COSMAC Microkit I
(RCA)

μC Systems Directory: where have all the μP's gone?

When you don't have time for a do-it-yourself design, you buy a μC from someone else. But first you have to know what is available.

Robert M. Grossman, Associate Editor

Sometime in the future, with the advantage of perspective, it may be said that the introduction of μP's was one of the great events in electronics. What historians will in all likelihood fail to mention is how time-consuming it was to initially design with them. Like all "radical" highly technological innovations, this is assumed to be the price one has to pay.

But not any longer! It was only a matter of time before someone took his hard-earned knowledge, assembled all the necessary components and produced a complete μC—not just one someone, but many. In fact, early signs indicate that μC systems may surpass even the meteoric rise of the μP.

In an effort to bring some order to this rapidly expanding field, EDN proudly presents the first μC Systems Directory. While it is impossible to completely describe a system in a single line of a chart, the information provided should be adequate to find the systems that meet your needs. If nothing else, it lists all μC's in one place.

Why all the fuss?

In the computer industry, few changes are gradual—instead, they tend to explode upon the scene. Microprocessors (and now microcomputer systems) are no exception.

Just two years ago, the microprocessor was in its infancy. Today, we're already into third-generation devices. In view of this rapidly changing technology, μP's are hard enough to keep up with, let alone get started in using them. The main problem stems from having to turn circuit designers into programmers and vice versa.

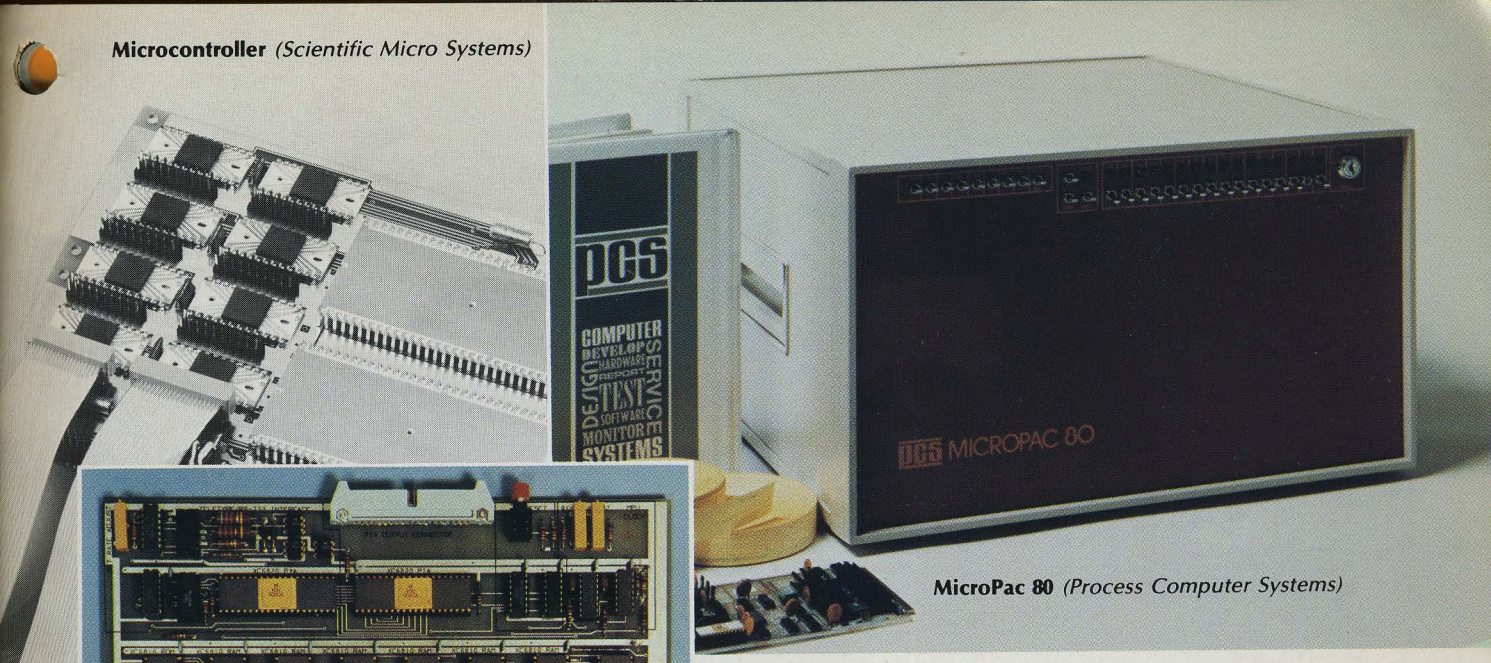
Unfortunately, the only effective way of learning how to design with μP's is by hands-on experience. No amount of reading thick specification, operator and application manuals can adequately prepare a user to jump right in and design a μC. He must work with the actual device—and that requires time.

Where does this leave companies that can't afford the time, personnel, or money to reinvent the wheel? What do they do when market pressure forces them to incorporate a μC into their product immediately? Obviously, the only cost-effective solution is to purchase a finished system.

Instant μC: Just add programs

At a minimum, most μC's contain a μP as the CPU, plus memory and I/O ports packaged on a single pc board. Because of this, the designer can now treat a μC as just another component, albeit a rather complicated one. The only thing he must do is write the program and load it into firmware. And programming aids, such as assemblers, text editors, debug programs and high-level languages, have even simplified this task.

Not to give the wrong impression, μC's can also be configured as stand-alone data processors and



Microcontroller *(Scientific Micro Systems)*

MicroPac 80 *(Process Computer Systems)*

M6800 *(Motorola Semiconductor Products, Inc.)*

some are manufactured as such. They include cabinets, power supplies, control panels and even terminals and peripherals. And their capabilities approach those of minicomputers and may even exceed some models.

All the specs that are fit to print

To avoid confusion, some explanation of the following chart is required. We indicate what is included in the basic price of each system by chart entries in black. All options, including expanded memory (the maximum number of bits), software, configurations, design aids, etc., are indicated by colored entries. Footnotes, explanatory information and significant features not covered under one of the column headings are presented in the "Remarks" column. A blank indicates either that the item does not apply to a particular system or that data was unavailable.

Each system listed has its own reader service number. You may circle this number on the reader service card to receive additional information directly from manufacturers. For those in a hurry, a listing of all the μC manufacturers with a complete address and phone number follows the chart.

Microcomputer systems in this chart are listed alphabetically by manufacturer. This purely arbitrary arrangement was dictated by the fact that the complexity of μC's precludes any two being identical.

Our goal in preparing this study is to present, in condensed form, sufficient information to permit you to quickly focus in on systems that may fill your needs. On the other hand, we also hope that the chart will point out systems you haven't considered because you did not know they existed.

One thing we would like to emphasize. As EDN has repeatedly mentioned, when choosing anything, from a mica capacitor to a mainframe computer, you must first precisely define your own needs and you must consider total cost. If the product doesn't do what you want it to do, it is useless. And remember that a fancy, expensive prepackaged system may actually wind up being cheaper than the bare-bones board when you finish adding all the extras.

Well, with that brief introduction, we leave you on your own. Good luck! □

Apples and oranges?

The tabulation of the μC System Directory has column headings for most of the common terms used to describe computers in general. We have listed, where applicable, the value given by the manufacturer. As always happens when an attempt is made to force diverse products into the same mold, the list may contain instances where the values given, while correct for the computer in question, nevertheless represent a misleading "apples to oranges" comparison to other μC's. Therefore you should beware of literal interpretations.

Ed. Note: *We are indebted to Microcomputer Technique, Inc., of Reston, VA whose Microprocessor Scorecard® provided the basic format for this chart.*

μC Systems Directory

To help you get further information on μC systems, here is a list of manufacturers. We thank them for answering our questions and providing the data and photos that made this directory possible.

Advanced Memory Systems
1275 Hammerwood Ave.
Sunnyvale, CA 94086
(408)734-4330

Allen-Bradley Co.
747 Alpha Dr.
Highland Hts., OH 44143
(216)449-6700

American Microsystems, Inc.
3800 Homestead Rd.
Santa Clara, CA 95051
(408)246-0330

Applied Computing Devices
Box 3194
Terre Haute, IN 47803
(812)232-1840

Applied Computing Technology Inc.
17815 Sky Park Circle
Irvine, CA 92664
(714)557-9972

Computer Automation, Inc.
18651 Von Karman Ave.
Irvine, CA 92664
(714)833-8830

Control Logic, Inc.
9 Tech Circle
Natick, MA 01760
(617)655-1170

Cramer Electronics
85 Wells Ave.
Newton, MA 02159
(617)969-7700

Data Numerics, Inc.
141A Central Ave.
Farmingdale, NY 11735
(516)293-6600

Digital Electronics Corp.
2126 6th St.
Berkeley, CA 94710
(415)548-2944

Digital Equipment Corp.
One Iron Way
Marlborough, MA 01752
(617)481-9511

E&L Instruments, Inc.
Tychon Div.
Box 242, Blacksburg, VA 24060
(703)951-9030

Electronic Memories & Magnetics Corp.
12621 Chadron Ave.
Hawthorne, CA 90250
(213)644-9881

Electronic Product Associates, Inc.
1157 Vega St., San Diego, CA 92110
(714)276-8911

Fabri-Tek, Inc.
5901 S. County Rd. 18
Minneapolis, MN 55436
(612)935-8811

Fairchild Camera & Instruments Corp.
MOS Div.
464 Ellis Ct., Mt. View, CA 94042
(415)962-3200

General Automation, Inc.
1055 S.E. St.
Anaheim, CA 92805
(714)778-4800

General Instrument Corp.
Microelectronics
600 W. John St., Hicksville, NY 11802
(516)733-3000

Hewlett-Packard Co.
1501 Page Mill Rd.
Palo Alto, CA 94304
(415)493-1501

Hughes Aircraft Co.
500 Superior Ave.
Newport Beach, CA 92663
(213)391-0711

IBM Corp.
General System Div.
Box 2150, Atlanta, GA 30301
(404)256-6116

Intel Corp.
3065 Bowers Ave.
Santa Clara, CA 95051
(408)246-7501

Intersil, Inc.
10900 N. Tantau Ave.
Cupertino, CA 95014
(408)996-5000

Martin Research, Ltd.
Microcomputer Design
3336 Commercial, Northbrook, IL 60062
(312)498-5060

Microcomputer Associates, Inc.
111 Main St.
Los Altos, CA 94022
(415)941-1977

Microcomputer Technique, Inc.
1120 Reston Int'l Center Office Bldg.
Reston, VA 22091
(703)620-9676

Microdata Corp.
17841 Red Hill Ave.
Irvine, CA 92705
(714)540-6730

MITS, Inc.
6328 Linn N.E.
Albuquerque, NM 87108
(505)265-7553

Monolithic Memories, Inc.
1165 E. Arques Ave.
Sunnyvale, CA 94086
(408)739-3535

Monolithic Systems Corp.
14 Inverness Dr. E.
Englewood, CO 80110
(303)770-7400

MOS Technology, Inc.
Valley Forge Corporate Ctr.
Norristown, PA 19401
(215)666-7950

Mostek Corp.
1215 W. Crosby Rd.
Carrollton, TX 75006
(214)242-0444

Motorola Semiconductor Products, Inc.
Box 20912
Phoenix, AZ 85036
(602)244-3466

National Semiconductor Corp.
2900 Semiconductor Dr.
Santa Clara, CA 95051
(408)732-5000

NEC Microcomputers, Inc.
5 Militia Dr.
Lexington, MA 02173
(617)862-6410

Panafacom, Ltd.
Box 4637
Mt. View, CA 94040

Plessey Microsystems Inc.
1674 McGaw Ave.
Santa Ana, CA 92705
(714)540-9945

Process Computer Systems, Inc.
5467 Hill 23 Dr.
Flint, MI 48507
(313)767-8920

Pro-Log Corp.
825 Airport Rd.
Monterey, CA 93940
(408)372-4593

Raytheon Co.
Semiconductor Div.
350 Ellis St.
Mt. View, CA 94040
(415)968-9211

RCA Solid State Div.
Box 3200
Somerville, NJ 08876
(201)685-6713

Rockwell International Corp.
3310 Miraloma Ave.
Anaheim, CA 92803
(714)632-3698

Scientific Micro Systems, Inc.
520 Clyde Ave.
Mt. View, CA 94043
(415)964-5700

Semiconductor Specialists, Inc.
Box 66125
O'Hare Int'l. Airport
Chicago, IL 60666
(312)279-1000

Signetics Corp.
811 E. Arques Ave.
Sunnyvale, CA 94086
(408)739-7700

Solid State Scientific Inc.
Montgomeryville, PA 18936
(215)855-8400

Sphere Corp.
791 S. 500 W.
Bountiful, UT 84010
(801)292-8466

Struthers-Dunn, Inc.
411 14th St.
Bettendorf, IA 52722
(319)359-7501

System Integration Associates
RD-1, Box 126
Glenmore, PA 19343
(215)242-8315

Technitrol, Inc.
1952 E. Allegheny Ave.
Philadelphia, PA 19134
(215)426-9105

Teledyne Systems Co.
19601 Nordhoff St.
Northridge, CA 91324
(213)886-2211

Texas Instruments, Inc.
Digital Systems Div.
Box 2909
Austin, TX 78767
(512)258-5121

Transitron Electronic Corp.
Microcomputer Div.
168 Albion St.
Wakefield, MA 01880
(617)245-4500

Wintex Computer Corp.
544 Lunt Ave.
Schaumberg, IL 60172
(312)529-3080

Xecon Associates
Box 267
Hawthorne, CA 90250
(213)676-8346