

PPS ASSEMBULATOR

for
MICROPROGRAM ASSEMBLY ... MICROPROGRAM DEBUGGING AND
REASSEMBLY ... ROM EMULATION ... PROTOTYPE TESTING ...
SYSTEM TESTING



"Assembler" is a trademark

The PPS ASSEMBULATOR was designed by Applied Computing Technology (ACT) to be used in applications of the Rockwell MOS/LSI parallel processing system (PPS) produced by the Microelectronics Divisions of Rockwell International Corporation.

It allows designers to:

1. Assemble simplified microprograms by simply typing the PPS mnemonic code on an ASR-33 teletype connected to the Assembler.
2. Assemble complex microprograms with the aid of Rockwell's program leased from the Tymshare network.
3. Edit, reassemble, debug, test and operate assembled programs.
4. Set program traps for individual program step analysis.
5. Prototype-Test particular equipment models interconnected with keyboards, printers, displays, or as a system interconnected with a modem to other peripherals.

A secondary but highly valuable use for the equipment is that of a powerful micro-processor which can be readily reprogrammed to perform a variety of dedicated functions.

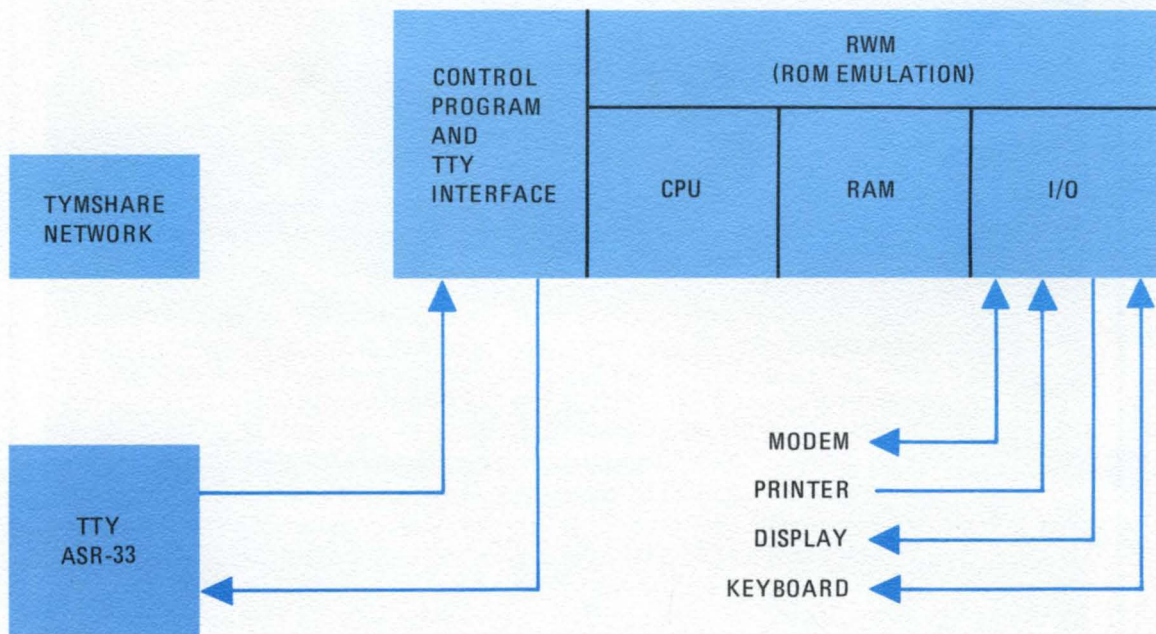
ACT APPLIED
COMPUTING
TECHNOLOGY
INCORPORATED

17815-G SKY PARK CIRCLE
IRVINE, CA 92707

Functional Description

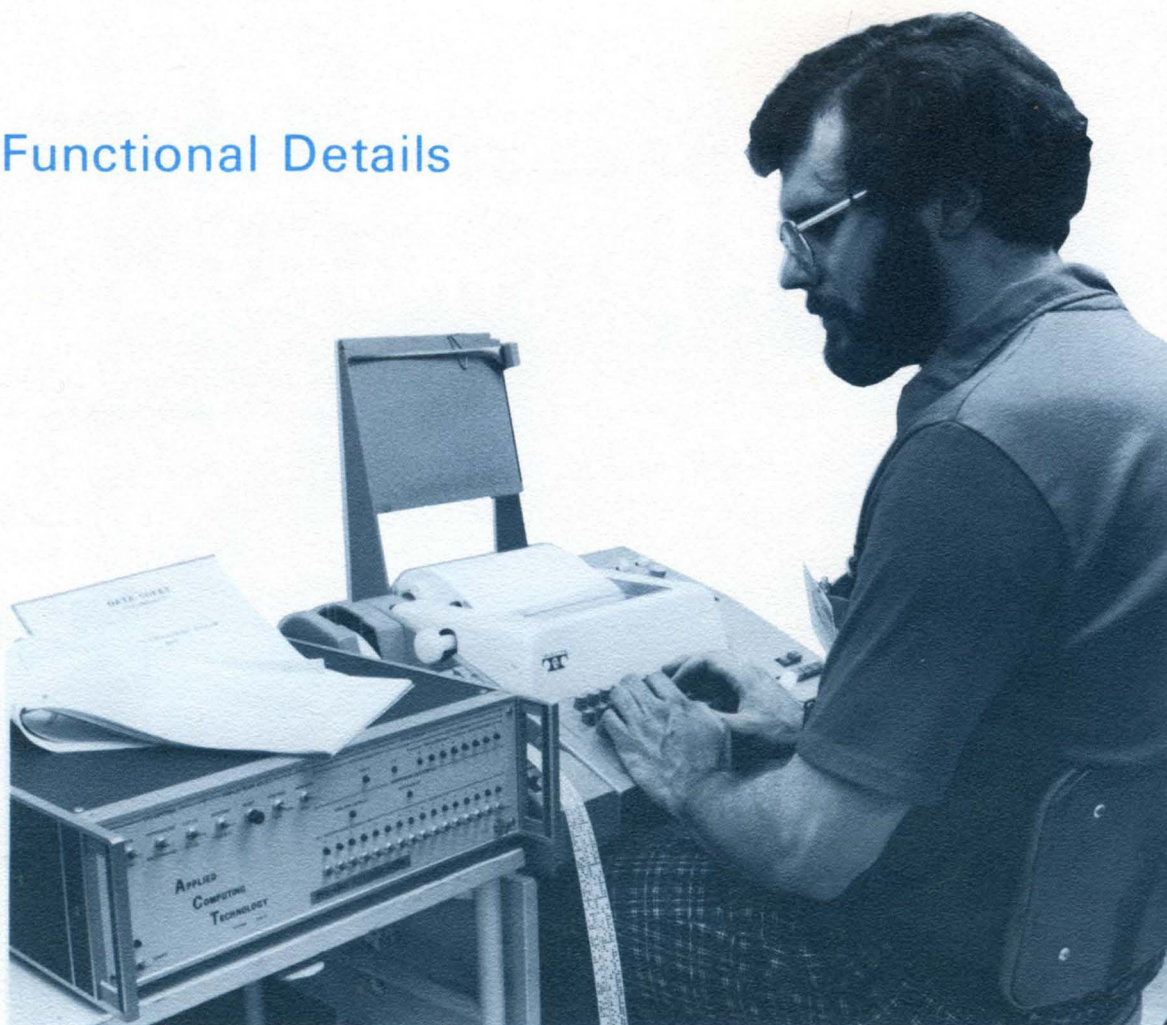
Functionally, the PPS ASSEMBULATOR consists of:

1. Control Program in ROM (read-only memory) and TTY Interface providing complete modes for software program assembly and on-line program checkout.
2. RWM (Read-Write Memory, PPS 256 x 4 RAM circuits) which performs the function of ROM emulation or programmable ROM (PROM). This section stores the assembled micro-program and is utilized by the CPU as the ROM during real time operation.
3. CPU (PPS Central Processing Unit) controls the loading of the RWM during program assembly, and then becomes the controlling CPU during actual program operation.
4. RAM (Random Access Memory, PPS 256x4 RAM) for data storage during normal operation of a PPS set of circuits.
5. I/O (PPS Input/Output Circuit) fully buffered with TTL drivers and interconnecting cables. One PPS I/O circuit has 12 inputs and 12 outputs which are buffered in groups of 4-bits each, providing three parallel 4-bit data ports for outputs and three 4-bit ports for inputs. Additionally, the 8 discrete inputs and 4 discrete outputs on the CPU are level-converted and TTL-buffered providing two additional 4-bit input ports and one 4-bit output port.



PPS ASSEMBULATOR Functional Organization

Functional Details



Microprogram Assembly: For relatively simple machines, the Equipment Designer types on an interconnected teletype a listing in mnemonic code of the instructions which he wants the PPS to execute. Through its Control Program in ROM, the CPU of the PPS Assembler is used to assemble and edit the microprogram which is stored in the RWM.

For complex machines, the Equipment Designer uses Rockwell's program for microprogramming. This assembly and simulation program is available through the Tymshare network. The assembled microprogram is dumped onto punched tape at the teletype which is connected to the computer as a terminal. The microprogram can then be loaded into the RWM of the Assembler for prototype testing.

Microprogram Editing: When the PPS ASSEMBLER is used as an assembler, the Equipment Designer can edit the assembled listing which is printed out on

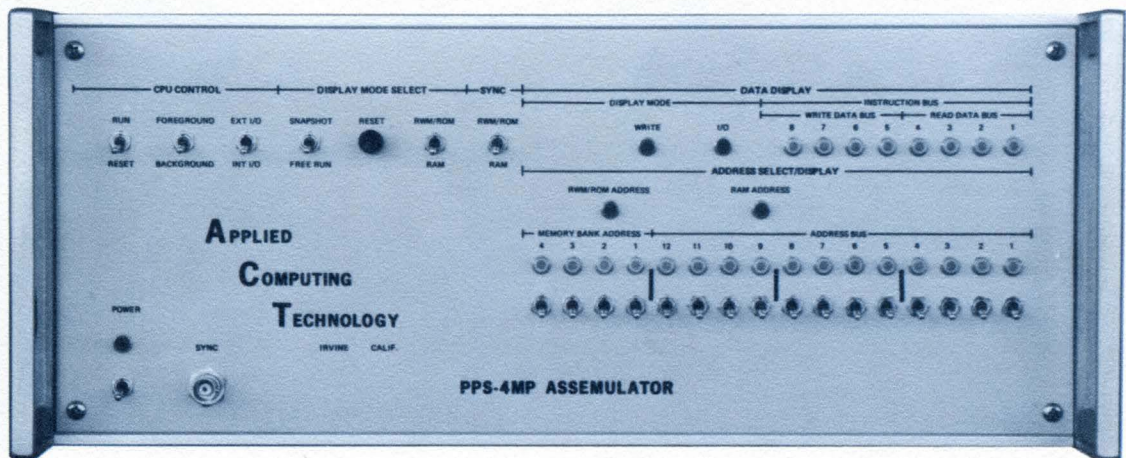
the teletype, and then output onto punched tape at the teletype for debugging and reassembling.

The Equipment Designer can use the teletype to set up traps during program execution. Additionally, an oscilloscope can be synchronized with the address and/or data bus lines to obtain displays of actual data as specific signals through a connector on the front panel so that execution of microprograms can be verified visually.

Prototype Testing: With the assembled microprogram in the RWM, the Equipment Designer can switch to an operate mode in which the stored microprogram is used as a ROM emulator. In this mode, the CPU accesses the microprogram in the RWM as if it were the ROM in an operational system. The teletype now functions as a peripheral input-output device. Or, other peripherals—keyboards, displays, printers, etc.—can be connected and operated.

The PPS Assemulator is packaged in a 7-inch high standard 19-inch rack mount chassis. The front panel provides switches and light indicators for:

1. Address selection and display of ROM, RAM, RWM, or I/O data and status with sync provision via connector.
2. Mode initialization for the CPU:
 - a. Foreground — RWM reassembled to emulate a PROM.
 - b. Background — PROM is utilized as the controlling memory for the program being assembled loaded modified or checked in the RWM.
3. Reset control for P counter — initializes and sets P count to zero, or initializes the mode at the start to foreground or background.



Entry and control of data into the unit is made via an ASR-33 teletype, which also prints outputs. Connection is made on the rear panel.

Detailed information and all necessary parts are provided for connecting the unit to an ASR-33 or equivalent teletype with paper tape loader (optional).

PPS Assemulator

(Model PPS-4MP)

Basic Unit

Includes Power Supply, Chassis, Interconnecting Cables, Complete Control Program in SOS ROM and teletype interface, 16 PPS RAM circuits providing 2K x 8 RWM, PPS CPU circuit, PPS Crystal-Controlled Clock with Power-On Initialization, 2 PPS RAM circuits providing 512 x 4 Data Storage, 1 PPS I/O circuit which with the CPU provide five 4-bit parallel input and four 4-bit output ports or channels.

\$6,950 FOB Irvine, CA DELIVERY: 120 ARO

NOTE: The chassis of the MODEL PPS-4MP ASSEMBULATOR can accommodate additional circuit boards on which can be mounted PPS circuits to expand the system to the functional limit of the Rockwell Parallel Processing System



17815-G SKY PARK CIRCLE
IRVINE, CA 92707

TELEPHONE: (714) 557-9972
(714) 549-3123