

Report No. 2198

Bolt Beranek and Newman Inc.

Manual for the IMP-15 Special Interface
to the Interface Message Processor
and the ARPA Computer Network

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File
good point in including:
IMPs are the common
ground for LMS to
for a network
→ they sit on the
with periphery etc.

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1. INTRODUCTION

The ARPA Network is being constructed to provide a capability for dissimilar, geographically separated Host computers to communicate with each other. Host computers may differ from one another in manufacturer, type, size, speed, word length, operating systems, etc. To allow these different computers to communicate, each Host is connected into the network through an Interface Message Processor (IMP) located on the Host premises. The complete network is formed by interconnecting these IMPs through wideband communication lines (initially 50 kilobits/sec) supplied by the telephone company. Each IMP is then programmed to store and forward messages to the neighboring IMPs in the network. During a typical operation, a Host passes a message to its IMP; this message is then passed from IMP to IMP through the network until it finally arrives at the destination IMP, which passes the message to the destination Host.*

The interconnection of a Host and an IMP is a joint effort that requires the Host personnel to provide interfacing hardware and software. Bolt Beranek and Newman Inc. (BBN) has built a special interface to connect the IMP to a Digital Equipment Corp. PDP-15 Host computer. This report describes the design, installation, and operation of such a special interface.

Appendix A to this report reproduces Section 4 of the BBN Report No. 1822, "Specifications for the Interconnection of a Host and an IMP", which discusses the hardware requirements for

*The initial IMP design is described in Bolt Beranek and Newman Inc. Report No. 1763 (January 1969), AD-682-905. The specifications for IMP-Host interconnection are described in BBN Report No. 1822 (first issued February 1970; latest revision October 1971).

the special Host/IMP interface unit and describes the standard Host/IMP interface unit in the IMP.

Appendix B contains the device code and jumpering for specific installations.

2. INSTALLATION

The interface will normally connect to an IMP that is no more than 30 feet from the interface. A special Distant Host option is required if the IMP is between 30 and 2000 feet from the interface. This option includes special cable drivers and receivers required to deal with the Distant Host version of the standard interface on the IMP itself.

The IMP-15 interface ordinarily connects to the PDP-15's positive logic I/O bus, using BC09B I/O bus cables. It can also be connected to the PDP-15's negative bus, or to a PDP-9, using BC09C I/O bus cables. In this case, the modules used to drive and receive the bus are replaced by equivalent negative-logic modules. The polarity of the bus to be connected to must be known to BBN before a proposal for construction can be made. The host must provide the I/O bus cables (BC09B or BC09C) required.

The IMP-15 interface deals with the PDP-15 I/O bus, doing both accumulator transfers and DCH transfers. The interface is built out of DEC M, R, and W-series modules, mounted in two Type H911 mounting panels. Two power supplies are furnished, one of which provides +5 volts, the other +10 and -15 volts. These ordinarily plug in using two conventional 3-prong plugs.

The interface mounts in a PDP-15 rack, occupying 10-1/2 inches of front panel space for the two logic card mounting panels, and approximately 16 inches of back panel space for the power supplies. Two standard single-phase 115-volt power outlets with a third-wire ground should be provided by the Host.

The I/O bus cables plug into the lower mounting panel (rows C and D), the input cable to slots 29 and 30 and the output cable to slots 31 and 32. A type H003 block is supplied for mounting the I/O bus connectors.

The IMP cable plugs into slot A1, or, in the case of a distant Host, D1 and D2.

The device selection code is determined by jumpers on the W990 modules in slots C24 and C25. The jumpers should be placed as follows:

For the input device IMPA

in order to effect the						
device code in bit no.	0	1	2	3	4	5
then pin	F	L	R	F	L	R
on the W990 in	C24	C24	C24	C25	C25	C25
should be connected						
(to get a 0) to pin	E	K	P	E	K	P
or (to get a 1) to pin	D	J	N	D	J	N

For the output device IMPB

in order to effect the						
device code in bit no.	0	1	2	3	4	5
then pin	H	M	S	H	M	S
on the W990 in	C24	C24	C24	C25	C25	C25
should be connected						
(to get a 0) to pin	E	K	P	E	K	P
or (to get a 1) to pin	D	J	N	D	J	N

For the specific jumpering used, see Appendix B.