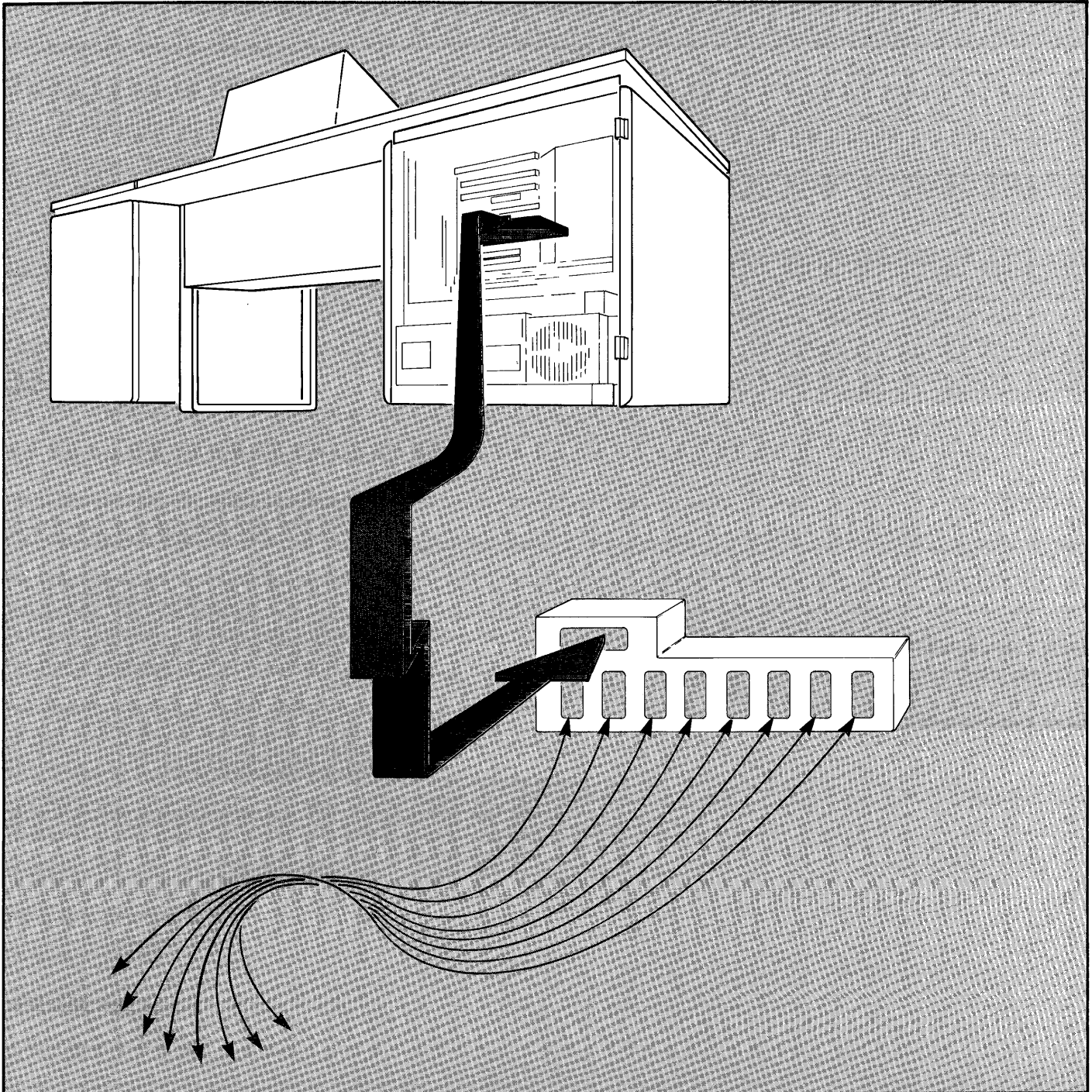


HP 12792A

8-Channel Asynchronous Multiplexer Subsystem Configuration Guide

for HP 1000 M/E/F-Series Computers



HP 12792A 8-Channel Asynchronous Multiplexer Subsystem Configuration Guide



HEWLETT-PACKARD COMPANY
Data Systems Division
11000 Wolfe Road
Cupertino, California 95014

Library Index No.
MUX.320.12792-90003

MANUAL PART NO. 12792-90003
Printed in U.S.A. September 1980

PRINTING HISTORY

The Printing History below identifies the Edition of this Manual and any Updates that are included. Periodically, Update packages are distributed which contain the latest replacement pages and write-in instructions to be merged into the manual, including an updated copy of this Printing History page.

To replenish stock, this manual will be reprinted as necessary. Each such reprinting will incorporate all past Updates, however, no new information will be added. Thus, the reprinted copy will be identical in content to prior printings of the same edition with its user-inserted update information.

To determine the specific manual edition and update which is compatible with your current software revision code, refer to the appropriate Software Numbering Catalog.

First Edition Sept. 1980

NOTICE

The information contained in this document is subject to change without notice.

HEWLETT-PACKARD MAKES NO WARRANTY OF ANY KIND WITH REGARD TO THIS MATERIAL, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. Hewlett-Packard shall not be liable for errors contained herein or for incidental or consequential damages in connection with the furnishing, performance or use of this material.

Hewlett-Packard assumes no responsibility for the use or reliability of its software on equipment that is not furnished by Hewlett-Packard.

This document contains proprietary information which is protected by copyright. All rights are reserved. No part of this document may be photocopied, reproduced or translated to another program language without the prior written consent of Hewlett-Packard Company.

Table of Contents

Chapter 1 Overview

Chapter 2 System Planning

SOFTWARE MODULES	2-1
DEVICE DRIVERS	2-2
SUPPORTED DEVICES	2-3
INTERFACE SUPPORT DEFINITION	2-3
INTERFACE DRIVER WITH/WITHOUT USER WRITTEN DEVICE DRIVER	2-5
INTERFACE DRIVER WITH DDV05	2-5
INTERFACE DRIVER WITH DDV12	2-5
OTHER HP SUBSYSTEMS	2-6
MODEMS	2-6

Chapter 3 System Generation

GENERAL CONSIDERATIONS	3-1
INITIALIZATION PHASE	3-2
PROGRAM INPUT PHASE	3-2
PARAMETER INPUT PHASE	3-3
TABLE GENERATION PHASE	3-3
EQUIPMENT TABLE ENTRIES	3-3
DEVICE REFERENCE TABLE ENTRIES	3-5
INTERRUPT TABLE ENTRIES	3-6
PARTITION DEFINITION PHASE -- SYSTEM AVAILABLE MEMORY	3-8

Chapter 4 Initialization

USING THE DEFAULT DEVICE DRIVER	4-1
ENABLING A DDV12 DEVICE	4-2
ENABLING A DDV05 DEVICE	4-2
EXAMPLE	4-3

Chapter 5 Troubleshooting

Appendix A Partial Sample System Generation

Index

Chapter 1

Overview

The purpose of this Configuration Guide is to give the System Manager specific instructions for generating the HP 12792A Multiplexer into an RTE-IVB or RTE-MIII system. Also included are instructions on initializing the devices attached to the Multiplexer and on troubleshooting if problems arise upon installation.

For more detailed information on the operation of the HP 12792A Multiplexer, the reader is referred to the Multiplexer User's Manual and the Multiplexer Subsystem Installation and Reference Manual.

Chapter 2

System Planning

Software Modules

Software modules provided with the HP 12792A Multiplexer are listed in Table 2-1 along with their approximate sizes.

Table 2-1. Software Modules for 12792A.

<u>Module</u>	<u>Approx size (decimal bytes)</u>	<u>Description</u>
%DVM00	2700	Interface card driver
%PVM00	150	Pre-driver
%DDV05	440	26XX terminal screen mode device driver
%DDV12	320	2631/2635/7310 printer device driver
;%DVTB	6	Device driver address table

%DVM00 and %PVM00 are always used in every system generation. %DVTB is always used but if the user writes an additional device driver %DVTB must be modified. %DDV05 and %DDV12 are used according to the needs of the user and the devices attached to the Multiplexer interface. For more information on the tasks of these modules, refer to the Multiplexer User's Manual, Chapter 4 (Device Driver Writing).

Device Drivers

One of the features of the HP 12792A is its device driver capability. Users can write "device" drivers for RS-232-C or RS-423-A devices attached to the Multiplexer to take care of special control required by the device. Device drivers are simply subroutines of the interface driver and use the interface driver to communicate with the CPU and devices. When writing device drivers, the user need only be concerned with adding the required character sequences to user data to control the devices.

HP supplies two device drivers with the 12792A product -- DDV05 (26XX terminal screen mode device driver) and DDV12 (2631/2635/7310 printer device driver). These device drivers, along with the interface driver (DVM00), the pre-driver (PVM00) and \$DVTB can be relocated in a two page driver partition. Users adding their own device drivers may find that all of the software won't fit into a two page driver partition. There are several alternatives besides using a three page driver partition (which decreases maximum size of a user partition). Refer to the Multiplexer User's Manual Chapter 4 (Device Driver Writing) for the alternative locations of these modules.

The interface driver (DVM00) uses the device driver address table (\$DVTB) to find the appropriate device driver when the device driver is selected with a control 33B request. The device drivers are selected by numbers which are determined by the device driver's position in the device driver address table. Each device driver to be used with the interface driver must have an entry in the device driver address table. Thus, users writing their own device drivers must modify \$DVTB. This modification is explained in the Multiplexer User's Manual Chapter 4 (Device Driver Writing). \$DVTB need not be modified if users are simply using the HP-supplied device drivers or a subset thereof. If one of the HP-supplied device drivers is not relocated (e.g., DDV05 is used for terminals, but DDV12 is not used) and HP-supplied \$DVTB is used, an undefined external will result at system generation time. This will be the name of the device driver not used. This undefined external can be ignored, or \$DVTB can be coded specifically for the device drivers used (refer to Chapter 4 "Device Driver Writing" in the User's Manual for instructions on re-coding \$DVTB).

Supported Devices

This section describes the extent of Hewlett-Packard's support for terminals and devices not specifically called out as supported by the HP 12792A Multiplexer Subsystem. Hewlett-Packard's responsibility extends only to insuring that the HP 12792A performs according to the following specifications when correctly installed and commanded to perform according to the instructions in the HP 12792A documentation supplied to the user.

Interface Support Definition

Electrical: The HP 12792A provides connection for two twisted pair data lines per channel. One pair provides send data, the other provides receive data. Two of the wires may be connected together to form a signal common. The electrical specifications of the data lines are RS-423-A, which is backwards compatible with RS-232-C.

Line Speeds: The 12792A will transmit and receive data simultaneously on any combination of channels at the following baud rates, provided that the aggregate throughput of 76800 baud (total for all 8 channels) is not exceeded.

SUPPORTED BAUD RATES

50	150	2400
75	300	4800
110	1200	9600
134.5	1800	19200

In addition, the rate at which the interface driver/card can process read and write requests (including device driver read and write requests) may not exceed 128 requests per second. This request rate may be reduced by other system activity.

User data reproduction: The character size may be specified at 5, 6, 7, or 8 bits per character not including an optional parity bit. On transmit, the user data will be processed byte by byte passing the 5, 6, 7, or 8 least significant bits in each byte to the character depending on character size. A parity bit will be added by the interface if parity is enabled. On receive, the user data from each character will be passed to the user's buffer into the 5, 6, 7, or 8 least significant bits of each byte, with the unused bits defined as follows:

Receive 8 bits/char:

bits 0 - 7: data
parity bit: always stripped

Receive 7 bits/char:

bits 0 - 6: data
bit 7: always zero (parity bit is
always stripped)

Receive 6 bits/char:

bits 0 - 5: data
bit 6: parity bit or, if no parity
defined, is always 1
bit 7: always 0

Receive 5 bits/char:

bits 0 - 4: data
bit 5: parity bit or, if no parity
defined, is always 1
bit 6: always 1
bit 7: always 0

Character Insertion/Deletion: To support the broadest range of devices the HP 12792A may be configured to completely pass all user data in both directions. Character handshakes required by devices may be inserted or deleted from the user data with a user-written device driver. Devices using hardware handshaking between the Multiplexer card and the device are not supported. XON/XOFF protocol and transmit handshaking controlled by the device (rather than the interface) are not supported.

Additionally, the interface driver/card has the capability to perform the following character-oriented functions when configured by control requests:

TRANSMIT: Send ENQ (ASCII 5) and wait 5 seconds for an ACK (ASCII 6) response after every 80 characters.

Add a CR LF after each record or, if the last character is an underscore, delete the underscore and don't add CR LF.

RECEIVE: End transfer on, and strip one or more of the following:
CR, RS, EOT and DC2. Or, end transfer on count and strip
nothing.

On BS, strip the BS and delete the last character entered.

On DEL, strip the DEL and delete all characters previously
entered in the record, restarting the record.

Echo all characters received and, on CR or DEL, echo CR LF.

Interface Driver With/Without User Written Device Driver

The HP 12792A Multiplexer Subsystem will support any RS-232-C or RS-423-A asynchronous bit serial character mode device whose interface characteristics are compatible with the Electrical, Line Speed, and User Data Reproduction sections of the preceding Interface Support Definition. The user may be required to write a device driver for the device in order to obtain this support.

Interface Driver With DDV05

The HP-supplied device driver DDV05 supports character and block mode operation with the following HP terminals:

2621A/P	2640B
2645A	2647A
2648A	2649B/C/G
2626A	

DDV05 provides no support for EQT subchannels. This includes cartridge tape units, printers, etc.. A separate LU is required for a serial line printer, in which case it may be connected directly to the MUX via either DDV12 or a user-written device driver.

Interface Driver With DDV12

The HP-supplied DDV12 device driver supports write-only with optional lineprinter-like column one carriage control on the following HP devices:

2631A/B
2635A/B
7310

For more information on HP-supplied device drivers, refer to Appendix B of the Multiplexer User's Manual.

Other HP Subsystems

Support of non-HP terminals and devices by the HP 12792A Multiplexer Subsystem does not imply support of the devices by other HP systems or subsystems communicating with these devices through the HP 12792A. Consult the specific subsystem documentation for devices supported by that subsystem.

Modems

The MUX will passively support asynchronous, full duplex modems. Passive support means the MUX does not recognize or supply any modem control or status lines. The RS-232-C connectors on the HP 12828A have modem "clear to send" connected back to "request to send" and "carrier detect" wired back to "data terminal ready." ("Data set ready" is pulled to +12v through a 1K ohm resistor for those terminals that require it.) Use of the HP 12828A or connectors similar to these allow the passive support of modems. The user should be aware that "line loss" or other "modem not ready" problems cannot be detected by the MUX or user software through the MUX. Modem connect or disconnect sequences cannot be requested through the MUX.

When using modems be aware that if the modem line (with auto answer) is disconnected, no provision is available to detect the condition. If the user was logged on under an RTE-IVB session and the line is disconnected before the user logs off, anyone dialing in to that port will be re-connected to the session in progress at the time of the previous disconnect.

Chapter 3

System Generation

The following paragraphs outline the recommended procedure for generating the HP 12792A Multiplexer into an RTE Operating System. Examples of input at each of the relevant phases is shown. An example listing of the relevant generation phases is shown in Appendix A.

General Considerations

The generation of the HP 12792A Multiplexer driver software into RTE is very similar to that of other terminal drivers. Each multiplexer card may be assigned up to 8 EQT's (one EQT per port). Each EQT to be used with this driver is assigned to an interface card at generation time by the select code designated when EQT's are specified. Any EQT associated with a particular interface card can be used for any port on that card, but EQT's cannot be moved from one card to another after generation.

The size of an extent assigned to an EQT is determined by adding the size required by the interface driver (17 words) to the largest of the extents required by any device drivers attached to that EQT. The HP-supplied device drivers both require 4 word extents, so when using only HP-supplied software the extent size would be $17 + 4 = 21$ words.

A Device Reference Table (DRT) entry must be generated for each logical unit (LU) to be used. A different LU number must be assigned to each individual terminal or device.

On system boot-up, the WELCOM file should contain control requests needed to initialize the ports. It is at this time that the association between LU (and its EQT), and physical port (device) is made. The WELCOM file contents are covered in Chapter 4 (Initialization).

In the following examples the step numbers referred to in each phase refer to the steps in Section 2 of the RTE-IVB On-Line Generator Reference Manual. While the step numbers are not referenced in the RTE-M System Generation Manual, the procedure is basically the same. Where differences occur, they are noted.

Initialization Phase

Since the HP 12792A Multiplexer driver is NOT privileged (as opposed to the HP 12920B Multiplexer product), nothing related to the MUX needs to be done in this phase.

Program Input Phase

Step 16C (in the RTE-IVB On-Line Generator Reference Manual) specifies the modules to be relocated by their relocatable file names with optional security code and disc cartridge specification. Relocate %DVM00, %PVM00, %\$DVTB, and all HP- and User-supplied device drivers to be used. Refer to Figure 3-1, which shows only the HP-supplied software being relocated.

16c Enter the RELOCATE commands (with optional MAP, LINKS IN, and DISPLAY commands)

```
REL       , %DVM00                      (REL [(name)] ,filename [: sc [: cartridge label]])
REL       , %PVM00                      (RT4GN responds with a - after each user input)
REL       , %DDV05                     
REL       , %DDV12                     
REL       , %$DVTB                     
```

Figure 3-1. Relocating HP-Supplied Software.

Parameter Input Phase

In step 17 the user is required to change the program type of module PVM00 to 13. This forces PVM00 to reside in Table Area II. Refer to Figure 3-2.

In RTE-M users need not change this parameter.

Parameter Input Phase	(modify type, priority, and execution interval, or the ENT (entry) record of any of the programs specified during the Program Input Phase)
17 PARAMETERS	(output by generator at start of Parameter Input Phase)
-	(generator prompt)
PVM00, 13, _____, _____	(name, Type [,priority [,execution interval]])
-	
_____, _____, _____, _____	
-	(terminate your final entry with a /E)
-	

Figure 3-2. Changing PVM00 Parameter.

Table Generation Phase

Equipment Table Entries

In step 19, the user specifies the EQT entries for the Multiplexer. All EQT's associated with devices on one interface card use that card's select code number. Each EQT may specify buffering (B), and

should have an EQT extent as determined at the beginning of this chapter (17 + largest extent required by device drivers). When using only HP-supplied device drivers, the extent will be 21. A timeout value may optionally be specified. Do not specify DMA usage ("D" option). Refer to Figure 3-3. Note that EQT's shown here are contiguous, but need not be. Also, "SC" refers to the select code of the Multiplexer card.

<p>①9 EQUIPMENT TABLE ENTRY</p> <p>EQT XX?</p> <p>SC, DVMØØ, B, X=21, T=32767, _____, _____, _____</p> <p>EQT XX+1?</p> <p>SC, DVMØØ, B, X=21, T=32767, _____, _____, _____</p> <p>EQT XX+2?</p> <p>SC, DVMØØ, B, X=21, T=32767, _____, _____, _____</p> <p>EQT XX+3?</p> <p>SC, DVMØØ, B, X=21, T=32767, _____, _____, _____</p> <p>EQT XX+4?</p> <p>SC, DVMØØ, B, X=21, T=32767, _____, _____, _____</p> <p>EQT XX+5?</p> <p>SC, DVMØØ, B, X=21, T=32767, _____, _____, _____</p> <p>EQT XX+6?</p> <p>SC, DVMØØ, B, X=21, T=32767, _____, _____, _____</p> <p>EQT XX+7?</p> <p>SC, DVMØØ, B, X=21, T=32767, _____, _____, _____</p>	<p>(oct. select code, driver [,B] [,D] [,S] [,M] [,T= tttt] [,X = xxx])</p> <p>(do not specify SDA for system disc driver)</p> <p>(terminate your final entry with a /E)</p>
---	--

Figure 3-3. Equipment Table Entries

Device Reference Table Entries

Step 20 specifies the Device Reference Table (DRT) entries for the MUX. There should be one entry for each port utilized by a terminal or device.

Each entry in the DRT is the EQT number of the equipment table entry for a port. The DRT entries are in LU number order. The terminal on that port will be referred to by the LU number of the current DRT entry.

No support is provided for EQT subchannels in the HP-supplied device drivers or interface drivers (these drivers will ignore any subchannel specification although for compatibility with future products it should be set to zero). This includes cartridge tape units, printers, etc.. Users may write their own device drivers which will use EQT subchannels (refer to the HP 12792A Multiplexer User's Manual Chapter 4, Device Driver Writing).

Refer to Figure 3-4 for the format of DRT entries, where XX refers to the EQT number and YY refers to the LU number. Note that these entries are sequential, but need not be.

20

DEVICE REFERENCE TABLE

YY = EQT #?
XX , _____

YY+1 = EQT #?
XX+1 , _____

YY+2 = EQT #?
XX+2 , _____

YY+3 = EQT #?
XX+3 , _____

YY+4 = EQT #?
XX+4 , _____

YY+5 = EQT #?
XX+5 , _____

YY+6 = EQT #?
XX+6 , _____

YY+7 = EQT #?
XX+7 , _____

Figure 3-4. DRT Entries For The MUX.

Interrupt Table Entries

Step 21 specifies the interrupt table entries for the HP 12792A Multiplexer. One entry is required for each interface card generated into the system. On systems using up to 8 terminals on the MUX, users will want to specify:

sc, PRG, PRMPT

to enable scheduling of PRMPT on unsolicited interrupts. Unsolicited interrupts are caused by striking a key on a terminal which does not have a read request pending on it. If a user-written program is to be scheduled upon receipt of an unsolicited interrupt, include that program's name in place of PRMPT. Note that the program specified is used for all channels on that card unless overridden on-line via a user request. If unsolicited interrupts are to be ignored, use:

sc,EQT,eqt#

where sc is the select code of the card and eqt# is the number of any one of the EQT's specified for that card. This will still allow communication with each port's EQT -- the only effect it has is to ignore unsolicited interrupts. This can be overridden via an on-line request.

Refer to the RTE-IVB On-Line Generator Reference Manual for more details. Figure 3-5 shows the entry used when devices are connected to the MUX.

(21)	INTERRUPT TABLE	(enter octal select codes in ascending order)
—	SC , PRG , PRMPT	(generator prompt)
—	_____ , _____ , _____	(select code, option, destination)
—	_____ , _____ , _____	(terminate your final entry with a /E)
—	_____ , _____ , _____	
—	_____ , _____ , _____	
—	_____ , _____ , _____	
—	_____ , _____ , _____	

NOTE:
 SC= OCTAL SELECT CODE OF
 MUX CARD
 ENTER OCTAL SELECT CODES
 IN ASCENDING ORDER

Figure 3-5. Interrupt Table Entries.

Partition Definition Phase — System Available Memory

Step 33 allows the system manager to increase the size of System Available Memory (SAM) by moving the starting page of the first user partition to a higher location in memory.

The system manager should keep in mind that, since terminals on the MUX may be buffered, SAM will be required for programs to communicate with terminals. If there is not enough SAM, programs communicating with terminals may be suspended waiting for System Available Memory.

Chapter 4

Initialization

Initialization of the HP 12792A Multiplexer Subsystem is typically performed at boot-up in the WELCOM file by a sequence of control requests. Three requests are performed on each port:

```
control 30B:  Set port ID
control 33B:  Configure driver responses, if needed
control 20B:  Enable schedule, if needed
              (schedule a program on
              unsolicited interrupts)
```

These control functions must be given in the above order, and are defined in detail in the User's Manual.

The HP 12792A Interface card contains two baud rate generators. When using the HP 12828A Multiplexer Panel with the standard cable, baud rate generator 0 (BRG0) is wired to port 0, and baud rate generator 1 (BRG1) is wired to ports 1-7. Typically, the printer port is port 0 (running at, say, 2400 baud) while the other seven ports are terminals running at 9600 baud. Note that these two baud rate generators can be split in other ways (2 or 3 or 4 ports on one baud rate generator and the rest on the other). Refer to the HP 12792A Multiplexer Subsystem Installation and Reference Manual for more information.

It is important to remember that devices must be configured to agree with the values specified in the control 30B request in the WELCOM file. For example, when using a 7310 line printer, the switches on the back of the 7310 line printer should be set for whatever baud rate and parity option is to be used. All other switches should be in their normal positions.

Using the Default Device Driver

All ports must be associated with a device driver. For devices which do not require request processing beyond what the interface driver performs, a "default device driver" is included as part of the interface driver. Upon being sent a request by the interface driver,

the default device driver simply passes the request back to the interface driver without performing any processing on the request.

The default device driver is selected by specifying device driver number one when issuing a control 33B request.

Enabling a DDV12 Device

The following could be used to initialize a line printer attached to port 0:

```
:CN,lu,30B,142310B * Port 0, 2400 baud, ENQ/ACK enabled, no
                    parity, 1 stop bit, BRG 0, 8 bits char.

:CN,lu,33B,2        * Attach device driver number 2, DDV12 (in
                    the HP-supplied $DVTB, DDV12 is device
                    driver number 2).

:CN,lu,21B          * Disable schedule (see below).
```

The last request (control 21B, disable schedule) is included so that the device driver is entered before any user request is given. This gives the driver a chance to set the port's driver type to 12B in case a user inquires driver type before any other request is given. Any reasonable control request may be given -- 21B was chosen since it also ensures that extraneous noise will not cause program scheduling.

Note that a control 20B is not used for a line printer since there will be no read requests or unsolicited interrupts from the printer.

As with all devices, when using a 7310, 2631, or 2635, be sure the switches are set for whatever baud rate and parity option is to be used. These must agree with the values specified using the control 30B request in the WELCOM file.

Enabling a DDV05 Device

The control requests that could be used to initialize a terminal port are shown below. Typically these are running off of baud rate generator one (BRG1).

```

:CN,1u,30B,152334B * Port 4, 9600 baud, ENQ/ACK enabled, no
                    parity, 1 stop bit, BRG 1, 8 bits per
                    character.

:CN,1u,33B,3 * Attach device driver 3, DDV05 (in the
              HP-supplied $DVTB, DDV05 is device driver
              3).

:CN,1u,20B * Enable scheduling (schedule program on
            unsolicited interrupt).

```

Be sure that the terminal strapping configuration switches agree with the commands given in the control request. Refer to the appropriate terminal/device instruction manual.

Example

The following is a sample part of a WELCOM file which initializes each port to 9600 baud, no parity, one stop bit, ENQ/ACK handshake enabled, attaches device driver 3 (the 26XX screen mode terminal device driver), and puts the port in type-ahead mode with cancel on break. Port 7 on the second card is configured for a 7310 lineprinter (device driver 2). Note that the default (hardwired) baud rate configuration is used (port 0 uses baud rate generator 0, ports 1-7 use baud rate generator 1). With the HP 12828A Multiplexer Panel, port 0 uses BRG0 and ports 1-7 use BRG1 unless the user modifies the hood connector.

```

:*
:* SET PORT ID'S ON CARD 1
:*
:CN,19,30B,142330B
:CN,20,30B,152331B
:CN,21,30B,152332B
:CN,22,30B,152333B
:CN,23,30B,152334B
:CN,24,30B,152335B
:CN,25,30B,152336B
:CN,26,30B,152337B
:*
:* SET PORT ID'S ON CARD 2
:*
:CN,27,30B,142330B
:CN,28,30B,152331B
:CN,29,30B,152332B
:CN,30,30B,152333B
:CN,31,30B,152334B

```

```
:CN,32,30B,152335B
:CN,33,30B,152336B
:CN,34,30B,152337B
:*
:* CONFIGURE DRIVER RESPONSES ON ALL PORTS
:*
:CN,19,33B,23003B
:CN,20,33B,23003B
.
.
.
etc
.
.
.
:CN,33,33B,23003B
:CN,34,33B,2
:*
:* ENABLE SCHEDULING ON ALL PORTS
:*
:CN,19,20B
:CN,20,20B
.
.
.
etc
.
.
.
:CN,33,20B
:CN,34,21B
```

Chapter 5

Troubleshooting

When your system has been generated, booted up, and the Multiplexer terminals initialized according to the instructions in the preceding sections of this manual, your Multiplexer terminals should respond to pressing of any key, in a manner similar to that of any DVR05 or DVR00 terminal. If a Multiplexer terminal fails to respond properly, the following checklist may help to correct the problem.

- Verify that the baud rate of the terminal matches the baud rate expected by the software.
- Verify that the Baud Rate Generator specified for each port during initialization agrees with the BRG strapped for that port on the edge connector.
- If one port is not working, verify that the baud rate for the BRG on the port has not been changed. This could have happened by changing the baud rate of another port using the same BRG.
- Check that the terminal strap switches are set according to the terminal instruction manual.
- Verify that the cables are connected properly according to the HP 12792A Multiplexer Subsystem Installation and Reference Manual and the terminal and/or modem instruction manual.
- Verify that the MUX board is in the appropriate select code.
- Verify that PVM00 was set to type 13 in the parameter input phase of the system generation.
- Check power-up echo. The card "comes up" in a state where it echoes everything that comes in and sends CR LF on CR. Rubout echoes CR LF. The default (power-up) baud rates are 2400 baud for BRG0 and 9600 baud for BRG1. If the terminal is attached to port 0, set the baud rate to 2400 and check to see if it echoes (set terminals connected to BRG1 to 9600 baud). This verifies that the card, terminal, and cable are operating. If this doesn't work, try the other seven terminals to determine if it is the cable or terminal.
- Run the on-line or off-line diagnostics. Refer to the HP 12792A Multiplexer Subsystem Installation and Reference Manual for a detailed explanation.

Appendix A

Partial Sample System Generation

Below is listed some relevant sections of a system generation listing which includes the HP 12792A Multiplexer. Some irrelevant portions have been omitted due to space considerations.

RTE-IV GENERATOR MODEL 92068A 1:56 PM TUE., 19 AUG., 1980

ECHO?

YES * ECHO ON

OUTPUT FILE NAMR?

MXENSY::50::3500 * 800819

.
.
.

PRIV. INT. SELECT CODE?

0 * NO PRIV. INT.

MEM. RES. ACCESS TABLE AREA II?

YES * MR ACCESS TA II

RT MEMORY LOCK?

YES * RT MEMORY LOCK

BG MEMORY LOCK?

YES * BG MEMORY LOCK

SWAP DELAY?

50 * SWAP DELAY

MEM SIZE?

96 * MEM SIZE

BOOT FILE NAMR?

0 * NO BOOT FILE

PROG INPUT PHASE:

-
MAP GLOBALS,MODULES,LINKS

-
LINKS IN CURRENT

.
.
.

*
-
REL,%DVM00::2040 * MUX DRIVER
-
REL,%PVM00::2040 * MUX PRE-DRIVER
-
REL,%DDV05::2040 * 26XX DEVICE DRIVER
-
REL,%DDV12::2040 * DEVICE DRIVER FOR 7310 LINE PRINTER
-
REL,%\$DVTB::2040 * DEVICE DRIVER ADDRESS TABLE

*
-
*
-

.
.
.

PARAMETERS

-
D.RTR,3,1
-
WHZAT,3,51
-
PRMPT,1,10
-
R\$PN\$,1,10
-
MEM,1,9000
-

.
.
.

AUTOR,1,1
-
PVM00,13
-
/E

CHANGE ENTS?

-
.MVW,RP,105777
-
.MBT,RP,105765
-
.LBT,RP,105763
-

.
:
.

IFIX,RP,105100
-
FLOAT,RP,105120
-
/E

TABLE AREA I <<PAGE 00001>>:

EQUIPMENT TABLE ENTRY

EQT 01?

.
:
.

EQT 06? 13,DVM00,B,X=21	* EQT 6 - MUX PORT
EQT 07? 13,DVM00,B,X=21	* EQT 7 - MUX PORT
EQT 08? 13,DVM00,B,X=21	* EQT 8 - MUX PORT
EQT 09? 13,DVM00,B,X=21	* EQT 9 - MUX PORT
EQT 10? 13,DVM00,B,X=21	* EQT 10 - MUX PORT
EQT 11? 13,DVM00,B,X=21	* EQT 11 - MUX PORT

EQT 12?
13,DVM00,B,X=21 * EQT 12 - MUX PORT

EQT 13?
13,DVM00,B,X=21 * EQT 13 - MUX PORT

EQT 14?
/E

DEVICE REFERENCE TABLE

001 = EQT #?
2,0 * LU 1 - CONSOLE

.
.
.

012 = EQT #?
6 * LU 12 - MUX PORT

013 = EQT #?
7 * LU 13 - MUX PORT

014 = EQT #?
8 * LU 14 - MUX PORT

015 = EQT #?
9 * LU 15 - MUX PORT

016 = EQT #?
10 * LU 16 - MUX PORT

017 = EQT #?
11 * LU 17 - MUX PORT

018 = EQT #?
12 * LU 18 - MUX PORT

019 = EQT #?
13 * LU 19 - MUX PORT

020 = EQT #?
/E

INTERRUPT TABLE

-
4,ENT,\$POWR * POWER FAIL
-

.
.
.

13,PRG,PRMPT * MUX
-

.
.
.

17,PRG,PRMPT * DVR05
-

/E

TABLE AREA I MODULES

\$\$TB1(0099)03011 03152 92067-16103 REV.2013 800201

*\$ERAB 03021
*\$PVCN 03023
*\$EXEC 03013
*\$XLUEX 03016
*\$LIBR 03025
*\$LIBX 03032
*\$PVST 03024

.
.
.

DRIVR PART 00002
CHANGE DRIVR PART?

2 * CHANGE DP SIZE

DP 01 <<PAGE 00005>>:

.
.
.

•
•
•

SUBSYSTEM GLOBAL AREA <<PAGE 00007>>:

•
•
•

TABLE AREA II <<PAGE 00010>>:

OF I/O CLASSES?

40 * # OF I/O CLASSES

OF LU MAPPINGS?

5 * # OF LU MAPPINGS

OF RESOURCE NUMBERS?

30 * # OF RESOURCE NUMBERS

BUFFER LIMITS (LOW, HIGH)?

100,400 * BUFFER LIMITS

0024 LONG ID SEGMENTS USED

OF BLANK LONG ID SEGMENTS?

50 * # OF BLANK ID SEGMENTS

0012 SHORT ID SEGMENTS USED

OF BLANK SHORT ID SEGMENTS?

41 * # OF BLANK SHORT ID SEGMENTS

0000 ID EXTENSIONS USED

OF BLANK ID EXTENSIONS?

5 * # OF BLANK ID EXTENSIONS

MAXIMUM # OF PARTITIONS?

20 * MAX NUMBER OF PARTITIONS

TABLE AREA II MODULES

\$\$TB2(0099)33547 33653 92067-16103 REV.2001 791016

*\$MATA 33547

*\$MCHN 33550

*\$MBGP 33551

*\$MRTP 33552

*\$DLTH 33553

*\$DVPT 33554

*\$TIME 33555
*\$BATM 33560
*\$DLP 33562
*\$PLP 33563
*\$SSCT 33602
*\$STRK 33601
*\$ENDS 33564
*\$MPFT 33567
*\$BGFR 33570
*\$RTRF 33571
*\$IDEX 33572
*\$MRMP 33573
*\$MPS2 33575
*\$EMRP 33607
*\$MPSA 33574
*\$SSDA 33576
*\$SDT2 33577
*\$CMST 33600
*\$COML 33603
*\$CFR 33604
*\$MNP 33605
*\$DVMP 33606
*\$RLB 33610
*\$RLN 33611
*\$SBTB 33612
*\$OTAT 33565
*\$OPRI 33566
*\$SPCR 33620
*\$ELTB 33621
*\$PNTI 33631
*\$MAXI 33632
*\$SALI 33633
*\$SRTI 33634
*\$CES 33652
*\$LMES 33637
*\$SMEM 33635
BP LINKAGE 01420

PVM00(0099) 33654 33765 12792-16001 REV.2032 800605 V.03
*PM00 33654
BP LINKAGE 01420

\$\$SUB2(0099) 33766 33766 92068-1X042 REV.2013 800129

SYSTEM <<PAGE 00013>>:

\$CSY4(0099)33767 33766 92067-16102 REV.2040 800801
BP LINKAGE 00100

DISP4(0099)33770 41521 92067-16102 REV.2040 800730
*\$RENT 34617
*\$BRED 41222
*\$ZZZZ 41322

.
.
.

*\$NPGQ 70004
*\$GDPG 72565
*\$SAVE 65335
BP LINKAGE 01322

PARTITION DRIVERS

DP 02 <<PAGE 00030>>:

DVA05(0099)12102 15164 92001-16035 REV. CODE 1913 9-28-78
*IA05 12102
*CA05 12200
BP LINKAGE 01367

DP 03 <<PAGE 00032>>:

DVM00(0099)12056 14566 12792-16002 REV.2032 800819 V.49
*IM00 12117
*CM00 12255
BP LINKAGE 01357
\$DVTB 14636 14640 12792-16005 REV.2032 800602 V.05
*\$DVTB 14636
BP LINKAGE 01356
DDV05 14641 15174 12792-16003 REV.2032 800602 V.02
*DDV05 14654
BP LINKAGE 01356
DDV12 15175 15430 12792-16004 REV.2032 800602 V.08
*DDV12 15206
BP LINKAGE 01356

DP 04 <<PAGE 00034>>:

.
.
.

MULTIPLEXER

- %\$DVTB module size, 2-1
- %DDV05
 - enabling a device on, 4-2
 - module size, 2-1
 - support of, 2-5
- %DDV12
 - enabling a device on, 4-2
 - module size, 2-1
 - support of, 2-5
- %DVM00 module size, 2-1
- %PVM00 module size, 2-1

B

- Baud rates supported, 2-3

C

- Character insertion/deletion
 - interface support definition, 2-4

D

- DDV05
 - enabling a device on, 4-2
 - module size, 2-1
 - support of, 2-5
- DDV12
 - enabling a device on, 4-2
 - module size, 2-1
 - support of, 2-5
- Default device driver
 - specifying, 4-2
- Device characteristics
 - hardware handshaking, 2-4
- Device drivers general description, 2-2
- Device reference table
 - system generation, 3-5

E

- EQT extent size
 - specifying at system generation, 3-1, 3-4

Equipment table entries
 system generation, 3-3

G

Generation of system
 device reference table, 3-5
 EQT extent size, 3-1
 equipment table entries, 3-3
 general considerations, 3-1
 initialization phase, 3-2
 interrupt table, 3-6
 parameter input phase, 3-3
 program input phase, 3-2
 SAM considerations, 3-8
 table generation phase, 3-3

H

Hardware handshaking, 2-4

I

Initialization of devices
 example, 4-3
 in WELCOM file, 4-1
Initialization phase
 system generation, 3-2
Interface driver
 support of, 2-5
 support with DDV05, 2-5
 support with DDV12, 2-5
Interface support definition
 character insertion/deletion, 2-4
 electrical, 2-3
 line speeds, 2-3
 user data reproduction, 2-3
Interrupt table
 system generation, 3-6

M

Modems
 support of, 2-6
Modules
 approximate size, 2-1
 provided with 12792A product, 2-1.

Index-2

P

- Parameter input phase
 - system generation, 3-3
- Parity bit
 - description of interface processing, 2-3
- Power-up echo
 - and troubleshooting, 5-1
- Program input phase
 - system generation, 3-2

S

- SAM considerations during system generation, 3-8
- Size of 12792A software modules, 2-1
- Software modules
 - approximate sizes, 2-1
 - provided with 12792A product, 2-1
- Support definition
 - electrical, 2-3
 - line speeds, 2-3
 - user data reproduction, 2-3
- Supported baud rates, 2-3
- Supported devices, 2-3
- System generation
 - device reference table, 3-5
 - EQT extent size, 3-1
 - equipment table entries, 3-3
 - general considerations, 3-1
 - initialization phase, 3-2
 - interrupt table, 3-6
 - parameter input phase, 3-3
 - program input phase, 3-2
 - SAM considerations, 3-8
 - table generation phase, 3-3

T

- Table generation phase
 - system generation, 3-3
- Terminals supported, 2-5
- Transmit handshaking, 2-4
- Troubleshooting, 5-1

U

Undefined externals
 when using HP-supplied \$DVTB, 2-2
User data processing on interface, 2-3
User data reproduction
 interface support definition, 2-3

W

WELCOM file
 example, 4-3
 requests performed in, 4-1

X

XON/XOFF protocol, 2-4

READER COMMENT SHEET
12792A MULTIPLEXER SUBSYSTEM
Configuration Guide

12792-90003 Update No. _____ September 1980
(If Applicable)

We welcome your evaluation of this manual. Your comments and suggestions help us improve our publications. Please use additional pages if necessary.

FROM:

Name _____
Company _____
Address _____

FOLD

FOLD



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 141 CUPERTINO, CA.

— POSTAGE WILL BE PAID BY —

Hewlett-Packard Company
Data Systems Division
11000 Wolfe Road
Cupertino, California 95014
ATTN: Technical Marketing Dept.



FOLD

FOLD

