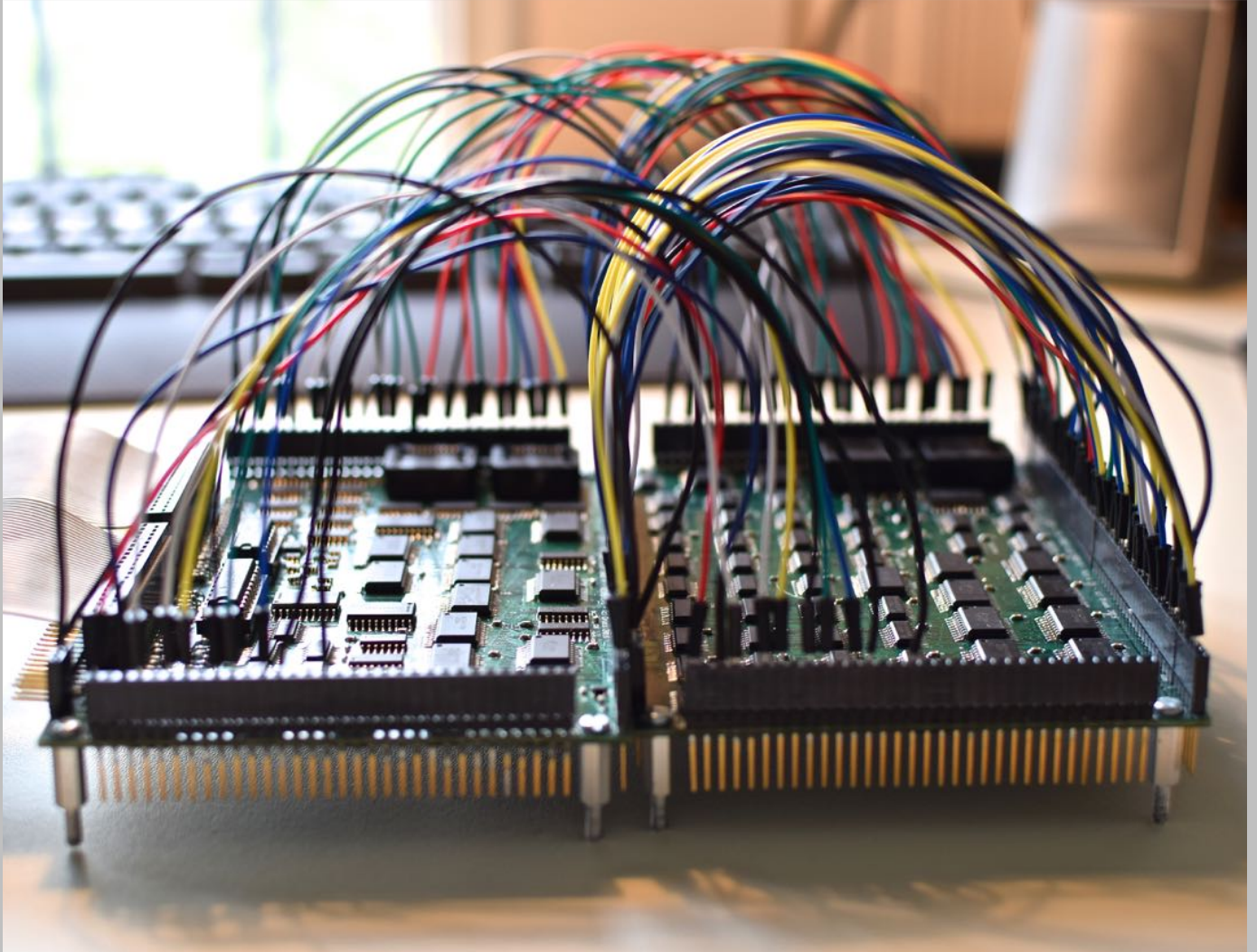


C74-6502



HOMEMADE TTL CPU

The C74-6502 is a cycle-accurate, pin-compatible implementation of the classic 6502 8-bit microprocessor. Built using 7400 series discrete components, it can run at clock-speeds of up to 20MHz and may be configured to operate natively as an 6502, a 6510, or 65C02 processor.

C74PROJECT.WORDPRESS.COM

C74-6502 Datasheet

The C74-6502 is a cycle-accurate, pin-compatible implementation of the classic 6502 8-bit microprocessor. Built using 7400 series discrete components, it can run at clock-speeds of up to 20MHz and may be configured to operate as an 6502, a 6510, or 65C02 processor.

With the addition of an optional "K24 Card", the CPU acquires certain WDC 65816 capabilities, namely a 24-bit address bus (16MB memory space), additional addressing modes and dozens of new opcodes. The K24 Card also enables the instruction-set to be switched programmatically, allowing separate 6502 and 65C02 programs to run concurrently in independent 64K "partitions".

Architecturally, the C74-6502 is a microcode-based design where a 32-bit control-word is decoded "on-the-fly" prior to use by the Control Unit. A single-stage microcode pipeline pre-fetches micro-instructions from ROM, effectively eliminating the microcode fetch time from the critical path, and allowing the CPU to execute one microinstruction per clock-cycle at 20MHz.

The C74-6502 implements all NMOS 6502 and WDC 65C02 instructions, interrupts and functions, including Decimal Mode and "Undocumented Opcodes" (with some exceptions, as detailed in the datasheet). The C74-6502 uses 7400 series ICs from the AC, LVC and CBT logic families for its circuitry, which includes a discrete-component ALU, an integrated 6510 I/O port and a built-in SPI interface.

The CPU can operate in place of an existing 6502 IC in a host-computer through the use of a custom 40-pin Socket-Adapter. Alternatively, it may be installed in new designs by way of standard pin headers.

See C74Project.wordpress.com for further information on the C74 Project.

Specifications

- Cycle-accurate, pin-compatible 6502, 6510 & 65C02 operation²
- Implements all 6502 and 65C02 instructions and functions, including Decimal Mode²
- Supports NMOS 6502 Undocumented Opcodes²
- Includes an on-board 6-bit, bidirectional I/O port which is compatible with the MOS 6510
- Custom 40-Pin Host Socket Adapter
- Compatible with TTL or CMOS Host Systems
- Auxiliary Power Supply Connections
- 0 to 20MHz Clock-Rate
- Operating Voltage: 5V³
- Current Draw: 130mA at 1MHz, 750mA at 20MHz³

K24 Card Optional Features: (untested)

- 24-bit address bus
- Additional 65816 instructions and addressing modes
- Software selectable instruction-sets
- Built-in SPI Interface and custom Opcode

Notes:

¹ The control word is 48 bits when the K24 card is installed

² There are specific limitations and caveats to compatibility with the target processors. These are described in detail below and summarized in Appendix J.

³ Quoted figures reflect approximate measurements only