8 IODEVICE ADDRESS=(3C0,8),CUNUMBR=(027),UNIT=3344,DEVNUMBR=03C0
  223|
  224|* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
  225|*
  226|* ---- CH04 DASD        ---------------------------------------------
  227|*
  228|* ---- 3880 - 3370 ------------------------------------------------
  229|CU028    CNTLUNIT CUNUMBR=028,PATH=(04),PROTOCL=D,SHARED=N,            X
  230|               UNITADD=((40,8)),UNIT=3880
  231|D440-8 IODEVICE ADDRESS=(440,8),CUNUMBR=(028),UNIT=3370,DEVNUMBR=0440
  232|*
  233|* ---- 3880 - 3350 ------------------------------------------------
  234|CU030    CNTLUNIT CUNUMBR=030,PATH=(04),PROTOCL=D,SHARED=N,            X
  235|               UNITADD=((B0,8)),UNIT=3880
  236|D4B0-8 IODEVICE ADDRESS=(4B0,8),CUNUMBR=(030),UNIT=3350,DEVNUMBR=04B0
  237|*
  238|* ---- 3830 - 3344 ------------------------------------------------
  239|CU031    CNTLUNIT CUNUMBR=031,PATH=(04),PROTOCL=D,SHARED=N,            X
  240|               UNITADD=((C0,8)),UNIT=3830
  241|D4C0-8 IODEVICE ADDRESS=(4C0,8),CUNUMBR=(031),UNIT=3344,DEVNUMBR=04C0
  242|
  243|* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
  244|*
  245|* ---- CH05 DASD        ---------------------------------------------
  246|*
  247|* ---- 3880 - 3370 ------------------------------------------------
  248|CU032    CNTLUNIT CUNUMBR=032,PATH=(05),PROTOCL=D,SHARED=N,            X
  249|               UNITADD=((40,8)),UNIT=3880
  250|D540-8 IODEVICE ADDRESS=(540,8),CUNUMBR=(032),UNIT=3370,DEVNUMBR=0540
  251|*
  252|* ---- 3880 - 3350 ------------------------------------------------
  253|CU034    CNTLUNIT CUNUMBR=034,PATH=(05),PROTOCL=D,SHARED=N,            X
  254|               UNITADD=((B0,8)),UNIT=3880
  255|D5B0-8 IODEVICE ADDRESS=(5B0,8),CUNUMBR=(034),UNIT=3350,DEVNUMBR=05B0
  256|*
  257|* ---- 3830 - 3344 ------------------------------------------------
  258|CU035    CNTLUNIT CUNUMBR=035,PATH=(05),PROTOCL=D,SHARED=N,            X
  259|               UNITADD=((C0,8)),UNIT=3830
  260|D5C0-8 IODEVICE ADDRESS=(5C0,8),CUNUMBR=(035),UNIT=3344,DEVNUMBR=05C0
  261|
  262|* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
  263|*
  264|* ---- CH06 DASD        ---------------------------------------------
  265|*
  266|* ---- 3880 - 3370 ------------------------------------------------
  267|CU036    CNTLUNIT CUNUMBR=036,PATH=(06),PROTOCL=D,SHARED=N,            X
  268|               UNITADD=((40,8)),UNIT=3880
  269|
  270|D640-8 IODEVICE ADDRESS=(640,8),CUNUMBR=(036),UNIT=3370,DEVNUMBR=0640
  271|*
  272|* ---- 3880 - 3350 ------------------------------------------------
  273|CU038    CNTLUNIT CUNUMBR=038,PATH=(06),PROTOCL=D,SHARED=N,            X
  274|               UNITADD=((B0,8)),UNIT=3880
  275|D6B0-8 IODEVICE ADDRESS=(6B0,8),CUNUMBR=(038),UNIT=3350,DEVNUMBR=06B0
```

Figure B-1 (Part 5 of 12). 4381 Dual Processor Input Example Listing

```
IOCP VERSION 001              LEVEL 000                  INPUT RECORDS
IOCP RUN ON 06-22-84 AT 14.25                          PAGE NUMBER     6
NUMBR| RECORD
_____|....+....1....+....2....+....3....+....4....+....5....+....6....+....7.C..+....8
  276|*
  277|* ---- 3830 - 3344 ------------------------------------------------
  278|CU039    CNTLUNIT CUNUMBR=039,PATH=(06),PROTOCL=D,SHARED=N,            X
  279|               UNITADD=((C0,8)),UNIT=3830
  280|D6C0-8 IODEVICE ADDRESS=(6C0,8),CUNUMBR=(039),UNIT=3344,DEVNUMBR=06C0
  281|
  282|* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
  283|*
  284|* ---- CH07 DASD        ------------------------------------------
  285|*
  286|* ---- 3880 - 3370 ------------------------------------------------
  287|CU040    CNTLUNIT CUNUMBR=040,PATH=(07),PROTOCL=D,SHARED=N,            X
  288|               UNITADD=((40,8)),UNIT=3880
  289|D740-8 IODEVICE ADDRESS=(740,8),CUNUMBR=(040),UNIT=3370,DEVNUMBR=0740
  290|*
  291|* ---- 3880 - 3350 ------------------------------------------------
  292|CU042    CNTLUNIT CUNUMBR=042,PATH=(07),PROTOCL=D,SHARED=N,            X
  293|               UNITADD=((B0,8)),UNIT=3880
  294|D7B0-8 IODEVICE ADDRESS=(7B0,8),CUNUMBR=(042),UNIT=3350,DEVNUMBR=07B0
  295|*
  296|* ---- 3830 - 3344 ------------------------------------------------
  297|CU043    CNTLUNIT CUNUMBR=043,PATH=(07),PROTOCL=D,SHARED=N,            X
  298|               UNITADD=((C0,8)),UNIT=3830
  299|D7C0-8 IODEVICE ADDRESS=(7C0,8),CUNUMBR=(043),UNIT=3344,DEVNUMBR=07C0
  300|
  301|* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
  302|*
  303|* ---- CH08 DASD        ------------------------------------------
  304|*
  305|* ---- 3880 - 3370 ------------------------------------------------
  306|CU044    CNTLUNIT CUNUMBR=044,PATH=(08),PROTOCL=D,SHARED=N,            X
  307|               UNITADD=((40,8)),UNIT=3880
  308|D840-8 IODEVICE ADDRESS=(840,8),CUNUMBR=(044),UNIT=3370,DEVNUMBR=0840
  309|*
  310|* ---- 3880 - 3350 ------------------------------------------------
  311|CU046    CNTLUNIT CUNUMBR=046,PATH=(08),PROTOCL=D,SHARED=N,            X
  312|               UNITADD=((B0,8)),UNIT=3880
  313|D8B0-8 IODEVICE ADDRESS=(8B0,8),CUNUMBR=(046),UNIT=3350,DEVNUMBR=08B0
  314|*
  315|* ---- 3830 - 3344 ------------------------------------------------
  316|CU047    CNTLUNIT CUNUMBR=047,PATH=(08),PROTOCL=D,SHARED=N,            X
  317|               UNITADD=((C0,8)),UNIT=3830
  318|D8C0-8 IODEVICE ADDRESS=(8C0,8),CUNUMBR=(047),UNIT=3344,DEVNUMBR=08C0
  319|
  320|
  321|* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
  322|*
  323|* ---- CTC              ------------------------------------------
  324|*
  325|CU061    CNTLUNIT CUNUMBR=061,PATH=(03),PROTOCL=D,SHARED=N,            X
  326|               UNITADD=((02,1)),UNIT=CTC
  327|D302   IODEVICE ADDRESS=(302,1),CUNUMBR=(061),UNIT=CTC
  328|
  329|* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
  330|*
```

Figure B-1 (Part 6 of 12). 4381 Dual Processor Input Example Listing

```
IOCP VERSION 001              LEVEL 000                  INPUT RECORDS
IOCP RUN ON 06-22-84 AT 14.25                          PAGE NUMBER     7
NUMBR| RECORD
_____|....+....1....+....2....+....3....+....4....+....5....+....6....+....7.C..+....8
  331|*
  332|*  DEVICES FOR PU1
  333|*
  334|*
  335|* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
  336|
  337|* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
  338|*
  339|* ---- 2501 CARD READER ------------------------------------------------
  340|CU101    CNTLUNIT CUNUMBR=101,PATH=(10),PROTOCL=D,SHARED=N,            X
  341|               UNITADD=((0A,1)),UNIT=2501
  342|D00A   IODEVICE ADDRESS=(00A,1),CUNUMBR=(101),UNIT=2501,DEVNUMBR=100A
  343|
  344|* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
  345|*
  346|* ---- 2821 - 2540 - 1403 ------------------------------------------------
  347|CU102    CNTLUNIT CUNUMBR=102,PATH=(10),PROTOCL=D,SHARED=N,            X
  348|               UNITADD=((0C,3)),UNIT=2821
  349|D00C   IODEVICE ADDRESS=(00C,1),CUNUMBR=(102),UNIT=2540R,DEVNUMBR=100C
  350|D00D   IODEVICE ADDRESS=(00D,1),CUNUMBR=(102),UNIT=2540P,DEVNUMBR=100D
  351|D00E   IODEVICE ADDRESS=(00E,1),CUNUMBR=(102),UNIT=1403,DEVNUMBR=100E
  352|
  353|* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
  354|*
  355|* ---- 3705            ------------------------------------------------
  356|CU003    CNTLUNIT CUNUMBR=003,PATH=(00),PROTOCL=D,SHARED=N,            X
  357|               UNITADD=((20,1)),UNIT=3705
  358|D020   IODEVICE ADDRESS=(020,1),CUNUMBR=(003),UNIT=3705,DEVNUMBR=0020
  359|
  360|* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
  361|*
  362|* ---- LOCAL TERMINALS  ------------------------------------------------
  363|
  364|CU104    CNTLUNIT CUNUMBR=104,PATH=(10),PROTOCL=D,SHARED=N,            X
  365|               UNITADD=(30,16),UNIT=3274
  366|D030S  IODEVICE ADDRESS=(030,16),CUNUMBR=(104),UNIT=3278,DEVNUMBR=1030
  367|
  368|* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
  369|*
  370|* ---- CH11 TAPES       ------------------------------------------------
  371|CU105    CNTLUNIT CUNUMBR=105,PATH=(11),PROTOCL=D,SHARED=Y,            X
  372|               UNITADD=((80,8)),UNIT=3803
  373|D180   IODEVICE ADDRESS=(180,1),CUNUMBR=(105),UNIT=8809,DEVNUMBR=1180
  374|D181   IODEVICE ADDRESS=(181,1),CUNUMBR=(105),UNIT=3420,DEVNUMBR=1181
  375|D182-7 IODEVICE ADDRESS=(182,6),CUNUMBR=(105),UNIT=3420,DEVNUMBR=1182
  376|
  377|* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
  378|*
  379|* ---- CH12 TAPES       ------------------------------------------------
  380|CU106    CNTLUNIT CUNUMBR=106,PATH=(12),PROTOCL=D,SHARED=Y,            X
  381|               UNITADD=((80,8)),UNIT=3803
  382|D280   IODEVICE ADDRESS=(280,1),CUNUMBR=(106),UNIT=8809,DEVNUMBR=1280
  383|D281   IODEVICE ADDRESS=(281,1),CUNUMBR=(106),UNIT=3420,DEVNUMBR=1281
  384|D282-7 IODEVICE ADDRESS=(282,6),CUNUMBR=(106),UNIT=3420,DEVNUMBR=1282
  385|
```

Figure B-1 (Part 7 of 12). 4381 Dual Processor Input Example Listing

```
IOCP VERSION 001              LEVEL 000                 INPUT RECORDS
IOCP RUN ON 06-22-84 AT 14.25                        PAGE NUMBER     8
NUMBR| RECORD
_____|....+....1....+....2....+....3....+....4....+....5....+....6....+....7.C..+....8
  386|* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
  387|*
  388|* ---- CH13 TAPES       ---------------------------------------------
  389|CU107    CNTLUNIT CUNUMBR=107,PATH=(13),PROTOCL=D,SHARED=Y,            X
  390|               UNITADD=((80,8)),UNIT=3803
  391|D380    IODEVICE ADDRESS=(380,1),CUNUMBR=(107),UNIT=8809,DEVNUMBR=1380
| 392|D381    IODEVICE ADDRESS=(381,1),CUNUMBR=(107),UNIT=3420,DEVNUMBR=1381
  393|D382-7 IODEVICE ADDRESS=(382,6),CUNUMBR=(107),UNIT=3420,DEVNUMBR=1382
  394|
  395|* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
  396|*
  397|* ---- CH14 TAPES       ---------------------------------------------
  398|CU108    CNTLUNIT CUNUMBR=108,PATH=(14),PROTOCL=D,SHARED=Y,            X
  399|               UNITADD=((80,8)),UNIT=3803
  400|D480    IODEVICE ADDRESS=(480,1),CUNUMBR=(108),UNIT=8809,DEVNUMBR=1480
| 401|D481    IODEVICE ADDRESS=(481,1),CUNUMBR=(108),UNIT=3420,DEVNUMBR=1481
  402|D482-7 IODEVICE ADDRESS=(482,6),CUNUMBR=(108),UNIT=3420,DEVNUMBR=1482
  403|
  404|* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
  405|*
  406|* ---- CH15 TAPES       ---------------------------------------------
  407|CU109    CNTLUNIT CUNUMBR=109,PATH=(15),PROTOCL=D,SHARED=Y,            X
  408|               UNITADD=((80,8)),UNIT=3803
  409|D580    IODEVICE ADDRESS=(580,1),CUNUMBR=(109),UNIT=8809,DEVNUMBR=1580
| 410|D581    IODEVICE ADDRESS=(581,1),CUNUMBR=(109),UNIT=3420,DEVNUMBR=1581
  411|D582-7 IODEVICE ADDRESS=(582,6),CUNUMBR=(109),UNIT=3420,DEVNUMBR=1582
  412|
  413|* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
  414|*
  415|* ---- CH16 TAPES       ---------------------------------------------
  416|CU110    CNTLUNIT CUNUMBR=110,PATH=(16),PROTOCL=D,SHARED=Y,            X
  417|               UNITADD=((80,8)),UNIT=3803
  418|D680    IODEVICE ADDRESS=(680,1),CUNUMBR=(110),UNIT=8809,DEVNUMBR=1680
  419|
| 420|D681    IODEVICE ADDRESS=(681,1),CUNUMBR=(110),UNIT=3420,DEVNUMBR=1681
  421|D682-7 IODEVICE ADDRESS=(682,6),CUNUMBR=(110),UNIT=3420,DEVNUMBR=1682
  422|
  423|* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
  424|*
  425|* ---- CH17 TAPES       ---------------------------------------------
  426|CU111    CNTLUNIT CUNUMBR=111,PATH=(17),PROTOCL=D,SHARED=Y,            X
  427|               UNITADD=((80,8)),UNIT=3803
  428|D780    IODEVICE ADDRESS=(780,1),CUNUMBR=(111),UNIT=8809,DEVNUMBR=1780
| 429|D781    IODEVICE ADDRESS=(781,1),CUNUMBR=(111),UNIT=3420,DEVNUMBR=1781
  430|D782-7 IODEVICE ADDRESS=(782,6),CUNUMBR=(111),UNIT=3420,DEVNUMBR=1782
  431|
  432|* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
  433|*
  434|* ---- CH18 TAPES       ---------------------------------------------
  435|CU112    CNTLUNIT CUNUMBR=112,PATH=(18),PROTOCL=D,SHARED=Y,            X
  436|               UNITADD=((80,8)),UNIT=3803
  437|D880    IODEVICE ADDRESS=(880,1),CUNUMBR=(112),UNIT=8809,DEVNUMBR=1880
| 438|D881    IODEVICE ADDRESS=(881,1),CUNUMBR=(112),UNIT=3420,DEVNUMBR=1881
  439|D882-7 IODEVICE ADDRESS=(882,6),CUNUMBR=(112),UNIT=3420,DEVNUMBR=1882
  440|
```

Figure B-1 (Part 8 of 12). 4381 Dual Processor Input Example Listing

```
IOCP VERSION 001              LEVEL 000                    INPUT RECORDS
IOCP RUN ON 06-22-84 AT 14.25                          PAGE NUMBER     9
NUMBR| RECORD
_____|....+....1....+....2....+....3....+....4....+....5....+....6....+....7.C..+....8
  441|
  442|* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
  443|*
  444|* ---- CH11 DASD        ------------------------------------------
  445|*
  446|* ---- 3880 - 3370 ------------------------------------------------------
  447|CU116    CNTLUNIT CUNUMBR=116,PATH=(11),PROTOCL=D,SHARED=N,            X
  448|               UNITADD=((40,8)),UNIT=3880
  449|
  450|D140-8 IODEVICE ADDRESS=(140,8),CUNUMBR=(116),UNIT=3370,DEVNUMBR=1140
  451|*
  452|* ---- 3880 - 3380 ------------------------------------------------------
  453|CU117    CNTLUNIT CUNUMBR=117,PATH=(11),PROTOCL=S,SHARED=N,            X
  454|               UNITADD=((A0,8)),UNIT=3880
  455|D1A0-8 IODEVICE ADDRESS=(1A0,8),CUNUMBR=(117),UNIT=3380,DEVNUMBR=11A0
  456|*
  457|* ---- 3880 - 3350 ------------------------------------------------------
  458|CU118    CNTLUNIT CUNUMBR=118,PATH=(11),PROTOCL=D,SHARED=N,            X
  459|               UNITADD=((B0,8)),UNIT=3880
  460|D1B0-8 IODEVICE ADDRESS=(1B0,8),CUNUMBR=(118),UNIT=3350,DEVNUMBR=11B0
  461|*
  462|* ---- 3830 - 3344 ------------------------------------------------------
  463|CU119    CNTLUNIT CUNUMBR=119,PATH=(11),PROTOCL=D,SHARED=N,            X
  464|               UNITADD=((C0,8)),UNIT=3830
  465|D1C0-8 IODEVICE ADDRESS=(1C0,8),CUNUMBR=(119),UNIT=3344,DEVNUMBR=11C0
  466|
  467|* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
  468|*
  469|* ---- CH12 DASD        ------------------------------------------
  470|*
  471|* ---- 3880 - 3370 ------------------------------------------------------
  472|CU120    CNTLUNIT CUNUMBR=120,PATH=(12),PROTOCL=D,SHARED=N,            X
  473|               UNITADD=((40,8)),UNIT=3880
  474|D240-8 IODEVICE ADDRESS=(240,8),CUNUMBR=(120),UNIT=3370,DEVNUMBR=1240
  475|*
  476|* ---- 3880 - 3380 ------------------------------------------------------
  477|CU121    CNTLUNIT CUNUMBR=121,PATH=(12),PROTOCL=S,SHARED=N,            X
  478|               UNITADD=((A0,8)),UNIT=3880
  479|D2A0-8 IODEVICE ADDRESS=(2A0,8),CUNUMBR=(121),UNIT=3380,DEVNUMBR=12A0
  480|*
  481|* ---- 3880 - 3350 ------------------------------------------------------
  482|CU122    CNTLUNIT CUNUMBR=122,PATH=(12),PROTOCL=D,SHARED=N,            X
  483|               UNITADD=((B0,8)),UNIT=3880
  484|D2B0-8 IODEVICE ADDRESS=(2B0,8),CUNUMBR=(122),UNIT=3350,DEVNUMBR=12B0
  485|*
  486|* ---- 3830 - 3344 ------------------------------------------------------
  487|CU123    CNTLUNIT CUNUMBR=123,PATH=(12),PROTOCL=D,SHARED=N,            X
  488|               UNITADD=((C0,8)),UNIT=3830
  489|D2C0-8 IODEVICE ADDRESS=(2C0,8),CUNUMBR=(123),UNIT=3344,DEVNUMBR=12C0
  490|
  491|* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
  492|*
  493|* ---- CH13 DASD        ------------------------------------------
  494|*
  495|* ---- 3880 - 3370 ------------------------------------------------------
```

Figure B-1 (Part 9 of 12). 4381 Dual Processor Input Example Listing

```
IOCP VERSION 001              LEVEL 000                  INPUT RECORDS
IOCP RUN ON 06-22-84 AT 14.25                          PAGE NUMBER    10
NUMBR| RECORD
_____|....+....1....+....2....+....3....+....4....+....5....+....6....+....7.C..+....8
  496|CU124    CNTLUNIT CUNUMBR=124,PATH=(13),PROTOCL=D,SHARED=N,            X
  497|               UNITADD=((40,8)),UNIT=3880
  498|D340-8 IODEVICE ADDRESS=(340,8),CUNUMBR=(124),UNIT=3370,DEVNUMBR=1340
  499|*
  500|* ---- 3880 - 3380 ------------------------------------------------
  501|CU125    CNTLUNIT CUNUMBR=125,PATH=(13),PROTOCL=S,SHARED=N,            X
  502|               UNITADD=((A0,8)),UNIT=3880
  503|D3A0-8 IODEVICE ADDRESS=(3A0,8),CUNUMBR=(125),UNIT=3380,DEVNUMBR=13A0
  504|*
  505|
  506|* ---- 3880 - 3350 ------------------------------------------------
  507|CU126    CNTLUNIT CUNUMBR=126,PATH=(13),PROTOCL=D,SHARED=N,            X
  508|               UNITADD=((B0,8)),UNIT=3880
  509|D3B0-8 IODEVICE ADDRESS=(3B0,8),CUNUMBR=(126),UNIT=3350,DEVNUMBR=13B0
  510|*
  511|* ---- 3830 - 3344 ------------------------------------------------
  512|CU127    CNTLUNIT CUNUMBR=127,PATH=(13),PROTOCL=D,SHARED=N,            X
  513|               UNITADD=((C0,8)),UNIT=3830
  514|D3C0-8 IODEVICE ADDRESS=(3C0,8),CUNUMBR=(127),UNIT=3344,DEVNUMBR=13C0
  515|
  516|* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
  517|*
  518|* ---- CH14 DASD        ---------------------------------------------
  519|*
  520|* ---- 3880 - 3370 ------------------------------------------------
  521|CU128    CNTLUNIT CUNUMBR=128,PATH=(14),PROTOCL=D,SHARED=N,            X
  522|               UNITADD=((40,8)),UNIT=3880
  523|D440-8 IODEVICE ADDRESS=(440,8),CUNUMBR=(128),UNIT=3370,DEVNUMBR=1440
  524|*
  525|* ---- 3880 - 3350 ------------------------------------------------
  526|CU130    CNTLUNIT CUNUMBR=130,PATH=(14),PROTOCL=D,SHARED=N,            X
  527|               UNITADD=((B0,8)),UNIT=3880
  528|D4B0-8 IODEVICE ADDRESS=(4B0,8),CUNUMBR=(130),UNIT=3350,DEVNUMBR=14B0
  529|*
  530|* ---- 3830 - 3344 ------------------------------------------------
  531|CU131    CNTLUNIT CUNUMBR=131,PATH=(14),PROTOCL=D,SHARED=N,            X
  532|               UNITADD=((C0,8)),UNIT=3830
  533|D4C0-8 IODEVICE ADDRESS=(4C0,8),CUNUMBR=(131),UNIT=3344,DEVNUMBR=14C0
  534|
  535|* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
  536|*
  537|* ---- CH15 DASD        ---------------------------------------------
  538|*
  539|* ---- 3880 - 3370 ------------------------------------------------
  540|CU132    CNTLUNIT CUNUMBR=132,PATH=(15),PROTOCL=D,SHARED=N,            X
  541|               UNITADD=((40,8)),UNIT=3880
  542|D540-8 IODEVICE ADDRESS=(540,8),CUNUMBR=(132),UNIT=3370,DEVNUMBR=1540
  543|*
  544|* ---- 3880 - 3350 ------------------------------------------------
  545|CU134    CNTLUNIT CUNUMBR=134,PATH=(15),PROTOCL=D,SHARED=N,            X
  546|               UNITADD=((B0,8)),UNIT=3880
  547|D5B0-8 IODEVICE ADDRESS=(5B0,8),CUNUMBR=(134),UNIT=3350,DEVNUMBR=15B0
  548|*
  549|* ---- 3830 - 3344 ------------------------------------------------
  550|CU135    CNTLUNIT CUNUMBR=135,PATH=(15),PROTOCL=D,SHARED=N,            X
```

Figure B-1 (Part 10 of 12). 4381 Dual Processor Input Example Listing

```
IOCP VERSION 001              LEVEL 000                    INPUT RECORDS
IOCP RUN ON 06-22-84 AT 14.25                          PAGE NUMBER    11
NUMBR| RECORD
_____|....+....1....+....2....+....3....+....4....+....5....+....6....+....7.C..+....8
  551|               UNITADD=((C0,8)),UNIT=3830
  552|D5C0-8 IODEVICE ADDRESS=(5C0,8),CUNUMBR=(135),UNIT=3344,DEVNUMBR=15C0
  553|
  554|* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
  555|*
  556|* ---- CH16 DASD        ---------------------------------------------
  557|*
  558|* ---- 3880 - 3370 ------------------------------------------------
  559|CU136    CNTLUNIT CUNUMBR=136,PATH=(16),PROTOCL=D,SHARED=N,            X
  560|               UNITADD=((40,8)),UNIT=3880
  561|
  562|D640-8 IODEVICE ADDRESS=(640,8),CUNUMBR=(136),UNIT=3370,DEVNUMBR=1640
  563|*
  564|* ---- 3880 - 3350 ------------------------------------------------
  565|CU138    CNTLUNIT CUNUMBR=138,PATH=(16),PROTOCL=D,SHARED=N,            X
  566|               UNITADD=((B0,8)),UNIT=3880
  567|D6B0-8 IODEVICE ADDRESS=(6B0,8),CUNUMBR=(138),UNIT=3350,DEVNUMBR=16B0
  568|*
  569|* ---- 3830 - 3344 ------------------------------------------------
  570|CU139    CNTLUNIT CUNUMBR=139,PATH=(16),PROTOCL=D,SHARED=N,            X
  571|               UNITADD=((C0,8)),UNIT=3830
  572|D6C0-8 IODEVICE ADDRESS=(6C0,8),CUNUMBR=(139),UNIT=3344,DEVNUMBR=16C0
  573|
  574|* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
  575|*
  576|* ---- CH17 DASD        ---------------------------------------------
  577|*
  578|* ---- 3880 - 3370 ------------------------------------------------
  579|CU140    CNTLUNIT CUNUMBR=140,PATH=(17),PROTOCL=D,SHARED=N,            X
  580|               UNITADD=((40,8)),UNIT=3880
  581|D740-8 IODEVICE ADDRESS=(740,8),CUNUMBR=(140),UNIT=3370,DEVNUMBR=1740
  582|*
  583|* ---- 3880 - 3350 ------------------------------------------------
  584|CU142    CNTLUNIT CUNUMBR=142,PATH=(17),PROTOCL=D,SHARED=N,            X
  585|               UNITADD=((B0,8)),UNIT=3880
  586|D7B0-8 IODEVICE ADDRESS=(7B0,8),CUNUMBR=(142),UNIT=3350,DEVNUMBR=17B0
  587|*
  588|* ---- 3830 - 3344 ------------------------------------------------
  589|CU143    CNTLUNIT CUNUMBR=143,PATH=(17),PROTOCL=D,SHARED=N,            X
  590|               UNITADD=((C0,8)),UNIT=3830
  591|D7C0-8 IODEVICE ADDRESS=(7C0,8),CUNUMBR=(143),UNIT=3344,DEVNUMBR=17C0
  592|
  593|* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
  594|*
  595|* ---- CH18 DASD        ---------------------------------------------
  596|*
  597|* ---- 3880 - 3370 ------------------------------------------------
  598|CU144    CNTLUNIT CUNUMBR=144,PATH=(18),PROTOCL=D,SHARED=N,            X
  599|               UNITADD=((40,8)),UNIT=3880
  600|D840-8 IODEVICE ADDRESS=(840,8),CUNUMBR=(144),UNIT=3370,DEVNUMBR=1840
  601|*
  602|* ---- 3880 - 3350 ------------------------------------------------
  603|CU146    CNTLUNIT CUNUMBR=146,PATH=(18),PROTOCL=D,SHARED=N,            X
  604|               UNITADD=((B0,8)),UNIT=3880
  605|D8B0-8 IODEVICE ADDRESS=(8B0,8),CUNUMBR=(146),UNIT=3350,DEVNUMBR=18B0
```

Figure B-1 (Part 11 of 12). 4381 Dual Processor Input Example Listing

```
IOCP VERSION 001              LEVEL 000                  INPUT RECORDS
IOCP RUN ON 06-22-84 AT 14.25                         PAGE NUMBER    12
NUMBR| RECORD
_____|....+....1....+....2....+....3....+....4....+....5....+....6....+....7.C..+....8
  606|*
  607|* ---- 3830 - 3344 ------------------------------------------------
  608|CU147    CNTLUNIT CUNUMBR=147,PATH=(18),PROTOCL=D,SHARED=N,            X
  609|               UNITADD=((C0,8)),UNIT=3830
  610|D8C0-8 IODEVICE ADDRESS=(8C0,8),CUNUMBR=(147),UNIT=3344,DEVNUMBR=18C0
  611|
  612|
  613|*
  614•*            END OF THE SAMPLE CONFIGURATION FOR A 4381 DUAL PROCESSOR
  615|*
  616|* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
```

Figure B-1 (Part 12 of 12). 4381 Dual Processor Input Example Listing

Appendix C. List of I/O Devices and Control Units

For the IBM 4381 Processors, "IODEVICE/CNTLUNIT Macro Instruction Parameter Value Tables" list some I/O devices and show the keyword values you use to specify the UNIT and MODEL keywords in the IODEVICE macro to define those devices for your configuration. The figure also lists the control units that attach the I/O devices and shows the keyword values you may use to specify the UNIT, SHARED, and PROTOCL keywords in the CNTLUNIT macro. The section entitled NOTES tells you how to code specific I/O devices and control units.

See Chapter 2, "IOCP Input" on page 2-1 for a full description of the IODEVICE and CNTLUNIT macros and the meanings of the keyword values shown in "IODEVICE/CNTLUNIT Macro Instruction Parameter Value Tables."

Notes:

1. *This section gives you hints on how to code the macros to define various devices for your configuration.* **It is not intended to completely describe every available device.**

2. *If you are coding the source deck for use with MVS/SYSGEN, see the MVS/Extended Architecture System Generation Reference for a full description of the non-IOCP parameters and macros and the UNIT= and MODEL= parameter values for the CNTLUNIT and IODEVICE macros.*

3. *Initially, in the IODEVICE macro, the STADET parameter should be coded as* **NO** *on all model groups from the Model Group 13 upward. Refer to the STADET parameter description (under IODEVICE macro) on page 2-15.*

4. *For information about the attachment of I/O equipment used in System/370, see* **IBM System/370 Input/Output Configurator,** *GA22-7002.*

IODEVICE/CNTLUNIT Macro Instruction Parameter Value Tables

Direct Access Devices

IODEVICE UNIT=	IODEVICE MODEL=	IODEVICE Notes	CNTLUNIT UNIT=	CNTLUNIT MODEL=	CNTLUNIT SHARED=	CNTLUNIT PROTOCL=	CNTLUNIT Notes
2305	2	1	2835	2	N	D	2
3330	1, 2, 11	3	3830	2	N	D	
3330	1, 2, 11	3	3880	1, 2, 11	N	D/S	4, 5
3330V	-	7	3830	3	N	D	7
3333	1, 11	6	3830	2	N	D	
3333	1, 11	6	3880	1, 2, 11	N	D/S	4, 5
3340	-	8	3830	2	N	D	
3340	-	8	3880	1, 2	N	D/S	4, 5
3344	-	8, 9	3830	2	N	D	
3344	-	8, 9	3880	1, 2	N	D/S	4, 5
3350	-	8	3830	2	N	D	
3350	-	8, 10	3880	1, 2, 11, 21	N	D/S	4, 5
3375	-	8	3880	1, 2	N	D/S	4, 5
3380	-	8	3880	2, 3	N	S	4, 5, 11
3380	-	8	3880	2, 3	N	S	4, 5
3380	-	8	3880	13, 23	N	S	4

Display Devices

IODEVICE UNIT=	IODEVICE MODEL=	IODEVICE Notes	CNTLUNIT UNIT=	CNTLUNIT MODEL=	CNTLUNIT SHARED=	CNTLUNIT PROTOCL=	CNTLUNIT Notes
2250	3	-	2840	2	Y	D	-
3250	-	12	3258	-	YB	D	-
3262	3, 13	13	3272	1, 2	N, YB	D	14
3262	3, 13	13	3274	1A, 21A, 31A, 1B, 21B, 1D, 21D, 31D	N, YB	D	15
3277	1, 2	-	3272	1, 2	N, YB	D	14
3277	1, 2	-	3274	1A, 21A, 31A, 1B, 21B, 1D, 21D, 31D	N,YB	D	15
3278	-	-	3272	1, 2	N, YB	D	14

IODEVICE UNIT=	IODEVICE MODEL=	IODEVICE Notes	CNTLUNIT UNIT=	CNTLUNIT MODEL=	CNTLUNIT SHARED=	CNTLUNIT PROTOCL=	CNTLUNIT Notes
3278	1, 2, 2A, 3, 4	-	3274	1A, 21A, 31A, 1B, 21B, 1D, 21D, 31D	N, YB	D	15
3279	2A, 2B, 2C, 3A, 3B	-	3274	1A, 21A, 31A, 1B, 21B, 1D, 21D, 31D	N, YB	D	15
3284	1, 2	-	3272	1, 2	N, YB	D	14
3284	1, 2	-	3274	1A, 21A, 31A, 1B, 21B, 1D, 21D, 31D	N, YB	D	15
3286	1, 2	-	3272	1, 2	N, YB	D	14
3286	1, 2	-	3274	1A, 21A, 31A, 1B, 21B, 1D, 21D, 31D	N, YB	D	15
3287	1, 1C, 2, 2C	13, 16	3272	1, 2	N, YB	D	14
3287	1, 1C, 2, 2C	13, 16	3274	1A, 21A, 31A, 1B, 21B, 1D, 21D, 31D	N, YB	D	15
3288	2	13	3272	1, 2	N, YB	D	14
3288	2	13	3274	1A, 21A, 31A, 1B, 21B, 1D, 21D, 31D	N, YB	D	15
3289	1, 2	13	3272	1, 2	N, YB	D	14
3289	1, 2	13	3274	1A, 21A, 31A, 1B, 21B, 1D, 21D, 31D	N, YB	D	15
5080	-	-	5088	-	N	S	-

Magnetic Tapes

IODEVICE UNIT=	IODEVICE MODEL=	IODEVICE Notes	CNTLUNIT UNIT=	CNTLUNIT MODEL=	CNTLUNIT SHARED=	CNTLUNIT PROTOCL=	CNTLUNIT Notes
3420	3, 4, 5, 6, 7, 8	17	3803	1, 2	Y	D	17
3480	B22	17, 30	3480	A22	N	S	17

Magnetic Ink Character Readers

IODEVICE UNIT=	IODEVICE MODEL=	IODEVICE Notes	CNTLUNIT UNIT=	CNTLUNIT MODEL=	CNTLUNIT SHARED=	CNTLUNIT PROTOCL=	CNTLUNIT Notes
3890	A, B	-	3890	A,B	N	D	-

Unit Record Devices

IODEVICE UNIT=	IODEVICE MODEL=	IODEVICE Notes	CNTLUNIT UNIT=	CNTLUNIT MODEL=	CNTLUNIT SHARED=	CNTLUNIT PROTOCL=	CNTLUNIT Notes
1403	N1, N2, N7	31	2821	1, 2, 3, 5	N	D	-
2501	B1, B2	-	2501	B1, B2	N	D	-
2540	1	18	2821	1, 4, 5, 6	N	D	-
3203	5	19, 32	3203	4	N	D	-
3211	-	20, 33	3811	1	N	D	-
3505	-	20	3505	B1, B2	N	D	-
3525	-	20	3505	B1, B2	N	D	-
3540	-	20	3540	B1, B2	N	D	-
3800	-	20, 28, 33	3800	1, 2, 3	N	D	-
3838	-	20, 21	3838	1, 2, 3	N	D	22
3848	-	20	3848	1	N	D	-
3820	-	32	3820	-	N	D	-
4250	II	-	4250	-	N	D	-
4248	2	33	4248	-	N	D	-
4245	12, 20, D12, D20	34	4245	-	N	D	-
3262	5	32	3262	-	N	D	-
6262	-	32	6262	-	N	D	-

Control Units

IODEVICE UNIT=	IODEVICE MODEL=	IODEVICE Notes	CNTLUNIT UNIT=	CNTLUNIT MODEL=	CNTLUNIT SHARED=	CNTLUNIT PROTOCL=	CNTLUNIT Notes
3851	-	20, 23	3851	all	N	D	23
5088	1, 2	-	5088	1, 2	N	S	-

Special Features

IODEVICE UNIT =	IODEVICE MODEL =	IODEVICE Notes	CNTLUNIT UNIT =	CNTLUNIT MODEL =	CNTLUNIT SHARED =	CNTLUNIT PROTOCL =	CNTLUNIT Notes
CTC	-	26, 29	CTC	-	N	D	-
CTC	-	26, 29	3088	1, 2	N	D/S	27

Telecommunications

IODEVICE UNIT =	IODEVICE MODEL =	IODEVICE Notes	CNTLUNIT UNIT =	CNTLUNIT MODEL =	CNTLUNIT SHARED =	CNTLUNIT PROTOCL =	CNTLUNIT Notes
3275	-	20	3275	1, 2	N	D	-
uuuuu	-	24	2701	1	N	D	-
3704	-	20	3704	all	N	D	-
uuuuu	-	25	3704	all	N	D	-
3705	-	20	3705	all	N	D	-
uuuuu	-	25	3705	all	N	D	-
3791L	-	20	3791L	1, 2	N	D	-

Notes for the List of I/O Devices and Control Units

The 4381 IOCP is not sensitive to the device model numbers and types. Those fields are only checked to ensure they contain valid alphanumeric characters and not that the values indicate any particular machine.

In the following list, an * indicates that the note applies only when you specify the IODEVICE macro instruction for use with MVS SYSGEN, and the input deck contains both MVS SYSGEN macro instructions and IOCP macro instructions.

1. For the 2305, specify ADDRESS=(aaa,8).

2. For the 2835, specify UNITADD=((aa,n)), where n=8 or n=16 depending on the number of 2305 unit addresses required.

3. Specify the 3330 Model 2 as MODEL=1.* Notice that the 3330 attaches to the 3830 via the 3333.

4. For the 3880, you must specify one CNTLUNIT macro for each 3880 storage director.

5. Each channel path attaching to the 3880 Model 1, 2, 3, or 11 can operate independently in either data streaming or DCI mode; the 3880 has eight channel speed control switches that allow you to select the mode of operation. Regardless of the device types attached to the 3880, you should set all 3880 channel speed control switches for attached channel paths to the same setting.

   For maximum data transfer rates and the use of longer cable lengths, set data streaming mode and specify PROTOCL=S in the CNTLUNIT macro for each 3880 storage director.

   The processor complex requires that all control units attaching a common device use the same interface protocol. When both a 3880 and a 3830 attach a common device to the processor complex, you must specify PROTOCL=D in the CNTLUNIT macro for the 3830 storage director, and in the CNTLUNIT macro instruction(s) for the attached 3880 storage director(s). You must also set the 3880 channel speed control switches for attached channel paths to the non-data streaming mode.

6. Specify the 3333 as UNIT=3330.*

7. For the 3330V (virtual volume for MSS), you must also specify the 3851 in the IODEVICE macro. For more information, see the entries for 3851 under "Control Units."

8. Do not specify the MODEL parameter if the IODEVICE macro will be used as input to MVS SYSGEN.*

9. Specify the 3344 as UNIT=3340.*

10. 4381 IOCP does not generate multiple addresses for a 3350 attached to a 3880 paging storage director.

11. The 3880 Speed Matching Buffer feature is required.

12. Specify the 3250 as UNIT=2250,MODEL=3.*

13. Specify the 3262, 3287, 3288, and 3289 as UNIT=3284 or UNIT=3286. If the 3287, 3288, or 3289 will be used as an MVS/XA operator's console, specify UNIT=3286,MODEL=2.*

14. For a 3272, the recommended specification is SHARED=YB if multiple devices are attached to the control unit.

    If you specify SHARED=N when multiple devices are attached to the control unit, you must run the special Error Recovery Program (ERP) for possible zero sense data. For more information, see *IBM 3271 Control Unit, 3272 Control Unit, 3275 Display Station Description and Programmer's Guide*, GA23-0060. Running multiple devices may increase the possibility of additional overhead in the control program because of a deferred condition code 1 I/O interruptions.

    If a single device is attached to the control unit, you can specify SHARED=N without special ERP support; there will be no increase in the control program overhead.

15. For a 3274 attached to a block multiplexer channel path, the recommended specification is SHARED=YB if multiple devices are attached to the control unit. If necessary, you can specify SHARED=N when multiple devices are attached to the control unit, but this increases the possibility of additional overhead in the control program.

    If a single device is attached to the control unit (as is the case for the 3274 Model 1A), you can specify SHARED=N without the risk of increased overhead in the control program.

16. Specify the Model 1C as Model 1 and the Model 2C as Model 2.*

17. If the magnetic tape subsystem contains two to four control units accessing the same group of magnetic tape units, define each control unit separately. Each of the control units must have a different channel path identifier, but all of the control units should specify the same address range.

    Specify in the IODEVICE macro that the tape units are attached to all of the control units, even if the tape units are only logically attached.

18. Specify the 2540 with two IODEVICE macro instructions: one with UNIT=2540R, the other with UNIT=2540P.*

19. For the 3203, only the Model 5 is supported, but you specify the Model 5 as MODEL=4.*

20. Do not specify the MODEL parameter if the IODEVICE macro will be used as input to MVS SYSGEN.*

21. For the 3838, specify ADDRESS=(aa0,8). The last digit of the unit address must be 0.

22. For the 3838, specify UNITADD=((a0,8)).

23. For the 3330V (virtual volume for MSS), you must specify the 3851 in the IODEVICE macro. For more information, see the entry for 3851 under "Control Units."*

24. In the UNIT parameter, you can specify any device or line that is attached to the 2701.*

25. In the UNIT parameter, you can specify any device or line that is attached to the 3704 and 3705 if in EP and byte multiplexer mode.*

26. For a 3088, specify ADDRESS=(aa0,n) in the IODEVICE macro, where n=32 or 64 depending on the number of unit addresses required.

27. For a 3088, specify UNITADD=(a0,n) in the CNTLUNIT macro, where n=32 or n=64 depending on the number of unit addresses required.

28. Attach the 3800 to a block multiplexer channel (TYPE=BL) for optimum system performance.

29. The channel-to-channel adapter (CTC) only attaches to block multiplex channels:TYPE=BL, SHARED=N, PROTOCL=D.

30. A sixteen (16) addresses range must be specified.

31. When used as an IOCP output device, specify device type=1403.

32. When used as an IOCP output device, specify device type=3203.

33. When used as an IOCP output device, specify device type=3211.

34. When used as an IOCP output device, specify the device type according to the mode plugged in for 4245. For instance, if the 4245 is plugged for "3203", specify the device type=3203. If the 4245 is plugged for "3211", specify the device type=3211, etc.

Appendix D. 308x IOCP Differences

This information is for those who are familiar with 308x Processors.

Instruction Differences

By applying these modifications to the general rules for coding, IOCP instructions for 308x Processors can be used on 4381 Processors.

1. The ID macro may appear anywhere in the 4381 IOCP input record data set.
2. The 4381 IOCP can process any number of ID macros.
3. The CHPID macro may appear anywhere in the 4381 IOCP input record data set.
4. The CNTLUNIT macro may appear anywhere in the 4381 IOCP input record data set.
5. The 4381 IOCP can process up to 256 valid CNTLUNIT macros.
6. The IODEVICE macro may appear anywhere in the 4381 IOCP input record data set.
7. The 4381 IOCP can process up to 2,048 valid IODEVICE macros.
8. IOCP comment cards [specified by asterisk (*) in column 1] can be inserted in the input deck where desired. The IOCP characters following the * are required.
9. The 4381 IOCP uses the DEVNUMBR parameter on the IODEVICE macro to specify a device number, but will accept 308x Processors' definition of UNITADD for the device's unit address and assume that the ADDRESS parameter specifies a device number if UNITADD= is specified. Specification of a UNITADD parameter and a DEVNUMBR parameter on the IODEVICE marco is mutually exclusive. For information on coding, see the IODEVICE macro instruction definition on page 2-12. Note that when the UNITADD parameter is used, the ADDRESS parameter will not accept a replication factor; that is, a parameter added to the base number and used to specify a repetitive amount added to the original base number.
10. The 4381 Processors do not support the TIMEOUT function. This is not a problem even for devices which normally run with the timeout function, such as the channel-to-channel adapter, because 4381 Processors always wait sufficiently long enough for I/O operations to complete without "timing out."

11. The 4381 Processors do not support the preferred path function. For information on path selection in the 4381, see "Path Selection" on page 3-2.

12. The 4381 IOCP does not support special processing of certain unit types. For example, when 3350P is specified for paging devices to be used by MVS, the 4381 IOCP does not generate the multiple addresses expected by that operating system because not all operating systems have the same requirements. As this type of specification is simply a short-hand method of specifying multiple addresses, the same effect can be achieved by actually hand coding the desired device addresses separately.

13. CNTLUNIT values of "***" are not supported by the 4381 IOCP. The statement containing the "***" specification will be nullified but other processing will continue.

Operational Differences

- IOCP for 4381 Processors operates stand-alone in 370 mode **ONLY**. There is no batch version of the 4381 IOCP that runs under MVS/370 or MVS/XA nor any online capability for adding, removing, or changing single channel/control unit/device definitions.

  There is no provision for generating UCWs required for operation in 370-mode in the 4381 IOCP; it is done using the support processor functions (see *IBM 4381 Processor Operations Manual*).

- The MVS JCL parameter IGNORE is not applicable to the 4381 *stand-alone* IOCP. The 4381 always ignores all *known* MVS SYSGEN macros and parameters. Any unrecognized macros or macro parameters and all "coding errors" are **always** flagged.

- To see the contents of the 4381 I/O Configuration Data Set, use the Service Processor commands QFOIL and QFOIN. (For more information, see the *IBM 4381 Processor Operations Manual.*)

- The 4381 Processors have the capability of storing two different I/O configuration definitions (IOCDSs). The IOCDSs are designated D0 and D1 and contain the complete I/O configuration description for the processor. For the Model Groups 3 and 14 dual processors, each IOCDS will contain the complete configuration for both of the processors.

Related Processor Differences

- The 4381 uniprocessors have six standard channels numbered 0 through 5. There are six optional channels, numbered 0 through B, available to bring the total number to 12.
- The 4381 dual processors have two groups of channels, one for each processing unit. Each channel group is numbered 0 through 8. Each group has a **channel set number** of 0 or 1 associated with it depending on which processing unit it is attached to. (For information on coding, see "CHPID Macro" on page 2-4.)
- An I/O configuration description run can be made on a different 4381 than it is intended to describe. This allows you to set up the configuration for a new or reconfigured machine without access to the target machine. For more information, see the *IBM 4381 Processor Operations Manual.*
- The 4381 Processors support natively attached display terminals and printers as console devices. These devices are not necessary to the operation of the operating system but at least one must be available for operation of the processor. If any attempt is made to use one of these devices for the operating system without first defining it through IOCP, the system will probably hang up.

CHPID Interpretation Differences

The 4381 considers the channel path identifier to be a *logical* entity that permits a user to "name" a physical channel, much as a user employs a *device number* to "name" an I/O device. The chpid allows IOCP to cross-reference other facilities specified in the configuration description, but does not "define" the actual channel. The definition is actually done with the channel number and the channel set.

The *chpid number* can be thought of as a "label" for a 4381 channel. As such, this user-specified number is what IOCP assumes has been used in a CNTLUNIT macro to indicate attachment of that control unit to a channel. The control unit number specified by the user in the CNTLUNIT macro is a control unit "label" that IOCP requires be used in an IODEVICE macro. This identifies the control unit to which the subject I/O device is to be considered to be attached.

This is a departure from the manner in which the 308x looks at the chpid number. The 308x IOCP considers that the chpid number specifies the number of the physical channel attaching to the 308x Processors.

As a matter of practical consideration, the user must take care in specifying chpid numbers. The chpid-number-to-channel-number correlation and the control unit and I/O device attachment to the channels is delineated in the various configuration reports produced by the 4381 IOCP. The reports generated by the 4381 IOCP are only available at initial configuration and cannot be recreated from the data set, as can those produced by the 308x IOCP. Therefore, if the user does not select a chpid-channel-number relationship that can be readily remembered and/or does not maintain the set of reports generated at configuration time, some difficulties may be experienced if any errors should occur during operation of the system.

Examples of situations that 308x users might experience when using the 4381 Processors:

1. 4381 Processors return the physical channel number in place of the logical chpid in response to a store subchannel instruction.

2. Error reports from the 4381 hardware/microcode will report the physical channel number.

3. The real channel number(s) to which the device is attached, not the logical chpid number specified by the user in the generation deck, will be displayed if a 4381 user displays a subchannel number or a device number from one of the I/O data sets using the console functions facility.

Glossary

The following terms are defined as they are used in this book. If you do not find the term you are looking for, refer to the Index or to the *Vocabulary for Data Processing, Telecommunications, and Office Systems*, GC20-1699.

channel path. A connection between a processor and control unit along which signals and data can be sent to perform I/O requests. Analogous to channel.

channel subsystem. The collection of channels, channel paths, control units, and I/O devices that attaches to the processor.

contention. A condition arising when two or more data stations attempt to transmit at the same time over a shared channel, or when two data stations attempt to transmit at the same time in two-way alternate communication.

data streaming. The I/O interface protocol that operates at the rate governed by the control unit. This protocol does not require the demand response. (See Direct Control Interlock.)

Direct Control Interlock (DCI). The I/O interface protocol that is the standard I/O interface and requires a demand response.

device number. Three hexadecimal digits that uniquely identify an I/O device in 370-XA mode.

Input/Output Configuration Data Set (IOCDS). The data set that contains the I/O configuration definition generated by IOCP.

Input/Output Configuration Program (IOCP). An IBM-supplied program that creates the I/O configuration definition (IOCDS) based on user-defined input.

IOCDS. Input/output configuration data set.

IOCP. Input/output configuration program.

LCA. The Local Channel Adapter (LCA) of the 4381 provides the connection of the natively attached consoles to the processor.

unit address. The last two digits of a device address or a device number.

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