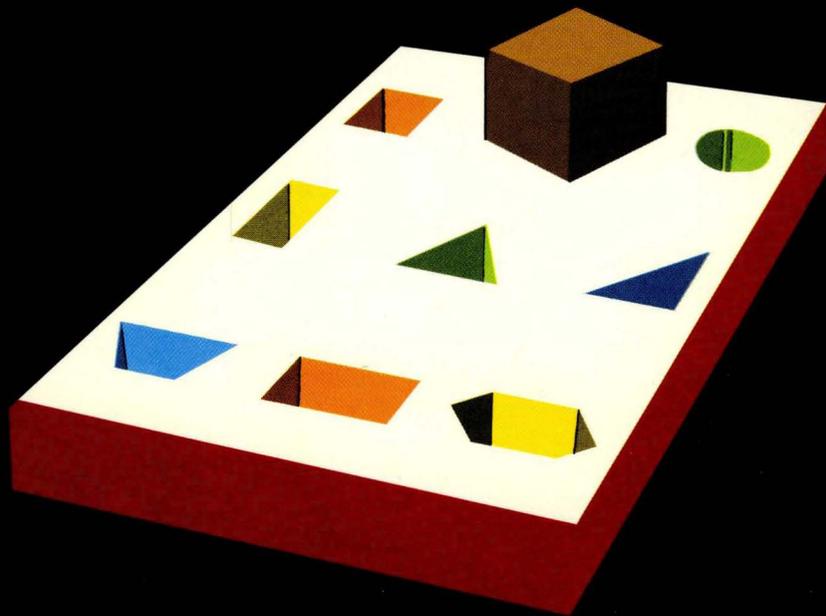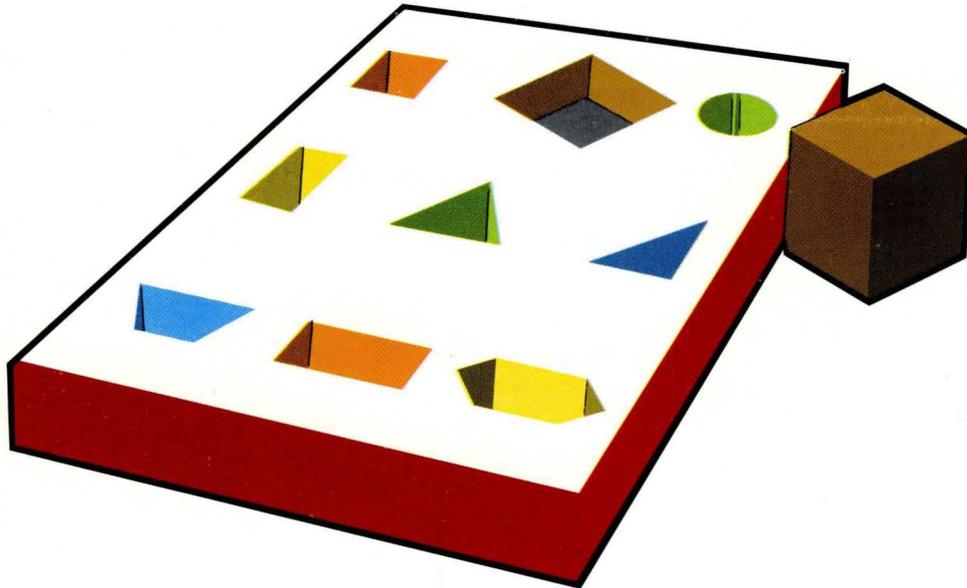# ATRON 601 CONTROLLERS

The Solution to a Puzzling Problem

ATRON 601 CONTROLLERS

Matching the controller to your application is the problem and the ATRON 601 is the answer. It lets you select from a comprehensive set of standard, pluggable assemblies to configure low-cost, programmable controllers shaped to fit your application.

Controller packages designed from these assemblies are

LOW COST because they

- are constructed from standard assemblies produced in large volume

- require low system development cost

- eliminate wasted capability

PROGRAMMABLE

- with comprehensive instruction repertoire

- to adapt to changing applications inexpensively

HIGH PERFORMANCE with

- 260 nanosecond Processor

- 200 nanosecond Program Memories

- 1 microsecond Main Memories

FIELD MODIFIABLE and **FIELD EXPANDABLE** because

- Program Assemblies can be modified

- standard bus interfaces allow easy field-substitution or addition of assemblies.

Pluggable assemblies shaped

From our complement of processor, program memory, main memory, and support assemblies, you can now design application-tailored packages for

PERIPHERAL CONTROL

INCREASE mainframe throughput by verifying, formatting and translating in the 601
CONTROL remote peripherals by installing communication capability
PROVIDE interface control by the Read Only Memory
CHANGE systems readily for RPQ's
MINIMIZE interface hardware
REDUCE cost of spares

COMMUNICATION CONTROL

RECOGNIZE line control characters
HANDLE multiple data codes
DETECT errors (LRC, CRC)
MAINTAIN handshaking capabilities even at 9600 bauds
COMMUNICATE with different central site computers

MULTIPLEXING

DECREASE per-unit costs
TRANSFER data in record/blocks if desired
VERIFY and translate codes
INTERFACE mainframe or communications
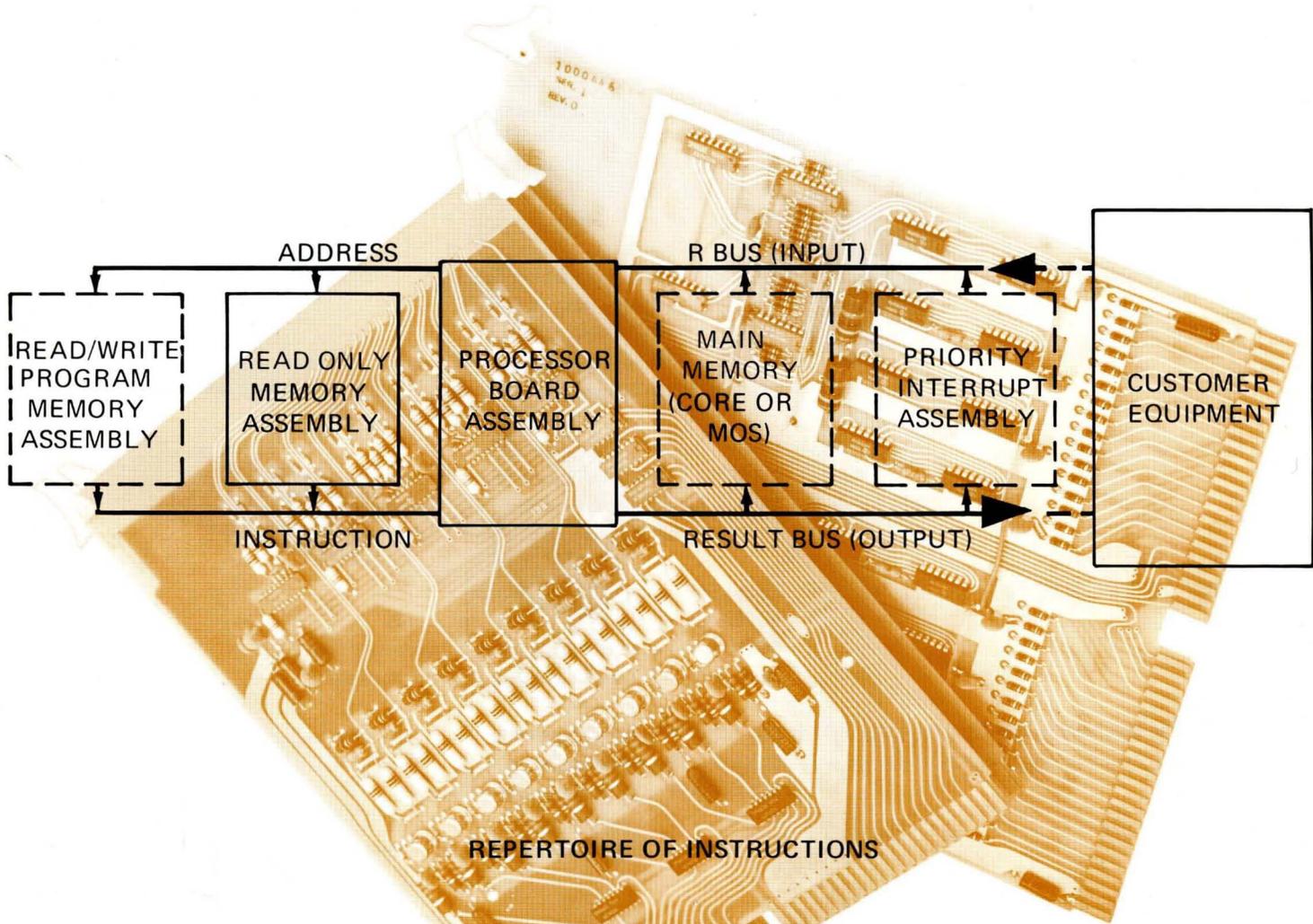
PROCESS CONTROL

MONITOR and control at megacycle rates
IMPLEMENT complex control equations
PROGRAM normalization, summations and limits
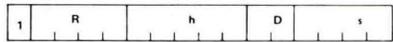**ADD** communications to central site if desired

DEDICATED PROCESSING

ELIMINATE wasted hardware
DECREASE system costs
PROGRAM logic in Read Only Memory

to fit YOUR APPLICATION...

ADDRESS R BUS (INPUT)

| READ/WRITE PROGRAM MEMORY ASSEMBLY | READ ONLY MEMORY ASSEMBLY | PROCESSOR BOARD ASSEMBLY | MAIN MEMORY (CORE OR MOS) | PRIORITY INTERRUPT ASSEMBLY | CUSTOMER EQUIPMENT |

INSTRUCTION RESULT BUS (OUTPUT)

REPERTOIRE OF INSTRUCTIONS

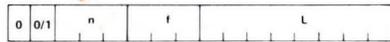| 1 | R | h | D | s |

(s) → Destination, Set C
(R) → Destination, Set C
(s) - 1 → Destination, Set C
(R) - 1 → Destination, Set C
(s) + 1 → Destination, Set C
(R) + 1 → Destination, Set C
(s) + SIGN + LK → Destination, Set C
(R) + SIGN + LK → Destination, Set C
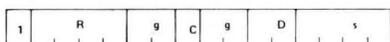
See Note 1 to determine Destination.

| 0 | R | f | L |

$L \cup (R) \rightarrow R$
$L \rightarrow R$
$L \oplus (R) \rightarrow R$
$L \cap (R) \rightarrow R$
$L \oplus (R)$, SET C
$L \cap (R)$, SET C

| 0 | s | f | L |

$L \rightarrow s$

| 0 | 0/1 | n | f | L |

If BIT n of C = 0/1, $L \rightarrow P_L$

| 1 | R | g | C | g | D | s |

(s) + (R) → Destination
(s) + (R) + LK → Destination
(s) + ($\overline{R}$) + 1 → Destination
(s) + ($\overline{R}$) + LK → Destination
(s) $\cup$ (R) → Destination
(s) $\oplus$ (R) → Destination
(s) $\cap$ (R) → Destination
($\overline{R}$) → Destination

Right Shift (R), Fill 1 → Destination, Set C
Right Shift (R), Fill Sign → Destination, Set C
Left Shift (R), Fill 0 → Destination, Set C
Left Shift (R), Fill Sign → Destination, Set C
Right Shift (s), Fill 1 → Destination, Set C
Right Shift (s), Fill Sign → Destination, Set C
Left Shift (s), Fill 0 → Destination, Set C
Left Shift (s), Fill Sign → Destination, Set C

See Note 1 to determine Destination.

Note 1: Determining Destination

If D = 0, Result → Pu, (A) → P_L
= 1, s
= 2, R
= 3, s and R

...with support

THE ATRON SUPPORT CONCEPT

Use Our Support Facilities

Eliminate the need for establishing and maintaining a special staff of technicians and programmers. Atron offers

- design, programming, and maintenance advice from Atron's 601 Support Engineering Staff.
- design, manufacture, and programming of complete or partial systems using 601 Controller assemblies. This may include any or all specialized Interface Assemblies.
- 601 Micro Program Assembler.
- 601 Program Development Support System (PDSS).

Provide Your Own Support

Develop and depend primarily upon your own service facilities. Atron's services are available should a special need arise.
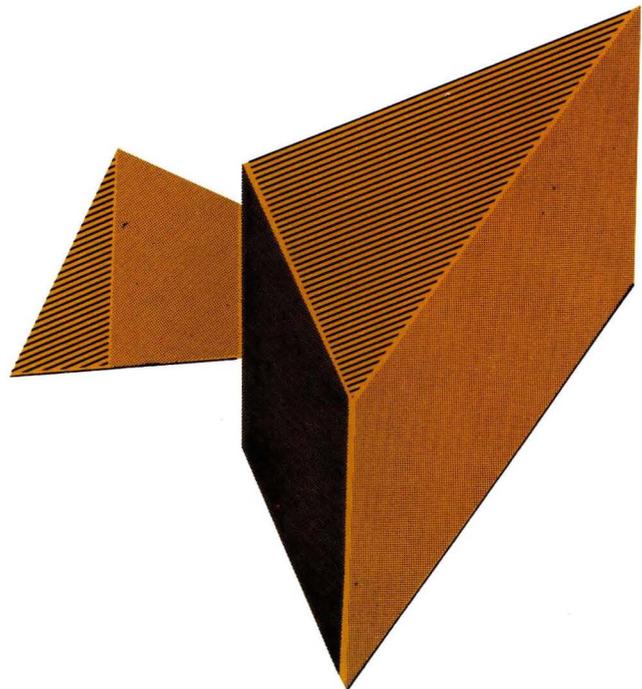
Combine Our Support With Your Own

PROGRAM DEVELOPMENT SUPPORT SYSTEM (PDSS)

The PDSS is a programming and maintenance tool which can be attached to the 601 Controller. When connected, it provides

- alterable, high-speed program memory for the ATRON 601
- an inspect-and-change feature for altering this program memory
- an external peripheral interface to facilitate loading and dumping the program memory before and/or after alteration
- instruction step and break point features with display of all program-addressable registers
- and a maintenance facility for locating hardware faults.

The PDSS is especially useful for full-speed program debugging before the Read Only Memory is programmed. The PDSS also functions as a hardware instruction assembler.

shaped to fit YOUR NEEDS.

TECHNICAL CHARACTERISTICS

0601-00   Micro-Processor Assembly

- 260 nanosecond execution time
  (Jumps: 520 nanoseconds)
- 16 Byte Scratch Pad Memory
- +5 volts
- Bus interface
- Variable clock
- Addresses 4096 words of
  Program Memory

0602-00   Transformer Read-Only Program Memory

- Read-Only Core Rope
- Up to 256 16-bit words
- +5 volts
- 200 nanosecond cycle time
- 130 nanosecond access time
- Field-alterable

0602-10   Transformer Read-Only Program Memory

- Read-Only Core Rope
- Up to 512 16-bit words
- +5 volts
- 260 nanosecond cycle time
- 170 nanosecond access time
- Field-alterable

0602-20   Transformer Read-Only Program Memory

- Read-Only Core Rope
- Up to 1024 16-bit words
- +5 volts
- 300 nanosecond cycle
- 200 nanosecond access time
- Field-alterable

0603-00   Ferrite Core Alterable Memory

- Read/Write Core
- 4K bytes expandable to 16K
- Parity optional
- 1 microsecond cycle time
- 600 nanosecond access time
- +5, +14 volts

0603-50   MOS Alterable Memory

- Read/Write MOS
- 512 bytes
- 1.5 microsecond cycle time
- 1.5 microsecond access time
- -7, -10, +5 volts

0603-60   MOS Alterable Memory

- Read/Write MOS
- Up to 1024 bytes
- 1.5 microsecond cycle time
- 1.5 microsecond access time
- -7, -10, +5 volts

0604-00   Read/Write Program Memory

- Read/Write Bipolar
- Up to 256 16-bit words
- 130 nanosecond access time
- +5 volts

0604-10   Read/Write Program Memory

- Read/Write Bipolar
- Up to 512 16-bit words
- 130 nanosecond access time
- +5 volts

0605-00   Maintenance Console

- Instruction hold/step
- Phase step clocking
- ROM read feature
- Register monitoring

0606-XX   Interconnect Assemblies

Accommodate

- Micro Processor Assembly
- Read-Only Program Memories
- Interface Adaptor Assemblies
- Memory
- Optional Power Supply Assemblies

0607-XX   Power Supply Complement

- Basic Power Supply, 0607-00
- MOS Power Supply, 0607-20
- Ferrite Core Power Supply, 0607-10

0608-00   Priority Interrupt Assembly

- Up to 32 Interrupts
- Automatic Instruction Counter Storage
- Automatic Processor Interrupt
- +5 volts

ATRON CORPORATION
1256 TRAPP ROAD·ST. PAUL, MINNESOTA 55118
TELEPHONE: (612) 454-6150

ATRON 601 CONTROLLERS

600 SERIES CONTROLLER

TYPE NUMBER	PRODUCT NAME AND DESCRIPTION	PURCHASE PRICE
0601-00	Micro Processor	395
0602-20	Transformer Read Only Memory - 1024 Words, 16 Bit	445
0603-00	Ferrite Core Alterable Memory - 4096 Bytes, 8 Bit	1325
0603-10	Ferrite Core Alterable Memory - 2nd 4096 Bytes	1155
0603-20	Ferrite Core Alterable Memory - 3rd or 4th 4096 Bytes	885
0603-50	MOS Alterable Memory - 512 Bytes, 8 Bit	695
0603-60	MOS Alterable Memory - 1024 Bytes, 8 Bit	995
0606-00	Interconnect 12 Card	240
0606-10	Interconnect 6 Card	150
0606-20	Interconnect 18 Card	350
0607-00	Basic Logic PowerSupply	125
0607-10	Logic and Core Memory Power Supply	400
0607-20	Logic and MOS Memory Power Supply	225
0608-00	Priority Interrupt Assembly	225
0604-00	Read/Write Program Memory - 256 Words, 16 Bit	1175
0604-10	Read/Write Program Memory - 512 Words, 16 Bit	2090
0604-20	Read/Write Program Memory - 1024 Words, 16 Bit	3950
0605-00	Maintenance Console	950

Subject to Change
Effective 3-1-71