

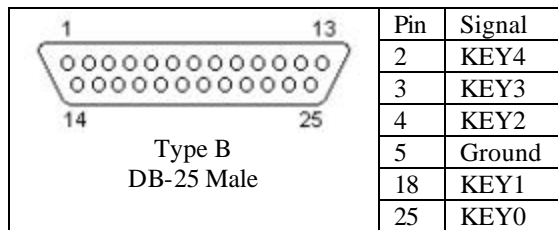
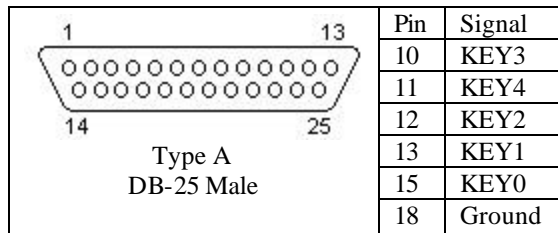
Memorandum

To: Dag Spicer, Curator, Computer History Museum
CC: NLS Technical Working Group
From: Phil Gust, Project Manager, SCC NLS Restoration Project
Date: 5/19/2006
Re: Proposal to compare the Xerox Alto Keypad interface to the SRI NLS Keypad interface

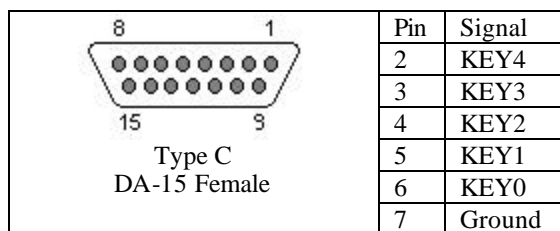
Background

The NLS Restoration Project has been working with the six remaining keysets that Doug Engelbart's group at SRI built for the NLS project, to understand the pin-out scheme used by the SRI keysets. Our purpose is two-fold. The first is to document the pin-outs of the keysets for preservation purposes. The second is so that we can connect the keysets to a computer through a USB interface and use them with a running NLS system.

Our investigations have shown that five of the SRI keysets have 25-pin DB-25 male connectors with one of two pin arrangements, which we have designated Type A and Type B:



One of the keysets (CHM-01) has a 15-pin DA-15 female connector with a pin arrangement that we have designated as Type C.



Brian Cardanha, a Sun electrical engineer, has built converter cables for Type A and Type B keysets that provide standard game port pin-outs. The Type C keyset, which we got from Jake Feinler, came with a Type C to Type A converter cable that connects to our Type A to game port cable. We are trying to ascertain the history of this keyset and its relationship to the other keysets.

Using these cables together with a Radio Shack game port to USB converter and appropriate game port drivers, we can use the keysets with the Java Augterm GUI that the project built to access to the NLS/Augment system through a Java-enabled web browser. We also plan to interface the keysets with the NSF-funded Hyperscope system being developed under Doug Engelbart's direction.

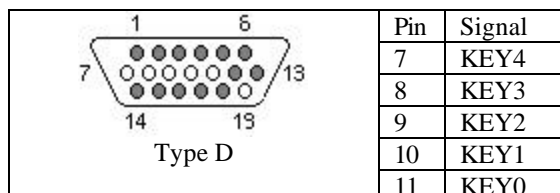
Proposal

When the NLS project was terminated at SRI, a number of staff members moved to Xerox PARC, where some of them continued aspects of their work at SRI. Some of the concepts developed for NLS were adapted for Xerox PARC Alto system. Bill English, one of the key NLS engineers, created a version of the NLS keyset for the Xerox Alto. CHM has several of these Xerox Alto keysets in its collection.

We have examined several of these keysets in the CHM connection and have discovered that they use a 19-pin DA-19 male connector, which we have identified it as ITT-Cannon 2DE-19S.



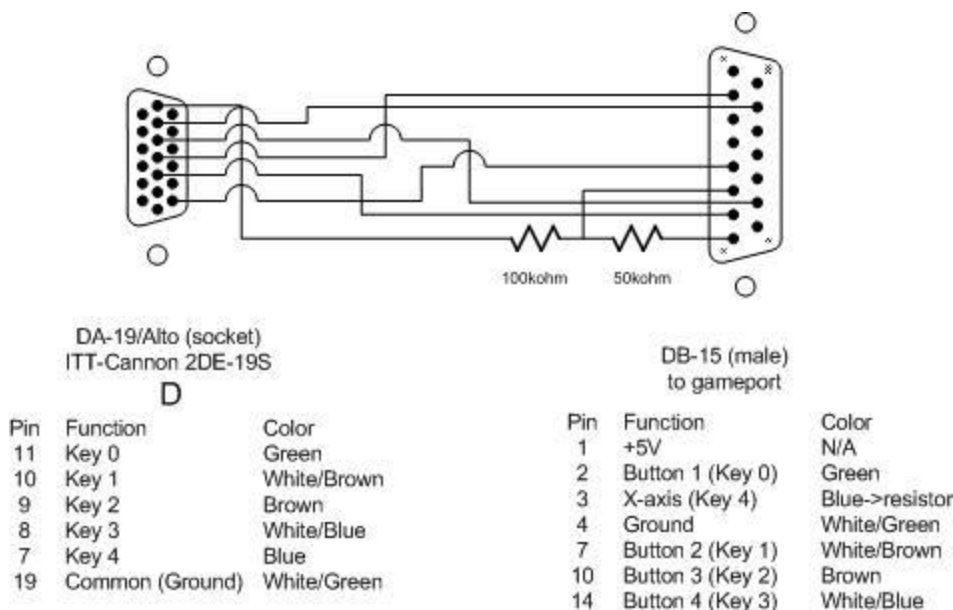
From Alto schematics scanned by Al Koslow, we believe that all of the Xerox keysets have a single pin-out scheme, which we have tentatively designated as Type D, and have identified the pin-outs (see http://www.bitsavers.org/pdf/xerox/alto/AltoSchems/05b_KBD.pdf)



DA-19 Male	19	Ground
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We propose to validate our findings by testing each of the Xerox keysets in the CHM collection to determine whether our identification and assumptions are correct.

The test consists of connecting each of the Xerox keysets to a Radio Shack game port to USB adapter through a custom Type D cable that Brian Cardanha has built, in the same way we did for the SRI keysets. Here is a schematic of this cable.



We will connect the game port to USB adapter to a computer running the Java Augterm application. If we are correct, we should be able to use the Xerox keysets with the Java Augterm application in the same way we did with the SRI keysets

We believe that there will be minimal risk to the Xerox keysets, since we have already successfully conducted these tests with the SRI keysets. A qualified CHM staff member can physically connect the Type D cable to the keyset and perform the chording tests under our direction. We will observe and record the results.

CHM will derive several benefits from this investigation. First, it will gain concrete confirmation as to the pin-out arrangement of the keysets in its collection. Second, it will gain valuable information about the relationship of the original SRI keyset design compared to the later Xerox keysets design, both of which were designed by the same engineer, Bill English. Finally, CHM will gain technology that would enable it to connect the Xerox keyset to a standard USB interface, should the need to do so arise in the future.