

T H E U N I V E R S I T Y O F M I C H I G A N

Memorandum

PDP-8/103A DATAPHONE INTERFACE

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ABSTRACT

The Concomp Project's DEC 338 Display system is now interfaced to two Bell System 103A Dataphones. This memorandum describes the use of the system as well as the interface construction.

I. GENERAL DISCUSSION

The interface to the 103A Dataphones required only minimum hardware additions. It involved the use of the teletype control built into the PDP-8. Figure 1 shows the standard system configuration.

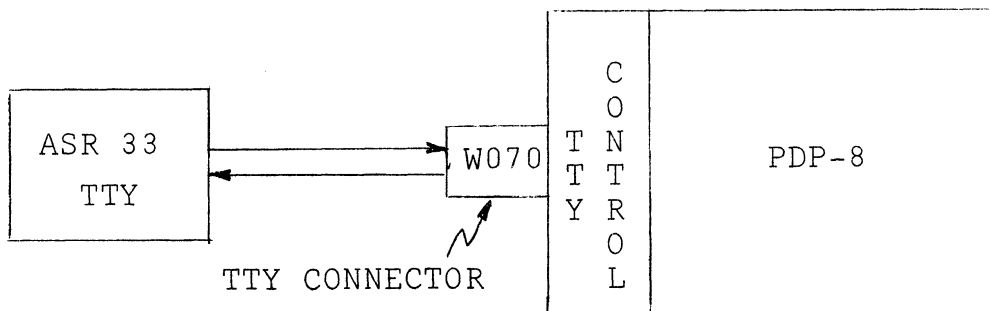


Figure 1. Standard PDP-8 TTY I/O Configuration.

Figure 2, below, shows the additions to the above basic system.

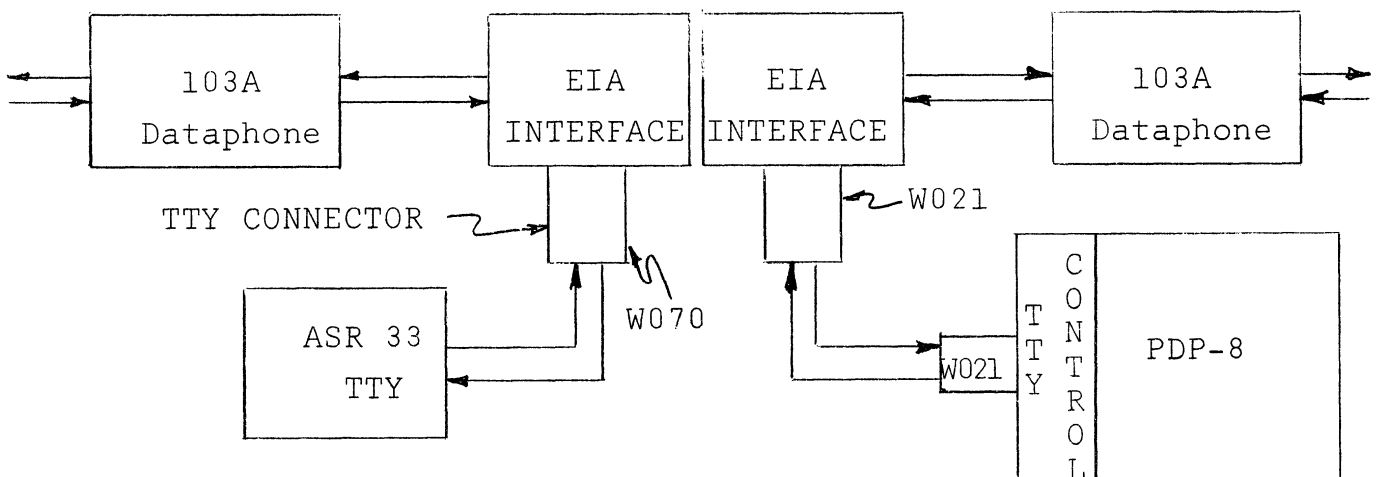


Figure 2. Modified PDP-8 TTY I/O Configuration.

Notice that the console typewriter is now essentially an independent console since it is connected to its own dataphone. In particular, it may be connected to the PDP-8 to operate as a normal online teletype with one exception: the tape reader on the ASR 33 will advance as long as there is tape in the reader (similar to handling tape in the reader during interrupt control of the normal online configuration).

II. PROGRAMMING CONSIDERATIONS

The new system is programmed using the standard PDP-8 IOT Instructions for teletype I/O (see the PDP-8 User's Handbook). The programmer should note the comment above concerning the independence of tape advance from the TTY reader flag. Also, the programmer should note that many standard Bell System teletypes automatically generate a parity bit which appears as the high order bit of the 8-bit character code. In such cases, there will be no guarantee that the high order bit is set during input from the keyboard as is the case with the ASR 33 supplied with the PDP-8.

III. SYSTEMS CONSIDERATIONS

The new PDP-8 I/O configuration allows a wider degree of flexibility in the integration of the 338 Display into The University of Michigan timeshared system. Both the teletype and the PDP-8 may be connected to the U of M Computing Center's IBM System 360 through standard teletype input ports. Thus, both the teletype and the PDP-8 may take direct advantage of System 360 programming support of typewriter terminals such

as device control, symbolic file storage and editing, assembly or compilation of symbolic file, or data transmission control, and may be particularly useful when the additional interface to the Bell System 201A Dataphone is provided. This device is a higher speed device than the 103A Dataphone. However, the 201A Dataphone can communicate in only one direction at a time (half-duplex) rather than two directions at a time (full-duplex) as can the 103A Dataphone. Thus, if the slow speed 103A Dataphone lines are used only for control communication, the 201A Dataphone line would handle only data, resulting in a higher effective data transmission rate.

IV. INTERFACE HARDWARE

The interface used in the modification described here was developed by David L. Mills and will be described in forthcoming publications on the data concentrator. It is included herein for completeness. The interface was wired onto a spare section of the 338 Display's Rand Tablet interface.

Figure 3 is the logic diagram of the PDP-8 TTY I/O modifications. The module marked "E1A RCVR" in Figure 3 was made by modifying a standard R111 Diode Gate as shown in Figure 4. The modified module is less expensive than either of the special purpose Input Converter modules (W510, W511) and is more resistant to overloads.

Figure 5 is the actual module layout used. Table 1 is the wire list.

TELETYPE INTERFACE

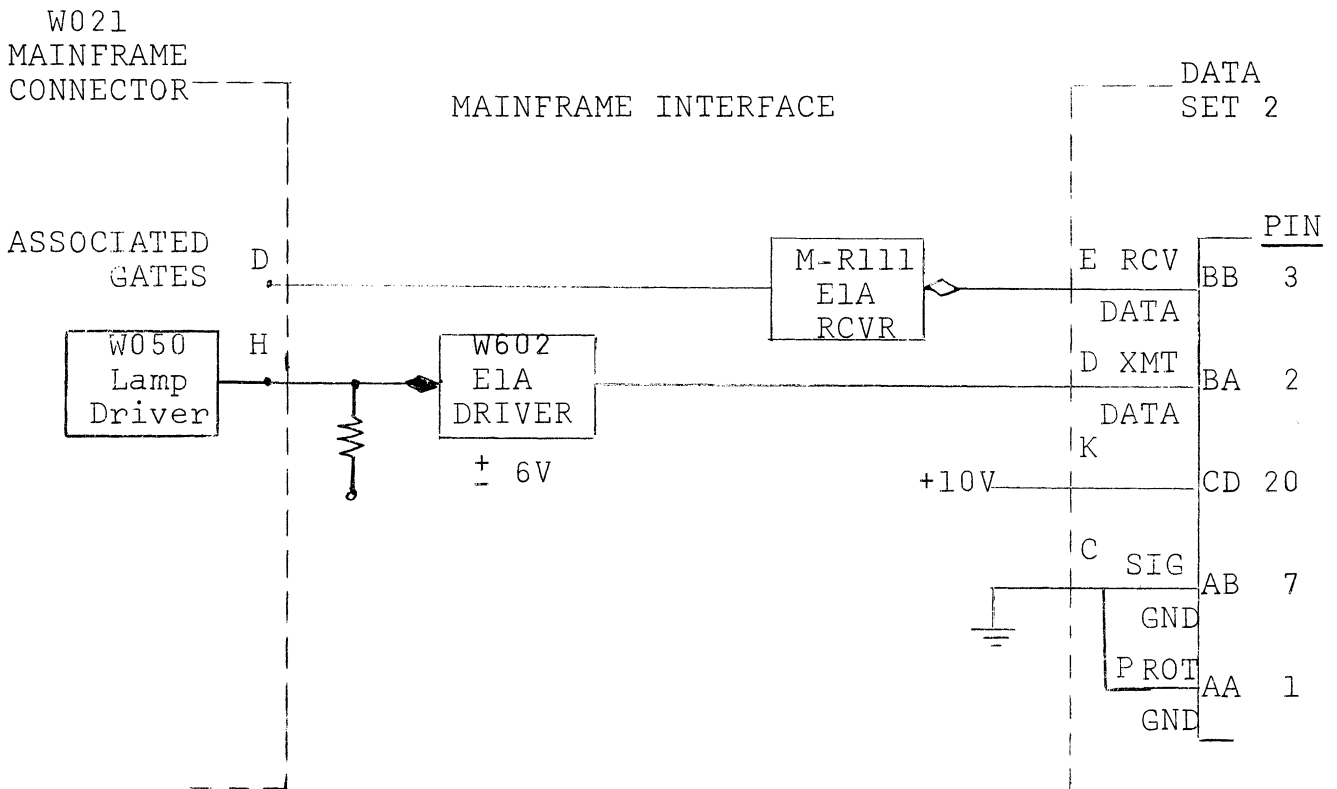
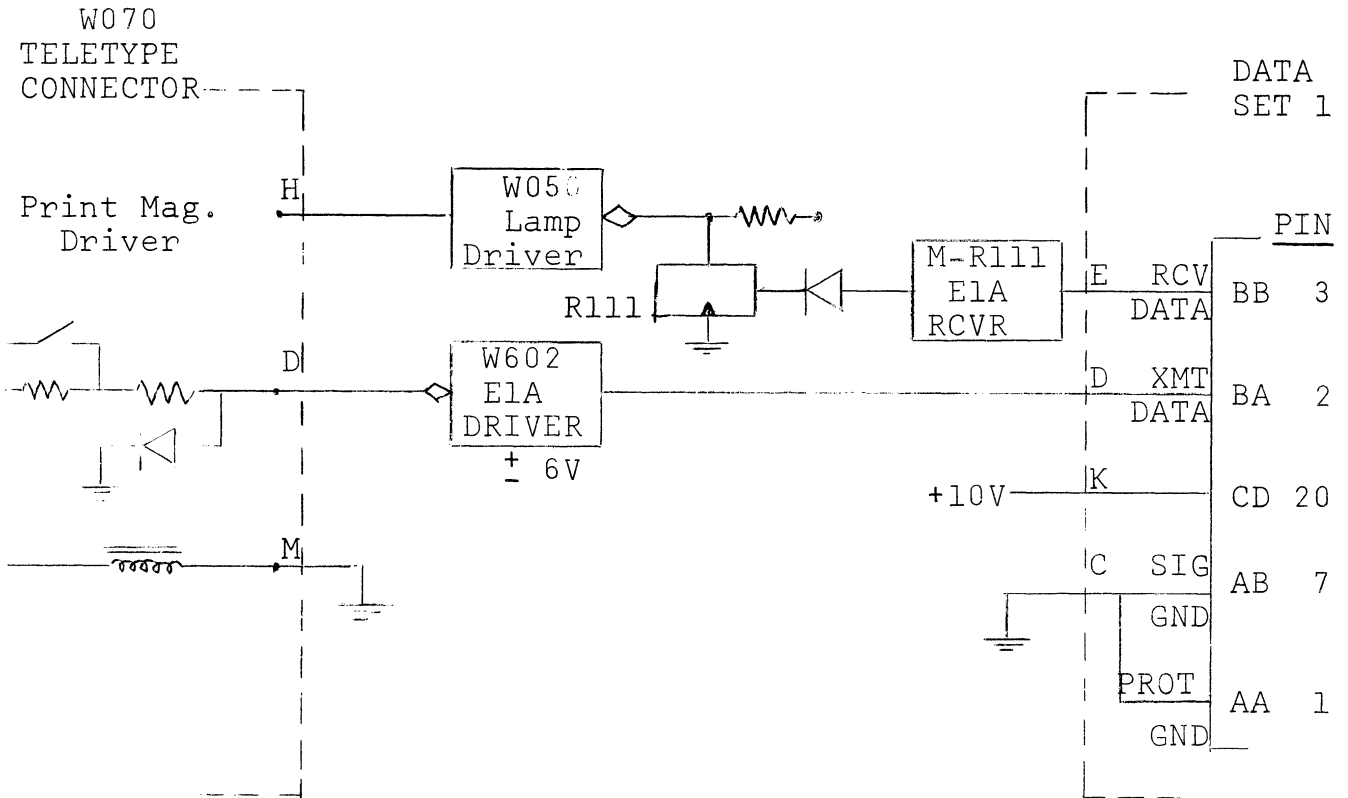
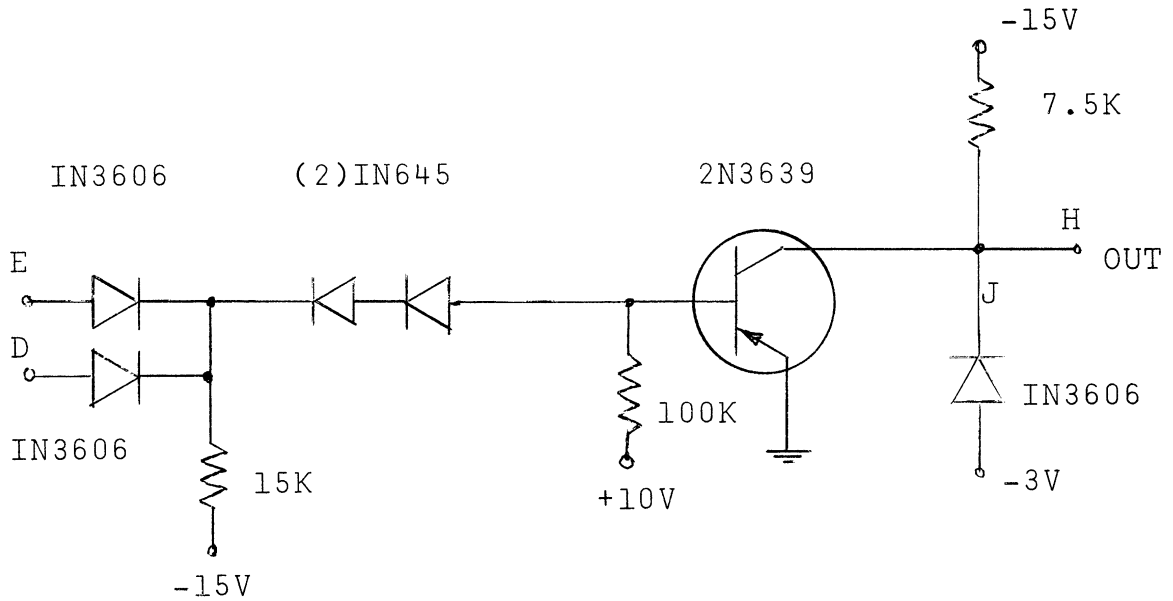


Figure 3. PDP-8 Mainframe and Teletype Interfaces for 103A Data Sets.

STANDARD R111



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MODIFIED R111

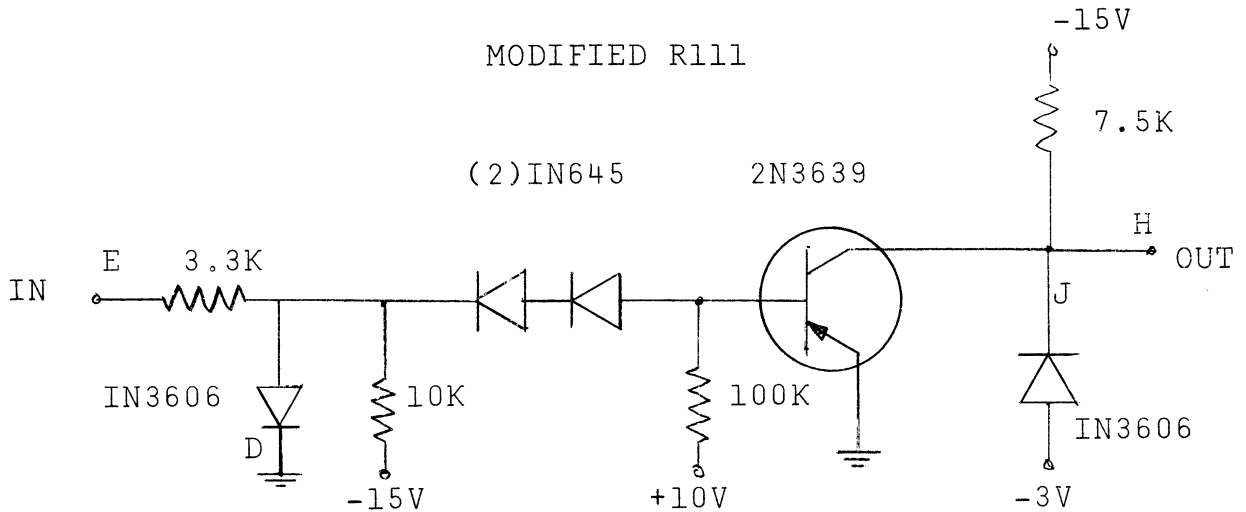


Figure 4. R111 Modifications for Use as EIA Receiver.

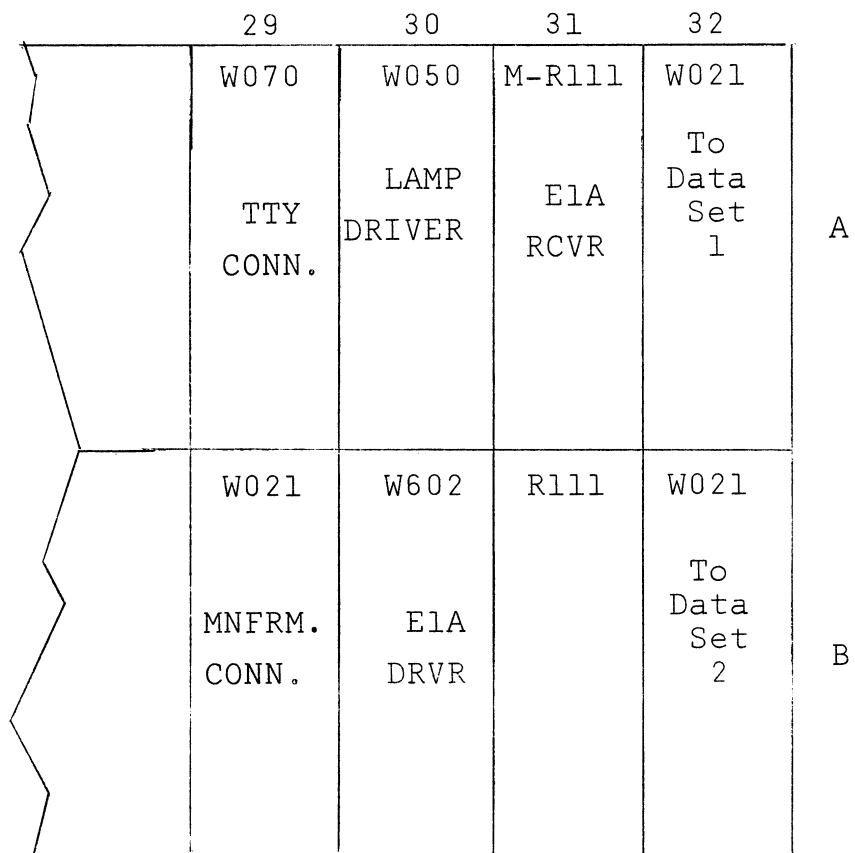


Figure 5. 103A Dataphone Interface Module Layout.

Table 1. Wire List

<u>From</u>	<u>To</u>
A32E	A31E
A31H	A31J
A31J	B31D
B31H	B31J
B31H	A30E
A30F	A29H
A29D	B30D
B30F	A32D
A32K	A32A
B30S	B30P
B30V	B30R
B29D	A31P
A31N	A31P
A31L	B32E
B32K	B32A
A31D	A31C
A31K	A32C
A29M	A29C
B29H	B30H
B31V	B30H
B30K	B32D

