

AccessionIndex: TCD-SCSS-T.20121208.015

Accession Date: 8-Dec-2012

Accession By: Dr.Brian Coghlan

Object name: Interdata Model 70

Vintage: c.1970

Synopsis: 16-bit 'IBM-360-like' commercial minicomputer.

**Description:**

Interdata Inc. was founded by Daniel Sinnot Snr and Jim Bruno in Jun-1966, and manufactured minicomputers in Oceanport, New Jersey, participating in the first generation of that class of machines. They were taken over by Perkin-Elmer in 1973 for \$64M, but then were spun off as Concurrent Computer Corporation in 1985. The Model 70 superceded and was upwardly compatible with their Models 1, 3, 4 and 5.

The Model 70 had a 16-bit microprogrammed CPU with a set of 16 microinstructions. It was built over two boards, a microprogram ROM board and an ALU board, clocked at 4MHz. The instruction set was like a simplified IBM 360 (Dan Sinnot was ex-IBM). There were 16-bit and 32-bit integer instructions, including multiply and divide, as well as 32-bit floating-point instructions, and a core set of 22 privileged instructions. Most instructions executed in about 1uSec. Unlike some competing accumulator-based minicomputers, it had 16 general-purpose 16-bit registers (15 of which could be used as index registers), plus a 16-bit status register (PSW).

It had a 16-bit address space (max.64kB), with an optional limited form of memory write protection. The system in the collection has a memory controller board and two 16kB non-volatile core memory boards. Core memory was a second-generation memory technology introduced by Wang and Forrester in the mid-1950s that provided a very large improvement to performance and density compared to the first generation technologies like mercury or nickel delay lines and Williams tubes, and persisted for well over a decade until superceded by semiconductor dynamic memories.

Interdata made a distinction between higher-speed DMA-driven I/O via 'selector' channels that transferred data directly between memory and a private bus per channel, and CPU-driven (programmed) I/O via 'multiplexor' channels over a separate 8-bit shared I/O bus. I/O addressing was provided for up to 256 multiplexor I/O devices, with a reasonably flexible interrupt structure. Program loading on the system in this collection was from a dual magnetic cassette unit, with user I/O via a serial line interface.

The system in this collection was purchased by the Dept.Mechanical Engineering in TCD and used by Dr.Arthur Dexter (of that department) for industrial boiler monitoring, analysis and control experiments, with the boiler interface via an Interdata I/O Expansion Chassis, see elsewhere in this catalog.

The Model 70 itself was also used by Dr.Neville Harris of the Dept.Computer Science for teaching assembly language to 1st year engineers. For a teaching aid he wrote a simulator for the Interdata assembly language that ran on the department's Burroughs B1700. In 1980 both the Interdata Model 70 and its I/O Extension Chassis were moved to the Dept.Computer Science for use by Dr.Brian Coghlan, who then

mounted it in a DEC disk drive chassis that was originally part of the VAX 11/780 used by the department.

The system was fully operational when last switched off, with Interactive Fortran live in core memory. With luck this program will still be resident and executing if the system is ever powered back on.

Two efforts need to be made to restore a front panel. Firstly, during an attempt to replace faulty front panel indicators the panel itself became faulty, and this needs to be fixed. Secondly, in 1982/3 Tom Reid constructed a very nice if somewhat home-made MC6809-based front panel with built-in boot leaders, etc, for his final-year computer science undergraduate project, and this needs to be revived.

*trivial1: Anglo-Australian Telescope at Siding Springs was controlled by a Model 70 from 1974-2008 (34yrs).*

*trivia2: Sinnot and Bruno later founded Syntrex Inc.*

The Interdata Model 70 documentation and software are properly part of the Literature and Software categories of this catalog, but are listed here too for convenience.

<b>Accession Index</b>	<b>Object with Identification</b>
TCD-SCSS-T.20121208.015.01	Interdata Model 70 Chassis. Includes 2 x board retention brackets. P/N: 11-102 F01 R11
TCD-SCSS-T.20121208.015.02	Interdata Model 70 CPU board 1 (ROM). P/N: 35-388 M02 R02
TCD-SCSS-T.20121208.015.03	Interdata Model 70 CPU board 2 (ALU). P/N: 35-389 M01 R02
TCD-SCSS-T.20121208.015.04	Interdata Model 70 Front Panel I/O board. P/N: 35-300 M02 R05
TCD-SCSS-T.20121208.015.05	Interdata Model 70 Memory Controller board. P/N: 35-387 M01 R02
TCD-SCSS-T.20121208.015.06	Interdata Model 70 16kB Core Memory board (1). P/N: 35-436F02 M10 R01
TCD-SCSS-T.20121208.015.07	Interdata Model 70 16kB Core Memory board (2). P/N: 35-344F02 M10 R03
TCD-SCSS-T.20121208.015.08	Interdata Model 70 Dual-Cassette Controller board. P/N: 35-418 M01 R01
TCD-SCSS-T.20121208.015.09	Interdata Model 70 PASLA Serial I/O board. Principal components: TR1402A UART. P/N: 35-457 M01 R02
TCD-SCSS-T.20121208.015.10	Interdata Model 70 Front Panel Unit.
TCD-SCSS-T.20121208.015.11	Interdata Model 70 16kB Dual Data Cassette Unit.
TCD-SCSS-T.20121208.015.12	Interdata Model 70 Power Supply (1, at front).
TCD-SCSS-T.20121208.015.13	Interdata Model 70 Power Supply (2, at rear).

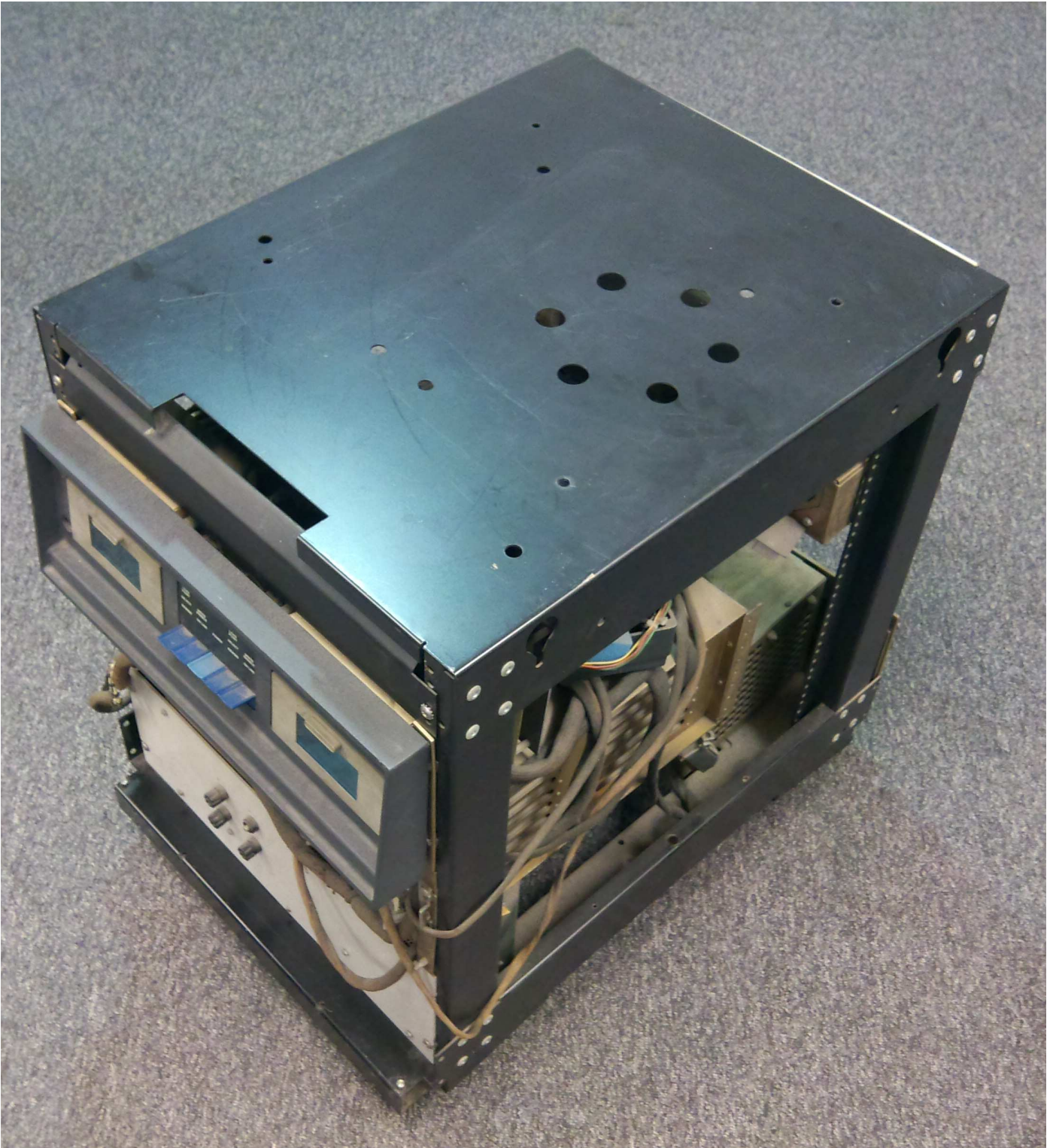
	P/N: 34-12R04
TCD-SCSS-T.20121208.015.14	DEC 872-B Power Controller. S/N: 872-B Rev-B AS30865
TCD-SCSS-T.20121208.015.15	Interdata Model 70 Bus Extender Board. P/N: 25-276 11-103 R01
TCD-SCSS-V.20151001.005	Interdata Model 70 Users Manual P/N: 29-261 Sep-1971, Interdata Users Manual P/N: 29-261R03 Jul-1974.
TCD-SCSS-V.20151001.006	Interdata Interchange Newsletter, May 1982.
TCD-SCSS-V.20151001.007	Interdata Model 70 usage examples, green folder with plastic-leaves containing Model 70 instruction load, assemble and compile examples, including digital cassette labelled 'FM TCDDOS, FM OS Assembler, FM OS library loader, FM OS Aids'.
TCD-SCSS-V.20151001.008	Interdata, folder with: Interdata Model 70 Microinstruction Reference Manual (including flow charts and microcode source listings), Speculative Notes on Adding a MC68451 MMU by Dr.B.A.Coghlan, Interdata Architectural and Product Line Standards for Memory Access Controller P/N: 43-003 (1) and 43-003R01 (2).
TCD-SCSS-V.20151001.009	Interdata, folder with: DISC Operating System (DOS) Reference Manual P/N: 29-293R06 Jun-1975, Introduction to Software P/N: 29-406 Oct-1974, OS Source Update P/N: B03-057A15, OS Copy P/N: B03-056R01A15 Jun-1975, OS Assembler Operating Instructions P/N: 03-025R01A16 Jul-1975, Assembler Language Manual P/N: 29-230R04 Jan-1976, OS/16 Aids (debugger) P/N: B29-319R03 Apr-1975, 16-bit Processor Users Manual P/N: B29-509 May-1976.
TCD-SCSS-V.20151001.010	Interdata, folder with: Programming Manual P/N: 29-013R12 Jul-1972, Keyboard Printer P/N: 29-193R03 Apr-1972, Basic Operating System (BOSS) (including source listing) P/N: B29-216R02 Jul-1971, Supplement to Assembler Language Manual P/N: 29-230R025-10-1(1246), Assembler Language Manual P/N: 29-230R01 Jun-1971, OS Assembler Operating Instructions P/N: 03-025R01A16 Jul-1971, Basic Assembler Operating Instructions P/N: 03-024A16 Oct-1970, Loader Descriptions Manual P/N: 29-231R02 Oct-1971, Editor (TIDE) P/N: 29-229R01 Jun-1971, Hexadecimal Debug P/N: 29-235R01 Jun-1971.
TCD-SCSS-V.20151001.011	Interdata, folder with: Supplement to Model 70 Maintenance Manual P/N: 29-266F01R02S-11-72, Model 70 Maintenance Manual (including circuit diagrams) P/N: 29-266F01 Aug-1972.
TCD-SCSS-V.20151001.012	Interdata, folder with: Interdata Model 5/16 Maintenance Manual (including circuit diagrams) P/N: 29-588 Apr-1977, Interdata Model 5/16 Users Manual P/N: 29-588 Feb-1977, Interdata 32-bit Series Reference Manual P/N: 29-365R01 Jun-1974, Interdata Model 5/16 Processor brochure P/N: 6761012 p.1-4, Interdata Model 6/16 Processor brochure P/N: E.102.1 p.1-4 (2 copies), Interdata Model 5/16 Description p.1-41.

**References:**

1. Bitsavers Interdata Model 70 documents and brochures,  
<http://www.bitsavers.org/pdf/interdata//>  
Downloaded 6-Nov-2015.

See the extensive set of documents in the related folder in this catalog.





*Figure 1: Interdata Model 70 front three-quarter view*





*Figure 2: Interdata Model 70 rear three-quarter view*



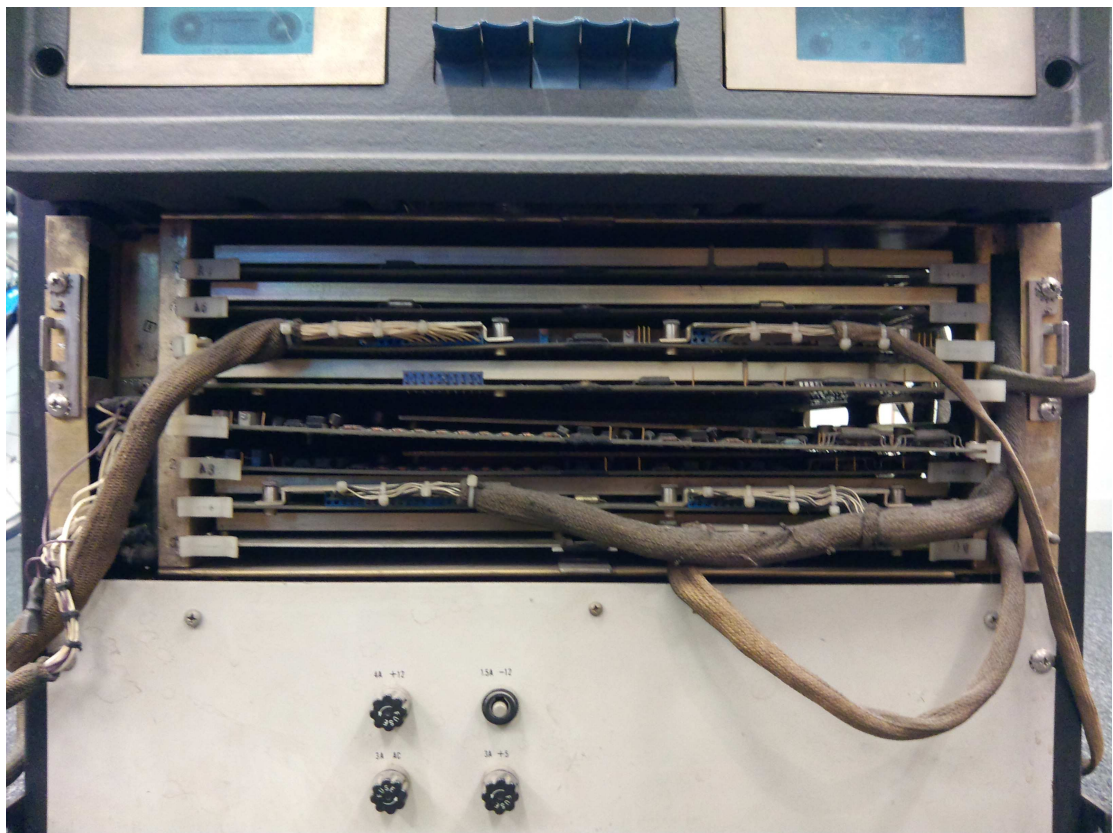


*Figure 3: Interdata Model 70 front view*



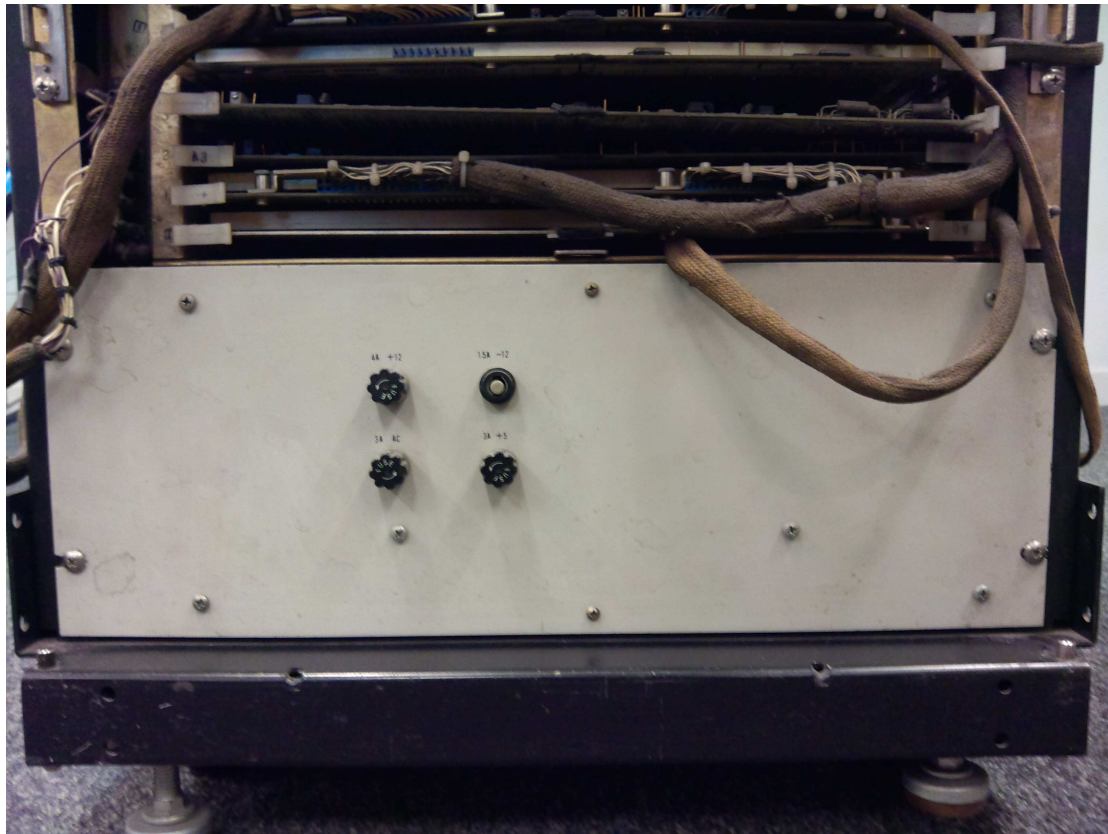


*Figure 4: Interdata Model 70 dual cassette unit front view*



*Figure 5: Interdata Model 70 CPU chassis front view*





*Figure 6: Interdata Model 70 power supply (1) front view*



*Figure 7: Interdata Model 70 rear view*



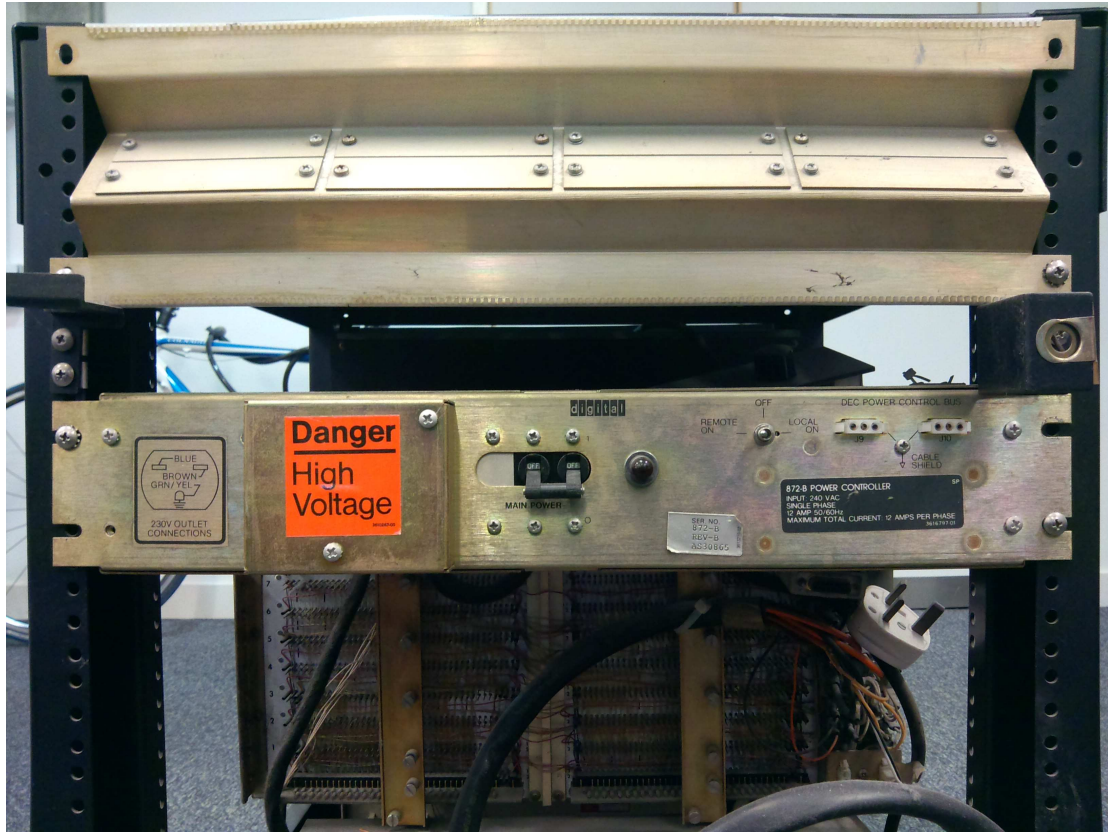


Figure 8: Interdata Model 70 power controller rear view  
S/N: 872-B Rev-B AS30865

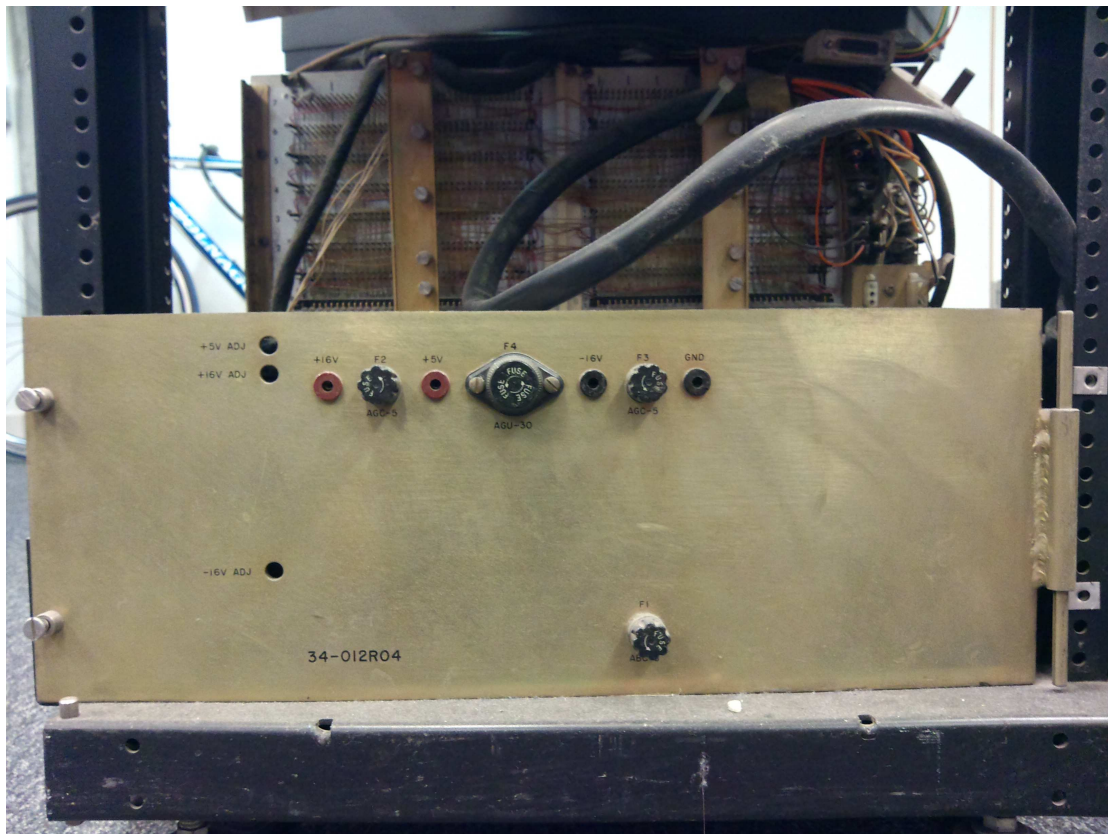
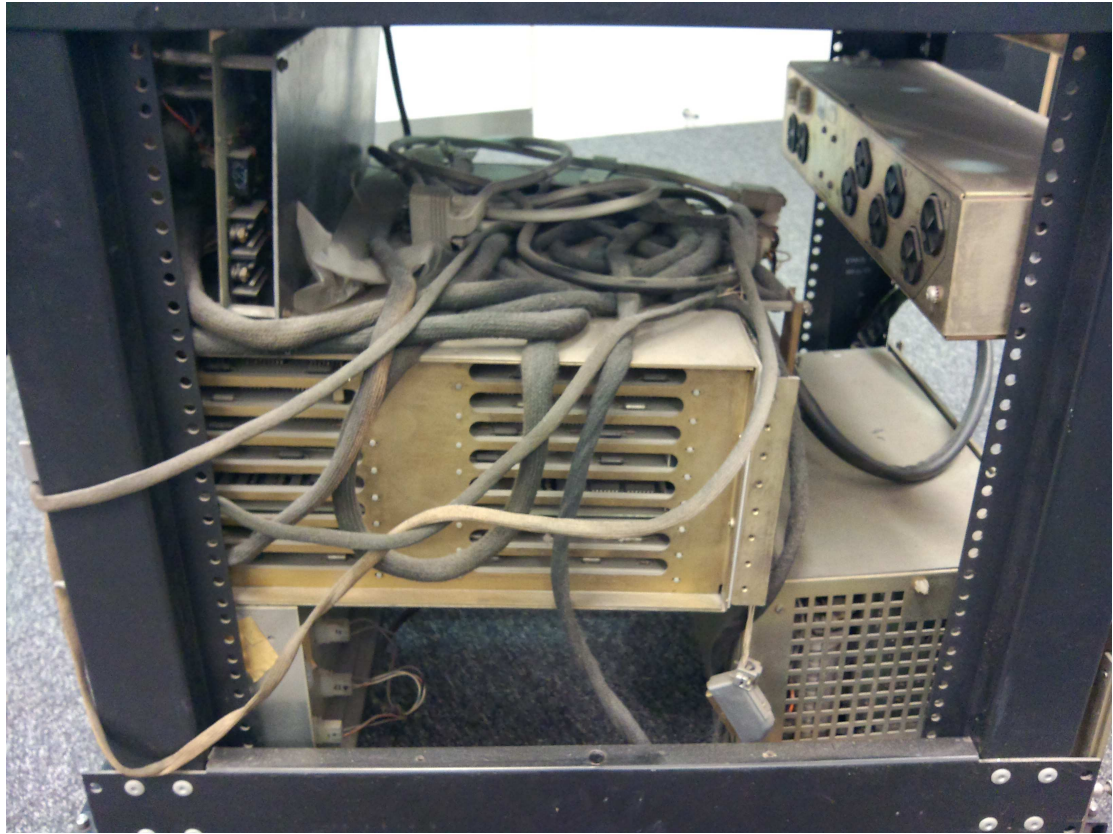
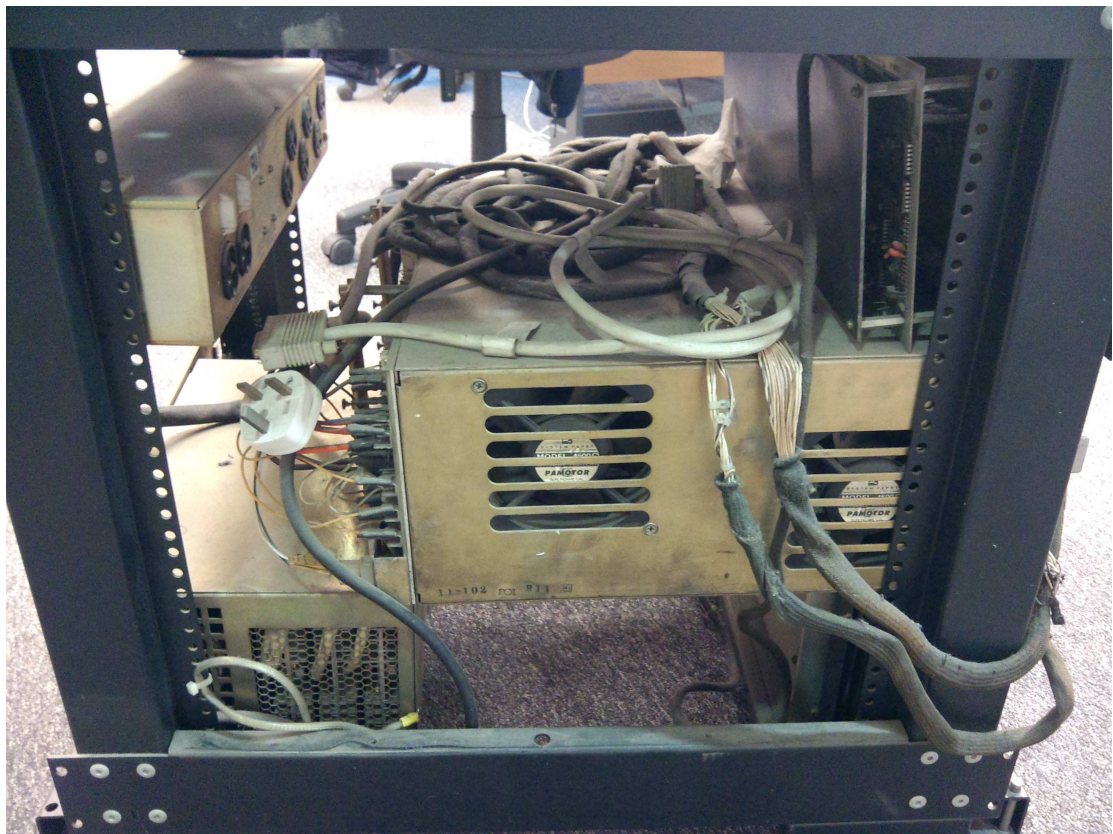


Figure 9: Interdata Model 70 power supply (2) rear view  
P/N: 34-012R04



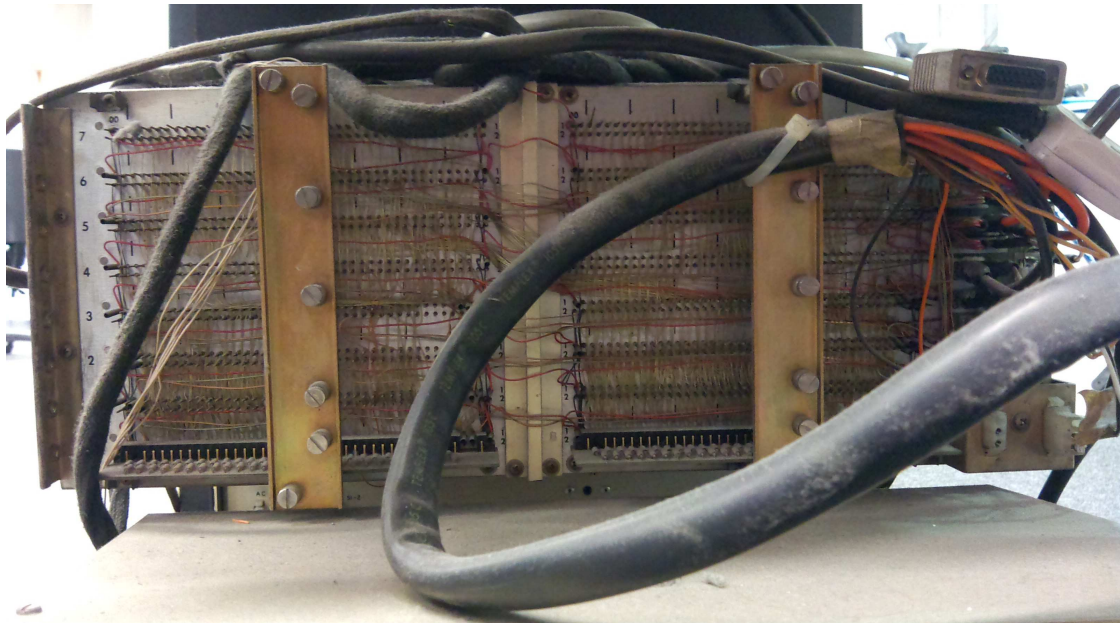


*Figure 10: Interdata Model 70 right side view*

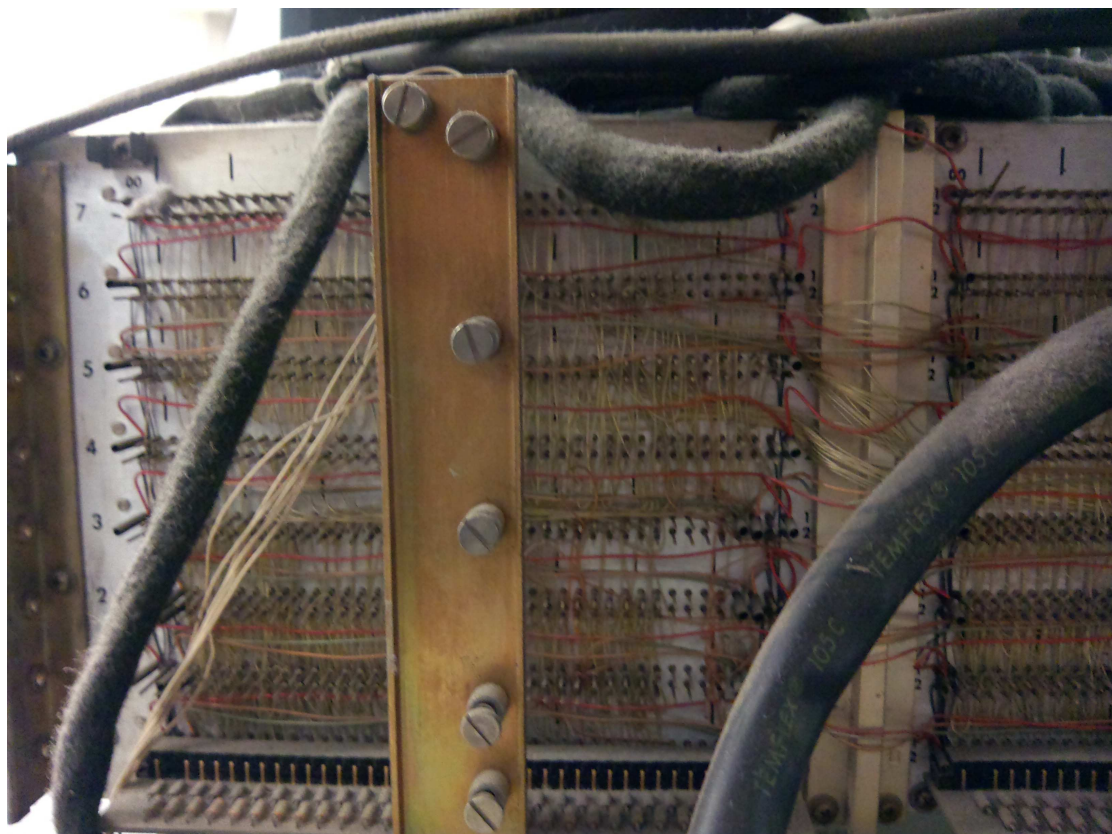


*Figure 11: Interdata Model 70 left side view  
CPU Chassis P/N: 11-102 F01 R11*



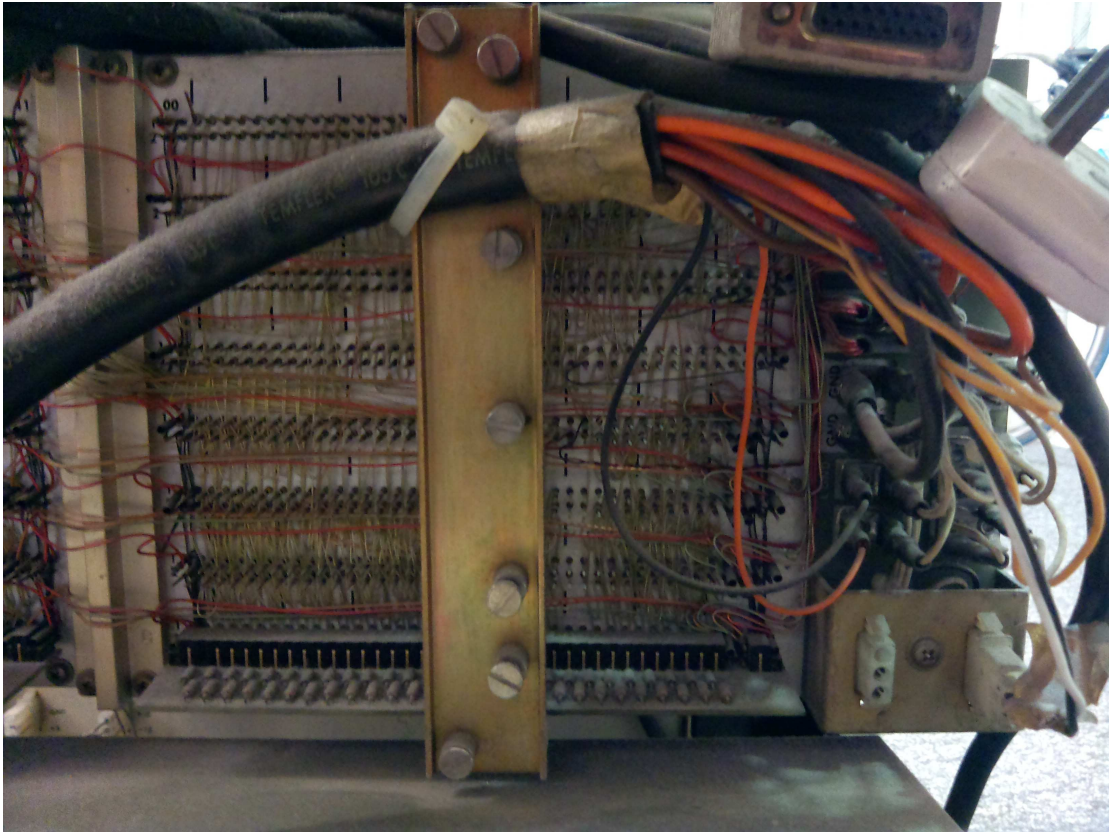


*Figure 12: Interdata Model 70 CPU chassis backplane*

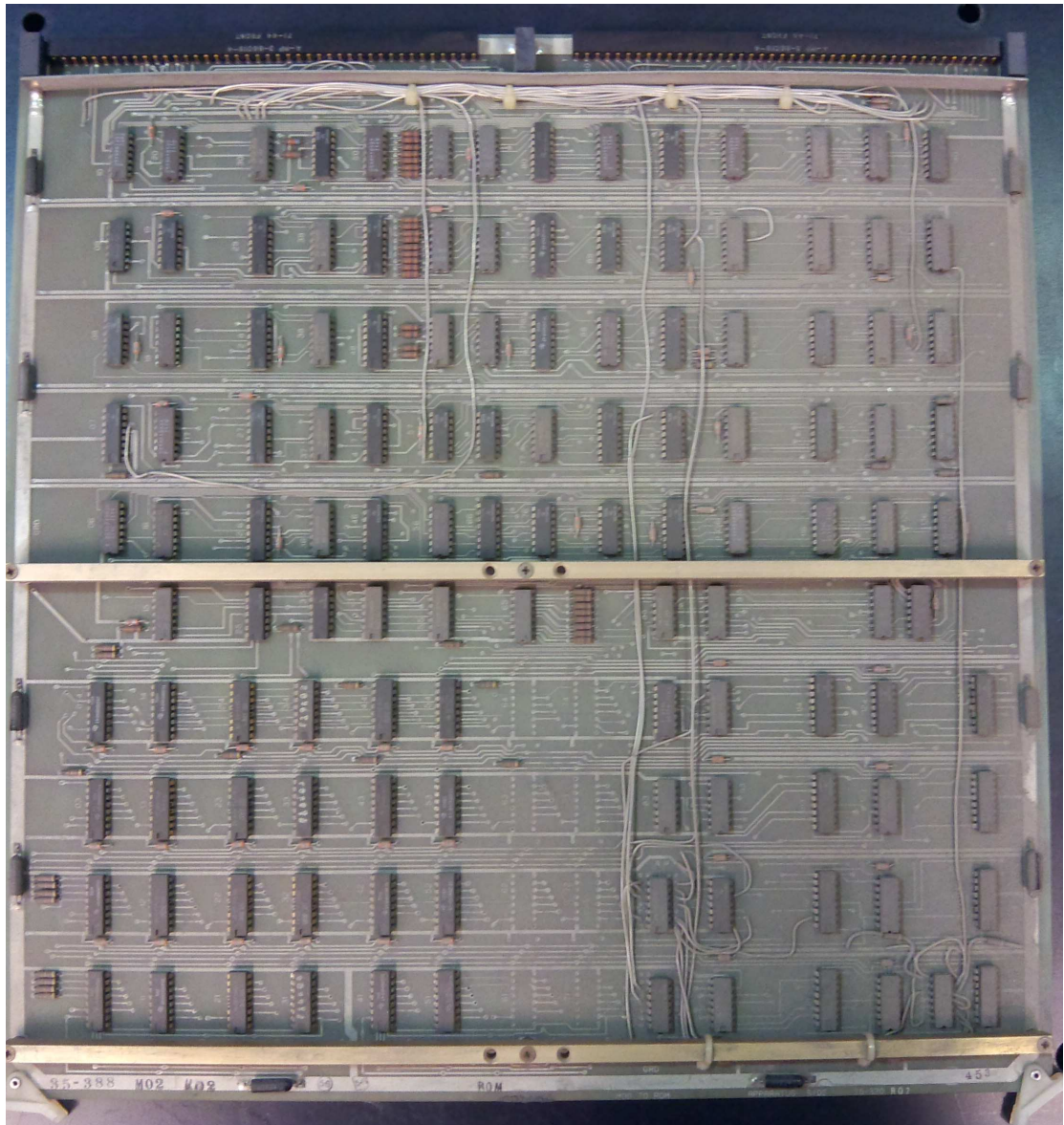


*Figure 13: Interdata Model 70 CPU chassis backplane left closeup*



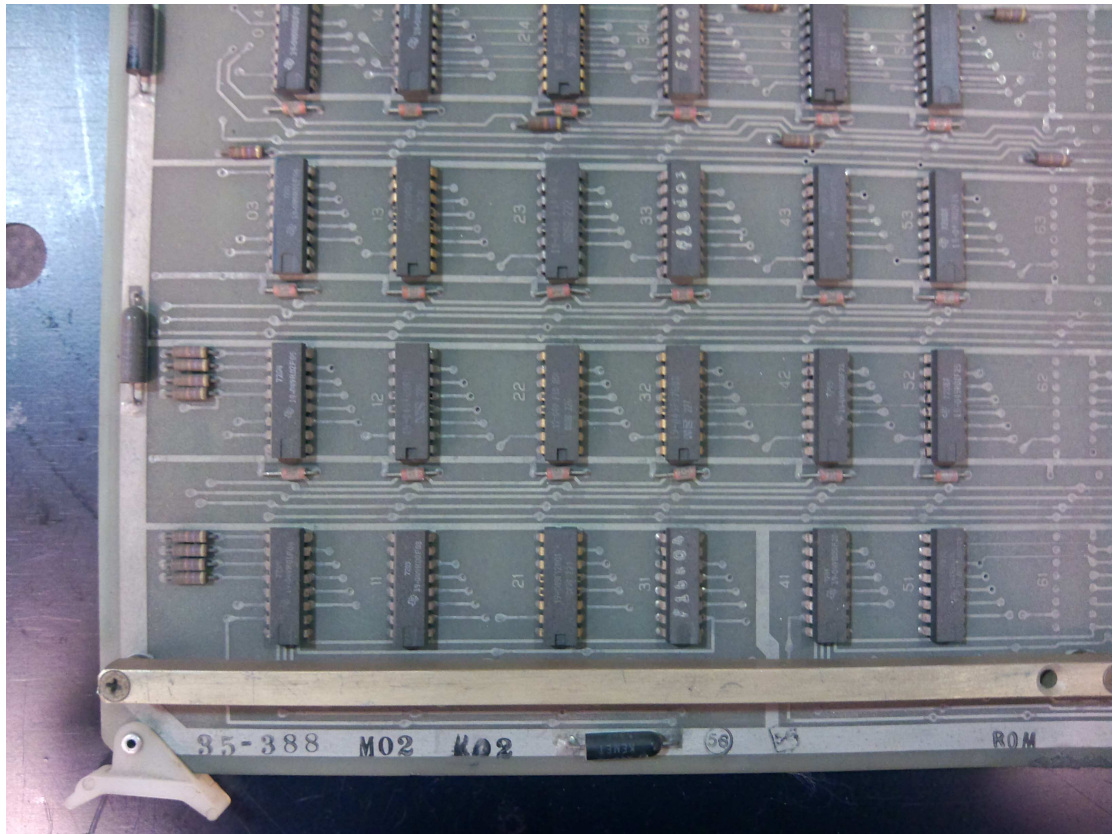


*Figure 14: Interdata Model 70 CPU chassis backplane right closeup*

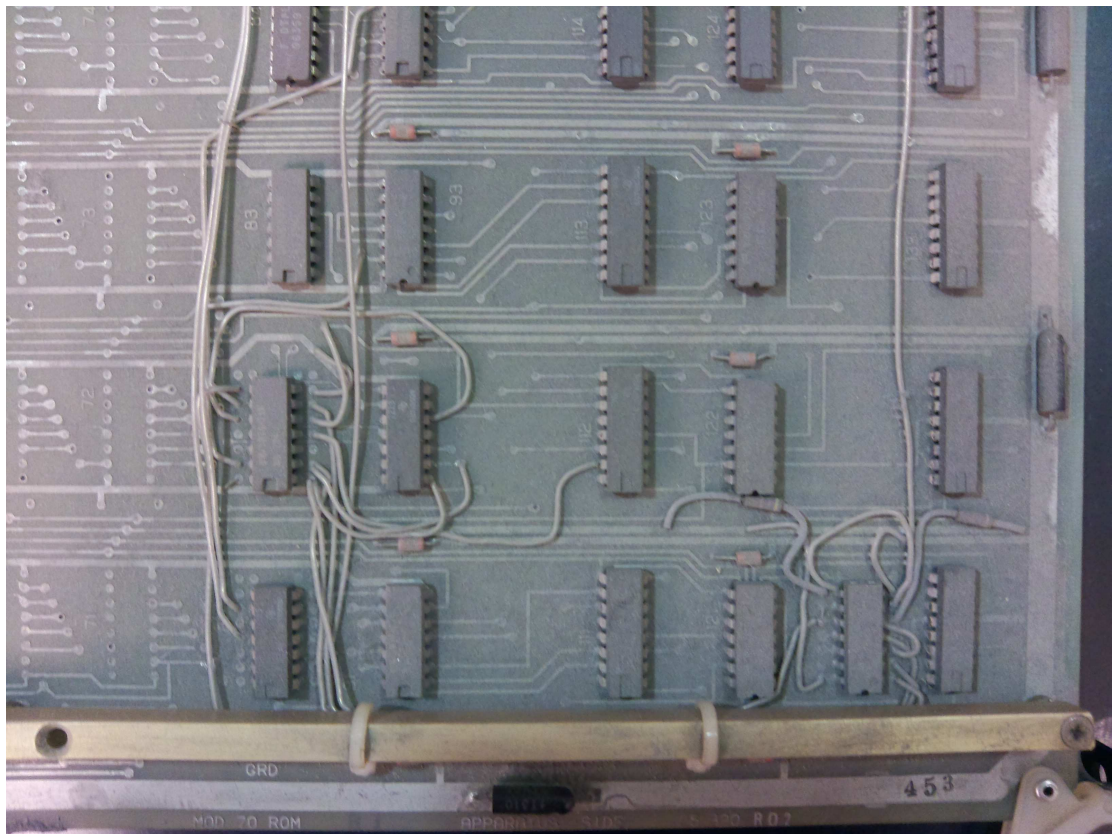


*Figure 15: Interdata Model 70 CPU ROM board*

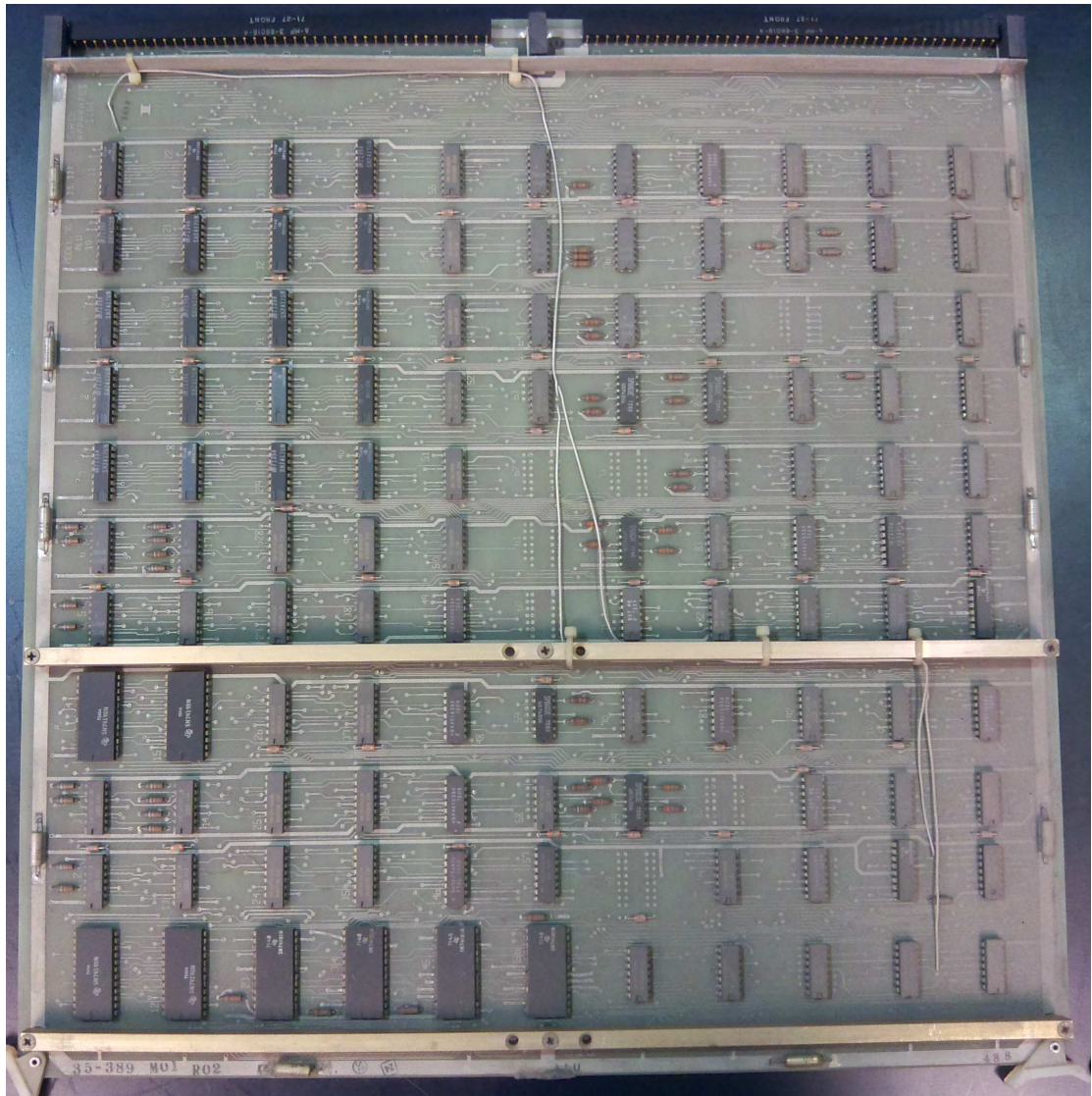




*Figure 16: Interdata Model 70 CPU ROM board left closeup  
P/N: 35-388 M02 R02*

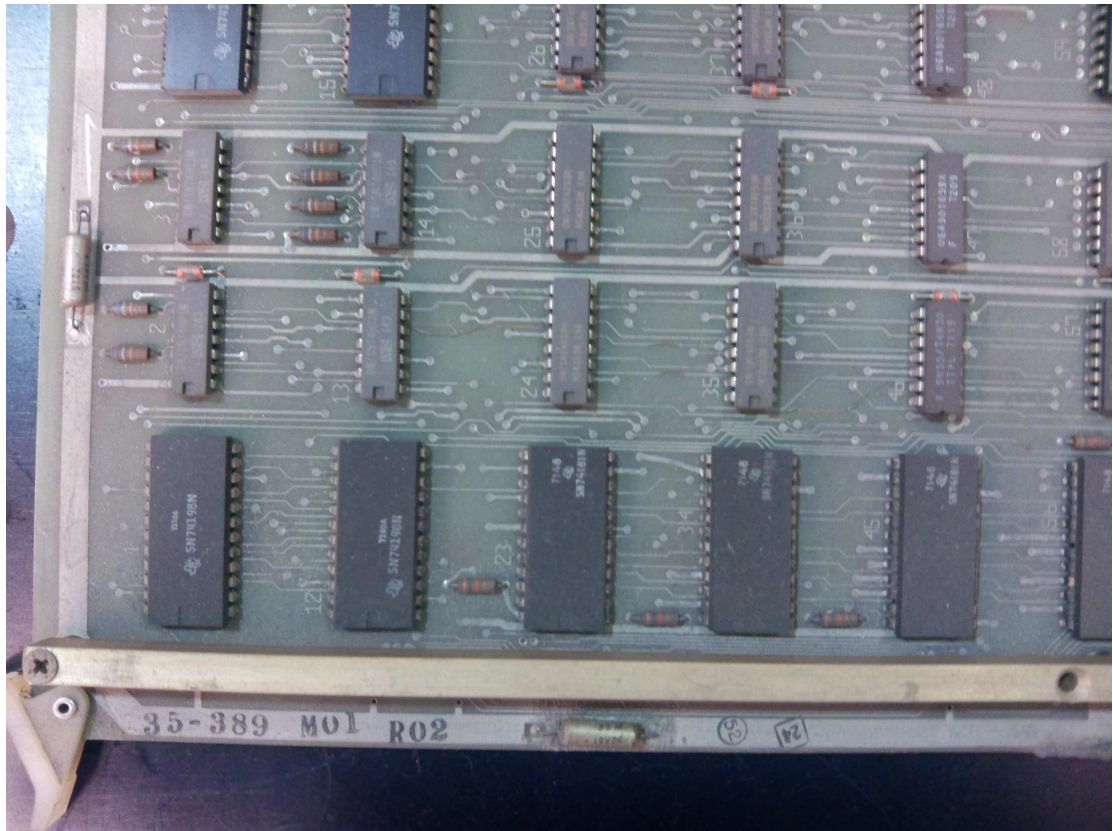


*Figure 17: Interdata Model 70 CPU ROM board right closeup*

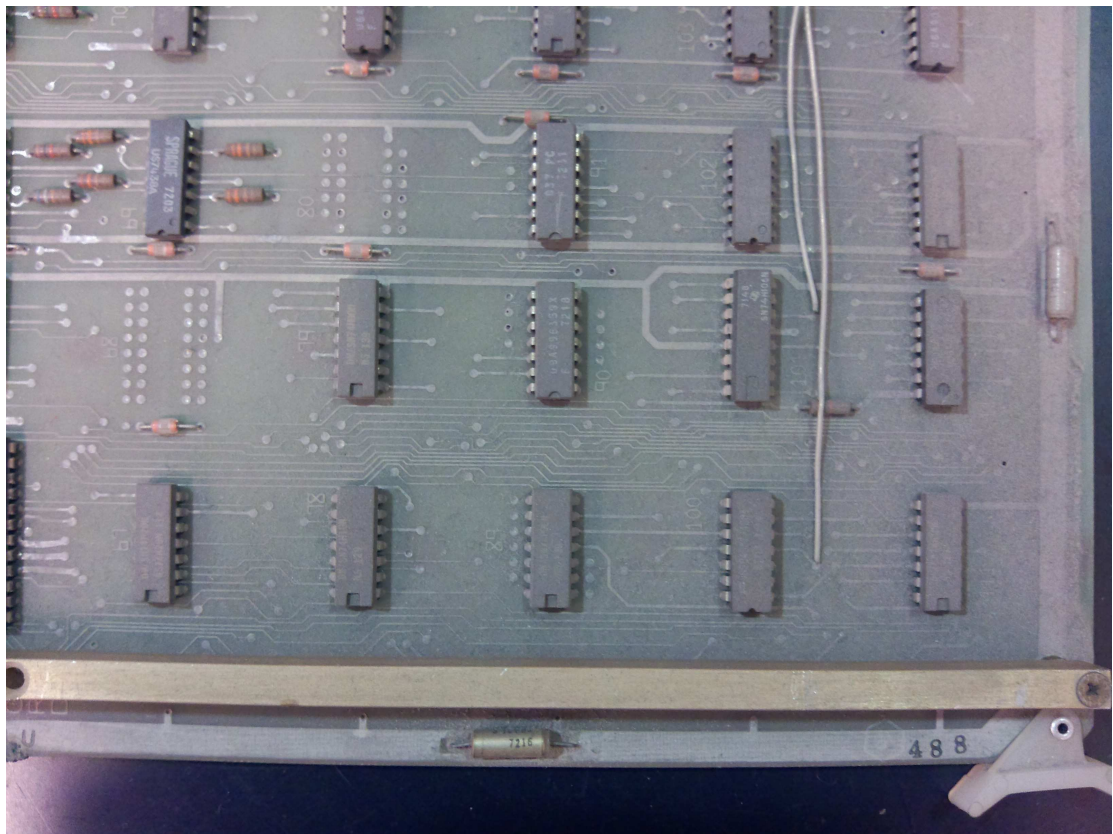


*Figure 18: Interdata Model 70 CPU ALU board*

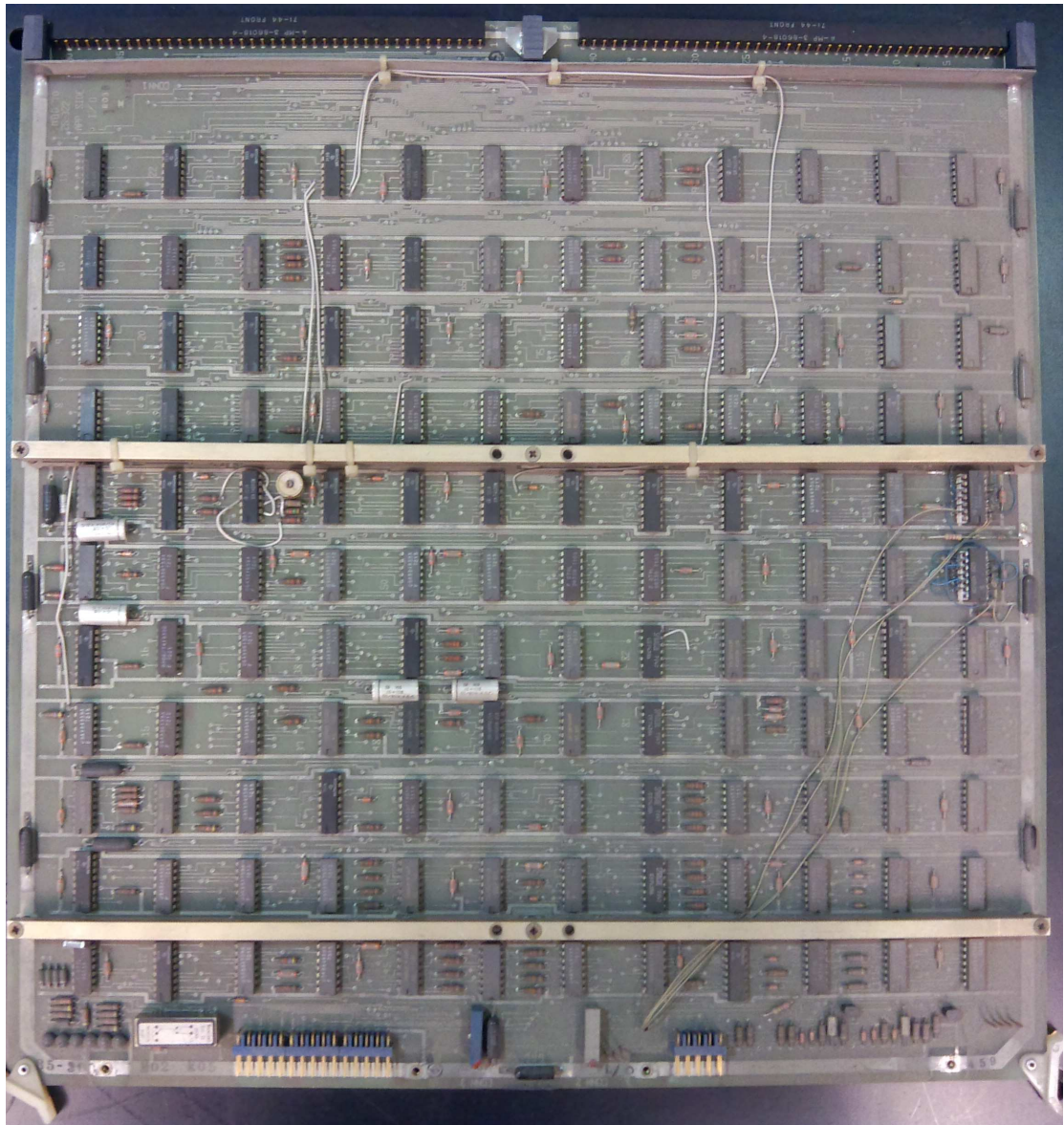




*Figure 19: Interdata Model 70 CPU ALU board left closeup  
P/N: 35-389 M01 R02*

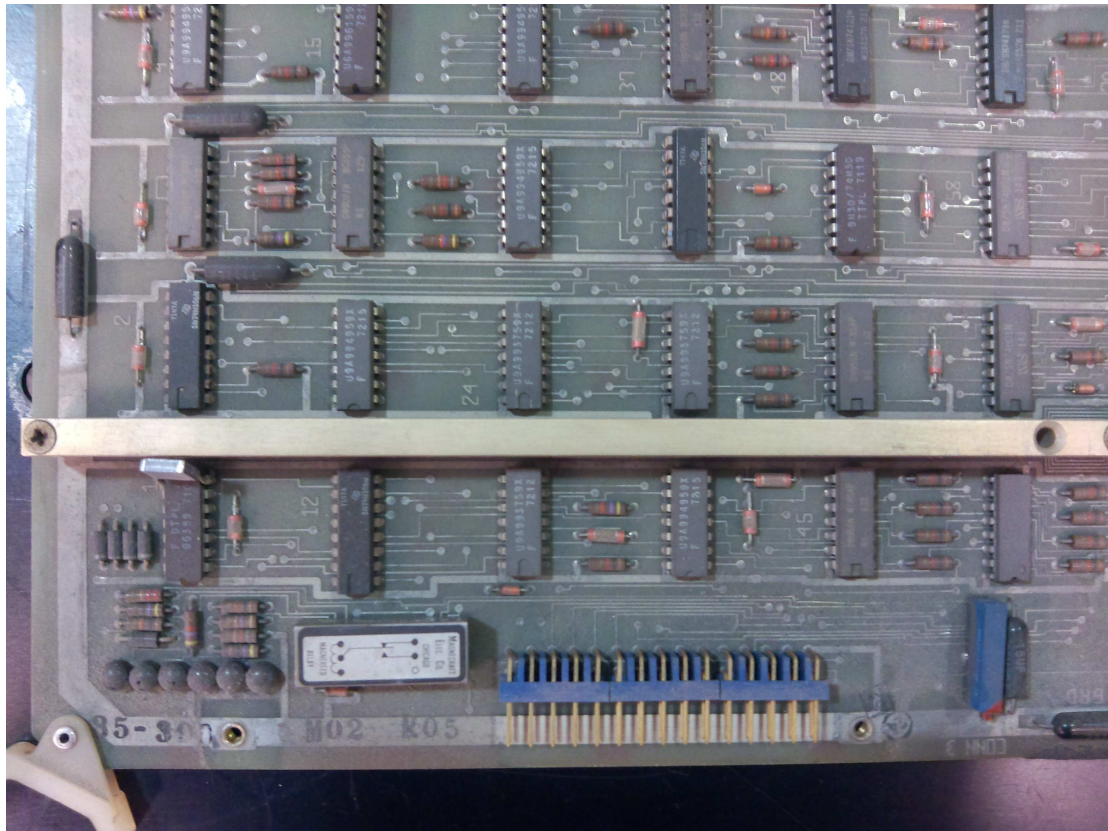


*Figure 20: Interdata Model 70 CPU ALU board right closeup*

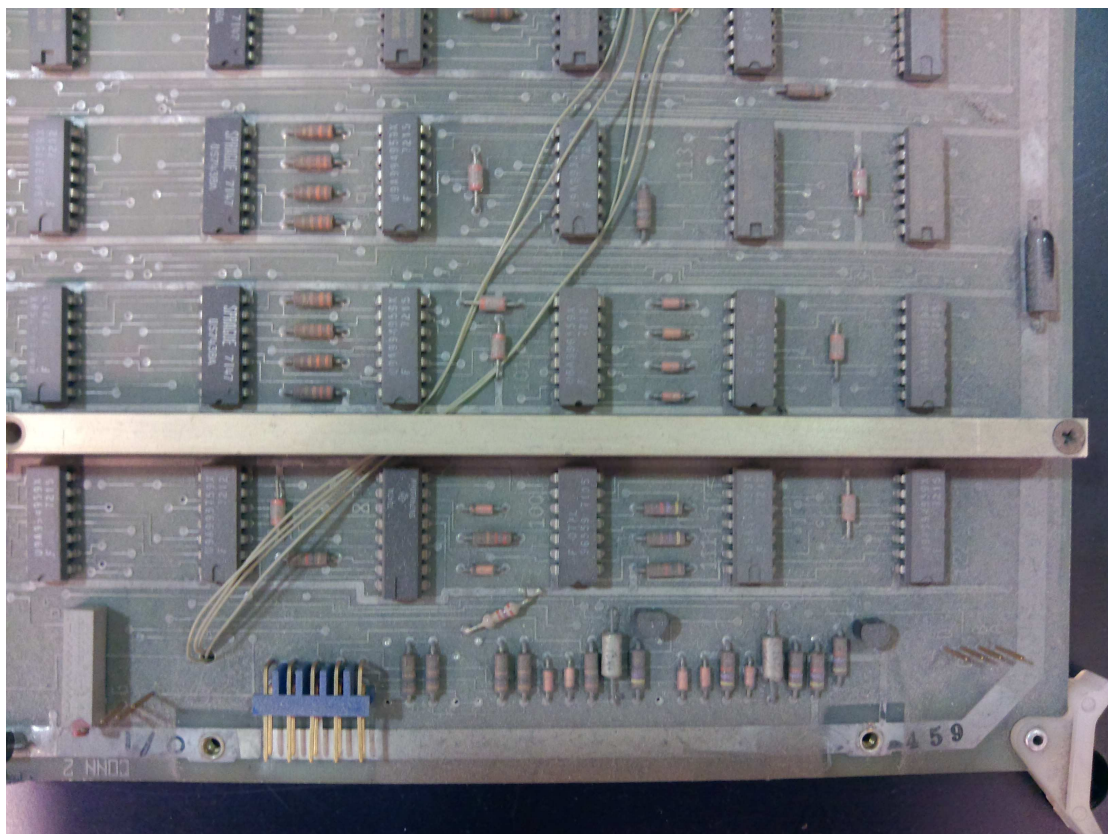


*Figure 21: Interdata Model 70 front panel I/O board*

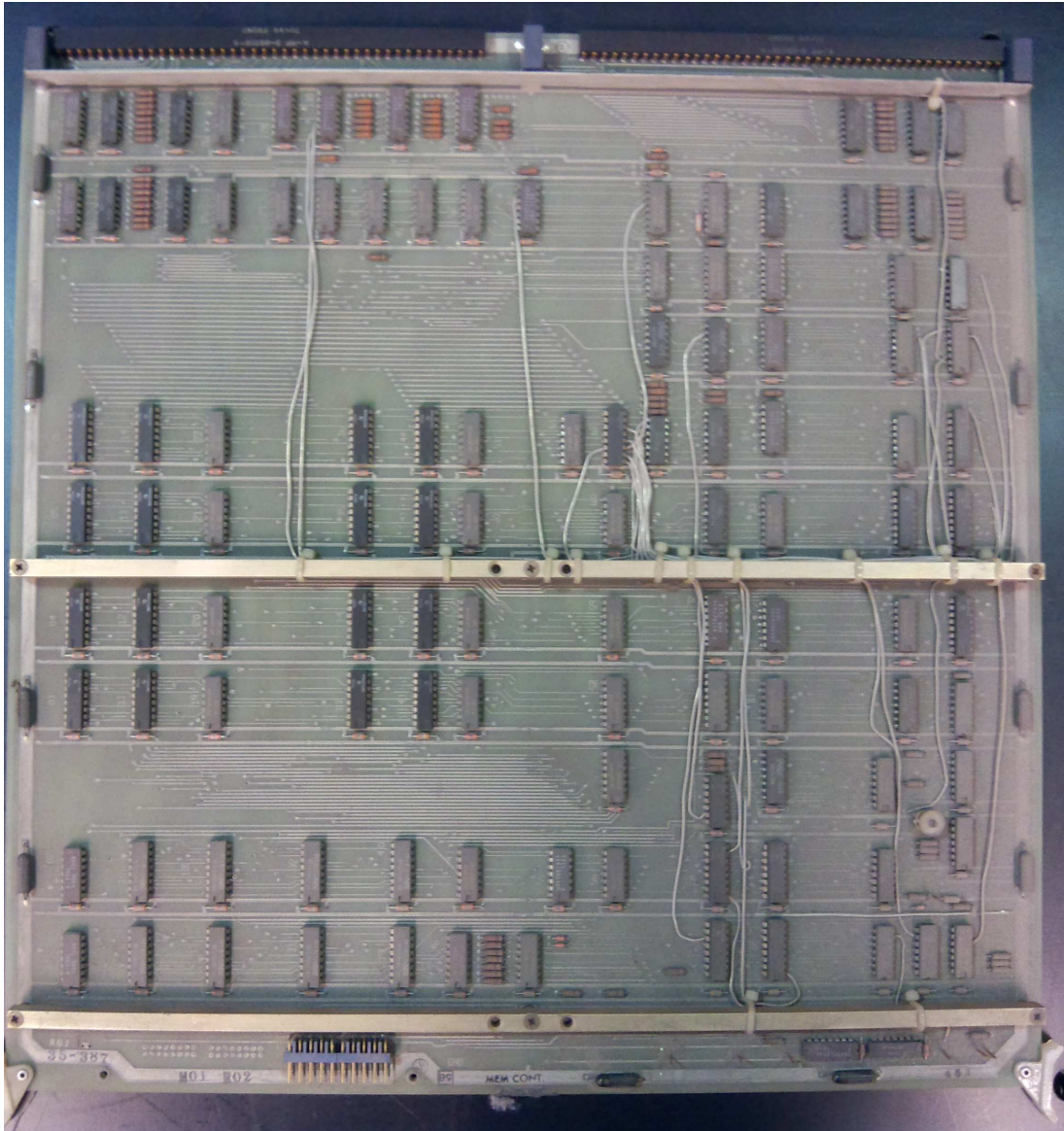




*Figure 22: Interdata Model 70 front panel I/O board left closeup  
P/N: 35-300 M02 R05*

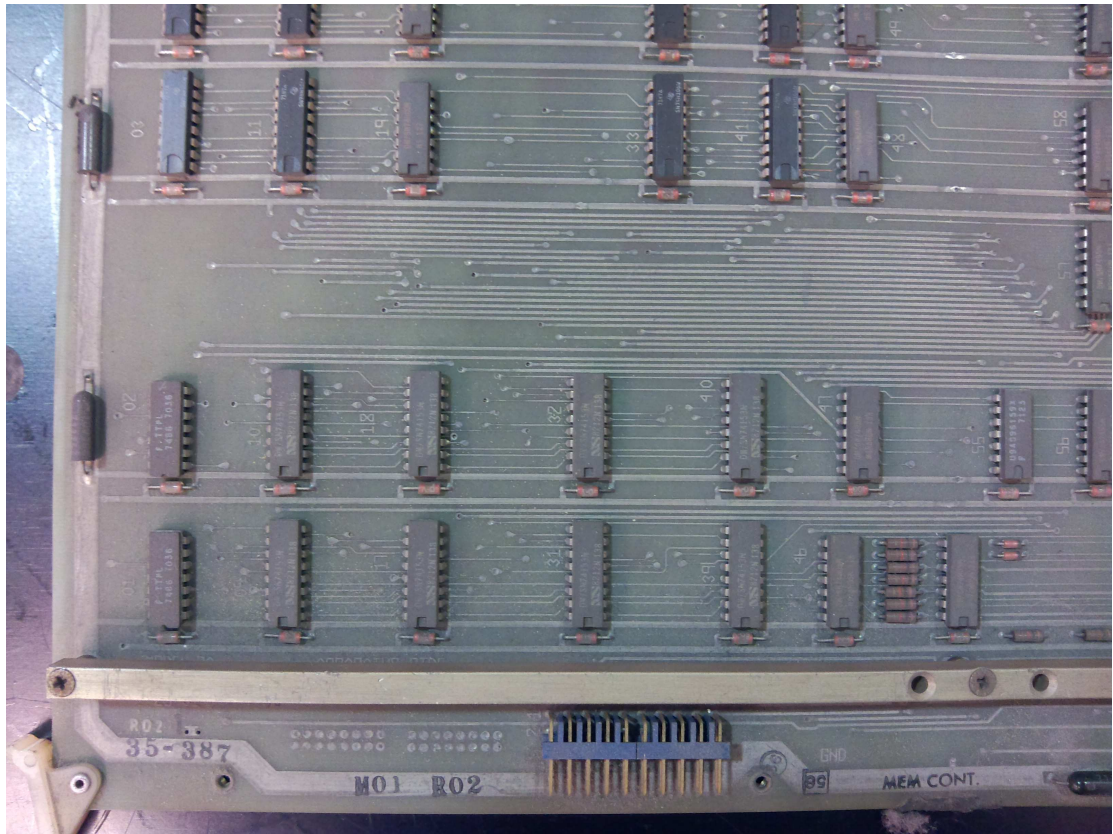


*Figure 23: Interdata Model 70 front panel I/O board right closeup*

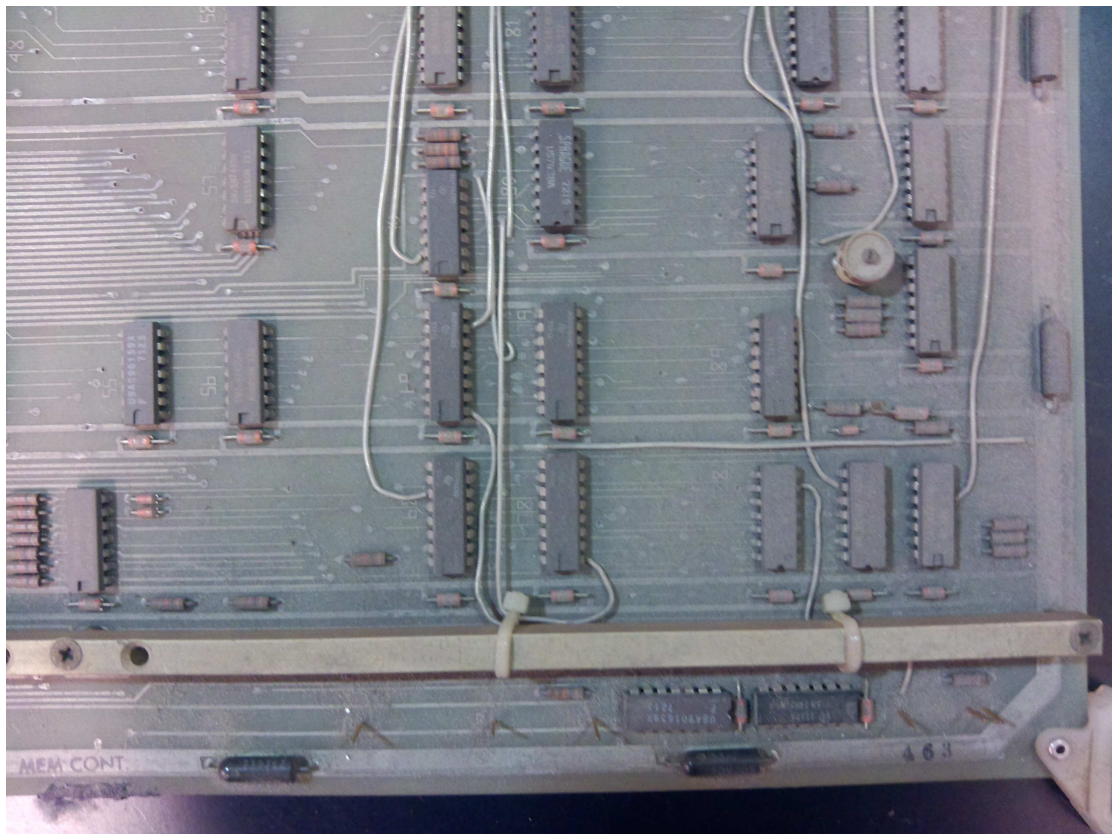


*Figure 24: Interdata Model 70 memory controller board*



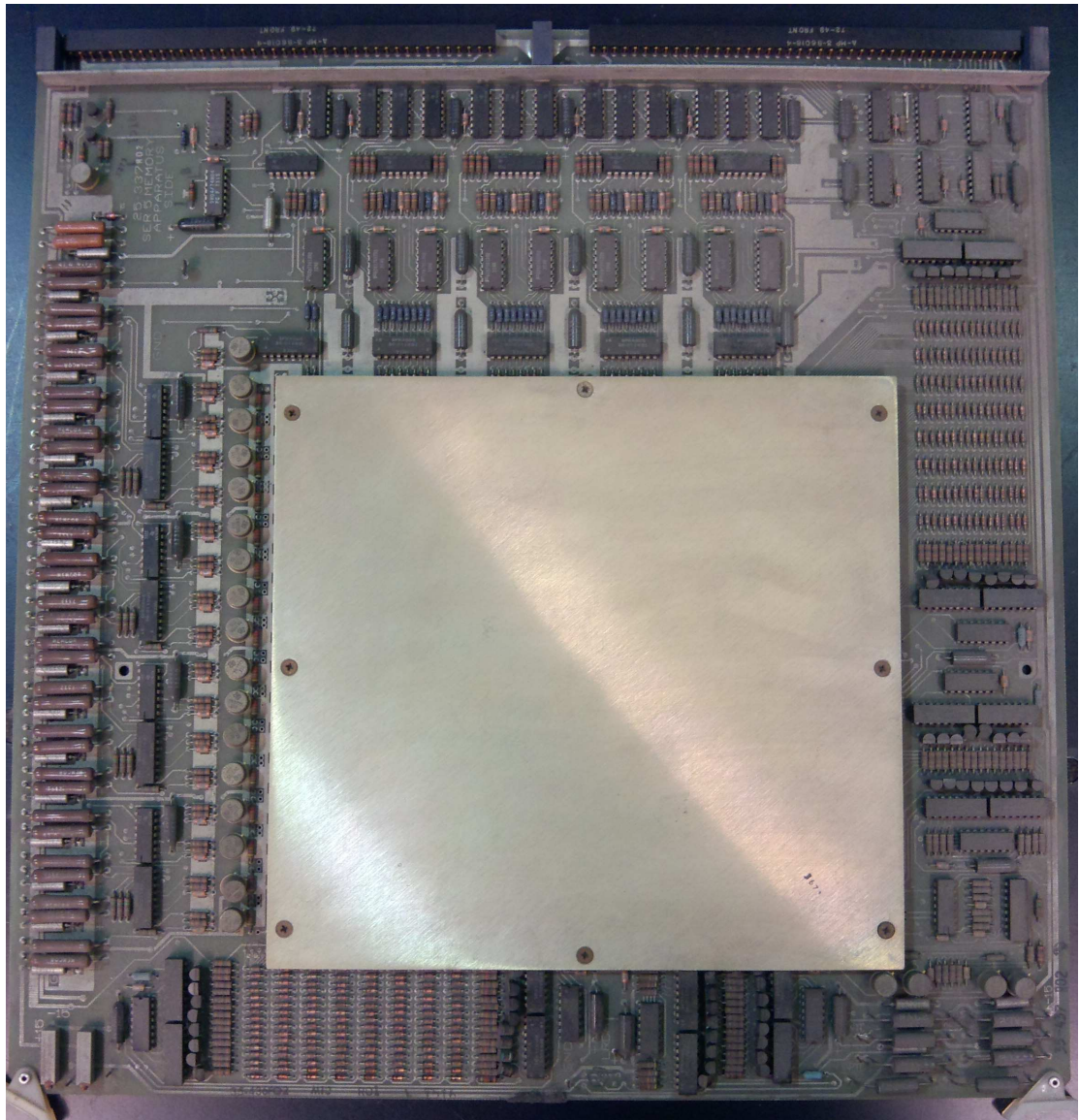


*Figure 25: Interdata Model 70 memory controller board left closeup  
P/N: 35-387 M01 R02*

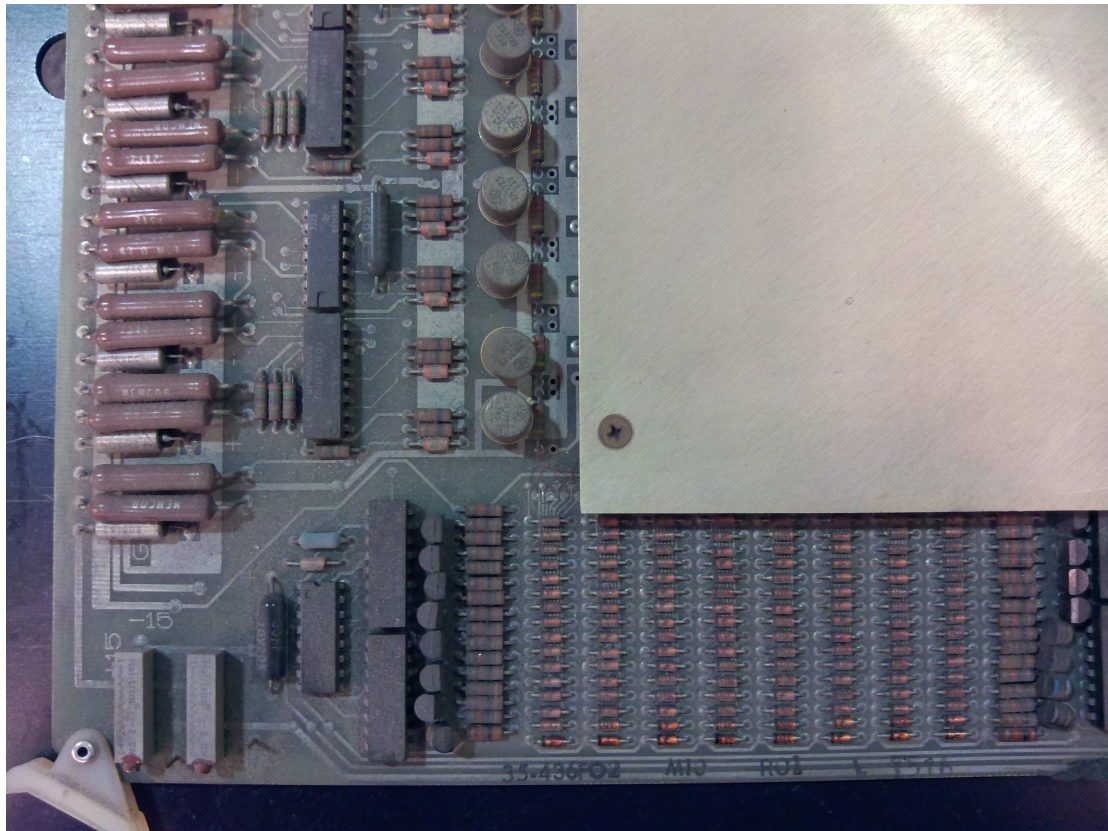


*Figure 26: Interdata Model 70 memory controller board right closeup*

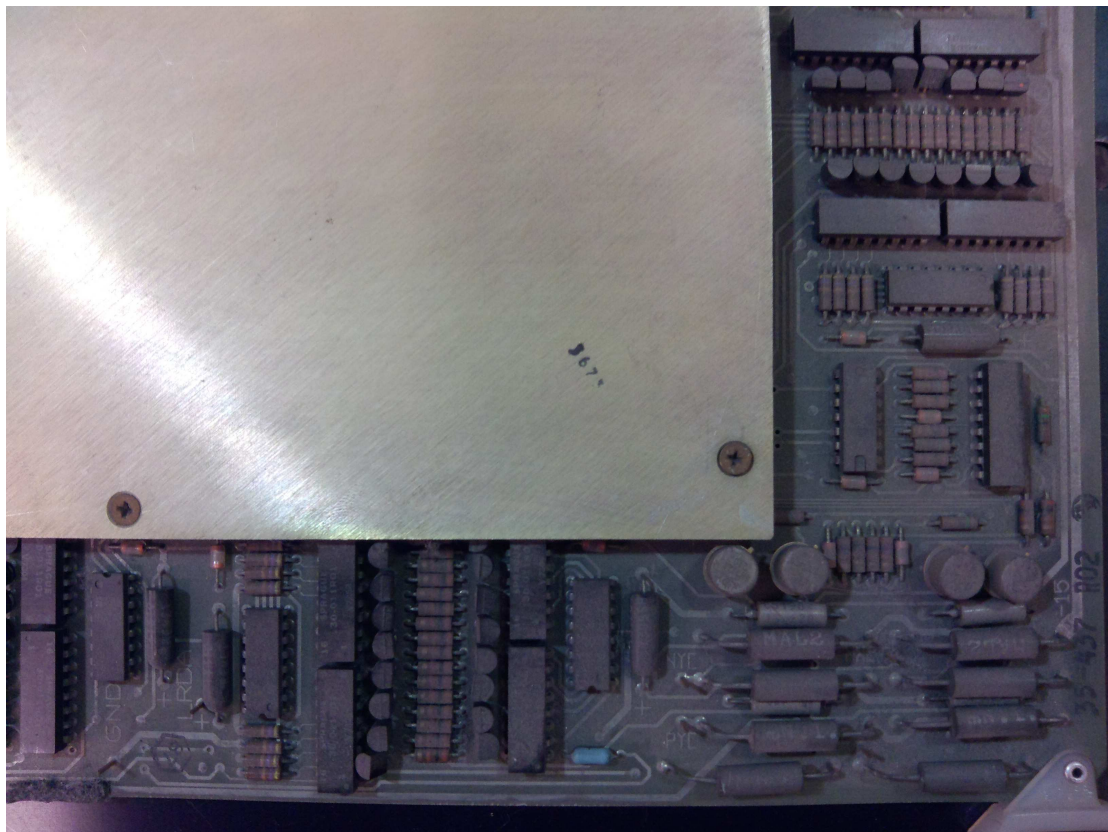




*Figure 27: Interdata Model 70 16kB core memory board (1)*



*Figure 28: Interdata Model 70 16kB core memory board (1) left closeup  
P/N: 35-436F02 M10 R01*



*Figure 29: Interdata Model 70 16kB core memory board (1) right closeup*



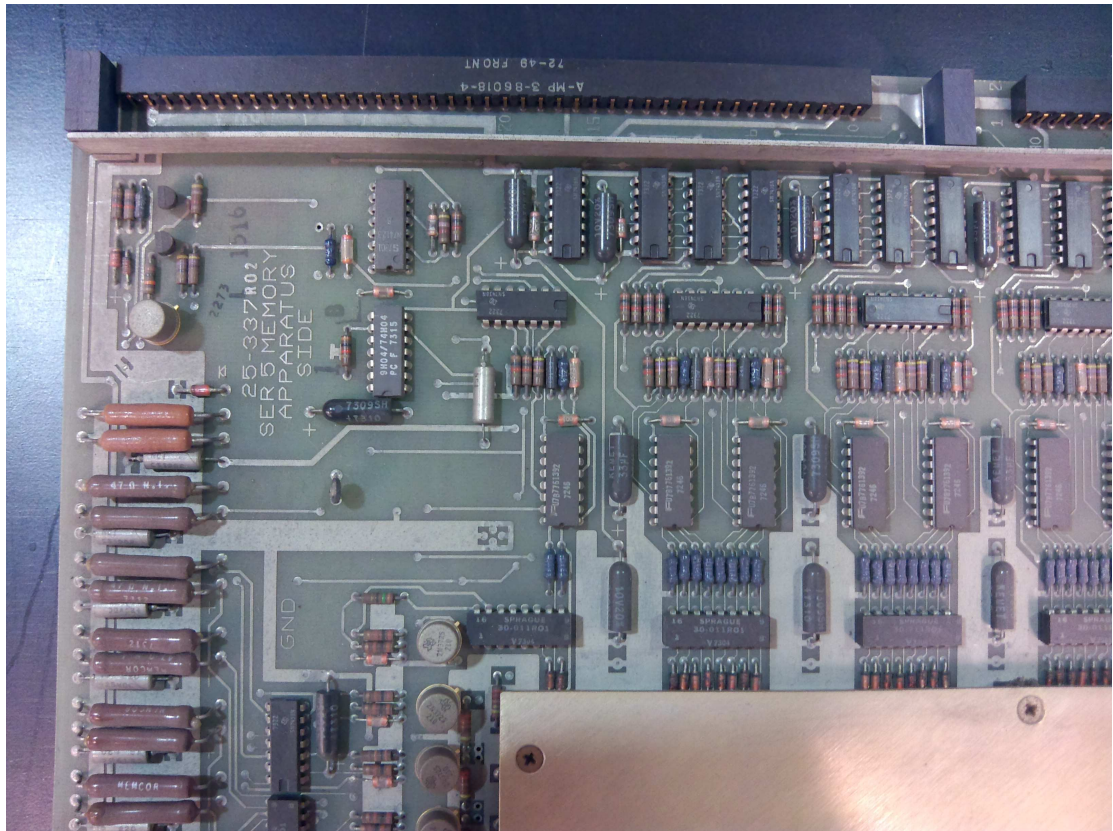
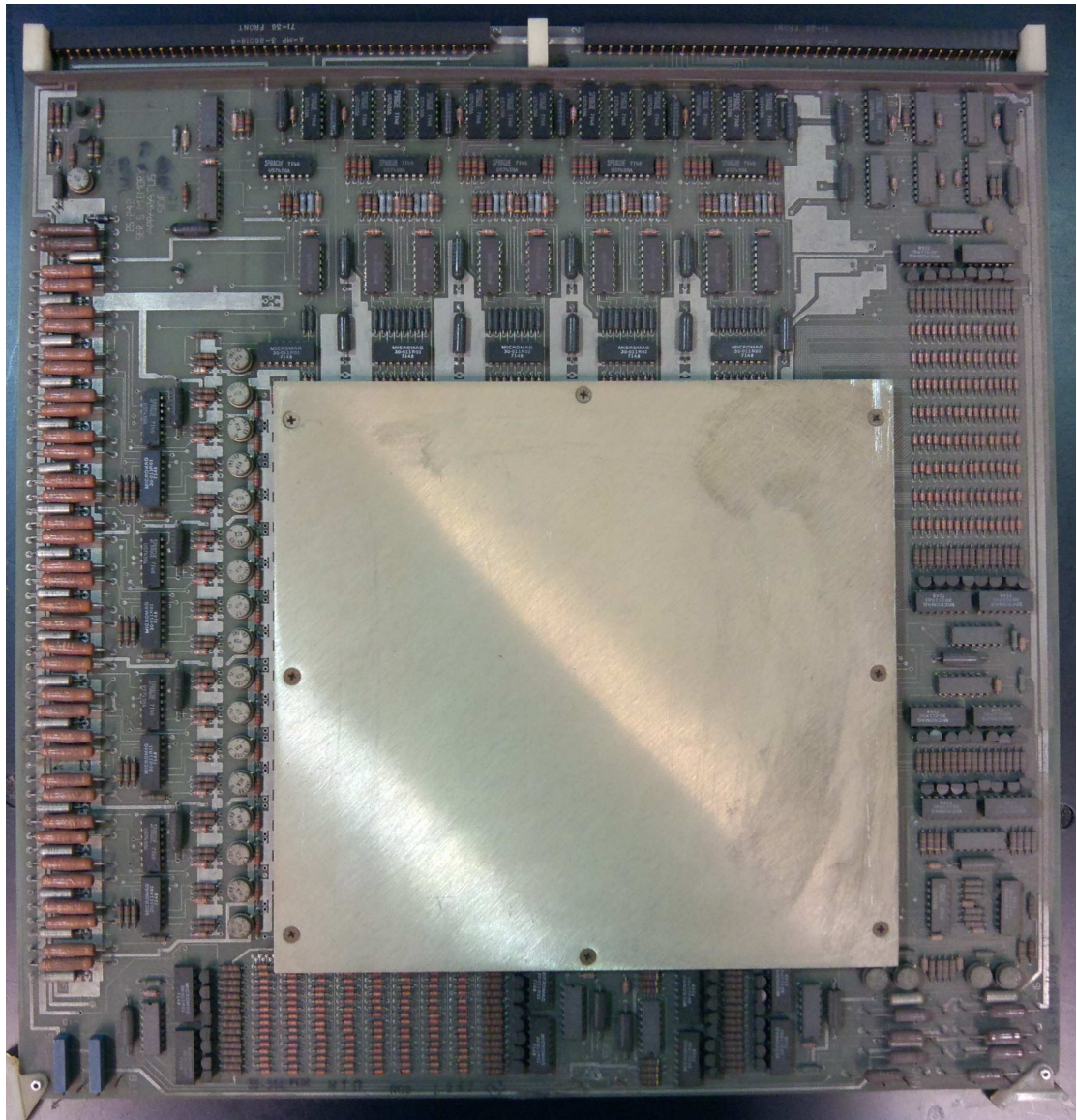
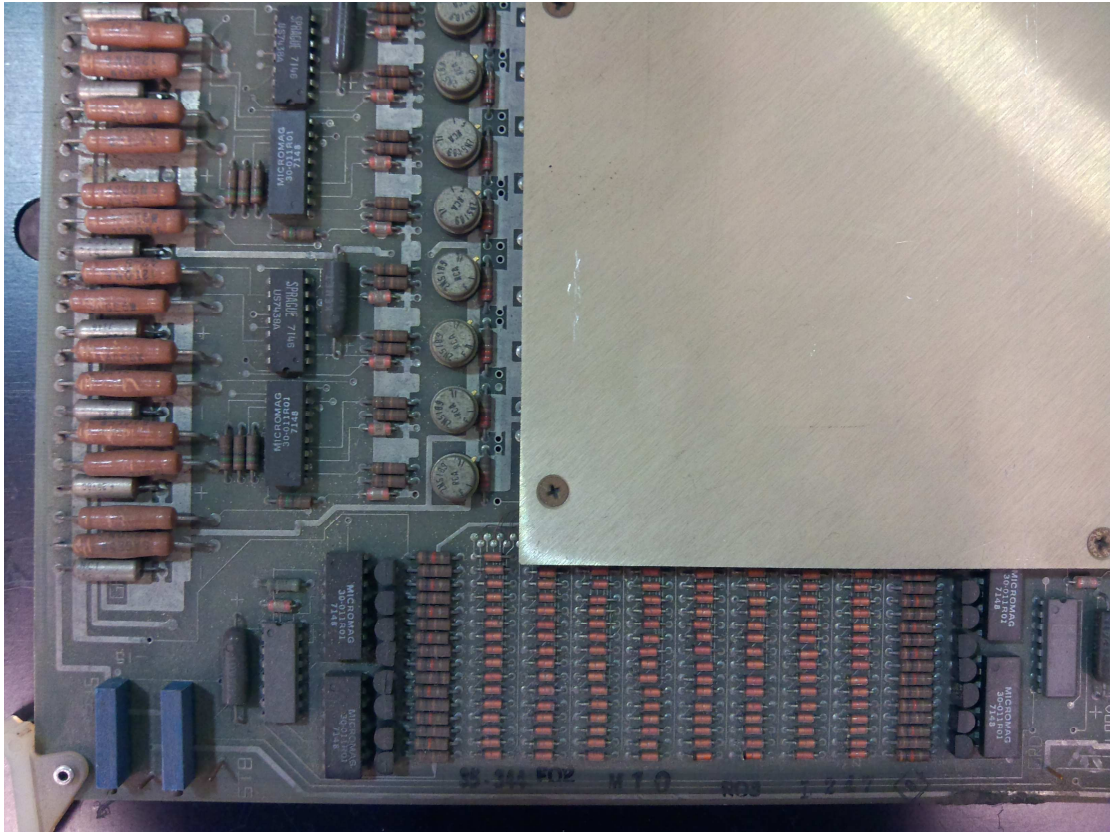


Figure 30: Interdata Model 70 16kB core memory board (1) left top closeup

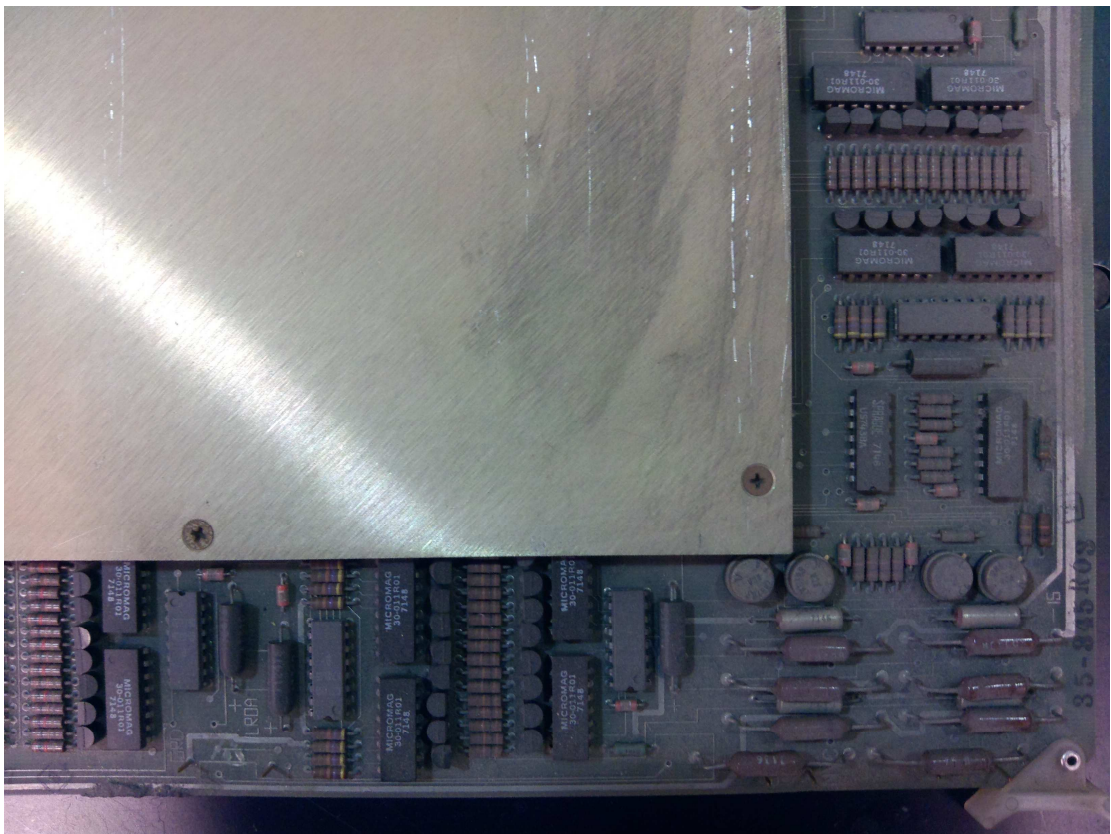


*Figure 31: Interdata Model 70 16kB core memory board (2)*



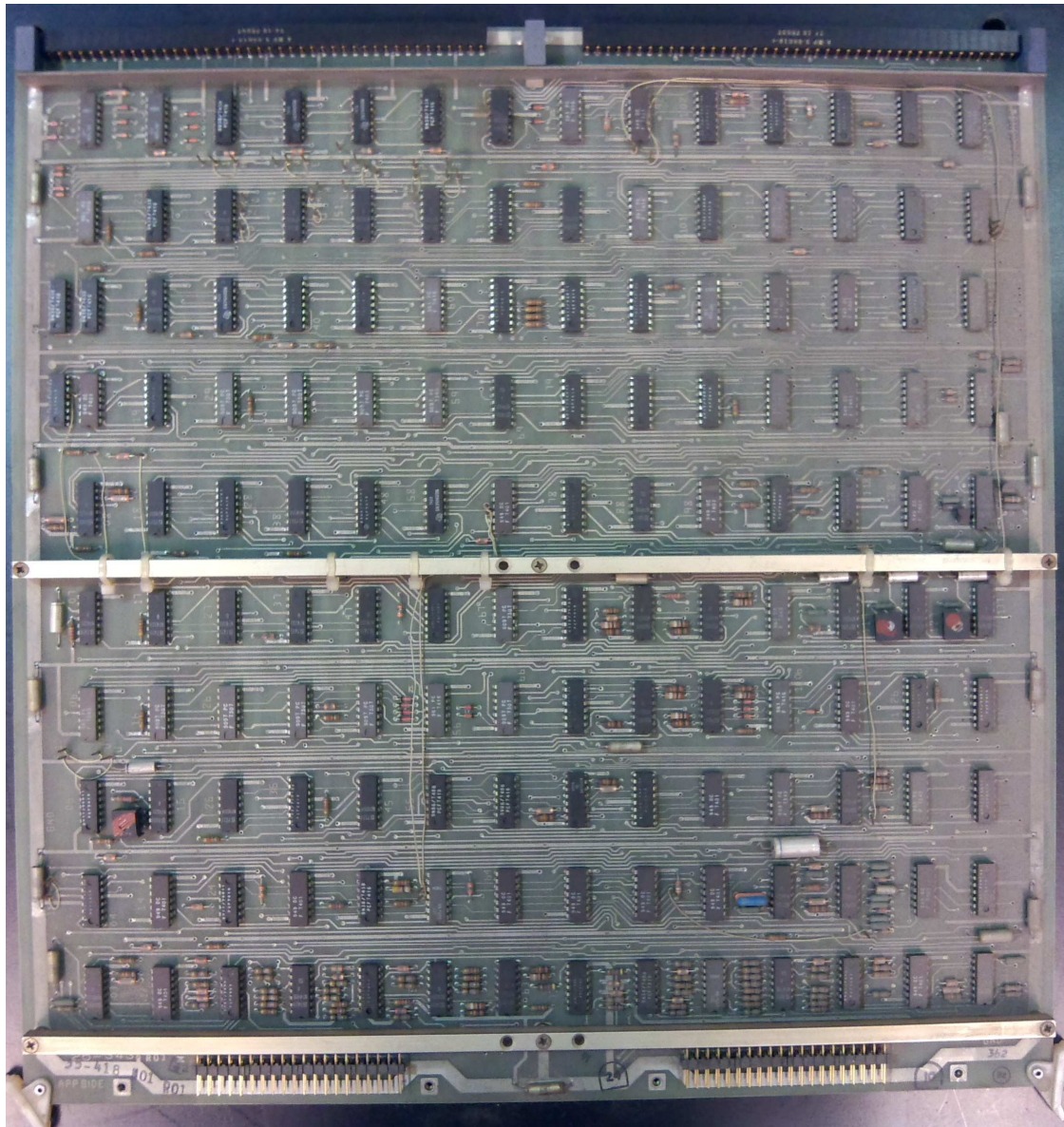


*Figure 32: Interdata Model 70 16kB core memory board (2) left closeup  
P/N: 35-344F02 M10 R03*



*Figure 33: Interdata Model 70 16kB core memory board (2) right closeup*





*Figure 34: Interdata Model 70 dual-cassette controller board*



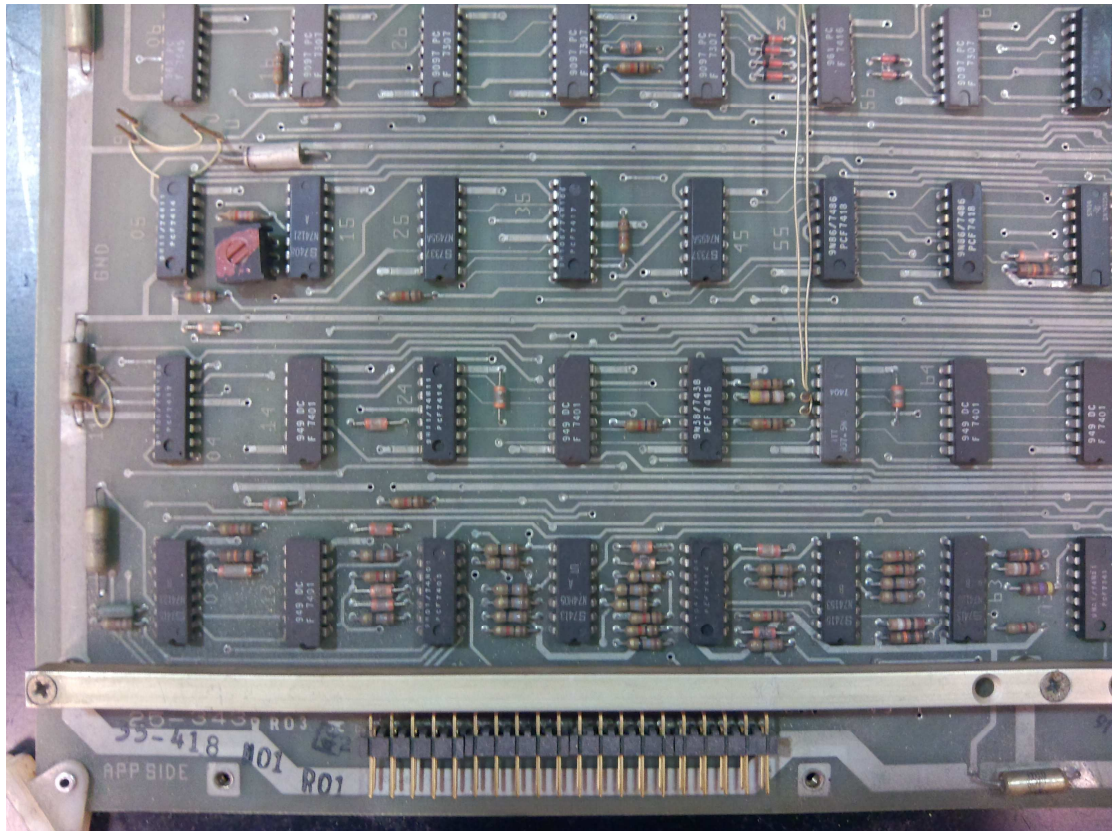


Figure 35: Interdata Model 70 dual-cassette controller board left closeup  
P/N: 35-418 M01 R01

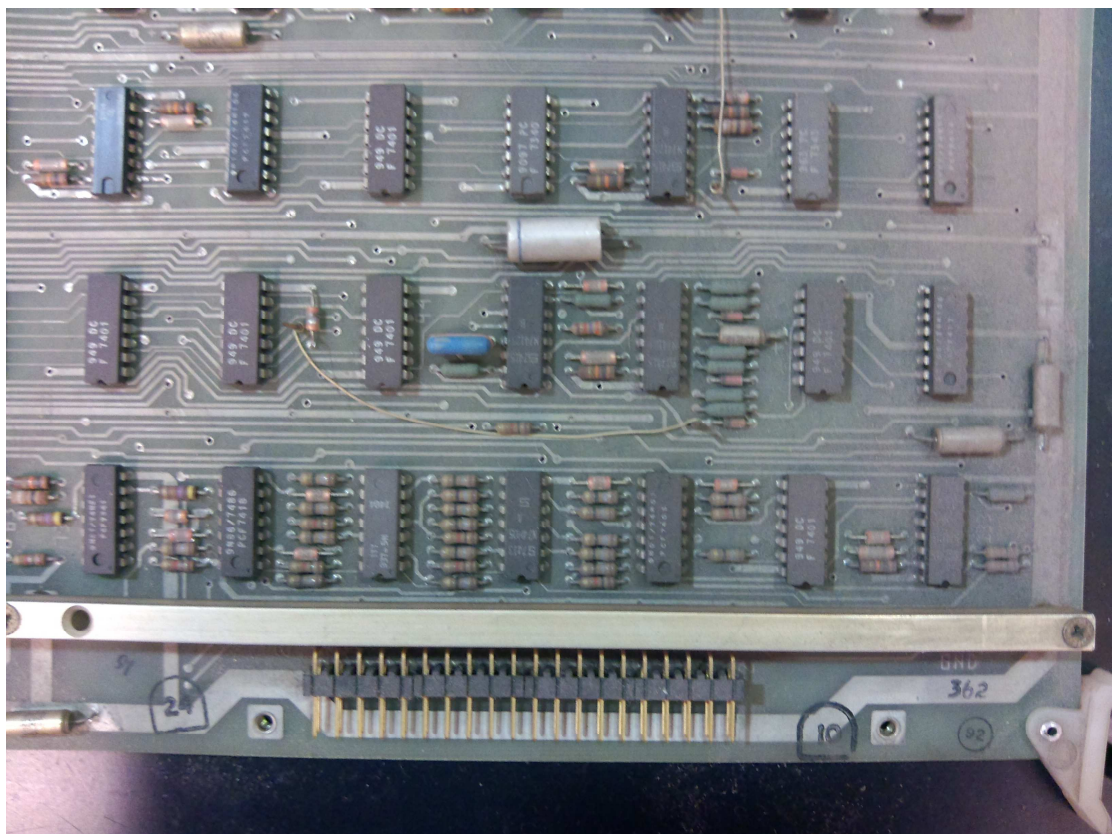
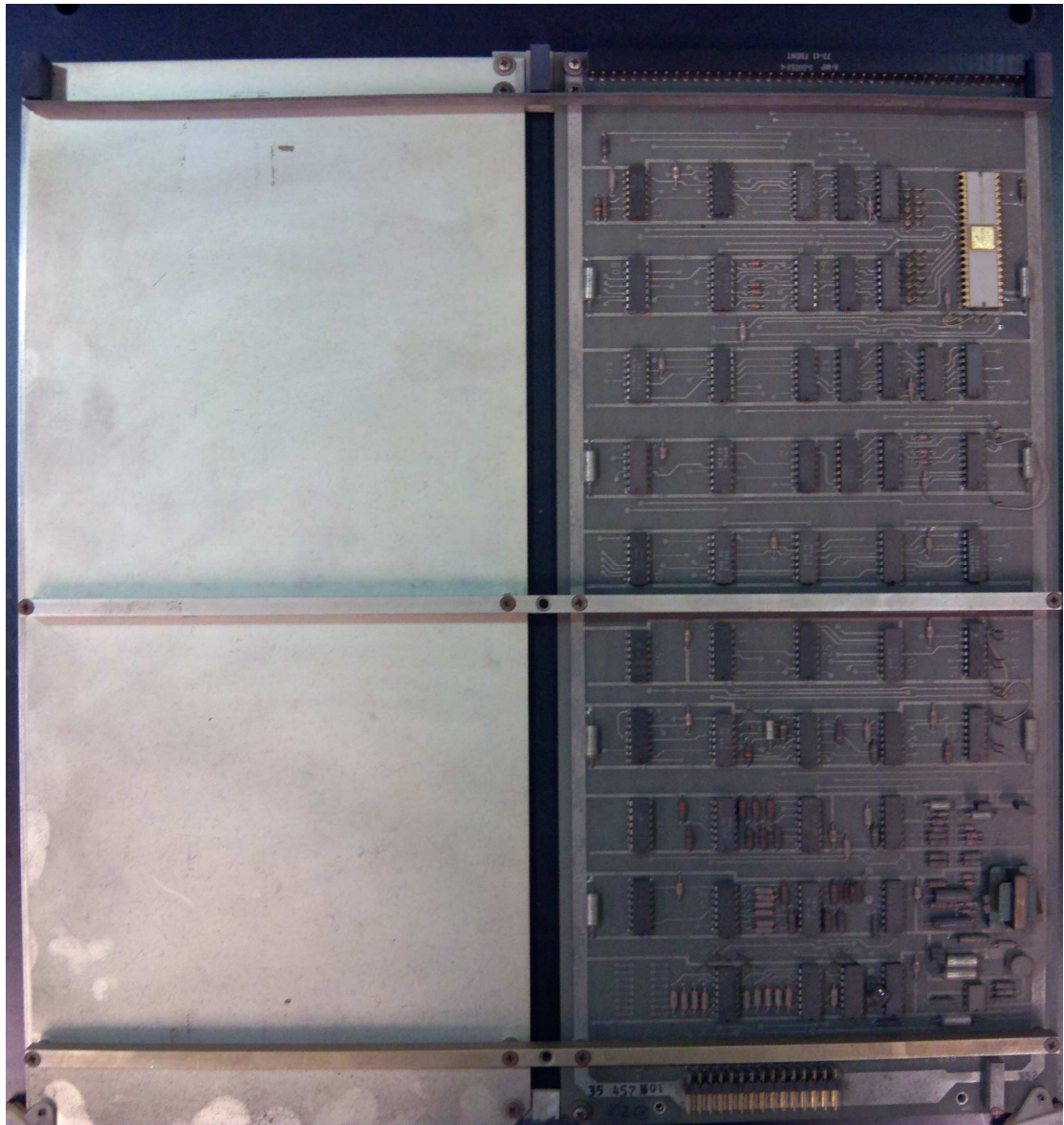
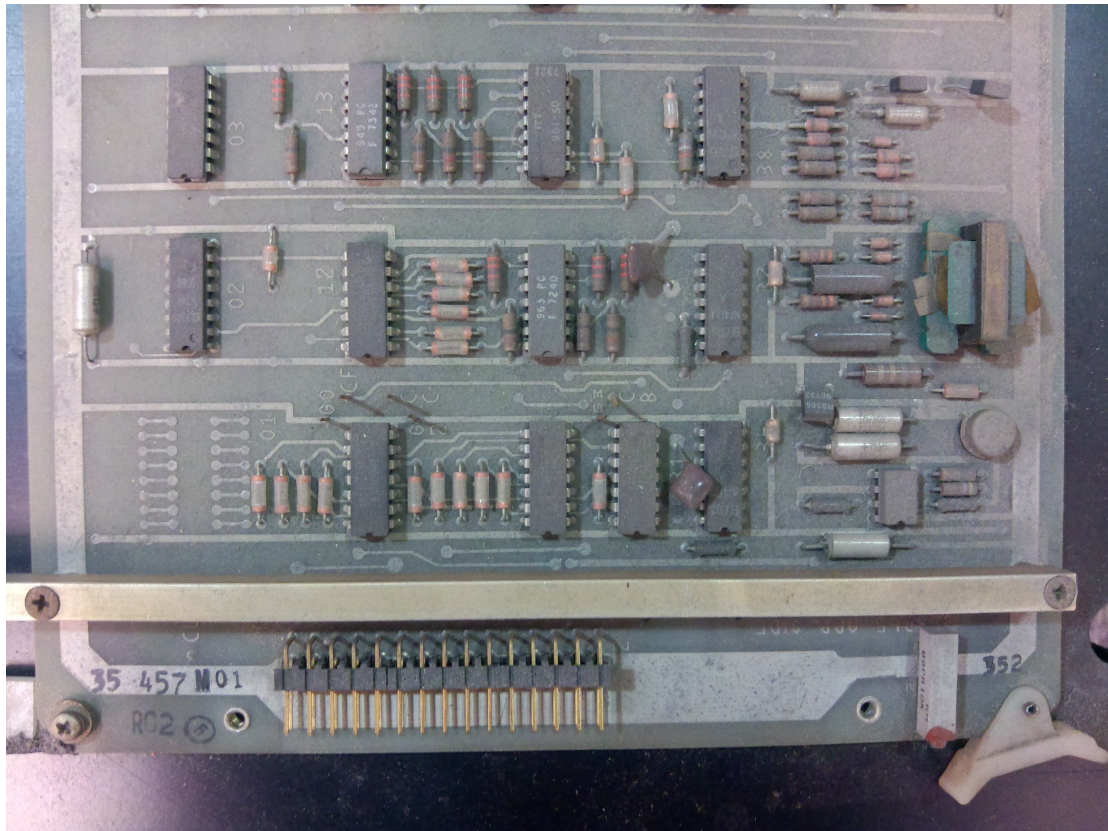


Figure 36: Interdata Model 70 dual-cassette controller board right closeup

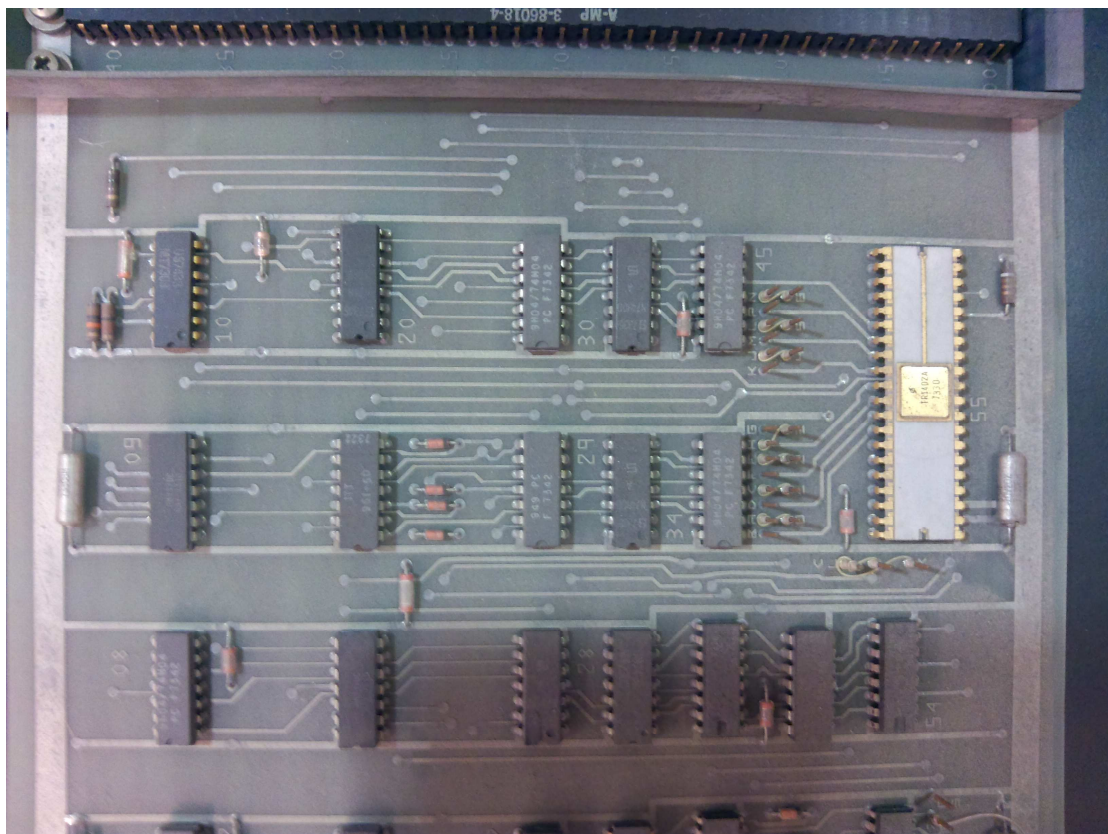




*Figure 37: Interdata Model 70 PASLA serial I/O board*

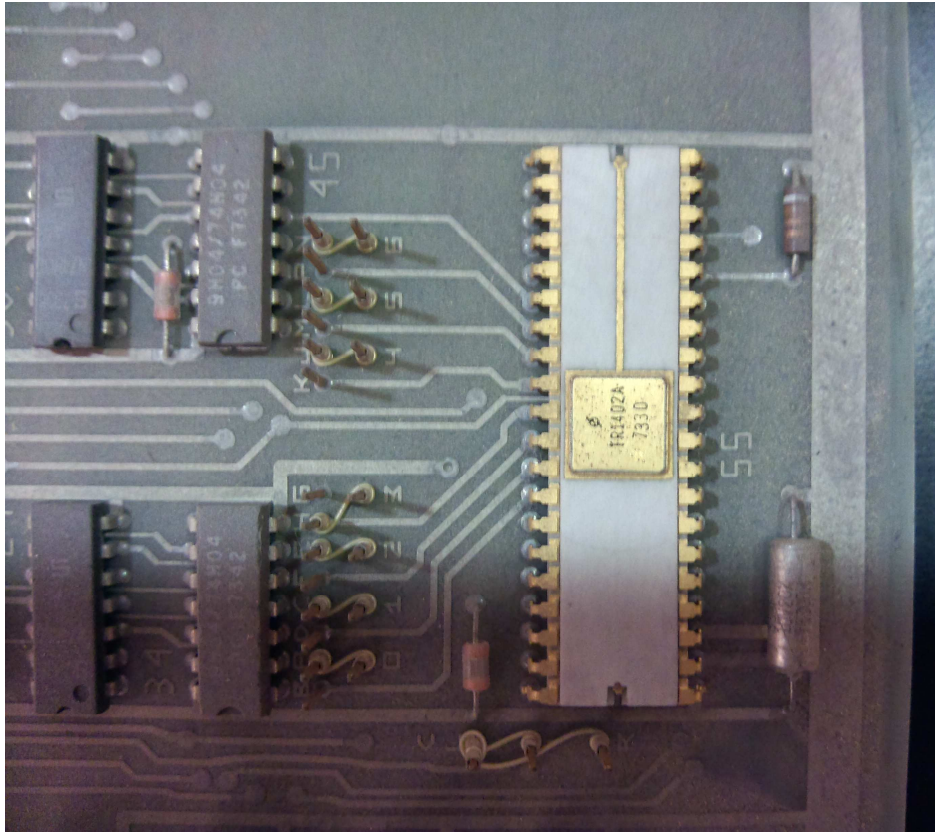


*Figure 38: Interdata Model 70 PASLA serial I/O board closeup  
P/N: 35-457 M01 R02*



*Figure 39: Interdata Model 70 PASLA serial I/O board closeup*





*Figure 40: Interdata Model 70 PASLA serial I/O UART closeup  
P/N: TR1402A 733D*