ECHO-IV HOME COMPUTER PUBLICITY

TABLE OF CONTENTS

ECHO-IV PUBLICITY EXPERIENCES

As soon as the Electronic Home Operating Computer (ECHO-IV) was actually running a few hand-loaded programs in my basement in 1966, my friend, Thom K. Phares, director of the public relations department of Westinghouse Electric Corporation, wanted to publicize it. Their first news-release was in the fall of 1966, and it was mainly limited to newspapers in western Pennsylvania. We had several radio and television interviews during 1967-68 period, and the Popular Mechanics article appeared in April, 1968.

When a request from the American Home Economics Association came to Westinghouse to provide a speaker on the general topic of "Home Computers" at the 1968 AHEA national convention in Dallas, they referred it to me because they believed I could offer first-hand experience. My wife, Ruth, is a home economics graduate from the University of Missouri, so we agreed to participate in the program presented in the main theater of the the Dallas Convention Center in June, 1968

I've not been able to forget one thing that happened in Dallas as we were backstage, getting ready to speak. Two other speakers, one from IBM and another from Southwestern Bell Telephone were also on the main program which was entitled "COMPUTERS: IMPLICATIONS FOR THE FUTURE". Phil Guthoff, Manager of Advanced Systems Planning, IBM, Yorktown Heights, New York, laughed at the box that I was using for small 'show and tell' computer parts. It was an old "Sears, Roebuck and Co." box which had once contained wood screws. He said, "So, THAT'S where Westinghouse gets its computers!. I was embarrassed by the the implication that if it wasn't IBM, it wasn't a REAL computer. We at Westinghouse had been designing transistorized process control computers since the late '50s, but the captains of the computer industry weren't aware we existed. I had designed and built the ECHO-IV at home from the ground up, cataloged and installed every wire, and written every word of code that it was executing. Now, I am pleased that SEARS has opened computer stores throughout the country, and they are actively promoting IBM personal computers along with other manufacturers' computers. In 1968, it was about 15 years too early to correct Mr. Guthoff's perception of the future market potential for personal computers.

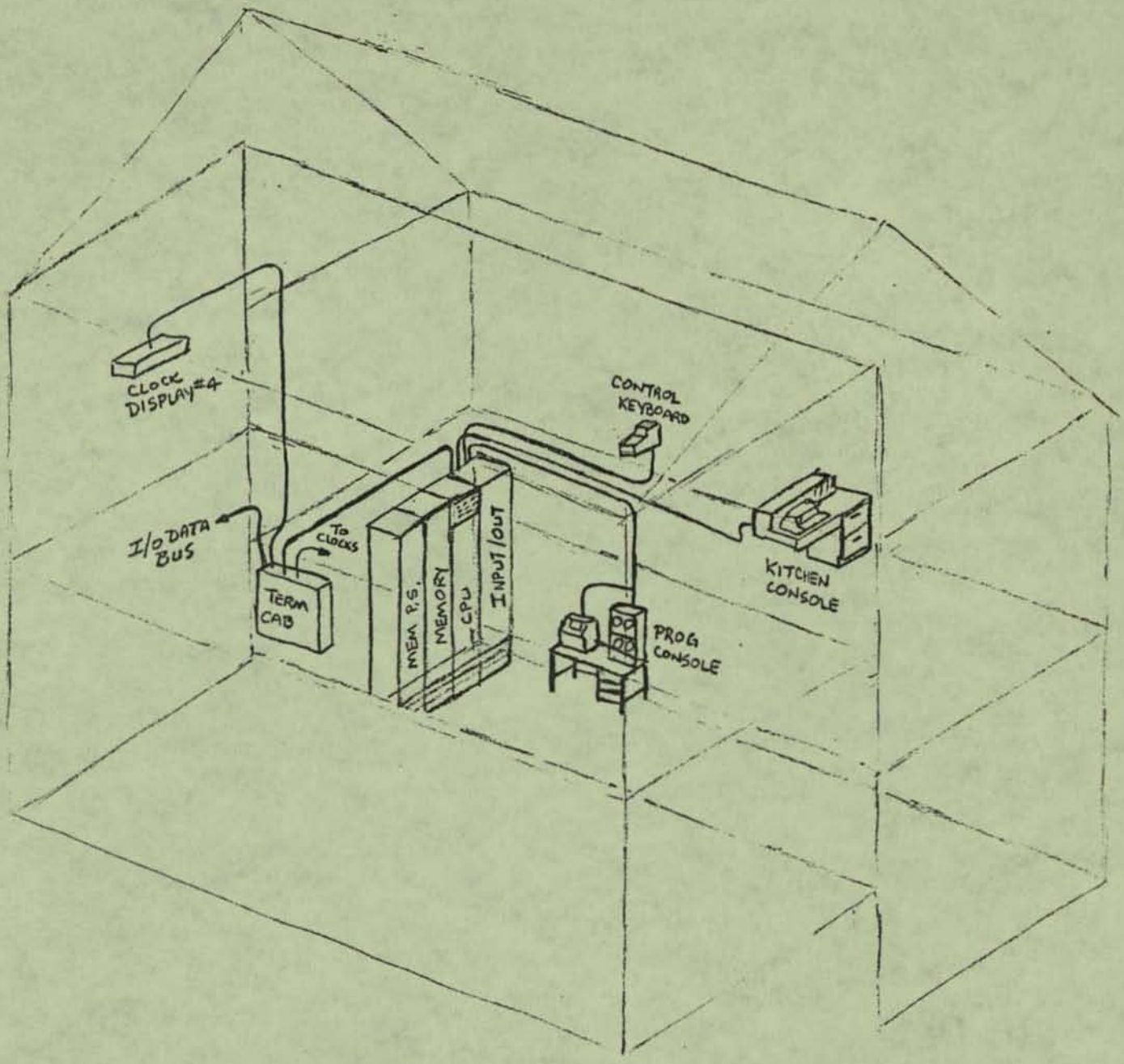
Several Home Ec. organizations asked us to speak about ECHO-IV after they had heard our presentations at the AHEA. We made

several visits to various groups in Pennsylvania, Ohio, New York, and Tennessee. For awhile, we enjoyed the 'speakers circuit' and used those opportunities to met some people who were very interested in finding ways to apply computers in the home. The titles of our speechs changed, but the content remained much the same as the original speeches we gave in Dallas.

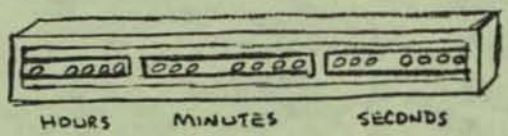
The first of two waves of national newspaper publicity began with an interview with Jacqueline Snyder, who wrote an AP newswire story about how I built the ECHO-IV from discarded computer parts. It was picked up by newspapers who were looking for news to fill the blank spaces in late January, 1970. It seemed to be a time in history when the public was intrigued by each new and unusual application of an electronic computer, so the editors readily grabbed it up. The total circulation of the newpapers which carried Snyder's article was estimated to be 77,000,000 readers. The second wave of publicity came on Mother's Day in 1970, when Jarate Kzickas' story made the same rounds on the AP wire circuit as the previous article, and it appeared in the same number of newspapers.

"DATAMATION" had a technically accurate story about ECHO-IV in March of 1970, which was a welcome relief from the slanted non-technical writing which we had seen in the AP newspaper stories. Also, Steve Gray's articles about the beginnings of the "Amateur Computer Society", to which I had belonged, accurately described ECHO-IV in "COMPUTERS & AUTOMATION" in 1972, "BYTE" in 1978, and "CREATIVE COMPUTING" in 1984.

James F. Sutherland
1 DEC 1984



ECHO IV SYSTEM DIAGRAM

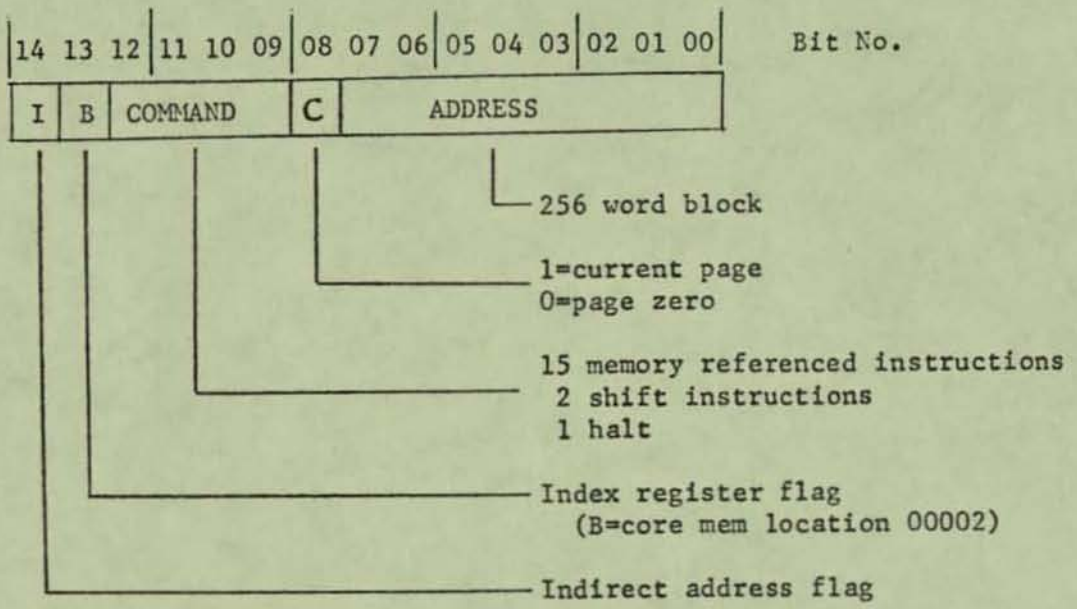


421 8421

DIGITAL CLOCK DISPLAY

J.S. 2-14-71

ECHO IV INSTRUCTION FORMAT



ASSIGNED CORE MEMORY LOCATIONS

00000 = P = Program Counter
00001 = Zero constant loc
00002 = B = Index Register
00003 = A = Accumulator
00004 = Interrupted program return
00005 = First instruction of Interrupt Executive

Bit 14 of Program Counter is Endaround Carry (E) designator
The E designator is set if carry out of adder bit 14 occurs during ADD. The E designator is cleared otherwise near end of ADD instruction execution.

The overflow designator (OV) is set if:
1. Bit 00 of accumulator equalled 1 before right shift
2. Sign of sum is different from sign of like-signed terms

Address modification occurs in the following order:

Indirect address is fetched BEFORE content of Index Register is added

COMMAND DEFINITIONS

Code	Mnemonic	Definition
01	JMP	Jump to Y + 1
02	JOV	Jump to Y + 1 if OV = 1
03	COM	Complement contents of Y
04	DCS	Decrement contents of Y and skip next instruction if contents of Y = minus one after decrement
05	SIP	Store incremented P in Y
06	ENB	Enter B with contents of Y
07	ENA	Enter A with contents of Y
10	OUT	Output from A to channel address
11	INP	Input to A from channel address
12	JAN	Jump to Y + 1 if bit 14 of A = 1
13	JAZ	Jump to Y + 1 if A = positive zero
14	STA	Store A in Y
15	ADD	Add contents of Y to A
16	EOR	Exclusive OR contents of Y with A
17	AND	And contents of Y with A
00000	HLT	Halt
40000	LSH	Left shift A, Bit 14 replaces bit 00
00400	RSH	Right shift A, Bit 00 enters OV designator

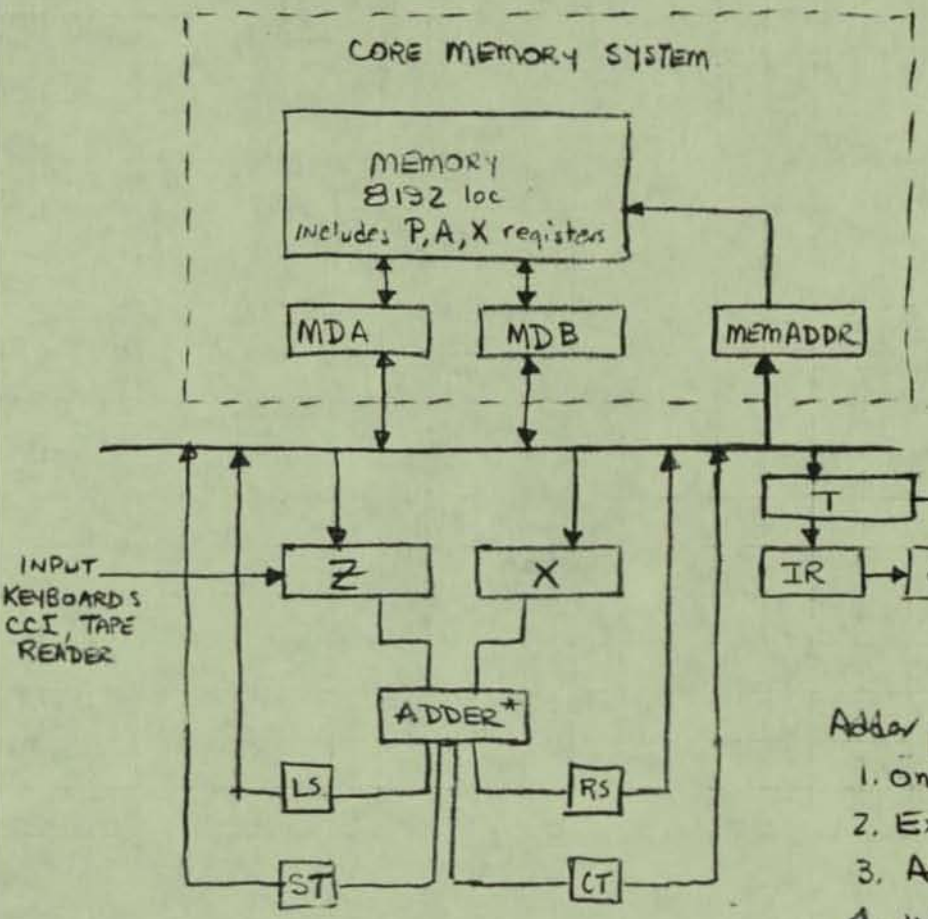
INPUT CHANNEL ASSIGNMENTS

Channel number is defined by bits 00 through 05 of effective address

Channel No.	Function
00	Interrupt word, 15 bits including SYNC
10	House trunk on low order 6 bits, Kitchen keyboard on high order 8 bits
20	Real-time clock, minutes and seconds in BCD
30	Contact-closure inputs
40	Magnetic tape storage unit (future)
50	Paper tape reader
60	unassigned
70	unassigned

OUTPUT CHANNEL ASSIGNMENTS

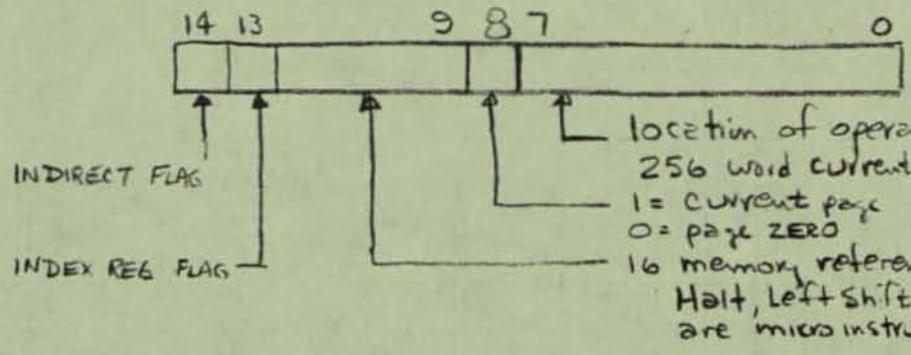
00	Programmer's printer/punch on low order 6 bits
10	House trunk DATA character on low order 6 bits
20	unassigned
30	Contact-closures,,31 to 35 designate 5 words, 15 bits/word
40	House trunk ADDR selector on low order 6 bits
50	Magnetic tape storage unit
60	Kitchen console printer on low order 8 bits
70	unassigned



Adder performs
1. Ones comp addition
2. Exclusive OR
3. AND
4. Increment of P

LS = Left shift gate
RS = Right shift gate
CT = Complement gate
ST = Straight transfer gate

INSTRUCTION FORMAT:



ECHO System Diag
Instructions 12/11/67

IMPRESSIONS OF A HOMEMAKER WITH A COMPUTER IN HER BASEMENT

Ruth Sutherland, Pittsburgh, Pa.

At first I thought it might really replace me! From the cartoons and jokes we see and hear about computers, isn't this the general impression that most homemakers at present would have if they suddenly found out they had a computer in their home? Even though my husband has been involved with computer design for the past eight years at Westinghouse, I never once gave it a thought that I would be directly involved in learning about the making of a computer. I would try to be attentive as he would tell me about the various units that make up a computer and the problems he was having, but I never cared whether I learned anything about them or not, for it just seemed too far beyond my world of being a mother and homemaker.

Before and since we have been married, Jim's hobby has been building something along the woodworking and electrical line and I had always been in complete accordance with whatever he was doing. When he started talking about the possible availability of a core memory unit and other parts of an obsolete Westinghouse computer that could be made into a computer for home use, I thought this was going a bit too far. My resistance didn't last, and it wasn't long until one wall of the dining room began to fill up with stack after stack of meaningless parts which I called junk.

After the circuit designing was done and the main computer cabinets began to take shape, the whole project began to become more and more of a family affair. As each portion became finished, the family; which includes Ann, now eleven; Sally,

six; and Jay, two; would run to the basement to view the latest accomplishment, even though none of us really understood what was going on. The biggest day was when the power was turned on and nothing blew up! As the keyboard, printer, tape reader, and punch were added we began to see and understand more clearly how the computer worked and some day could do work for us.

Jim has been working on the computer in his spare time for the past two years and the basement playroom has become strictly his workshop. One day during the early testing stages a neighbor child accidently switched the computer on. It was then that I realized that short of turning the power off at the circuit breaker of the house, I did not know what to do. It wasn't generally known at Westinghouse that Jim was building a computer. I'm sure the fellows in Jim's office thought I had gone kooky when I asked them to leave this message for him, "Please call home! The computer is running. How do I turn it off?"

Because of extra demands on Jim's time and the long process involved in writing and executing programs to test every section of the computer, it is not actually performing the number of household tasks that we had hoped to have in operation at this time. I don't doubt for a minute that eventually I will be able to write and enter programs that will save considerable time in daily household responsibilities. Last week we needed some address labels for the tape recorder cartridges that we mail as letters back and forth to our parents. It wasn't long until we got a call from Jim to come see what the printer was doing. There it was typing out the address and return addresses on gummed

labels. This program is now stored in the memory unit so anytime these labels are needed, a certain code typed into the keyboard will cause the printer to type it again.

It will not be long until the computer will be taking care of the bookkeeping for our household. As this is a job that takes a good deal of my time each month, I'm looking forward to the computer typing out the checks, keeping an itemized account of expenditures and recording the expenses needed for income tax purposes. Since it will subtract accurately, I hope never again to receive a note from the bank reading, "Your account is overdrawn, please ... etc., etc."

Nearly every appliance in our home becomes useless, unless we plan ahead to use it in our daily lives. We want appliances to save us work and to save us time. In a sense, the oven timer is a small computer. We plan a meal and prepare the food for the oven, then we program the temperature, the time the oven is to come on and when it is to turn off. Those of us who use the oven clock and timer know what a convenience it is, but don't you also know many women who have never bothered to plan ahead or to learn to use the timer. Likewise, the computer does require some initial effort through the program to do a specific job better or faster.

I'm excited NOW about a computer in my home for three main reasons. First, it is making me learn how to think again. Yes, THINK again. For over eleven years I have been meeting the needs of a husband, home and three children so spaced that I have never been without a little one at home. Because Jim and many husbands

work late many evenings, and the problems we have in a young neighborhood of finding baby sitters, I gave up trying to attend evening education classes and other events that would have been interesting and inspiring to me. I truly don't begrudge my role as a mother, wife and homemaker in any way, but what a sense of accomplishment it will be to me to have an answer such as "I wrote a new menu and shopping list program today", when Jim asks the question that every man asks his wife when getting home from work, "And what did you do today?"

Second, I'm excited about a computer in my home to relieve me of some of the more menial tasks so that I will have time to do three things that are pure recreation to me: continue to make all of the clothes for the family, time to carry out ideas for home decorating, and to work outside with flowers and garden. I also feel a need to have time to work with youth groups. Several of my neighbors would love a computer to give them more time to work in jobs away from home.

And thirdly, I'm excited about a computer in my home because it is something that our whole family can use and has already enjoyed. With proper instruction, any school age child will be able to use it as a tool, for games, or actual mental exercise.

At the present time if homemakers were given a list of appliances to rate in order of their preference, I feel sure that a computer for home use would fall at the bottom of the list. Even if they were available for home use at a reasonable cost, the word COMPUTER is a little frightening to the average homemaker because she has had

no experience or personal contact with one. Homemakers must know that a computer only does what it is told to do through a program that has been written in a form that the machine can understand. It is almost like teaching a child how to do a specific chore or task. The child knows how to do it after he has been instructed. One important difference is that the computer always does it exactly as programmed. Therefore, one source of frustration to the homemaker is relieved because she works with a device that is always precisely predictable. Whole programs can be replaced by more current programs as the family needs change.

At this point, I cannot say or even comprehend all the things that a computer someday will be doing for our homes. Wouldn't it be wonderful if they could provide more time for all parents to spend with their children, therefore, making every home a happier one?

June 2, 1967

THERE'S A COMPUTER IN MY BASEMENT

James F. Sutherland
Westinghouse Electric Corp.
Pittsburgh, Pennsylvania

I. Why ECHO IV was built

1. To verify computer usefulness in a home
2. To utilize discarded computer parts
3. As a relaxing hobby
4. To see if it could be done

II. Description of the ECHO IV System

1. Printed Circuit Cards located in four cabinets

   A. Memory system
   B. Control Unit
   C. Arithmetic Unit
   D. Input/output controller

2. Programmer's Console

   A. Keyboard - made from discarded electric typewriter
   B. Printer - made from surplus page printer
   C. Paper Tape Reader - rebuilt from salvaged equipment
   D. Paper Tape Punch - rebuilt from salvaged equipment

3. Remote Stations

   A. Keyboards planned for kitchen, living room, bedroom
   B. Provisions in I/O Controller for TV display unit in kitchen, and mass memory attachment
   C. Remote Paper Tape Reader/Punch planned for kitchen
   D. Analog voltage to digital information converter system for sensing temperature, pressure and work bench signals
   E. Work-bench terminal for monitoring project tests
   F. Telephone answering station for remote control

III. Description of ECHO IV programs and applications

1. Basic Routines

   A. Time Keeping (seconds, minute, hour, day of week/month/year

   B. Conversion

      1) Binary ⟷ decimal
      2) Input/output code translation
      3) Proportioning recipes
      4) Input voltage signals ⟷ temperature/pressure value

C. Input/Output Control

1) Time checking and alarm/control
2) Paper tape ↔ printer for tape verification
3) Memory ↔ printer/punch for program verification
4) Message writer
5) Interrupt processor
6) Magnetic tape block transfers ↔ core memory

2. Household Tasks to be performed by ECHO

A. Monitor and alarm
B. Thermostat transfer
C. TV and stereo control
D. Garage door control
E. Weight trend record
F. Temperature monitor during sickness
G. Recipe Storage
H. Menu analysis
I. Inventory Control
J. Shopping List generation
K. Monthly budget storage
L. Monthly expense comparison

3. Looking into the future

A. Accurate prediction impossible
B. Best uses will evolve as more experience is gained
C. As computers get smaller and less expensive, more people will use them.
D. Computer status comparible to automobiles 60 years ago.

IV. Communicating with ECHO IV

1. Flowchart analysis of Task to be performed

A. Example of simple flowchart (day of week/month/year calculation)
B. Flowchart is similar to roadmap, recipe, or schematic
C. Flowchart can be converted into machine language instructions
D. Much easier to understand flowchart than program listing.
E. Once flowchart is made, the task can be coded for execution in any computer
F. Program can be easily modified later if flowchart is changed to improve performance

2. Methods of inputting information into ECHO IV

A. Both data and program calls can be entered through keyboards

1) Some jobs do not require feedback of output information to the user.
2) Restricted - call keyboards may be more practical than general purpose unit where only a few programs are called.

B. Paper tape storage is essential for permanent record of all programs and some basic data.

1) Some seldom-used programs may not justify magnetic tape storage.
2) Bootstrap program backup on paper tape
3) Magnetic tape memory is not yet operational on ECHO IV.

3. Ways that ECHO IV can/will output information

A. Printed page
B. Punch holes in paper tape
C. Open or close contacts to control external devices
*D. Display listings or graphic information on TV tubes
*E. Audio response selected from prerecorded tape

* Not presently running on ECHO IV

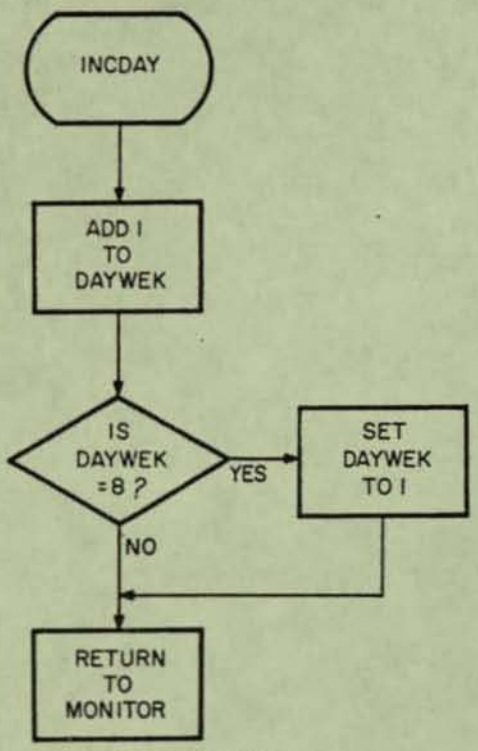
June 2, 1967

SPEECHES GIVEN BY JIM AND RUTH SUTHERLAND
ABOUT ECHO-IV HOME COMPUTER

Date	City	Organization	Speech Title(s)
Jun 27, 1967	Dallas TX	Amer. Home Eco. Assoc. Annual Convention	"There's A Computer In My Basement"
			"Learning To Live With A Computer"
Feb 21, 1968	Columbus OH	Ohio Farm & Home Elect. Council	"Learning To Live With A Computer"
Mar 11, 1968	Ithica NY	Cornell Univ, Home Ec. Dept. Seminar	"Household Econ. & Mngmt"
May 4, 1968	Chattanooga TN	Tenn. Home Ec. Assoc. Annual Convention	"The Computer - A Homemaker's Genie"
Sep 12, 1968	Pittsburgh PA	Allegheny County School Home Ec. Education	"A Computer In The Home"
Feb 16, 1971	Pittsburgh PA	IEEE Computer Society Ladies Night	"The Care And Feeding Of ECHO, Our Home Computer"
Oct 16, 1977	Pittsburgh PA	Pittsburgh Area Computer Club	"Anecdotes From The Echo-IV Logbook"
Oct 19, 1982	Pittsburgh PA	Heath Users Group (HUG) Meeting	"Getting A Home Computer To Operate In The 'Old Days'"

AHEA CONFERENCE

JUNE 27, 1967
DALLAS, TEXAS



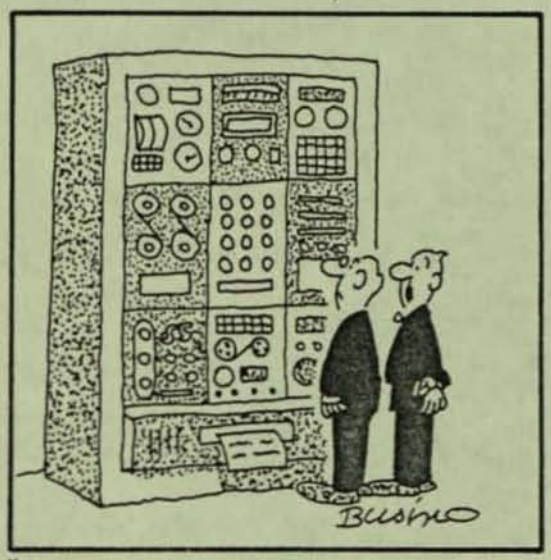
FLOWCHART

```
ENA     DAYWEK
ADD     C1
EØR     C8
JAZ     +1
JMP i   RETURN
ENA     C1
STA     DAYWEK
JMP i   RETURN
        DAYWEK
        C1
        C8
        RETURN
```

ECHØ SYMBOLIC PROGRAM

```
100     7110
101     15111
102     16112
103     13104
104     41113
105     7111
106     14110
107     41113
110     2
111     1
112     10
113     377
```

ECHØ NUMERICALLY CODED PROGRAM



"If you think this machine is complex, you should have seen the woman it replaced."

If ECHØ IV was in <u>your</u> Basement, what household tasks would you want it to do?

1.

2.

3.

4.

Please give or mail to:
Jim Sutherland
Westinghouse Electric Corporation
Computer Systems Division
R&D Center, Bldg. 501-3D33
Pittsburgh, Pa. 15235

Home Economists in Business*

Joint Meeting with Home Economists in Homemaking

10:30 a.m. to 12:30 p.m.

Dallas Memorial Auditorium Theatre

Presiding: Mrs. Virginia T. Habeeb, Food and Home Equipment Editor, *American Home* Magazine, New York City

COMPUTERS: IMPLICATIONS FOR THE FUTURE

What Is a Computer?
Phil Guthoff, Manager, Advanced Systems Planning, IBM, Yorktown Heights, New York

Can a Computer Become a Household Appliance?

There's a Computer in My Basement
James Sutherland, Fellow Engineer in Computer System Design, Westinghouse Electric Corporation, Pittsburgh, Pennsylvania

Programming a Telephone Computer
J. P. Ratzlaff, Senior Engineer, Southwestern Bell Telephone Company, Dallas

Learning to Live with a Computer
Mrs. Ruth Sutherland, Pittsburgh, Pennsylvania

Implications for the Future — Windup

Home Economists in Homemaking

Joint meetings with Home Economists in Business and Art Sections. (Programs on this page.)

Research

Joint meeting with Colleges and Universities Section. (Program on page 16.)

SUBJECT-MATTER SECTION MEETINGS

Art

Joint Meeting with Home Economists in Homemaking

2 p.m. to 4 p.m.

Dallas Memorial Auditorium

Room 302

Presiding: Dr. Margaret N. Keyes, Chairman of the Art Section; Assistant Professor, Department of Home Economics, University of Iowa, Iowa City

INTERACTION: ART AND THE FAMILY

The Family and This Crazy Modern Art
The Reverend Ralph S. March, S. O. Cist., Associate Professor of Music, University of Dallas, Texas

Business Meeting of the Section

* *Point credit for Army Reserve officers.*

PART B
THE DALLAS TIMES HERALD
LIVING
WOMENS NEWS
CAVALCADE
CLASSIFIED
Tuesday, June 27, 1967

Computer Finds Home In Family's Basement

By BARBARA RICHARDSON
Club Editor

That computer worth $10,000 in the basement of Mr. and Mrs. James F. Sutherland's Pittsburgh, Pa., home isn't earning a dime, but Mrs. Sutherland believes it will keep her checking account out of the red.

"It will not be long until the computer will be taking care of the bookkeeping for our household for me . . . typing out checks, keeping itemized account of expenditures and recording the expenses needed for income tax purposes," the vivacious brunette said Tuesday morning at the Dallas Memorial Auditorium Theater while addressing the American Home Economics Association and Home Economists in Business joint meeting.

"SINCE IT WILL SUBTRACT, I hope never again to receive a note from the bank reading, 'Your account is overdrawn, please . . . etc.," she laughed.

The computer is the creation of her husband, an engineer with Westinghouse Electric Corporation.

Sutherland, also speaking to the AHEA and HEIB delegates, explained, "I started working on this two years ago when an outmoded computer was dismantled by the company. They were going to throw the parts away and I couldn't stand that."

HIS WIFE'S REACTION: "At first I thought it might really replace me!

"When he started talking about the possible availability of a core memory unit and other parts of an obsolete Westinghouse computer that could be made into a computer for home use, I thought this was going a bit too far.

"My resistance didn't last and it wasn't long until one wall of the dining room began to fill up with stack after stack of meaningless parts which I called junk," his wife said.

Gradually though, Mrs. Sutherland admitted, the computer

See HOME on Page 3

COMPATIBLE THREESOME

Mr. and Mrs. James F. Sutherland believe a computer is adaptable to a household's problems and are programming their own computer to handle those problems. The couple told of their experiences at the American Home Economics convention Tuesday. — Staff Photo by Andy Hanson.

became a family project. "The children—Ann, 11; Sally, 6, and Jay, 2—and I would run down to the basement and cheer each time Jim announced the computer had passed another milestone, even though none of us really understood what was going on.

"The biggest day was when the power was turned on and nothing blew up! As the keyboard, printer, tape reader and punch were added we began to see and understand more clearly how the computer worked and some day would work for us," she continued.

All the possibilities for a home computer haven't been realized yet, said her husband. "We don't know all it will do. We are just now beginning to experiment to discover its uses.

"We can get it programmed so that when I hop on the scales (connected with the computer) and weigh a little heavy, the computer will give me a week's menus with calory levels to bring my weight down," Sutherland said.

His wife believes programming the computer will keep her alert mentally. "The average homemaker doesn't get much mental exercise cleaning the house and looking after the children. She tends to stagnate. The computer is making me learn how to think again."

Sutherland estimated a computer for the home would cost $10,000 now, but he has faith in its practical application to household duties and thinks the day is coming when a home computer will be a common household appliance costing $1,000.

"A computer will regulate your home's temperature; keep your Christmas card list up to date and provide gummed, addressed labels for each name; plan meals; adjust recipes to the exact number of portions needed; keep shopping lists current; tell the time and what you are supposed to be doing at that hour, and operate other appliances on a schedule," he said.

Electronics introduced Sutherland to his future wife while both were attending a 4-H Camp in high school. "I was a farm boy and when REA (Rural Electric Authority) came to the farms in Missouri, many people had no idea of all its uses. So I made a scale model farm illustrating the things electricity could do and toured the countryside with it. In the process I met Ruth," he said.

The couple was married during their senior year at the University of Missouri. And, this home economics convention isn't a foreign matter to Mrs. Sutherland . . . She got her degree in home ec.

Share Experiences Of Using A Home Computer

The typical housewife's view concerning the use of a computer to assist in her daily chores was given the Lions at their weekly luncheon meeting Tuesday.

Mrs. James Sutherland, whose husband has built a computer in the basement of their home in Pittsburg, Penn., talked on the topic, "Impression of a Homemaker With a Computer in the Basement". "While our household is just beginning to see the benefits of a home computer, we can see where it could be a big help to the housewife," Mrs. Sutherland said. There are many items it could perform such as taking care of the bookkeeping for the family; plan menus by the week; keep inventory of kitchen items; assist in income tax work; and keep temperatures in house consistent with outside weather.

Mr. and Mrs. Sutherland will go to Dallas, Texas, to appear on a home computers panel discussion at the American Home Economics Convention. It is believed that the Sutherland home computer is the only one in existence.

The computer was built by Sutherland, an engineer for Westinghouse, from spare parts of discarded company computers.

MRS. SUTHERLAND SPEAKS TO CLUB

Mrs. Jim Sutherland, Pittsburg, Pa., guest speaker, spoke to Windsor Garden Club No. 1 the morning of June 20 at the country home of Mrs. Sam Ferguson on "Impressions of a Homemaker through a Computer".

She told of the elaborate computer Mr. Sutherland has built in their home using spare parts no longer needed by the Westinghouse Co. Mrs. Sutherland told of using the computer for household bookkeeping, meal planning, temperature controls, school work and even as an aid to weight controls with dietary suggestions when your scale shows up with more pounds than you want.

She is soon to visit Dallas, Tex., and attend the National American Home Economics convention where she will help to demonstrate the uses of a computer in the home.

Refreshments were served by Mrs. Ferguson and assisting hostess, Mrs. W. S. Hughes. Mrs. Byron Chryst was a guest.

The September meeting will be with Mrs. Elbert Marti.

AFTERNOON

Wednesday, February 21, 1968

The Columbus and Southern Ohio Electric Company

Front and Spring Streets

Lee Harper, Presiding

2:00 Registration and Social Hour

2:30 "The Name of the Game is Living"
Margaret Easley, Home Service Director, The Tappan Company

3:00 "Control of Electric Energy for Homemaking through Solid State Electronics"
William Kraemer, Market Development Dept., Ranco Controls Division, Ranco, Inc.

3:30 Demonstrations of Motor Driven Appliances
Home Service Department
Cincinnati Gas & Electric Company

4:00 Recess

4:15 Demonstrations of Heating Appliances
Home Service Department, Columbus & Southern Ohio Electric Co.

4:45 Teachers' Business Meeting
Sonia Cole and Barbara Reed

5:30 Adjourn to Sheraton-Columbus Hotel

EVENING

The Venus Room,
Sheraton-Columbus Hotel

Third and Gay Streets

Janice Erisman, Presiding

6:00 Dinner

PROGRAM

"Learning to Live wtih a Computer"

Mr. and Mrs. James Sutherland

Design Engineer
Westinghouse Electric Corporation

Home Economics Committee of OFHEC

1967-68

Bernice Ballard	Columbus & Southern Ohio Electric Co.
Norma Campbell	Dayton Power & Light Co.
Lois Deneke	Ohio State University
Janice Erisman	University of Cincinnati
Lolita Harper	Cincinnati Gas & Electric
Dr. Fern Hunt	Ohio State University
Ann Klotz	Toledo Edison Company
Catherine Knarr	Ohio State University
Barbara Reed	State Department of Education
Virginia Winston	Cincinnati Public Schools

E-8342

NEW YORK STATE COLLEGE OF HOME ECONOMICS
A Statutory College of the State University
at Cornell University, Ithaca, New York

MEMORANDUM

February 21, 1968

TO: Faculty
Graduate Students
Others interested in expediting work

FROM: Rose E. Steidl

SUBJECT: Seminar - Household Economics and Management

DATE: March 11, 1968 (Monday)

TOPIC: Computers in Homes

SPEAKERS: Mr. & Mrs. James F. Sutherland
Pittsburgh, Pennsylvania

Mrs. Sutherland is a full-time homemaker.
Mr. Sutherland is a Fellow Engineer,
Hagan/Computer Systems Division,
Westinghouse Electric Corporation.

PLACE: Room 117 MVR

TIME: 4:00-5:00 p.m.

TEA: 3:30 p.m. Room 114 MVR

Note: The Sutherlands have a computer in their basement and are using it to automate tasks.

TENNESSEE Home Economics Assoc
Annual Convention
CHATTANOOGA, TN

SATURDAY, MAY 4, 1968
(Continued)

1:00-2:30 pm PROFESSIONAL SECTION LUNCHEONS

Agricultural Extension Service------ Downtowner Motel
Arrangements: Miss Mary Kate Sinclair
Speaker: Mr. George Little
Little Art Shop
Chattanooga

College Chapters ----------Holiday Inn
Arrangements: Miss Martha Johnson
Program: Fashion Show

Colleges, Universities, and Research--- Chestnut Room
Arrangements: Miss Georgia Bell
Speaker: Dr. Stanley B. Williams
Chairman, Department of Sociology
University of Chattanooga

Home Economists in Business -------- Continental Room
Arrangements: Miss Marie Smith
Speaker: Miss Rosemary Archibald
National HEIB Chairman-Elect

Home Economists
in Homemaking---------- Chattanooga Golf and
Country Club
Arrangements: Mrs. Faye Smartt
Speaker: Dr. Joe Sanders, Chairman
Religious Education Department
David Lipscomb College

Elementary, Secondary, and
Adult Education---------- Holiday Inn,
South Market
Arrangements: Miss Marion Sprayberry
Program: Career Panel Discussion
Miss Martha White, Moderator

5:00 -

7:00-

3:00-3:50 pm GENERAL SESSIONS MEETING --------- Continental Room
Miss Ruth Truett, THEA Vice President, Presiding
Program: "The Computer - A Homemaker's Genie"
Mr. James Sutherland, Fellow Engineer
Computer Systems Division
Westinghouse Electric Corporation
"Learning To Live With a Computer"
Mrs. Ruth Sutherland
Home Economist in Homemaking

4:00 - RESEARCH REPORTS---------- Parlor C
Chairman: Dr. Ada Marie Campbell

Home Economists to Hear Speakers at Convention

May 1, 1968
Free Press

The Tennessee Home Economics Association will hold a convention on Friday and Saturday at the Read House. The opening board meeting is set for 9 a.m. on Friday. The exhibit hall will open at 2 p.m. Sectional business meetings have been scheduled for Friday afternoon.

Sen. Howard Baker, guest speaker, will be honored with a reception from 6 to 7:15 p.m. in the Chestnut Room.

Mrs. Freida G. Malone, coordinator of the child development program of the Chattanooga-Hamilton County Community Action Program, will be the subject matter sessions leader. These sessions will take place in the foyer of the Read House on Saturday from 9 until 10 a.m. and from 10:30 to 11:30 a.m.

Mrs. Malone was a home economics teacher in the Chattanooga - Hamilton County school systems for six years. She received her B.S. degree from the University of Chattanooga and her M.S. degree in child development and family relations from the University of Tennessee. The mother of a son and a daughter, Mrs. Malone is a past president of the Chattanooga Area Home Economics Association.

Miss Irene Knauff, regional home economist for Frigidaire Division of General Motors, will speak on housing, equipment and management at these sessions.

The speaker attended Arkansas Polytechnic College and received a B.S. degree in home economics from Henderson State Teachers College in Henderson, Ark. She holds membership in the Home Economists in Business, the American Home Economics Association and several southern states' home economics associations. Miss Knauff has served offices of professional and civic organizations and is a past state chairman of the North Carolina Home Economists in Business.

Miss Knauff serves her company's sales zones headquartered in Atlanta, Charlotte, Fort Worth, Houston, Miami, Memphis, New Orleans, San Antonio and Tampa.

The convention's general session will take place in the Continental Room at 3 p.m. on Saturday. Mr. and Mrs. James F. Sutherland of Hagan Computer Systems Division, Westinghouse Electric Corp., will address the meeting.

Mr. Sutherland, a fellow engineer with his company, will speak on computers. A senior member in the Institute of Electrical and Electronic Engineers, he was graduated from the University of Missouri with a B.S. degree in electrical engineering and Penn State Uni- in meteorology. This computer expert has completed course work toward a master's degree from the University of Pittsburgh.

MR. AND MRS. JAMES F. SUTHERLAND

Allegheny County Schools

SPECIAL SERVICES

CHARLES A. BAIR, Superintendent
345 COUNTY OFFICE BUILDING, PITTSBURGH, PA. 15219
Area Code 412 — 471-8770

4

September 23, 1968

Mr. and Mrs. James F. Sutherland
4857 Habana Drive
Holiday Park
Pittsburgh, Pennsylvania 15239

Dear Mr. and Mrs. Sutherland:

Your presentation of the Computer in the Home was excellent for our first meeting of the school year.

If we in Home Economics Education could have the vision concerning the needs of the pupils as you have the vision of that home computer, we could make a trememdous contribution to the homes of today. Thank you for lifting our sights and enabling us to look more creatively at the direction we are heading. I will be interested in following the future of your computer at home and the new outlets you find for it.

Again, thank you for being part of our group of home economics teachers.

Sincerely yours,

Hester Munden, Supervisor
Home Economics Education
and School Food Service

HM/mlp

JOINT MEETING OF THE

COMPUTER SOCIETY

AND THE

AUTOMATIC CONTROL GROUP

LADIES NIGHT

TUESDAY, FEBRUARY 16, 1971 - 8:00 P.M.

Room 424 Benedum Hall (New Engineering Bldg.)

UNIVERSITY OF PITTSBURGH

The Care and Feeding of "ECHO," Our Home Computer

MRS. RUTH S. SUTHERLAND

BS Home Economics, Univ. Of Missouri

and

MR. JAMES F. SUTHERLAND

Fellow Engineer

Computer & Instrumentation Division

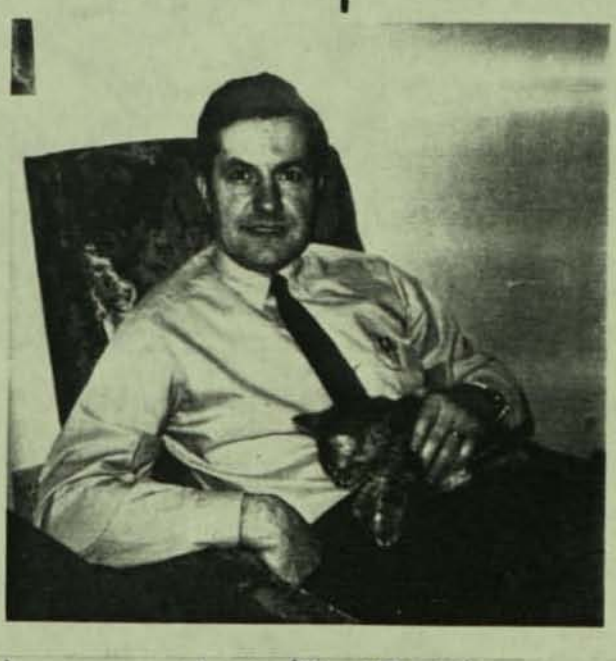
Westinghouse Electric Corporation

Starting with a carload of scrapped obsolete computer printed circuit boards and a 15 bit 8192 location core memory system, the Sutherlands have built a home computer which performs routine household tasks. The basement computer has required about six years of construction and programming, but it is now beginning to show signs of responsible independence. Past problems, present programs, and future plans for expansion will be discussed in this presentation which should be interesting to all members of the family.

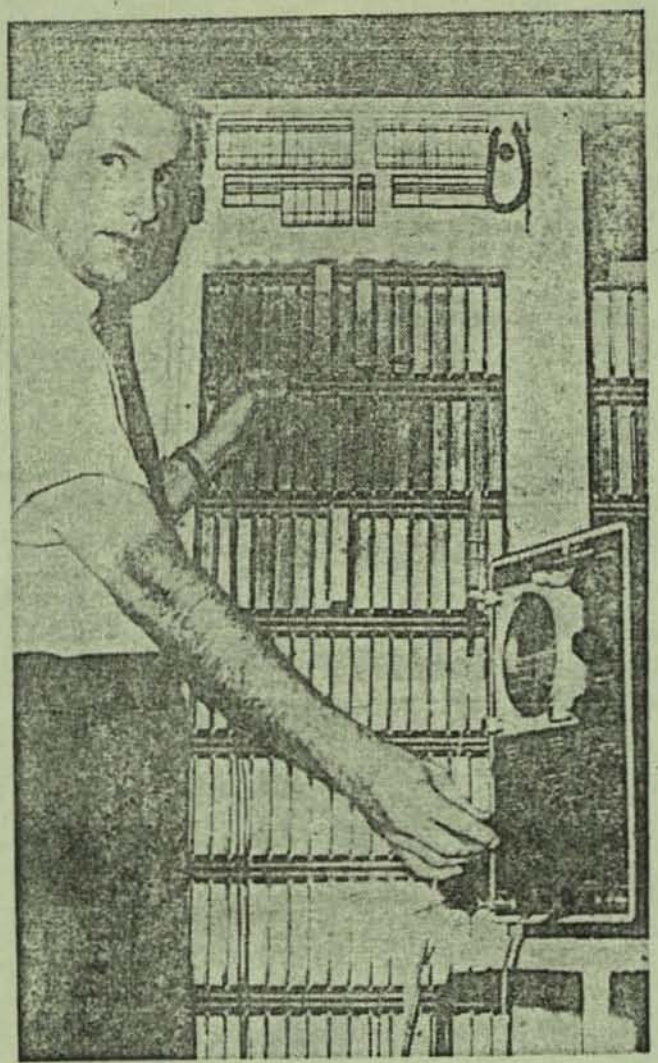
A pre-meeting dinner for the speakers will be held at Stouffer's Restaurant in Oakland at 5:30 p.m. All are invited. For reservations call R. G. Hoelzeman, 621-3500, Ext. 7403.

Feb 16, [redacted]. 1971
Before the IEEE speech

After speech Ruth + "Christmas"



Jim + "Christmas"



Jim Sutherland, a computer specialist at Westinghouse Electric Corp., checks over the computer built at his suburban Pittsburgh home. After programming, the computer will take charge—and tell Sutherland and his wife what's needed in groceries, how to handle the household budget and even predict the weather.
(AP Wirephoto)

Computers Seen as Boss of Household

By BOB VOELKER

PITTSBURGH (AP) — Tired of having people tell you what to do? Brace yourself--for the worst.

A new commanding voice is being heard across the land. It's only a whisper now. But someday it might be roaring at you in your home.

It's a computer.

Nowadays, computers aren't bothering you. There are only a relative handful around; and they're busy doing things like running steel mills and chewing up mountains of banking data.

"Mother's Little Helper"

But they have a fiendish eye on your home--with invasion in mind. They'll probably sneak in under the innocent-sounding guise of "mother's little helper."

Jim Sutherland, a computer specialist at Westinghouse Electric Corp., is among those who foresee the invasion. Matter of fact, he's aiding and abetting it.

Sutherland, 33, has built a computer in the basement of his suburban Plum Borough home. Now, he's busy programming it; that is, telling it what he wants it to do.

Later, the computer will take charge--and tell Sutherland and his wife what to do.

Household Bookkeeping

Initially, Sutherland is setting up programs to handle household bookkeeping and to prepare shopping lists.

He says home computers eventually will:

--keep an inventory of groceries on hand--and tell you what to buy.

--keep track of family finances--and tell you what luxuries to cut out.

--predict the weather--and tell you to wear an overcoat.

--keep track of your diet--and tell you to lay off the booze.

No Talking Back

There's no talking back to the computer. All you can do is listen--and squirm.

Sutherland, who dubbed his computer ECHO-IV for Electronic Computer for Home Operations, says:

"Actually, the number of things ECHO-IV will do around the home is almost unlimited.

"For instance, I plan to eventually hook up television sets to the system. When my wife, Ruth, or one of our three children wants to leave a message for other members of the family, they'll simply type it into the computer which will display the message on the TV screens."

Could Aid Golfer

Sutherland says a computer could be set up to tell a golfer what's wrong with his swing. He would swing at a stationary ball, and the computer would say something like:

"You didn't keep your head down, you jerk."

He predicted computer magazines will be published some day telling about new challenges and successes and presenting "game" problems.

He predicts computer tapes and records will be available much like today's recording tapes and records. A person will buy a tape, say for bookkeeping, then program into it his own personal data.

Sutherland put together his computer from obsolete parts and some equipment borrowed from Westinghouse. He estimates such a computer is worth about $10,000.

In time, he says, the cost will be reduced considerably. He feels people will start tinkering with home computers when the cost becomes comparable to that of early model color television.

Then, the invasion starts in earnest.

Will Even Tell You How Much To Drink

Beware: Computers Someday May Be Running Your Household

(Editor's Note: Someday computers may be running your household. This AP Spotlight tel what it would be like).

By BOB VOELKER

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Associated Press Wirephoto

CHECKING THE COMPUTER — Jom Sutherland, a computer specialist at Westinghouse Electric Corp., checks over the computer built at his suburban Pittsburgh home. After programming, the computer will take charge — and tell Sutherland and his wife what's needed in groceries, how to handle the household budget and even predict the weather.

"You didn't keep your head down, you jerk."

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Then, the invasion starts in earnest.

Unusual Fare

LONDON (UPI) —Taxi driver Harry Edge has in his possession 43 pairs of frilly lace panties. They were left in his cab by a pretty French girl whom he took to London Airport.

Man Fined $5,000 For Tax Evasion

PITTSBURGH (UPI) — William J. Caridi, Cheswick RD2, Monday was fined $5,000 and placed on two years probation on income tax evasion charges.

Judge Herbert P. Sorg ordered Caridi to pay the fine within a year and also gave him a six-month suspended sentence.

A former bookkeeper for the Aerial Map Service Co., Caridi was charged with embezzling $37,546 from his employer and failing to report it on his income tax.

Check GO Record, S Broderick

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that voters shoul
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Computer Specialist Builds Machine For Everyday Service in Household

HOME APPLIANCE: Jim Sutherland, computer specialist at Westinghouse Electric Corporation in Pittsburgh, checks over the computer he built for home use.

Right now computers are busy doing things like operating steel mills and chewing up piles of banking data, but don't be surprised if they come sneaking into your home someday soon.

That day already has arrived at the home of Jim Sutherland, computer specialist at Westinghouse Electric Corporation in Pittsburgh. He lives in the suburban community of Plum, Allegheny County.

Home Computer

Sutherland, 33, has built a computer in the basement of his home. He is busy programming it; that is, telling it what he wants it to do.

Later, the computer will take charge and tell Sutherland and his wife what to do. Initially, Sutherland is setting up programs to handle household bookkeeping and to prepare shopping lists.

He says home computers eventually will keep an inventory of groceries on hand and tell you what to buy, keep track of family finances and tell you what luxuries to cut out, predict the weather and tell you to wear an overcoat, keep track of your diet and tell you what food to avoid.

There is no talking back to the computer. All you can do is listen and squirm, Sutherland declared.

For the Home

Sutherland, who dubbed his computer ECHO-IV for electronic computer for home operations, said:

"Actually, the number of things ECHO-IV will do around the home is almost unlimited."

He said a computer could be set up to tell a golfer what is wrong with his swing. Computer magazines will be published someday telling about new challenges and success and presenting "game problems," he predicted.

He expects that computer tapes and records will be available much like today's recording tapes and records. A person will buy a tape, perhaps for bookkeeping, then program into it his own personal data.

Sutherland put together his computer from obsolete parts and some equipment borrowed from Westinghouse. He estimates its worth at $10,000. But, he says, the cost eventually will be reduced.

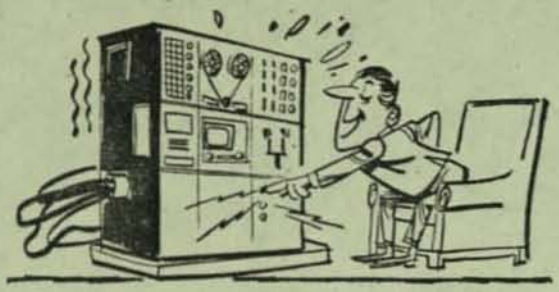
When that day arrives, when a computer can be bought for the home at a cost comparable to that for early model television, the home invasion will begin in earnest, Sutherland declared.

The Pittsburgh Press

No. 91 FRIDAY, SEPTEMBER 23, 1966 WEATHER—*Fair, cool.*

Runs House Scientifically

Basement Computer Echoes Jim's Life



By GEORGE THOMAS

The ECHO in Jim Sutherland's basement is starting to run his whole life.

But that's the way he planned it.

Known formally as ECHO-4—for Electronic Computer for Home Operation (the fourth) — the homemade computer is scheduled to:

—Produce shopping lists and inventory groceries on hand.

—Keep track of family finances.

—Predict the weather.

—Turn television sets on and off at pre-selected times.

—Develop recipes.

—Control thermostats according to weather and time of day.

But that's only the beginning.

"Actually," the 33-year-old Mr. Sutherland of 4857 Havana Dr., Plum Borough, observes, "the number of things ECHO-4 will do around the home is unlimited.

"I plan eventually to hook up television tubes to the system."

When he does that, his wife can leave a message for him or one of their three children or the family dog by typing it into the computer and having it displayed on the TV screen.

The computer, which has taken the Westinghouse Electric Co. system engineer a year to build from spare parts, is seven feet long, six feet high and two feet deep.

Mr. Sutherland began looking like a potential builder of home computers back in 1948.

That year he won a Westinghouse-sponsored 4-H scholarship for a display he built to demonstrate how electricity can be used on the farm.

A Missouri farm boy, he used the scholarship money at the University of Missouri, where he was graduated in 1952 with a degree in electrical engineering.

He also holds a degree in meteorolgy — so the whole question of a career for him has been weather or not.

He estimates it will take about 10 years of part-time work to program ECHO-4 to its full capacity—but he isn't worried.

Where the program is sound, he reasons, there will always be an ECHO.

PITTSBURGH POST GAZETTE SECTION IV SEPTEMBER 24, 1966

While Jim Sutherland checks his homemade computer, daughter Sally is buttoned up for rain by her mother. Jay and Ann look over food, one of many household items managed by selective device ECHO-IV.

—Post-Gazette Photo

ECHO CAN DO 600 HOUSEHOLD TASKS

Computer Carries Family Load In Engineer's Suburban Home

By DENNIS CASEY
Post-Gazette Staff Writer

Days of compiling shopping lists for trips to grocery stores are never over for Mrs. Ruth Sutherland, who will find out exactly what foods she needs by asking the computer her husband built in their Plum Borough home.

And if you think that sounds "1984ish," get a load of this: The computer, which look innocuous enough in the Sutherlands' basement, will keep track of family finances, predict the weather, run digital coded computer clocks, turn television sets and radios on and off, print recipes and control the house temperature.

And all that is just a start, according to James Sutherland, 33, whose family lives in a split-level home at 4857 Havana Drive. Sutherland, a Westinghouse Electric Corp. computer systems engineer, plans for his machine eventually to perform 600 tasks in the house.

For Jim, the computer is the culmination of a year's labor of love, during which he used discarded computer components and spare time to work on the machine. "I started it mostly just as a hobby," he said, "It was a way to unwind after coming home from work."

Jim designed the computer from scratch, making schematic sketches and mooching obsolete computer components from his company. "They were glad to give them to me," he said.

The computer, which Jim dubbed with the acronym ECHO-IV (Electronic Computer for Home Operation), stands about six feet high and takes about seven feet of floor space at one end of the family's basement.

Jim figures that to program the computer completely (which he explained means "give it directions on what to do") will take him about ten years of work in his spare time.

Clocks in the Sutherland home already are set up to run from the computer, as does one in the living room. It is a clock without hands or the conventional arabic numerals. It consists of sets of lights, which flash on and off.

"The kids could read this before regular clocks," he mused while glancing up at it. "We have one regular clock—that's in the kitchen stove, so we couldn't do too much about it."

Jim has two daughters, Sally, 6, and Ann, 10, and a son, Jay, 19 months. Jim said his son shows a penchant for computers as he plays around ECHO and drags pieces of wiring around with him. It's easy to imagine Jay 15 years from now asking the computer if he can use the car for an evening (or will the conveyance be a helicopter then?)

Post-Gazette
Daily
Magazine

TUESDAY, SEPTEMBER 27, 1966

Squirrel Cage

By DOUGLASS WELCH

SO I SAID TO Green Eyes: "Here is something I think you will find interesting." And she said: "You want to bet?"

And I said: "It is about an electronic engineer who has found that housekeeping can be more efficiently managed by computer." And she said: "Big deal."

Mr. Welch

And I said: "Fellow lives in Plum Borough, on the edge of Pittsburgh. Name of Jim Sutherland. He has built this housekeeping computer in the basement of his split-level home, and now he is programming it."

And she said: "Everybody knows better how to keep house than the woman who has to do it."

And I said: "Sutherland's computer will eventually make out shopping lists and keep an up-to-date inventory of foodstuffs on hand. A house wife will no longer say: "Gee, I don't know whether I have a can of pimento or not! She will glance at a list and will KNOW."

★ ★ ★

And she said: "Tell me. Will this computer go to the store and do the family shopping? Will it stand at the butcher's counter on one foot and then another trying to figure out whether wieners cost more than hamburger?"

And I said: "Of course not. The computer will simply ORGANIZE the housewife's life. You know, women don't know what they are doing around a house most of the time. The computer will type out a message before a woman goes to the store: "Today buy hamburgers.' "

★ ★ ★

And she said: "What does the computer do if one child comes in and announces that another child has just swallowed a caterpillar? Let's see a computer handle a domestic crisis like THAT!"

And I said: "Oh, that ridiculous. It's not supposed to handle that sort of thing. But it will forecase the weather. It will sound a bell and print a message: 'Be sure to have the kids put their rubbers on when they go out. It's going to rain soon'."

And she said: "How will it handle a husband who comes home late because he has had one or two—or ten—with the boys?"

And I said: "It probably could be programed for that. It will print out recipes, it will control the temperature of the home according to outside temperatures, it will guide the housewife through her day so that she will get more efficiency out of her time."

And she said: "What will it do where a husband comes home and says everybody at the office has been mean to him, and the boss doesn't love him any more? Will it kiss him and console him and sympathize with him?

And I said: "I don't think this electronic engineer has thought that far yet."

★ ★ ★

And she said: "It wouldn't work around here. I am SURE of that."

And I said: "Why wouldn't it?"

And she said: "Because the minute you left the house in the morning I would pull the plug and turn the nasty thing off."

And I said: "It is reported Mrs. Sutherland is very happy about the whole idea."

And she said: "She'll find out."

★ ★ ★

And I said: "I wish you wouldn't resist modern invention."

And she said: "While it is telling the housewife how to run her house, does it also do any practical work, too? For instance, does it make popcorn?"

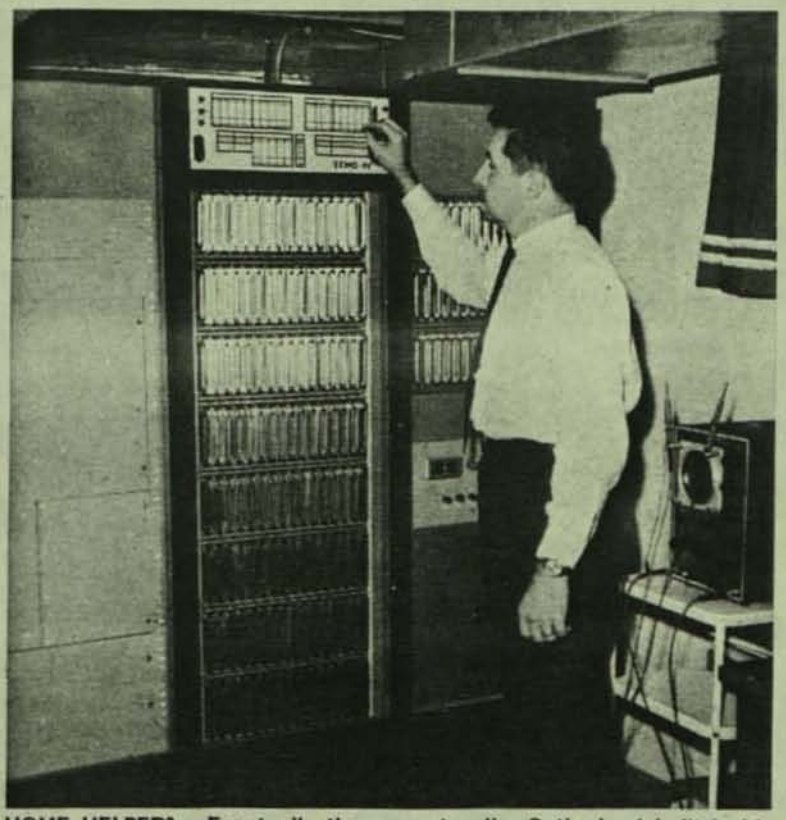
And I said: "Of course not. You can't ask a thinking machine to make popcorn." And she said: "Try me again some day when they come up with a machine that makes popcorn."

I don't know, sometimes I think it is hopeless. You try to help a woman get through her housework sooner and easier, you try to help her organize her work, and she resists and rejects you. Like I keep saying, if men ran business like women run homes, nothing would get done. But I only say it to myself.

Westinghouse NEWS

Vol. 21, No. 20 • October 4, 1966

Computer-Age Is Welcomed Into Jim Sutherland Home



HOME HELPER? — Eventually the computer Jim Sutherland built in his basement may turn out to be a big help around the house—but right now it just takes up a lot of Jim's spare time. He's shown here checking some of the circuits in the central processor cabinet—other cabinets house the input-output controller and memory units. Still to be completed is the keyboard to program the computer and to receive print-out information.

Mother's little helper is turning out to be a computer.

Called ECHO-4 by its creator, 33-year-old Jim Sutherland, the computer is tucked away in the basement of the Sutherland split-level in Plum Borough, a Pittsburgh suburb. ECHO stands for Electronic Computer for Home Operation.

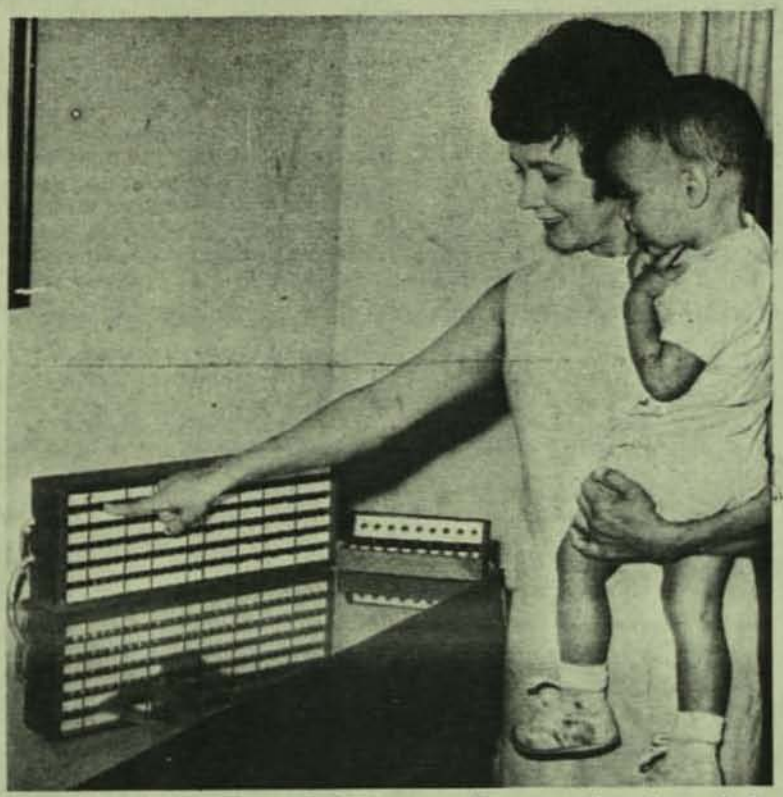
For Jim, a Computer Systems engineer, the home computer is a dream he's making come true diagram by diagram, wire by wire.

As Jim envisions it, his computer will eventually:

- Produce shopping lists as well as inventory of groceries on hand;
- Keep track of the family finances as carefully as banks do for their customers;
- Predict the weather;
- Turn television sets and radios on and off at pre-selected times;
- Print out recipes;
- Control the thermostats according to the time of day and the weather.

"These are just a few of the things I can see happening in the immediate future," said Jim. "Actually, the number of things ECHO-4 will do around the home is almost unlimited.

MESSAGES ON TV



ONE OF A KIND — It's a cinch there aren't many other alarm clocks around to compare with this model put together by Jim Sutherland to add a scientific touch to the everyday job of climbing out of bed. Based on the binary numbers system, the "clock" can regulate furnace thermostat, turning it up and down at pre-determined times, turn radios on and off and select one of three speaker circuits. Here, Jim's wife, Ruth, aided by young son, Jay, sets the clock by flipping the proper toggle switches.

CUSTOM BUILT—When you look at the coffee table in the Sutherland home, it's just like a lot of others. But when you swing down the front, you'll find a complete home-music center, including tape recorder, hi-fi tuner and pre-amp and record player—son Jay has been itching to take apart some of this equipment but hasn't yet found the right combination to get at it. Music can be played over remote speakers around the house.

"For instance, I plan to eventually hook up television tubes to the system. When my wife, Ruth, or one of our three children wants to leave a message for the other members of the family, they'll simply type it into the computer which will display the message on the TV screens."

ECHO-4 has been abuilding for a year. Now that the hardware portion is completed, Jim is busy programming it—that is, telling the computer what he wants it to do and when.

Measuring seven feet in length, two feet in depth and six feet in height, ECHO-4 is a little larger than the sophisticated computers being turned out today on the production line.

"That's because it is made almost entirely of discarded and obsolete components," Jim explained.

No stranger to what electricity can do, Jim won a Westinghouse-sponsored 4-H scholarship in 1948 for a display he built to demonstrate how electricity can be used on the farm. The Missouri farm boy used the scholarship money at the University of Missouri where he was graduated in 1952 with a degree in electrical engineering.

He also holds a degree in meteorology.

LONG-RANGE PROGRAM

Jim estimates that it will take 10 years of part-time work to program ECHO-4 to its full capacity, but that doesn't discourage him at all.

"Working with ECHO-4—doing every phase of building a computer from scratch — has helped me in my work at Westinghouse," he said.

"I can now better appreciate what some of the other fellows in our division are doing."

And when it comes to telling time from the "clocks" scattered through Jim's home, the other fellows in the division are about the only ones who wouldn't have any trouble.

Jim's clocks consist of rows of lights mounted in homemade cabinets. One light blinks quite rapidly, counting off the seconds. Another group is more sedate; they're the minute lights. Still another section tells the hour.

It's something the average household isn't ready for yet, because Jim's timepieces are based on the binary numbers system. Unless you understand binary numbers, you'd better depend on your own wrist watch.

Jim joined Westinghouse in 1959 as a Computer Systems engineer and is now in the Advanced Systems Section.

By Vince Johnson

GATEWAY GOSSIP

OTHER PEOPLE have playrooms in their basements. But Mr. and Mrs. James Sutherland, of 4857 Havana Drive, Plum Borough, have a "brainroom."

Sutherland, a computer systems design engineer for the Westinghouse Electric Corp., designed, built and programmed a computer in his basement. The computer is called Echo IV. Echo means Electronic Computing Home Operator.

The Sutherland home literally is run by computer. Echo serves as a temperature control and even regulates the TV schedule. For instance, on a school night, the children will have to answer some key questions on the keyboard before Echo will turn on the set.

The computer venture started two years ago when Sutherland bought some obsolete computer parts and sketched diagrams. Within a year, Echo was running simple programs.

A story about Sutherland and his computer appears in the current issue of Popular Mechanics, written by Glenn B. Infield, of 3507 Fourth Ave., Beaver Falls.

★ ★ ★

More power to Mr. Sutherland and his brainroom. But we doubt that Mrs. Sutherland ever is helped by Echo when the dishes need to be washed.

And this old gossip prefers the old fashioned kind of basement that Uncle Dudley used to make home brew in.

★ ★

ACS NEWSLETTER

a publication of the
AMATEUR COMPUTER SOCIETY

Number 8 January 1968

COMPUTER SURVEY RESULTS

ECHO-IV (PAGE 4)

ACS COMPUTER SURVEY RESULTS

Although not many ACS members sent in the computer survey forms, those who did are, not surprisingly, the furthest along with their machines. Two have finished.

Memory

Most of those who answered the survey are using core memory, with sizes ranging from 4K to 20K words; the majority are equally divided between 4K and 8K.

One member uses a delay line for memory, containing 512 words. Another uses a delay line (2K bytes), drum (8K bytes) and core memory (4K bytes); 4-bit bytes.

For his small machine, one member uses flip-flops for memory. Another uses punched paper tape, having convinced himself that "tape would eliminate the memory limit."

Input

Teletype is the most common input device. One member, however, uses a Flexowriter. Another uses punched cards, keyboard, magnetic tape, paper tape, and keyboard switches.

Output

Again, Teletype is the most common output device. Others include a Kleinschmidt printer, paper tape punch, IBM Selectric typewriter, lamps, and Nixie tubes. One member uses magnetic tape, paper tape, Selectric typewriter, printer and lamps. And the member with the Flexowriter also uses it for output.

Clock

Clock speeds include 100K, 160K, 250K, 500K, and 1Mc, with one given as 10-100K. The average is 500K.

Serial or Parallel

The situation is about equally divided into thirds: one-third serial; one-third parallel; one-third combinations such as serial character, parallel bit.

Transistor Types

A wide range here, of course. One uses only 2N404. Another, 2N2923, 2N3721, 2N2711 (npn) planar. A third, 2N2923, 2N2925, 2N3906. A fourth, MPS3640, MPS3646, and 2N3641 in core drivers.

Integrated-Circuit Types

(1) uses Fairchild RTL (67¢ FF, 36¢ dual 2-input gate, 36¢ buffer). (2) Fairchild RTμL and CTμL. (3) Motorola RTL (700P series). (4) Motorola and Fairchild RTL.

Card Types

None of those replying use surplus IBM or Univac cards, although one uses surplus Westinghouse RTL NOR gates. Another is considering Wyle modules. A third designs and etches his own PC cards. A fourth makes his cards from Vector boards. A fifth uses Ransom, SEI and Autonetics cards. A sixth uses Teletype etched boards, with his own circuits.

Number of Instructions

Generally speaking, beginning com-

puter amateurs hope to use a large number of instructions, from 50 to 100. Those who have gotten fairly well into the construction use no more than between 11 and 34. The one exception is a member who has spent $1,000 and two years on his machine, and has (or has projected) 67 instructions. The average number, counting all those reported, is 44. Leaving out those over 50, the average is 22.

Data-Word and Instruction Lengths

The data-word lengths specified range from 4 to 32 bits, with the average around 12 bits.

The instruction lengths also range from 4 to 32 bits, with an average of about 12 bits also.

Add Speed

The range of add speeds is from 8 μsec to 10 msec, with in-betweens of (1) 24 μsec, (2) 216 μsec, (3) 100-500 μsec, depending on the length of the binary number, (4) 8 μsec for one memory reference, but circuitry will operate in 1 μsec, (5) 30 μsec add speed, 4 msec memory cycle time with a magnetostrictive delay line, (6) 20 μsec with one number in accumulator, 25 μsec with both numbers in memory, (7) 32 μsec per pair of decimal digits, (8) 1 to 10 msec.

Number of Registers

The range of number of registers is from 2 to 11, with 3 the most popular. One member has 2 memory, 2 data, 1 op code and 5 address registers.

Special Features

Here are some of the special features reported. Not all of these features have yet been translated into hardware; some are only in the planning stage, or partially breadboarded.

(1) Over 100 Sylvania bulbs in strip sockets will monitor the major registers, etc. CRT displays planned. When completed it will be far more versatile than DEC's PDP8 line.

(2) Data-word length 16-32 bits (32-64 for floating). Planning modular op-code decoders (i.e., basic repertoire plus floating arithmetic, hardware stack operations, etc.). Basic structure is bus-oriented.

(3) Has D/A converted output to drive motor position. Machine has two 8-bit registers, one 15-bit accumulator.

(4) Variable-length instructions, variable-length indirect address fields.

(5) Contents of memory address zero and A register are swapped every cycle (inhibited on some instructions). Therefore one register serves as accumulator and program counter. Memory address 1 serves as index register.

(6) Double precision arithmetic; fixed and floating-point numbers; link on all arithmetic registers; full comparator; AND, OR, Exclusive OR registers for logical computations; data bus allows bi-directional transfer between any two registers.

(7) Will use IBM 1620 software, modified to use USASCII code and to get around unimplemented instructions.

Cost

As to "Cost so far," the range is from 0 to $1500, with an average (among those reporting a cost) of $650.

For "Estimated cost when complete,"

the range is from $300 to "over $10,000." with an average of $2,100. Without that "over $10,000" estimate, the average is $1,100.

Wiring

The large majority, over 80 percent, use fixed wiring.

How Long Working On It?

The range of time spent so far ranges from "one month on the present model" to 4 years, with an average of 2 years.

Size

Here are some present sizes: 3-foot relay rack; 6' x 7' x 18"; 35" x 23" x 20"; 1 work bench; 1 board complete; 30" x 36" x 40"; three 19" five-foot racks; 38" x 60" x 12" & TTY. The "Estimated size when complete" is usually just the same.

Education

Most of those responding have at least one technical degree, including BSEE, MEE, BA in Math, PhD EE, "BA and BS and working on MS," and several students.

Because the great majority of those sending in the survey have technical degrees, and because those who sent it in are among those who have advanced the most with their computers, it seems that lack of a technical education is holding back many ACS members from pushing ahead with their machines, or perhaps from just getting started. Unlike amateur radio, there just isn't enough circuit-level information available on how to build computers.

Other Information

(1) Presently supervising 5 Explorer scouts who are doing much of the construction work, such as building PC cards. I became an Explorer advisor at my company's post to get more hands on the project and to force me to get on the ball and make some progress.... I am going to debug the power supply transients and add a line filter. RTL has low noise immunity and my first wired-up register is dropping and gaining extra bits.

(2) Wish disks and line printers were cheaper! Fortunately, I can build my own software -- assembler, compiler (FORTRAN and/or ALGOL) and operating system.

(3) Teletype controller and memory operational. Can presently transfer data from TTY to register to memory and back. Delay-line memory stability problems solved -- successfully retrieved data after eight hours. Using 8½" x 17" Vectorboard with AA pattern, strengthened by chrome-plated angle. Dual Inlines mounted by alternately bending pin pairs inward and outward. Wiring directly soldered to ICs, using #22 wire with high-temperature-resistant insulation.

(4) This has been an evolutionary process without a fixed idea of exactly what the final product would be. Now I have outrun myself in some ways. For example, I know how to get back and forth from memory to TTY. Also, how to add binary numbers. I don't know how to turn TTY characters into binary numbers in any simple manner. I would appreciate any clues you might have on the subject. (ANY MEMBERS ABLE TO HELP HIM ON THIS?)

Interested in Computers Since...

Those who put down a date gave: 1951, 1955, 1957, 1965. Those who put down an age gave: 13, 14, 15, 18, 20, 21. Those who gave the number of years gave 3, 3, 9 and 17 years.

COMPLETED COMPUTERS

Only two ACS members have reported being anywhere near completing their computers:

ECHO-4

Jim Sutherland's ECHO-4 computer, reported briefly in ACS Newsletter 6, is 7 feet long, 1½ feet deep and 6 feet high. It took Jim a year to build it and will take 10 years to program. He says the CPU is complete, but the input/output system is still growing.

ECHO-4 uses 2N404 transistors and RTL NOR logic elements. The NOR gates were used in process control systems built by Westinghouse about 8 to 10 years ago and were declared scrap. They are mounted on etched circuit boards with 35-pin Elco connectors. A total of 120 boards were used in the entire system (input/output control, arithmetic units) but only 16 types of boards were used, so spare boards do not take up much room.

The memory unit, an Ampex 4096-RQ-30A, came from an obsolete process control computer. Memory cycle is 6 usec, but since the NORs require from 1 to 3 usec to switch, the add time suffers (add speed is 216 μsec).

Between instruction accesses, the memory is available as a refreshing buffer for a CRT display, which is planned but not built yet.

Jim says a story about ECHO-4 is tentatively scheduled for the April 1968 issue of Popular Mechanics. He says it doesn't go into much construction detail, "but the pictures should be interesting."

ECHO-4 has 4 flip-flop registers, and three (P, A and X) in core memory. There are 8,192 words in core memory, each 15 bits long. Clock speed is 160 Kc. There are 18 instructions, 4 bits long.

Special features: one's complement adder with end-around carry. Overflow and carry designators are stored in upper two bits of Program counter (location 0 of core memory). Interrupt automatically stores P and takes next instruction from specified SAVE routine entry. Using 15-pps sync derived from real-time clock. One index register, and also indirect addressing, can be specified by setting flags in the instruction word.

Input: alphanumeric keyboard, six control keyboards, 8-channel paper tape reader, 15 interrupts, 75 contact closures.

Output: Kleinschmidt printer, 60 contact closures, 8-channel paper tape punch, 4 digital clocks.

Interconnections are wire-wrapped.

By the way, ECHO stands for Electronic Computing Home Operator.

EL-65

Hans Ellenberger, who lives in Switzerland, worked a year on his computer and finished it in 1965. A small desk-top machine, looking a little like a Wang calculator with a separate keyboard, EL-65 has a keyboard input and Nixie-tube readout. Size is 40 by 40 by 20 centimeters.

A serial-type computer, EL-65 has 3 registers, 30 words in flip-flop memory, and 15 instructions. The transistors are AC122 (AF pnp germanium) "because of price."

Addition and subtraction times are 1/50 second. The longest multiplication and division times require 1.3 seconds. In addition to these four basic functions, EL-65 can also perform negative multiplica-

tion, and accumulate products.

The cost of materials alone was 1500 Swiss francs, which is about $345. Hans tried to market his computer, calling it "der erste Schweizer Pult-Elektronenrechner," meaning the first Swiss desk-top electronic calculator. But the sales price of 6000 SF ($1380) seems to have put it beyond the means of most Swiss and also it may have been too much of a novelty on the market. As Hans notes, "It seems almost impossible for an amateur to build a computer that can compete with commercial machines. (The amateur who can do that would be, before long, employed by a computer company.)"

Hans is working on a new model, with 16 registers, using Philips LTC cores, and ICs by Fairchild (RTL epoxy), TI and Philips.

MAGAZINE ARTICLES

Low-Cost Counters

The February Popular Electronics contains a construction article (pp 27-32) on a decimal counter with readout, which the magazine believes to be a price breakthrough, as the decade costs only $12, complete with counter, drivers and ten lamps. Parts are available from a Texas company at $12 a decade, including a PC board. A power-supply schematic is given. The maximum rate is 10 Mc, although the unit has been used up to 18 Mc.

Later issues will feature items based on the counter: an "Electronic Stop Watch," which is an EPUT (events per unit time) counter; a digital voltmeter; digital multimeter; and a frequency counter.

The ICs used are all Motorola: two MC790P dual JK flip-flops, and one each of the MC724P (quad, two-input) and MC715P (dual, three-input) NAND/NOR gates. And seven transistors.

An interesting coincidence is the appearance by the same author of an Electronics article (Jan. 22, pp 74-76), "For low cost, count on RTL," which compares the $12 decade with a $10 digital display that uses a milliameter with a special scale, calibrated from 0 to 9, and a biquinary 1-2-2-4 code.

The authors says in his last paragraph that the in-line counter is superior in readability, but the meter design is cheaper and smaller.

Basic Digital IC Circuits

Over a dozen simple digital circuits are given in "30 Basic IC Projects," in Radio-Electronics (Jan. 1968, pp 50-53). This second part of a two-part article uses the Fairchild μL914 as the basis for inverters, pulse-enabling and disabling gates, NOR/NAND and OR/AND gates, square-wave generators, one-shot, Schmitt trigger, flip-flop, and others. All that's needed is a 914 and a few resistors and capacitors, plus diodes for the generator.

The article on the following pages (pp 54, 55, 62) describes how to "Build a Low-Cost IC Signal Generator," with the same μL914, to provide square waves from 5 cps to 50 Kc.

The first part of the IC article appeared in the December 1967 issue (pp 43-45), and covered the basic description of the μL914, giving circuits for linear applications such as emitter followers and amplifiers.

Wireless World Digital Computer

The four-part article on building a small computer, described in the

The Amateur Computer Society is open to all who are interested in building and operating a digital computer that can at least perform automatic multiplication and division, or is of a comparable complexity.

For membership in the ACS, and a subscription of at least eight issues of the Newsletter, send $3 (or a check) to:

Stephen B. Gray
Amateur Computer Society
260 Noroton Avenue
Darien, Conn. 06820

The Newsletter will appear about every eight weeks.

previous Newsletter, has a fifth part now, completing the series. The December Wireless World (pp 601-605) covers the operation of the machine, with coding examples.

Using Miniature Relays?

An interesting comparison of major characteristics of miniature relays appeared in a new-product item in the January 8 Electronics (pp 171-172). Comparisons are made between crystal-case relays, mercury-wetted and dry reed relays, and solid-state switching devices. Each of the four types is said to provide certain advantages. "If speed is needed more than isolation, solid-state switches should be used. When cost is the prime factor and high isolation is also required, the reed relay is the best choice." The new product is a line of dry reed relays, made by Hi-G Inc. (Windsor Locks, Conn.) which sell for about $2, compared with about $8 for solid-state switches.

Would you believe a relay in a TO-5 transistor can? They're described in the January EEE (pp 20 & 24). Not cheap, though; over $20.

BREADBOARDING INTEGRATED CIRCUITS

Wade White says he breadboards in-line ICs with a board that holds 15 of the 14-pin packs, from J.R. Anderson Enterprises, Inc. 3691 Lee Road, Cleveland, Ohio 44120. The board, type MC-1, costs $4.85 for 1-9, $4.50 for 10-24, and $4.25 for 25-49.

No holes are drilled in the board. The components are soldered to the top, for easy removal or change. Size is 3/32" x 8-5/8" x 5-49/64".

For permanent mounting of 12 of the 14- or 16-pin ICs, Wade uses an M-96003-PG board from Dyna Sales Co., 962½ S. Atlantic Blvd., Los Angeles, Calif. 90022. Phone (213) 268-1175, ask for Milt Hollingsworth.

For TO-5 and flat-pack ICs, use board M-96002-PG. The boards have holes drilled for mounting components, and pins to fit a 22-contact connector (Amphenol series 143). The connector costs about $1.55 new, but can be bought surplus for much less.

Price for either board is $6.95, with a discount of 5% for 5-14, 10% for 15 or more.

Wade also notes that the Vero IC board kit listed in Newsletter 7 at $40, is available from Dyna Sales for $29.95, as item MC-10.

NEXT ISSUE

If any of you who have gotten into the construction of your machines fairly well would like to write up your experiences for the Newsletter, several pages are available for the gory details. Tell us all about your problems, solutions, discoveries, failures, components, and your future plans.

THE NATIONAL OBSERVER
Monday, September 16, 1968

What'll you have: Tax data? Recipes? Bank balance? These are Honeywell's display keyboards for experimental home-computer use.

Recipe for the Future

Computers Move Into Two Homes, Promising Help for Housewives

At 6:20 each morning, a computer awakens Jim and Ruth Sutherland. Jim built the computer in the basement of their suburban Pittsburgh home and programed it to run a clock in the ceiling above their bed. When the clock reaches the wake-up hour, the computer triggers a buzzer.

This extravagant alarm system is one of the first completely at-home uses of a computer, a potential new market that excites many computer-industry experts. Last week the Micro Switch division of Honeywell, Inc., introduced a keyboard that it says will sell for $100 by 1970 and may serve as the inexpensive link from millions of homes to a few central computers.

matics problems. Mr. Orr has a computer terminal tucked away next to the washing machine in his suburban Washington, D.C., home. After the children go to sleep, he often goes to the machine to run through sales projections or figures on a new market.

The distant computer sometimes does other tasks for the Orrs. "We might type a little program on it when we have guests coming to dinner. We'll tell a guest to type a question, and before the computer answers, it will type back: 'Hi, Bill. Has Dave Orr fixed you a drink yet?' "

What the Sutherlands do with their computer thus may become common for many families within a few years. Jim Sutherland, a computer designer for Westinghouse Electric Corp., has spent $1,000 on the machine so far. New devices he will add this fall will let his wife sit at the typewriter terminal in her kitchen and type notes into the computer to remind her to take the car for inspection on a certain day, or keep track of her deductible expenses for their income-tax records. "When I have a meal I like and it goes real well with the family, I'll probably make a note of it on the computer," she adds.

What the Computer Can Do

Computer experts look beyond recipes. "Such things as shopping for groceries and clothing, paying bills, and checking on your bank balance can be accomplished just by typing out a brief, coded message," says James S. Locke, a Honeywell official. He sees at-home voting through computers by 1988.

A key link to any at-home computer network will be a telephone circuit. For relatively complex functions, a typewriter keyboard will be hooked to the telephone circuit. A simple unit might consist of a touch-tone phone, with its 10 buttons.

A General Electric Co. official projects this possibility within five years: Through a touch-tone phone at a $25-a-month fee, the husband might store in some distant computer his tax data, the kids could run mathematics problems, and his wife could check on what stores have that pair of shoes she is looking for.

"We're experimenting in this area," says a spokesman for International Business Machines Corp. IBM has linked computers to touch-tone phones for tests with Brooklyn students and teachers. They heard a lecture over the phone, then answered multiple-choice questions or ran algebra problems by pushing the phone buttons. With recorded messages, the computer told each when he was right or wrong.

William R. Lonergan, a vice president of Radio Corp. of America's computer division, projects a fancier system, coupling a TV set into the at-home link to the computer. This would let a housewife see what she wants to buy, or give children a visual peek at microfilmed documents useful in homework that are in some far-off library.

Seeking Jobs by Computer

Their father might view pictures of the room choices available for the family's planned vacation to Bermuda, then type out his reservation request. "With mass production, the price could come down to the level of a complex TV set," Mr. Lonergan believes. A West Coast company now stores classified advertisements on computers, and Mr. Lonergan sees housewives hunting for part-time work by typing their job interest onto the at-home computer terminal.

Most of these uses remain 5, 10, or more years off. But David R. Orr, a GE computer sales executive, sees some uses becoming possible within two or three years, with $200-a-month computer terminals installed in the homes of thousands of middle- and top-management executives. These men, in the quiet of the evening, could then query the computer on stock-market forecasts and other problems they had no time for during a busy day at the office.

Nothing would bar these same executives in 1970 from running tax data on the machine, or letting the kids work mathe-

NEWSPAPERS KNOWN TO HAVE PRINTED THE ASSOCIATED PRESS
ARTICLE BY Jacqueline Snyder (Jan/Feb 1970)

City	Newspaper	Date	Headline
AR Little Rock	Democrat	1/23	Junk He Bought At Work Now Regulates
CA Costa Mesa	Daily Pilot	2/02	Home Computerized By Handy Designer
CA Fresno	Bee	1/25	Now They Have Real C. In The Family
CA Huntington Beach	Pilot	2/02	Home Computerized By Handy Designer
CA Laguna Beach	Pilot	2/02	Home Computerized By Handy Designer
CA Long Beach	Press Telegram	2/19	We're Not Sure That We're Ready
CA Los Angeles	Times (morn)	1/24	C. Built From Junk Runs Appliances
CA Newport Beach	Pilot	2/02	Home Computerized By Handy Designer
CA Pamona	Prog.-Bulletin	1/28	Home Computer
CA San Francisco	Chronicle	2/03	Family Has A Computer
CA San Rafael	Indep. Journal	2/03	Dad Builds A Home Computer
CA Santa Ana	Eve. Register	2/02	Home Computer Hard At Work
CA Santa Cruz	Sentinel	1/23	C. In Your Home Can Change Your Life
CA West Covina	Tribune	1/29	Junk Computer Runs Home
CO Colorado Springs	Gazette-Telegraph	1/25	Home Computer Is Constructed
CO Denver	Post	2/01	Junk-Built C. Handy Home Gadget
CT Hartford	Times	1/23	Home Is Run By Computer
CT Manchester	Herald	1/23	Family's C. A Maid, Trusted Companion
CT New Britain	Herald	1/23	C. Built Of Junk Operates His Home
CT New Haven	Register	1/23	C. Made From Junk Picks TV
CT New London	Day	1/27	Computer Eases Homework
CT Waterbury	American	1/23	Man Builds Computer In His Home
CT Waterbury	Republican	7/02	Amazing Kitchen Computers, Gadgets
FL Clearwater	Sun	1/23	Designer Builds C. That Operates
FL Ft. Lauderdale	News	1/23	Elect. Whiz Converts Junk Into C.
FL Orlando	Evening Star	1/23	Home Computer Handles Chores
IA Des Moines	Tribune	1/23	Builds A Computer For Household Jobs
IL Chicago	Chicago Today	1/23	Some Junk - This Is Living!
IL Chicago	Daily News	1/23	Computer Joins The Family
IN Ft.Wayne	News-Sentinel	1/23	Old Junk C. Handy About House
IN Lafayette	Journal & Courier	1/29	"Junk" Makes Life Easier For Family
IN Muncie	Press	1/24	Computer For The Home
IN South Bend	Tribune	1/23	"Old Junk" Functions As Home Computer
KS Augusta	Gazette	1/24	Computer Helps His Family
LA Lafayette	Advertiser	1/23	Designer Builds C. For Use In Home
LA Lafayette	Advertiser	1/25	Computer Controls Home Appliances
LA Shreveport	Journal	1/23	Home C. Helps Regulate Household
MA Boston	Christ. Sc. Mon. E	1/27	There's Just No Housekeeper Like a C.
MA Boston	Christ. Sc. Mon. W	2/17	"Some Old Junk" is Homemade C. Now.
MA Boston	Eagle Tribune	1/23	Computer Made From Old Junk
MA Boston	Evening Globe	1/23	Junk Brain Runs House, Tends Kiddies
MA Boston	Record-American	1/24	Home Is C.ized With Discarded Junk
MA Lowell	Sun	1/23	C. Helps Run Appliances & Do Homework
ME Portland	Express	1/23	He Has Almost Everything Fed Into C.
MI Battle Creek	Enquirer & News	1/23	It's So Nice To Have A C. Around
MI Bay City	Times	1/23	Handyman Runs Home With C. Setups
MI Benton Harbor	News-Palladium	1/23	It Even Tells Kids When To Go To Bed
MI Flint	Journal	1/23	C. Learns to Do Housework For Family
MI Grand Rapids	Press	1/24	His Computer Runs Home
MI Midland	News	1/24	Computer Controls Home Appliances
MI Mt. Clements	Macomb-Daily	1/23	Old Junk Runs Appliances
MI Saginaw	News	1/23	Even A 4-Year-Old Can Use It

MO	Kansas City	Times	1/24	Home C. Age Is Here For Family in Pgh
MO	St. Joseph	News-Press	1/28	C. Made At Home Performs Jobs
MS	Jackson	News	1/30	Home-Built C. May Keep Family Books
NC	Ashville	Times	1/23	C. Made Of Junk Helps With Homework
NC	Charlotte	Observer	1/24	Basement C. Does Homework
NC	Greensboro	Record	1/23	C. Helps Run Home Life
NE	Omaha	Eve. World-Herald	1/23	Hello... I'll Do Your Housework
NE	Omaha	Morn. World-Tele.	1/24	Junk C. Now Runs Home
NJ	Asbury Park	Press	1/23	C. Hobbyist Puts Idea To Work
NJ	Willingboro	County Times	1/26	Home C. Handles Chores For Design Man
NV	Las Vegas	Review-Journal	1/24	C. Controls Home Appliances
NY	New York	News	1/24	He's Got TV Set Watching The Kids
NY	Poughkeepsie	Journal	1/25	He Builds C. To Do Tasks At Home
NY	Rochester	Times Union	1/23	And Now - Computer In The Home
NY	Troy	Times Record	1/23	Makes Home C. From Elect. Junk Pile
NY	Utica	Observer-Dispatch	1/23	All Work, Maybe Some Play
NY	Yonkers	Herald Statesman	1/23	"Handyman" C.izes Junk To Help
OH	Columbus	Dispatch	1/23	Computer Does Home Chores
OH	Dayton	News	1/23	Downstairs Maid A Computer
OH	Port Clinton	News	2/05	Designs Computer Control
OH	Toledo	Times	1/26	C. Controls Home Appliances
OK	Enid	News	1/23	C. Controls Home Appliances
OK	Oklahoma City	Times	1/23	Old Junk Becomes Home Computer
PA	Butler	Eagle	2/18	Junk Turned Into C. Helps To Run Home
PA	Clearfield	Progress	1/23	Obsolete Parts Turned Into Computer
PA	Easton	Express	1/23	Old Junk Takes Over This Household
PA	Gettysburg	Times	1/24	Computer As Home Hobby Is Versatile
PA	Gettysburg	Times	1/26	C. Controls Home Appliances
PA	Greenville	Record-Argus	1/23	Home Operation C. Fashioned From Junk
PA	Hanover	Sun	2/04	Man Builds Computer To Run Appliances
PA	Harrisburg	News	1/23	Homemade C. Dominates Family's Life
PA	Harrisburg	Patriot	1/24	C. Becomes Family Jack-Of-All-Trades
PA	Johnstown	Tribune-Democrat	1/24	Tinkering Designer Builds C.
PA	Lancaster	New Era	1/23	C. Runs Pittsburgh Designer's Home
PA	Lebanon	News	1/24	Builds C. With Junk, Obsolete Parts
PA	Lehighton	Times-News Record	1/23	One Family Already Has A Computer
PA	Lewistown	Sentinel	1/24	Computer Does Chores
PA	Philadelphia	Bulletin	1/23	Smart Junk
PA	Phoenixville	Republican	1/26	Home Computer Aids Kids With Homework
PA	Pittsburgh	Advance-Leader	1/24	Plum Boro Man Creates Home Operat. C.
PA	Pittsburgh	Advance-Leader	1/28	Plum Family Has Fun With Home C.
PA	Pittsburgh	Post-Gazette	1/24	Computer Now Runs House in Plum Twp.
PA	Pottsville	Republican	1/24	Old Junk Reg. Furnace, Switches TV
PA	Punxsutawney	Spirit	1/29	A Household Computer
PA	Sayre-Athens	Times	1/23	Old C. Parts Organized To Run Home
PA	Somerset	American	1/24	"Useful Monster" Has Place In Family
PA	St. Mary's	Press	1/24	Man Built C. To Help At Home
PA	State College	Mirror	1/24	Pittsburgh Man Builds Computer
PA	Sunbury	Item	1/23	Home C. Runs TV, Helps With Homework
PA	Warren	Times-Mirror Obs.	1/24	Home-Built C. From Obsolete Units
PA	Washington	Observer-Reporter	1/24	Home C. In Basement Can Come In Handy
PA	Waynesboro	Record Herald	1/23	New Help For The Housewife
PA	Wilkes-Barre	Times-Leader News	1/23	C. Designed For Household Use
PA	York	Dispatch	1/23	Home C. Does Homework, Regulates Heat
SC	Columbia	Record	1/23	C. Gives Hand On Every Level of Famil
TN	Maryville-Alcoa	Times	1/26	Home Made C. Does Work
TN	Nashville	Banner	1/23	"Junk" C. Does Work For 5

TX Abilene	Eve. Reporter-News	1/23	Homemade Brain Is Member Of Family
TX Beaumont	Enterprise	1/25	Jim Sutherland of Pittsburgh...
TX Corpus Christi	Times	1/23	C. Helping To Run Household
TX Dallas	Times-Herald	2/02	He Programs TV, Furnace
TX Ft. Worth	Eve. Star-Telegram	1/23	Pardon Me, Is The C. Home?
TX Houston	Post	1/24	Jim Sutherland ....
TX Laredo	Times	1/25	C. Built of Junk Doing Home Chores
TX Port Arthur	News	1/23	Home C. Junk Runs House
TX Witchita Falls	Times	1/23	C. Built To Do Homework
VA Danville	Bee	1/23	Household Chores Done By Computer
VA Fredericksburg	Free Lance-Star	1/23	Appliance Computer
VA Roanoke	World-News	1/23	Computer Does Chores For Family
WA Yakima	Herald-Republic	1/26	Computer Controls Home
WI Racine	Journal-Times	1/27	C. Born of Junk Parts Doing Jobs

PITTSBURGH-GATEWAY
Industrial
Mr. J. E. Goetz, Mktg. Mgr.

O'HARA TOWNSHIP
Hagan/Computer Systems Div.
Mr. G. C. Turner, Gen. Mgr.

O'HARA TOWNSHIP
Hagan/Computer Systems Div.
Mr. G. R. Blake, Product Line Mgr.

O'HARA TOWNSHIP
Hagan/Computer Systems Div.
Mr. B. H. Murphy, Mktg. Comm. Mgr.

From : Pittsburgh-Gateway - 20 West
WIN : 235-3373
Date : February 19, 1970
Subject :

cc: O'HARA TOWNSHIP - Hagan/Computer Systems Div., Mr. J. Sutherland

I thought you would be interested in seeing the first returns on a story the Associated Press did on Jim Sutherland. While the story focuses on Jim as a family man, the real payoff I think is communication of the fact that Westinghouse makes computers and employs bright people.

Lawrie E. Rosenstiel
Director, Public Relations
Industrial

mem
Enclosures

P.S. I rarely play the numbers game, but I can't help pointing out that the combined circulation of newspapers carrying this story totaled more than 77,000,000.

SECOND SECTION

Pittsburgh Post-Gazette

SATURDAY, JANUARY 24, 1970

Jim Sutherland shows wife, Ruth, a logic board from computer he designed and built. Sutherland hopes to program it to play games

Machine Homemade

Computer Now Runs House in Plum Twp.

Some old junk Jim Sutherland brought home from the office is now regulating the furnace in his home, selecting channels on his television, typing papers for his wife, Ruth, and helping his children with their homework.

Sutherland, a computer designer for Westinghouse Electric Corp., bought some obsolete parts from the company and built Echo IV, an electronic computer for home operation, in the basement of his home at 4857 Havana Drive, Plum Borough.

Six Months Building

It took Jim six months to design and build Echo IV, housed in a white cabinet along one wall of his basement work room. Since he completed it about three years ago, he's been busy writing programs to make it operate various appliances in his home.

"The real fun of a home computer," Sutherland says, "is when you can tie into the apparatus you're using."

"For instance, I plan to hook up the television picture tube to the system so that Echo can communicate with the family through an unused channel," he explained. "On school nights, the set will switch to that channel at a certain time and remind the children to go to bed."

Jim's three children, including 4-year-old Jay, are learning about computer operations through their father's hobby. Sally, 9, was able to explain the lights and buttons on the small television control board.

Knows Problem

"When they all light up, it means it's messed up," she said. And she knew which button would remedy the problem.

The computer can analyze math problems quickly for 13-year-old Ann and Mrs. Sutherland said the editing feature of the computer typewriter in her kitchen came in handy when she was preparing a term paper for a night-school course in computers.

Since the system retains only the last thing typed in a certain space, she can simply go back and type over errors, then direct the computer to reprint, producing a perfect copy.

Call Up Recipe

Mrs. Sutherland, a home economist, also plans to program recipes into the machine so she can call for one from the memory bank whenever she needs it.

"It won't be long until the computer will be taking care of the bookkeeping for our household," Mrs. Sutherland said.

Plum family has fun with home computer

PLUM BOROUGH—For many of our parents, grandparents and great-grandparents, the invention of electricity, the telephone and the airplane brought forth gasps of disbelief. TV, a part of today's standard equipment, was just in the planning stage when many of us were kids.

In this push-button, automated, computerized world, however, a Plum Borough family tells time by binary clocks, can type term papers by a computer print out typewriter and can regulate the furnace by means of an electronic computer.

JIM SUTHERLAND, AN engineer at the Westinghouse Hagan/Computer Systems Division at RIDC's Industrial Park in O'Hara Township, built the computer for home operation out of obsolete parts from the company. He calls it Echo IV. It is housed in a white cabinet along one wall in his basement at 4857 Havana Dr., in the Holiday Park section of Plum Borough.

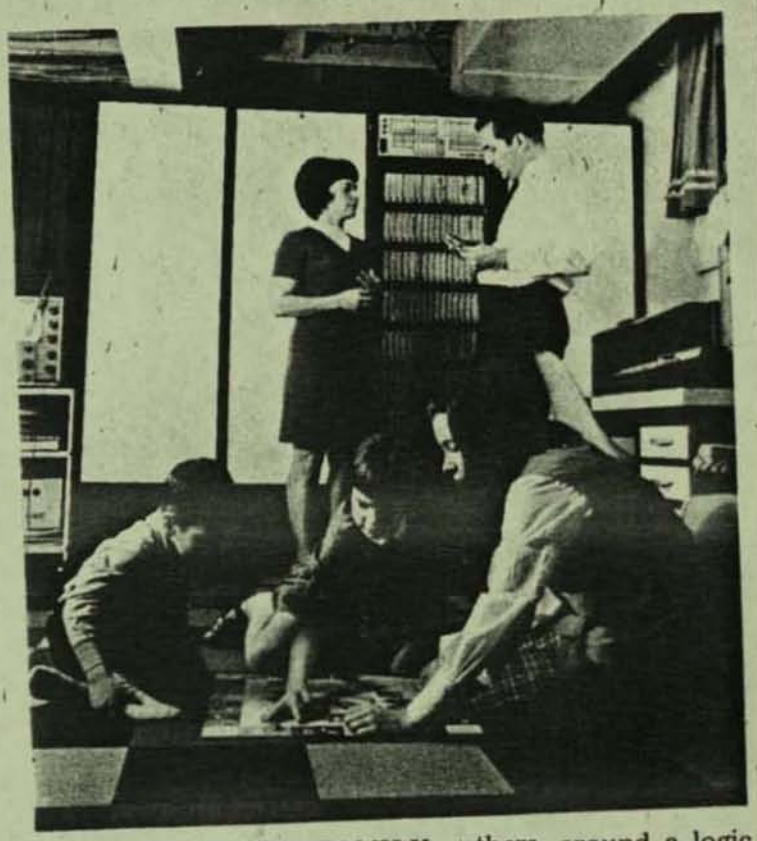
JIM HAS been working on the computer for almost five years putting the "hardware" together. . .wires, cabinets, connections, and so on. He is now programming the computer by telling it what he wants it to do. As this is considered a hobby, it could take 10 years before the computer is fully programmed.

Jim Sutherland is a native of Missouri, the 'Show Me' state, and he's been 'showing' everyone ever since. He was aided through college by a Westinghouse 4-H Club scholarship and met his wife at the 4-H Club Congress when he received his scholarship. In addition to an engineering degree, he has a degree in meteorology.

HIS WIFE, RUTH, is presently taking a course in computer Programming and recently turned in a term paper typed out by the computer print out typewriter in her kitchen. The children too, find it quite an asset having a computer help them with their homework.

The Sutherland's livingroom, diningroom, kitchen and main bedroom have binary clocks—clocks with no hands or numbers, but just a series of blinking lights to tell the time. The binary numeration system uses 1's and 0's to represent any number. Computers use the binary system to operate. The clock's numbers are represented by the number of lights that are on or off. The Sutherland children, Ann, age 13, Sally, nine, and four year old Jay, all tell time by these clocks, which are hooked up to the computer.

RECENTLY JIM PROGRAMMED the computer to find the odds in figuring 'Instant Insanity,' a game involving four blocks, each having four different colors. The idea is to line up the blocks so that all four colors are shown on all sides of the blocks when they are lined up in a row. According Jim's computer, there is only one way to line the blocks up, and the odds of finding the right way are 300,000 to one.



THE SUTHERLAND FAMILY gathers around a logic board from the computer designed and built by Mr. Sutherland. Shown here are Ruth and Jim Sutherland with their children (left to right) Jay, four; Sally, nine; and Ann, 13 years old.

At Christmas time, Jim had the computer play "Silent Night" and "O Come All Ye Faithful" on alternate half hours. The electronic sound was produced completely by the computer.

Mrs. Sutherland plans to program recipes into the machine so she can call on the memory bank for the recipe of her choice at any time.

PERHAPS SOME DAY it will be commonplace to program a computer to gather and type news stories for The Advance-Leader. It's doubtful it will happen soon, but if and when it does, it's a safe bet there will be someone just like Jim Sutherland to stand by to tell the staff which button to push.

Till then, we'll settle for Jim Sutherland's story. . .it surely is a fabulous one.

LEHIGHTON, PA.
TIMES-NEWS & RECORD
D. 3,000

JAN 23 1970

One family already has a computer

PITTSBURGH (AP) — Some old junk Jim Sutherland brought home from the office is now regulating the furnace in his home, selecting channels on his television, typing term papers for his wife and helping his children with their homework.

Sutherland, a computer designer for Westinghouse Electric Corp., bought some obsolete parts from the company and built ECHO IV, an Electronic Computer for Home Operation, in the basement of his split-level home in suburban Plum Borough.

It took Jim six months to design and build Echo IV, housed in a white cabinet along one wall of his basement work room. Since he completed it about three years ago, he's been busy writing programs to make it operate various appliances in his home.

"The real fun of a home computer," Sutherland says, "is when you can tie into the apparatus you're using."

"For instance, I plan to hook up the television picture tube to the system so that Echo can communicate with the family through an unused channel," he explained. "On school nights, the set will switch to that channel at a certain time and remind the children to go to bed."

Jim's family— including four-year-old Jay— already uses the computer to turn their television on and off, select channels and regulate volume from a portable oiled walnut control board.

The children are learning about computer operations through their father's hobby. Nine-year-old Ann was able to explain the lights and buttons on the small television control board.

"When they all light up, it mean's it's messed up," she said. And she knew which button would remedy the problem.

Jay is learning to tell time from the flashing lights of the foot-long narrow walnut "clocks" installed throughout the house.

The computer even helps the school-age Sutherlands with their homework.

It can analyze math problems quickly for 13-year-old Ann and Mrs. Sutherland said the editing feature of the computer typewriter in her kitchen came in handy when she was preparing a term paper for a night-school course in computers.

Since the system retains only the last thing that was typed in a certain space, she could simply go back and type over errors, then direct the computer to reprint, producing a perfect copy.

Mrs. Sutherland, a home economist, has used Echo's reprinting capabilities to address labels and prepare invitations. She also plans to program recipes into the machine so she can call for one from the memory bank whenever she needs it.

"It won't be long until the computer will be taking care of the bookkeeping for our household," Mrs. Sutherland added.

She says her job "takes a good deal of my time each month and I'm looking forward to the computer typing out checks, keeping an itemized account of expenditures and recording the expenses needed for income tax purposes."

GETTYSBURG, PA.
TIMES
— D. 10,010 —
YORK METROPOLITAN AREA
JAN 24 1970

Computer As Home Hobby Is Versatile

By JACQUELINE SNYDER
Associated Press Writer

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CLOSED CIRCUIT TV

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Jim's family—including four-year-old Jay—already uses the computer to turn their television on and off, select channels and regulate volume from a portable oiled walnut control board.

The children are learning about computer operations through their father's hobby. Nine-year-old Ann was able to explain the lights and buttons on the small television control board.

CAN TELL TIME

"When they all light up, it mean's it's messed up," she said. And she knew which button would remedy the problem.

Jay is learning to tell time from the flashing lights of the foot-long narrow walnut "clocks" installed throughout the house.

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It can analyze math problems quickly for 13-year-old Ann and Mrs. Sutherland said the editing feature of the computer typewriter in her kitchen came in handy when she was preparing a term paper for a night-school course in computers.

Since the system retains only the last thing that was typed in a certain space, she could simply go back and type over errors, then direct the computer to reprint, producing a perfect copy.

PRINTS LABELS

Mrs. Sutherland, a home economist, has used Echo's reprinting capabilities to address labels and prepare invitations. She also plans to program recipes into the machine so she can call for one from the memory bank whenever she needs it.

"It won't be long until the computer will be taking care of the bookkeeping for our household," Mrs. Sutherland added.

She says her job "takes a good deal of my time each month and I'm looking forward to the computer typing out checks, keeping an itemized account of expenditures and recording the expenses needed for income tax purposes."

"Since it can subtract accurately," she explained, "I will never get another note from the bank saying my account is overdrawn."

CLEARFIELD, PA.
PROGRESS
D. 15,719

JAN 23 1970

Obsolete Parts Turned Into Computer To Do Many Things

By JACQUELINE SNYDER
Associated Press Writer

PITTSBURGH (AP) — Some old junk Jim Sutherland brought home from the office is now regulating the furnace in his home, selecting channels on his television, typing term papers for his wife and helping his children with their homework.

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It took Jim six months to design and build Echo IV, housed in a white cabinet along one wall of his basement work room. Since he completed it about three years ago, he's been busy writing programs to make it operate various appliances in his home.

"The real fun of a home computer," Sutherland says, "is when you can tie into the apparatus you're using."

"For instance, I plan to hook up the television picture tube to the system so that Echo can communicate with the family through an unused channel," he explained. "On school nights, the set will switch to that channel at a certain time and remind the children to go to bed."

Jim's family—including four-year-old Jay—already uses the computer to turn their television on and off, select channels and regulate volume from a portable oiled walnut control board.

The children are learning about computer operations through their father's hobby. Nine-year-old Ann was able to explain the lights and buttons on the small television control board.

"When they all light up, it mean's it's messed up," she said. And she knew which button would remedy the problem.

Jay is learning to tell time from the flashing lights of the foot-long narrow walnut "clocks" installed throughout the house.

The computer even helps the school-age Sutherlands with their homework.

It can analyze math problems quickly for 13-year-old Ann and Mrs. Sutherland said the editing feature of the computer typewriter in her kitchen came in handy when she was preparing a term paper for a night-school course in computers.

Since the system retains only the last thing that was typed in a certain space, she could simply go back and type over errors, then direct the computer to reprint, producing a perfect copy.

Mrs. Sutherland, a home economist, has used Echo's reprinting capabilities to address labels and prepare invitations. She also plans to program recipes into the machine so she can call for one from the memory bank whenever she needs it.

"It won't be long until the computer will be taking care of the bookkeeping for our household," Mrs. Sutherland added.

She says her job "takes a good deal of my time each month and I'm looking forward to the computer typing out checks, keeping an itemized account of expenditures and recording the expenses needed for income tax purposes."

"Since it can subtract accurately," she explained, "I will never get another note from the bank saying my account is overdrawn."

Jim hopes to use the computer to monitor the weather, issue short-term forecasts, inventory groceries and make up shopping lists for the family.

But writing programs for all these things takes time and Jim says it will be at least ten years before he can bring Echo up to its full capability.

"When you build a computer, it's like having a car in the driveway, but no roads or highways to drive it on," he said. "You have to build your own highways by programming the computer for various tasks. This takes time, but it's my hobby."

He doesn't see a market for home computers unless "common highway is found for programming them."

But he said the day may come when programmed cassette tapes might be inserted into a home model to complete any given household task.

Of his own version he added: "It never will make us any money, but it sure has been fun."

DAYTON, OHIO
NEWS
D.140,675-S.186,227
Dayton Met. Area

JAN 23 1970

DOWNSTAIRS MAID A COMPUTER

Pile of Junk Running the House

PITTSBURGH — (AP) — Some old junk Jim Sutherland brought home from the office is now regulating the furnace in his home, selecting channels on his television, typing papers for his wife and helping his children with their homework.

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It took Jim six months to design and build Echo IV, housed in a white cabinet along one wall of his basement workroom. Since he completed it about three years ago, he's been busy writing programs to make it operate various appliances in his home.

"THE REAL FUN of a home computer," Sutherland says, "is when you can tie into the apparatus you're using."

"For instance, I plan to hook up the television picture tube to the system so that Echo can communicate with the family through an unused channel," he explained. "On school nights, the set will switch to that channel at a certain time and remind the children to go to bed."

Jim's three children, including 4-year-old Jay, are learning about computer operations through their father's hobby. Sally, 9 was able to explain the lights and buttons on the small television control board.

"WHEN they all light up, it means it's messed up," she said. And she knew which button would remedy the problem.

The computer can analyze math problems quickly for 13-year-old Ann and Mrs. Sutherland said the editing feature of the computer typewriter in her kitchen came in handy whe nshe was preparing a term paper for a night-school course in computers.

Since the systems retains only the last thing typed in a certain space, she can simply go back and type over errors, then direct the computer to reprint, producing a perfect copy.

MRS. SUTHERLAND, a home economist, also plans to program recipes into the machine so she can call for one from the memory bank whenever she needs it.

"It won't be long until the computer will be taking care of the bookkeeping for our household," Mrs. Sutherland said.

HARRISBURG, PA.
NEWS
— D. 74,624 —
HARRISBURG METROPOLITAN AREA
JAN 23 1970

Homemade computer dominates family's life

By JACQUELINE SNYDER

PITTSBURGH (AP) — Some old junk Jim Sutherland brought home from the office is now regulating the furnace in his home, selecting channels on his television, typing term papers for his wife and helping his children with their homework.

Sutherland, a computer designer for Westinghouse Electric Corp., bought some obsolete parts from the company and built ECHO IV, an electronic computer for home operation, in the basement of his split-level home in suburban Plum Borough.

It took Jim six months to design and build Echo IV, housed in a white cabinet along one wall of his basement work room. Since he completed it about three years ago, he's been busy writing programs to make it operate various appliances in his home.

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★ ★ ★

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★ ★ ★

"It won't be long until the computer will be taking care of the bookkeeping for our household," Mrs. Sutherland added.

She says her job "takes a good deal of my time each month and I'm looking forward to the computer typing out checks, keeping an itemized account of expenditures and recording the expenses needed for income tax purposes."

"Since it can subtract accurately," she explained, "I will never get another note from the bank saying my account is overdrawn."

EAGLE-TRIBUNE
— D. 44,094 —
BOSTON METROPOLITAN AREA
JAN 23 1970

Computer Made From Old Junk

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YONKERS, N.Y.
HERALD STATESMAN
— D. 49,614 —
NEW YORK CITY METROPOLITAN AREA
JAN 23 1970

'Handyman' Computerizes Junk To Help With Household Chores

By JACQUELINE SNYDER
Associated Press Writer

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FT. WAYNE, IND.
NEWS-SENTINEL
— D. 78,484 —
FT. WAYNE METROPOLITAN AREA

JAN 23 1970

Old Junk Computer Handy About House

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DES MOINES, IOWA
TRIBUNE
— D. 116,120 —
DES MOINES METROPOLITAN AREA

JAN 23 1970

FROM OFFICE 'JUNK'

Builds a Computer For Household Jobs

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GREENVILLE, PA.
RECORD-ARGUS
D. 6,142

JAN 23 1970

Home Operation Computer Fashioned From "Junk" Is WE Designer's Brainchild

By JACQUELINE SNYDER
Associated Press Writer

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It took Jim six months to design and build Echo IV, housed in a white cabinet along one wall of his basement work room. Since he completed it about three years ago, he's been busy writing programs to make it operate various appliances in his home.

"The real fun of a home computer," Sutherland says, "Is when you can tie into the apparatus you're using."

"For instance, I plan to hook up the television picture tube to the system so that Echo can communicate with the family through an unused channel," he explained. "On school nights, the set will switch to that channel at a certain time and remind the children to go to bed."

Jim's family—including four-year-old Jay—already uses the computer to turn their television on and off, select channels and regulate volume from a portable oiled walnut control board.

The children are learning about computer operations through their father's hobby. Nine-year-old Ann was able to explain the lights and buttons on the small television control board.

"When they all light up, it mean's it's messed up," she said. And she knew which button would remedy the problem.

Jay is learning to tell time from the flashing lights of the foot-long narrow walnut "clocks" installed throughout the house.

The computer even helps the school-age Sutherlands with their homework.

It can analyze math problems quickly for 13-year-old Ann and Mrs. Sutherland said the editing feature of the computer typewriter in her kitchen came in handy when she was preparing a term paper for a night-school course in computers.

Since the system retains only the last thing that was typed in a certain space, she could simply go back and type over errors, then direct the computer to reprint, producing a perfect copy.

Mrs. Sutherland, a home economist, has used Echo's reprinting capabilities to address labels and prepare invitations. She also plans to program recipes into the machine so she can call for one from the memory bank whenever she needs it.

"It won't be long until the computer will be taking care of the bookkeeping for our household," Mrs. Sutherland added.

She says her job "takes a good deal of my time each month and I'm looking forward to the computer typing out checks, keeping an itemized account of expenditures and recording the expenses needed for income tax purposes."

"Since it can subtract accurately," she explained, "I will never get another note from the bank saying my account is overdrawn."

Jim hopes to use the computer to monitor the weather, issue short-term forecasts, inventory groceries and make up shopping lists for the family.

But writing programs for all these things takes time and Jim says it will be at least ten years before he can bring Echo up to its full capability.

"When you build a computer, it's like having a car in the driveway, but no roads or highways to drive it on," he said. "You have to build your own highways by programming the computer for various tasks. This takes time, but it's my hobby."

He doesn't see a market for home computers unless "common highway is found for programming them."

But he said the day may come when programmed cassette tapes might be inserted into a home model to complete any given household task.

Of his own version he added: "It never will make us any money, but it sure has been fun."

MT. CLEMENTS, MICH.
MACOMB DAILY
— D. 77,859 —
DETROIT METROPOLITAN AREA

JAN 24 1970

Old Junk Runs Appliances

By JACQUELINE SNYDER
Associated Press Writer

PITTSBURGH (AP) — Some old junk Jim Sutherland brought home from the office is now regulating the furnace in his home, selecting channels on his television, typing papers for his wife and helping his children with their homework.

Sutherland, a computer designer for Westinghouse Electric Corp., bought some obsolete parts from the company and built Echo IV, an electronic computer for home operation, in the basement of his home.

It took Jim six months to design and build Echo IV, housed in a white cabinet along one wall of his basement work room. Since he completed it about three years ago, he's been busy writing programs to make it operate various appliances in his home.

"THE REAL fun of a home computer," Sutherland says, "is when you can tie into the apparatus you're using.

"For instance, I plan to hook up the television picture tube to the system so that Echo can communicate with the family through an unused channel," he explained. "On school nights, the set will switch to that channel at a certain time and remind the children to go to bed."

Jim's three children, including 4-year-old Jay, are learning about computer operations through their father's hobby. Sally, 9 was able to explain the lights and buttons on the small television control board.

"When they all light up, it means it's messed up," she said. And she knew which button would remedy the problem.

THE COMPUTER can analyze math problems quickly for 13-year-old Ann and Mrs. Sutherland said the editing feature of the computer typewriter in her kitchen came in handy when she was preparing a term paper for a night-school course in computers.

Since the system retains only the last thing typed in a certain space, she can simply go back and type over errors, then direct the computer to reprint, producing a perfect copy.

Mrs. Sutherland, a home economist, also plans to program recipes into the machine so she can call for one from the memory bank whenever she needs it.

SAYRE-ATHENS, PA.
TIMES
D. 8,335
JAN 23 1970

Old Computer Parts Organized to Help Run His Home

BY JACQUELINE SNYDER

PITTSBURGH (AP) — Some old junk Jim Sutherland brought home from the office is now regulating the furnace in his home, selecting channels on his television, typing term papers for his wife and helping his children with their homework.

Sutherland, a computer designer for Westinghouse Electric Corp., bought some obsolete parts from the company and built ECHO IV, an Electronic Computer for Home Operation, in the basement of his split-level home in suburban Plum Borough.

It took Jim six months to design and build Echo IV, housed in a white cabinet along one wall of his basement work room. Since he completed it about three years ago, he's been busy writing programs to make it operate various appliances in his home.

"The real fun of a home computer," Sutherland says, "is when you can tie into the apparatus you're using."

"For instance, I plan to hook up the television picture tube to the system so that Echo can communicate with the family through an unused channel," he explained. "On school nights, the set will switch to that channel at a certain time and remind the children to go to bed."

Jim's family — including four-year-old Jay — already uses the computer to turn their television on and off, select channels and regulate volume from a portable oiled walnut control board.

The children are learning about computer operations through their father's hobby. Nine-year-old Ann was able to explain the lights and buttons on the small television control board.

"When they all light up, it mean's it's messed up," she said. And she knew which button would remedy the problem.

Jay is learning to tell time from the flashing lights of the foot-long narrow walnut "clocks" installed throughout the house.

The computer even helps the school-age Sutherlands with their homework.

It can analyze math problems quickly for 13-year-old Ann and Mrs. Sutherland said the editing feature of the computer typewriter in her kitchen came in handy when she was preparing a term paper for a night-school course in computers.

Since the system retains only the last thing that was typed in a certain space, she could simply go back and type over errors, then direct the computer to reprint, producing a perfect copy.

Mrs. Sutherland, a home economist, has used Echo's reprinting capabilities to address labels and prepare invitations. She also plans to program recipes into the machine so she can call for one from the memory bank whenever she needs it.

"It won't be long until the computer will be taking care of the bookkeeping for our household," Mrs. Sutherland added.

She says her job "takes a good deal of my time each month and I'm looking forward to the computer typing out checks, keeping an itemized account of expenditures and recording the expenses needed for income tax purposes."

"Since it can subtract accurately," she explained, "I will never get another note from the bank saying my account is overdrawn."

MANCHESTER, CONN.
HERALD
— D. 14,572 —
HARTFORD METROPOLITAN AREA
JAN 24 1970

Family's Computer a Maid And a Trusted Companion

By JACQUELINE SNYDER
Associated Press Writer

PITTSBURGH (AP) — Some old junk Jim Sutherland brought home from the office is now regulating the furnace in his home, selecting channels on his television, typing papers for his wife and helping his children with their homework.

Sutherland, a computer designer for Westinghouse Electric Corp., bought some obsolete parts from the company and built Echo IV, an electronic computer for home operation, in the basement of his home.

It took Jim six months to design and build Echo IV, housed in a white cabinet along one wall of his basement work room. Since he completed it about three years ago, he's been busy writing programs to make it operate various appliances in his home.

"The real fun of a home computer," Sutherland says, "is when you can tie into the apparatus you're using."

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Mrs. Sutherland, a home economist, also plans to program recipes into the machine so she can call for one from the memory bank whenever she needs it.

"It won't be long until the computer will be taking care of the bookkeeping for our household," Mrs. Sutherland said.

WASHINGTON, PA.
OBSERVER-REPORTER
— D. 24,531 —
PITTSBURGH METROPOLITAN AREA

JAN 24 1970

Home Computer In Basement Can Come In Handy, Pittsburgh Resident Says

PITTSBURGH (AP) — Jim Sutherland's been tinkering with junk in his basement for about four years now and he's created a monster-but a useful one.

A computer designer for Westinghouse Electric Corp., Jim bought some obsolete parts from the company and built ECHO IV, short for Electronic Computer for Home Operation.

"The real fun of a home computer," Jim says, "is when you tie it into the apparatus you're using."

So, ever since he completed the ECHO about three years ago Jim's been busy programming it to regulate the volume and channels of the family TV set, control the furnace, regulate clocks, and play the stereo.

"I plan to hook up the television picture tube to the system so that ECHO can communicate with the family through an unused channel," he explained. "On school nights, the set will switch to that channel at a certain time and remind the children to go to bed."

Jim's three children and his wife, Ruth, enjoy having the computer live with them. Four-year-old Jay is learning to tell time from the flashing lights of the foot-long narrow walnut clocks installed throughout the house.

Nine-year-old Ann can explain the lights and buttons on the small television control board.

"When they all light up, it means it's messed up," she said, pointing out the button that would remedy the situation.

ECHO helps 13-year-old Ann analyze math problems for school and Mrs. Sutherland said the editing feature of the typewriter was useful in typing a term paper for a course she took in computers.

Since the system retains only the last thing that is typed in a certain space, Mrs. Sutherland could simply type over errors, then direct the computer to reprint, producing a perfect copy.

"It won't be long until the computer will be taking care of the bookkeeping for our household," she added. It will keep records of expenses for monthly budgets, write checks and retain records for income tax purposes.

Jim says he hopes to program the computer to monitor the weather and issue short-term forecasts, inventory groceries and make up shopping lists.

But writing programs is very time consuming, although once written they save much time and energy, Jim says.

He says it will take at least ten years to bring ECHO up to its full capabilities. "But it's my hobby, I enjoy it," he says.

"It will never make us any money," Jim adds, "But it sure has been fun."

YORK, PA.
DISPATCH
— D. 41,989 —
YORK METROPOLITAN AREA
JAN 25 197

NEW LONDON, CONN.
DAY
— D. 35,761 —
EW LONDON METROPOLITAN AREA
JAN 27 1970

Obsolete Parts Revived

Computer Eases Homework

By JACQUELINE SNYDER

PITTSBURGH (AP) — Some old junk Jim Sutherland brought home from the office is now regulating the furnace in his home, selecting channels on his vision, typing papers for his and helping his children with their homework.

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It took Jim six months to design and build Echo IV, housed in a white cabinet along one wall of his basement work room. Since he completed it about three years ago, he's been busy writing programs to make erate various appliances in home.

"The real fun of a home computer," Sutherland says, "is when you can tie into the apparatus you're using."

"For instance, I plan to hook up the television picture tube to system so that Echo can municate with the family through an unused channel," he explained. "On school nights, the set will switch to that channel at a certain time and remind the children to go to bed."

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Mrs. Sutherland, a home economist, also plans to program recipes into the machine so she can call for one from the memory bank whenever she needs it.

"It won't be long until the computer will be taking care of the bookkeeping for our household," Mrs. Sutherland said.

'Servant in Basement'

Home Computer Does Homework, Regulates Heat

PITTSBURGH (AP) — Some old junk Jim Sutherland brought home from the office is now regulating the furnace in his home, selecting channels on his television, typing papers for his wife and helping his children with their homework.

Sutherland, a computer designer for Westinghouse Electric Corp., bought some obsolete parts from electronic computer for home the company and built Echo IV, an operation, in the basement of his home.

It took Jim six months to design and build Echo IV, housed in a white cabinet along one wall of his basement work room. Since he completed it about three years ago, he's been busy writing programs to make it operate various appliances in his home.

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Children Learn Operation

Jim's three children, including 4-year-old Jay, are learning about computer operations through their father's hobby. Sally, 9, was able to explain the lights and buttons on the small television control board.

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Mrs. Sutherland, a home economist, also plans to program recipes into the machine so she can call for one from the memory bank whenever she needs it.

"It won't be long until the computer will be taking care of the bookkeeping for our household," Mrs. Sutherland said.

LEBANON, PA.
NEWS
— D. 26,003 —
LEBANON METROPOLITAN AREA
JAN 24 1970

Operates His Home

Designer Builds Computer With Junk, Obsolete Parts

PITTSBURGH (AP) — Some old junk Jim Sutherland brought home from the office is now regulating the furnace in his home, selecting channels on his television, typing term papers for his wife and helping his children with their homework.

Sutherland, a computer designer for Westinghouse Electric Corp., bought some obsolete parts from the company and built ECHO IV, an Electronic Computer for Home Operation, in the basement of his split-level home in suburban Plum Borough.

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Jim's family—including four-year-old Jay—already uses the computer to turn their television on and off, select channels and regulate volume from a portable oiled walnut control board.

The children are learning about computer operations through their father's hobby. Nine-year-old Ann was able to explain the lights and buttons on the small television control board.

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Jay is learning to tell time from the flashing lights of the foot-long narrow walnut "clocks" installed throughout the house.

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"It won't be long until the computer will be taking care of the bookkeeping for our household," Mrs. Sutherland added.

She says her job "takes a good deal of my time each month and I'm looking forward to the computer typing out checks, keeping an itemized account of expenditures and recording the expenses needed for income tax purposes."

"Since it can subtract accurately," she explained, "I will never get another note from the bank saying my account is overdrawn."

SOMERSET, PA.
AMERICAN
— D. 5,893 —
JOHNSTOWN METROPOLITAN AREA
JAN 24 1970

'Useful Monster' Has Place In Family Life

By JACQUELINE SNYDER
Associated Press Writer

PITTSBURGH (AP) — Jim Sutherland has been tinkering with junk in his basement for about four years now and he has created a monster but a useful one.

A computer designer for Westinghouse Electric Corp., Jim bought some obsolete parts from the company and built ECHO IV, short for Electronic Computer for Home Operation.

"The real fun of a home computer," Jim says, "is when you tie it into the apparatus you're using."

So, ever since he completed the ECHO about three years ago, Jim's been busy programming it to regulate the volume and channels of the family TV set, control the furnace, regulate clocks, and play the stereo.

"I plan to hook up the television picture tube to the system so that ECHO can communicate with the family through an unused channel," he explained. "On school nights, the set will switch to that channel at a certain time and remind the children to go to bed."

Jim's three children and his wife, Ruth, enjoy having the computer live wth them. Four-year-old Jay is learning to tell time from the flashing lights of the foot-long narrow walnut clocks installed throughout the house.

Nine-year-old Ann can explain the lights and buttons on the small television control board.

"When they all light up, it means it's messed up," she said, pointing out the button that would remedy the situation.

ECHO helps 13-year-old Ann analyze math problems for school and Mrs. Sutherland said the editing feature of the typewriter was useful in typing a term paper for a course she took in computers.

Since the system retains only the last thing that is typed in a certain space, Mrs. Sutherland could simply type over errors, then direct the computer to reprint, producing a perfect copy.

"It won't be long until the computer will be taking care of the bookkeeping for our household," she added. It will keep records of expenses for monthly budgets, write checks and retain records for income tax purposes.

Jim says he hopes to program the computer to monitor the weather and issue short-term forecasts, inventory groceries and make up shopping lists.

But writing programs is very time consuming, although once written they save much time and energy, Jim says.

He says it will take at least ten years to bring ECHO to its full capabilities. "But it's my hobby, I enjoy it," he says.

"It will never make us any money," Jim adds, "But it sure has been fun."

SAGINAW, MICH.
NEWS
D. 58,435 — S. 58,515
SAGINAW METROPOLITAN AREA
JAN 23 1970

Even a 4-Year-Old Can Use It

Old Junk Turned Into Handy Home Computer

PITTSBURGH (AP) — Some old junk Jim Sutherland brought home from the office is now regulating the furnace in his home, selecting channels on his television, typing papers for his wife and helping his children with their homework.

Sutherland, a computer designer for Westinghouse Electric Corp., bought some obsolete parts from the company and built Echo IV, an electronic computer for home operation, in the basement of his home.

It took Jim six months to design and build Echo IV, housed in a white cabinet along one wall of his basement work room. Since he completed it about three years ago, he's been busy writing programs to make it operate various appliances in his home.

"The real fun of a home computer," Sutherland says, "is when you can tie into the apparatus you're using."

"For instance, I plan to hook up the television picture tube to the system so that Echo can communicate with the family through an unused channel," he explained. "On school nights, the set will switch to that channel at a certain time and remind the children to go to bed."

Jim's three children, including 4-year-old Jay, are learning about computer operations through their father's hobby. Sally, 9 was able to explain the lights and buttons on the small television control board.

"When they all light up, it mean's it's messed up," she said. And she knew which button would remedy the problem.

JOHNSTOWN, PA.
TRIBUNE-DEMOCRAT
— D. 59,934 —
JOHNSTOWN METROPOLITAN AREA
JAN 24 1970

Tinkering Designer Builds Computer to Run Household

PITTSBURGH (AP) — Jim Sutherland's been tinkering with junk in his basement for about four years now and he's created a monster — but a useful one.

A computer designer for Westinghouse Electric Corp., Jim bought some obsolete parts from the company and built ECHO IV, short for Electronic Computer for Home Operation.

"The real fun of a home computer," Jim says, "is when you tie it into the apparatus you're using."

So, ever since he completed the ECHO about three years ago Jim's been busy programming it to regulate the volume and channels of the family TV set, control the furnace, regulate clocks, and play the stereo.

"I plan to hook up the television picture tube to the system so that ECHO can communicate with the family through an unused channel," he explained. "On school nights, the set will switch to that channel at a certain time and remind the children to go to bed."

Jim's children and his wife, Ruth, enjoy having the computer live with them. Four-year-old Jay is learning to tell time from the flashing lights of the foot-long narrow walnut clocks installed throughout the house.

Nine-year-old Ann can explain the lights and buttons on the small television control board.

"When they all light up, it means it's messed up," she said, pointing out the button that would remedy the situation.

ECHO helps Ann analyze math problems for school and Mrs. Sutherland said the editing feature of the typewriter was useful in typing a term paper for a course she took in computers.

Since the system retains only the last thing that is typed in a certain space, Mrs. Sutherland could simply type over errors, then direct the computer to reprint, producing a perfect copy.

"It won't be long until the computer will be taking care of the bookkeeping for our household," she added. It will keep records of expenses for monthly budgets, write checks and retain records for income tax purposes.

"It will never make us any money," Jim adds, "But it sure has been fun."

WILKES-BARRE, PA.
TIMES-LEADER NEWS
— D. 53,565 —
WILKES-BARRE METROPOLITAN AREA

JAN 23 1970

Computer Designed For Household Use

Pittsburgh (AP) — Some old junk Jim Sutherland brought home from the office is now regulating the furnace in his home, selecting channels on his televisioin, typing term papers for his wife and helping his children with their homework.

Sutherland, a computer designer for Westinghouse Electric Corp., bought some obsolete parts from his company and built ECHO IV, an Electronic Computer for Home Operation, in the basement of his split-level home in suburban Plum Borough.

It took Jim six months to design and build Echo IV, housed in a white cabinet along one wall of his basement work room. Since he completed it about three years ago, he's been busy writing programs to make it operate various appliances in his home.

"The real fun of a home computer," Sutherland says, "Is when you can tie into the apparatus you're using."

"For instance, I plan to hook up the television picture tube to the system so that Echo can communicate with the family through an unused channel," he explained. "On school nights, the set will switch to that channel at a certain time and remind the children to go to bed."

Jim's family — including four-year-old Jay — already uses the computer to turn their television on and off, select channels and regulate volume from a portable oiled walnut control board.

The children are learning about computer operations through their father's hobby. Nine-year-old Ann was able to explain the lights and buttons on the small television control board.

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Jay is learning to tell time from the flasning lights of the foot-long narrow walnut "clocks" installed throughout the house.

The computer even helps the school-age Sutherlands with their homework.

It can analyze math problems quickly for 13-year-old Ann and Mrs. Sutherland said the editing feature of the computer typewriter in her kitchen came in handy when she was preparing a term paper for a night-school course in computers.

Since the system retains only the last thing that was typed in a certain space, she could simply go back and type over errors, then direct the computer to reprint, producing a perfect copy.

Mrs. Sutherland, a home economist, has used Echo's reprinting capabilities to address labels and prepare invitations. She also plans to program recipes into the machine so she can call for one from the memory bank whenever she needs it.

"It won't be long until the computer will be taking care of the bookkeeping for our household," Mrs. Sutherland added.

She says her job "takes a good deal of my time each month and I'm looking forward to the computer typing out checks, keeping an itemized account of expenditures and recording the expenses needed for income tax purposes."

"Since it can subtract accurately," she explained, "I will never get another note from the bank saying my account is overdrawn."

TROY, N.Y.
TIMES RECORD
— D. 42,181 —
ALBANY METROPOLITAN AREA

JAN 23 1970

Makes Home Computer From Electronic Junk Pile

PITTSBURGH (AP) — Some old junk Jim Sutherland brought home from the office is now regulating the furnace in his home, selecting channels on his television, typing papers for his wife and helping his children with their homework.

Sutherland, a computer designer for Westinghouse Electric Corp., bought some obsolete parts from the company and built Echo IV, an electronic computer for home operation, in the basement of his home.

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Mrs. Sutherland, a home economist, also plans to program recipes into the machine so she can call for one from the memory bank whenever she needs it.

"It won't be long until the computer will be taking care of the bookkeeping for our household," Mrs. Sutherland said.

BENTON HARBOR, MICH.
NEWS-PALLADIUM
—D. 26,617—
BENTON HARBOR METROPOLITAN AREA
JAN 23 1970

Junked Computer Now Runs Home

It Even Tells Kids When To Go To Bed

PITTSBURGH (AP) — Some old junk Jim Sutherland brought home from the office is now regulating the furnace in his home, selecting channels on his television, typing papers for his wife and helping his children with their homework.

Sutherland, a computer designer for Westinghouse Electric Corp., bought some obsolete parts from the company and built Echo IV, an electronic computer for home operation, in the basement of his home.

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Since the system retains only the last thing typed in a certain space, she can simply go back and type over errors, then direct the computer to reprint, producing a perfect copy.

Mrs. Sutherland, a home economist, also plans to program recipes into the machine so she can call for one from the memory bank whenever she needs it.

"It won't be long until the computer will be taking care of the bookkeeping for our household," Mrs. Sutherland said.

PORTLAND, ME.
EXPRESS
— D. 29,992 —
PORTLAND METROPOLITAN AREA
JAN 23 1970

He Has Almost Everything Fed Into Home Computer

PITTSBURGH (AP) — Some old junk Jim Sutherland brought home from the office is now regulating the furnace in his home, selecting channels on his television, typing papers for his wife and helping his children with their homework.

Sutherland, a computer designer for Westinghouse Electric Corp., bought some obsolete parts from the company and built Echo IV, an electronic computer for home operation, in the basement of his home.

It took Jim six months to design and build Echo IV, housed in a white cabinet along one wall of his basement work room. Since he completed it about three years ago, he's been busy writing programs to make it operate various appliances in his home.

"The real fun of a home computer," Sutherland says, "is when you can tie into the apparatus you're using."

'For instance, I plan to hook up the television picture tube to the system so that Echo can communicate with the family through an unused channel," he explained. "On school nights, the set will switch to that channel at a certain time and remind the children to go to bed."

Jim's three children, including 4-year-old Jay, are learning about computer operations through their father's hobby. Sally, 9 was able to explain the lights and buttons on the small television control board.

"When they all light up, it mean's it's messed up," she said. And she knew which button would remedy the problem.

The computer can analyze math problems quickly for 13-year-old Ann and Mrs. Sutherland said the editing feature of the computer typewriter in her kitchen came in handy when she was preparing a term paper for a night-school course in computers.

Since the system retains only the last thing typed in a certain space, she can simply go back and type over errors, then direct the computer to reprint, producing a perfect copy.

Mrs. Sutherland, a home economist, also plans to program recipes into the machine so she can call for one from the memory bank whenever she needs it.

"It won't be long until the computer will be taking care of the bookkeeping for our household," Mrs. Sutherland said.

WARREN, PA.
TIMES-MIRROR OBSERVER
D. 12,419

JAN 24 1970

Home-Built Computer Useful, Built from Obsolete Units

PITTSBURGH (AP) — Jim Sutherland's been tinkering with junk in his basement for about four years now and he's created a monster-but a useful one.

A computer designer for Westinghouse Electric Corp., Jim bought some obsolete parts from the company and built ECHO IV, short for Electronic Computer for Home Operation.

"The real fun of a home computer," Jim says, "is when you tie it into the apparatus you're using."

So, ever since he completed the ECHO about three years ago Jim's been busy programming it to regulate the volume and channels of the family TV set, control the furnace, regulate clocks, and play the stereo.

"I plan to hook up the television picture tube to the system so that ECHO can communicate with the family through an unused channel," he explained. "On school nights, the set will switch to that channel at a certain time and remind the children to go to bed."

Jim's three children and his wife, Ruth, enjoy having the computer live with them. Four-year-old Jay is learning to tell time from the flashing lights of the foot-long narrow walnut clocks installed throughout the house.

Nine-year-old Ann can explain the lights and buttons on the small television control board. "When they all light up, it means it's messed up," she said, pointing out the button that would remedy the situation.

ECHO helps 13-year-old Ann analyze math problems for school and Mrs. Sutherland said the editing feature of the typewriter was useful in typing a term paper for a course she took in computers.

Since the system retains only the last thing that is typed in a certain space, Mrs. Sutherland could simply type over errors, then direct the computer to reprint, producing a perfect copy.

"It won't be long until the computer will be taking care of the bookkeeping for our household," she added. It will keep records of expenses for monthly budgets, write checks and retain records for income tax purposes.

Jim says he hopes to program the computer to monitor the weather and issue short-term forecasts, inventory groceries and make up shopping lists.

But writing programs is very time consuming, although once written they save much time and energy, Jim says.

He says it will take at least ten years to bring ECHO up to its full capabilities. "But it's my hobby, I enjoy it," he says.

"It will never make us any money," Jim adds, "But it sure has been fun."

ASBURY PARK, N.J.
PRESS
D.54,343 S.58,951

JAN 23 1970

HELPS RUN HOUSE

Computer Hobbyist Puts Idea to Work

PITTSBURGH (AP) — Some old junk Jim Sutherland brought home from the office is now regulating the furnace in his home, selecting channels on his television, typing papers for his wife, and helping his children with their homework.

Sutherland, a computer designer for Westinghouse Electric Corp., bought some obsolete parts from the company and built Echo IV, an electronic computer for home operation, in the basement of his home.

It took him six months to design and build Echo IV, housed in a white cabinet along one wall of his basement work room. Since he completed it about three years ago, he's been busy writing programs to make it operate various appliances in his home.

"The real fun of a home computer," Sutherland says, "is when you can tie into the apparatus you're using."

Sutherland's three children, including 4-year-old Jay, are learning about computer operations through their father's hobby.

"It won't be long until the computer will be taking care of the bookkeeping for our household," Mrs. Sutherland said.

POTTSVILLE, PA.
REPUBLICAN
D. 28,020

JAN 24 1970

Old Junk Regulates Furnace, Switches Television Channels

PITTSBURGH (AP) — Some old junk Jim Sutherland brought home from the office is now regulating the furnace in his home, selecting channels on his television, typing term papers for his wife and helping his children with their homework.

Sutherland, a computer designer for Westinghouse Electric Corp., bought some obsolete parts from the company and built ECHO IV, an Electronic Computer for Home Operation, in the basement of his split-level home in suburban Plum Borough.

It took Jim six months to design and build Echo IV, housed in a white cabinet along one wall of his basement work room. Since he completed it about three years ago, he's been busy writing programs to make it operate various appliances in his home.

"The real fun of a home computer," Sutherland says, "Iis when you can tie into the apparatus you're using."

Remind Children To Go To Bed

"For instance, I plan to hook up the television picture tube to the sytem so that Echo can communicate with the family through an unused channel," he explained. "On school nights, the set will switch to that channel at a certain time and remind the children to go to bed."

Jim's family—including four-year-old Jay—already uses the computer to turn their television on and off, select channels and regulate volume from a portable oiled walnut control board.

The children are learning about computer operations through their father's hobby. Nine-year-old Ann was able to explain the lights and buttons on the small television control board.

"When they all light up, it mean's it's messed up," she said. And she knew which button would remedy the problem.

Jay is learning to tell time from the flashing lights of the foot-long narrow walnut "clocks" installed throughout the house.

Computer Helps With Homework

The computer even helps the school-age Sutherlands with their homework.

It can analyze math problems quickly for 13-year-old Ann and Mrs. Sutherland said the editing feature of the computer typewriter in her kitchen came in handy when she was preparing a term paper for a night-school course in computers.

Since the system retains only the last thing that was typed in a certain space, she could simply go back and type over errors, then direct the computer to reprint, producing a perfect copy.

Mrs. Sutherland, a home economist, has used Echo's reprinting capabilities to address labels and prepare invitations. She also plans to program recipes into the machine so she can call for one from the memory bank whenever she needs it.

"It won't be long until the computer will be taking care of the bookkeeping for our household," Mrs. Sutherland added.

She says her job "takes a good deal of my time each month and I'm looking forward to the computer typing out checks, keeping an itemized account of expenditures and recording the expenses needed for income tax purposes."

"Since it can subtract accurately," she explained, "I will never get another note from the bank saying my account is overdrawn."

NEW YORK, N.Y.
NEWS
D. 2,102,655 — S. 3,132,083
NEW YORK CITY METROPOLITAN AREA

JAN 24 1970

He's Got TV Set Watching the Kids

Pittsburgh, Jan. 23 (AP)—Some old junk Jim Sutherland brought home from the office is now regulating the furnace in his home, selecting channels on his television, typing papers for his wife and helping his children with their homework.

Sutherland, a computer designer for Westinghouse Electric Corp., bought some obsolete parts from the company and built Echo IV, an electronic computer for home operation, in the basement of his home.

It took Jim six months to design and build Echo IV, housed in a white cabinet along one wall of his basement work room. Since he completed it about three years ago, he's been busy programming it to operate various appliances.

"The real fun of a home computer," Sutherland says, "is when you can tie into the apparatus you're using."

"For instance, I plan to hook up the television picture tube to the system so that Echo can communicate with the family through an unused channel," he explained. "On school nights, the set will switch to that channel at a certain time and remind the children to go to bed."

Jim's three children, including 4-year-old Jay, are learning about computer operations. Sally, 9, was able to explain the lights and buttons on the small television control board.

"When they all light up, it means it's messed up," she said. And she knew which button would remedy the problem.

POUGHKEEPSIE, N.Y.
JOURNAL
D. 35,739 — S. 41,003
POUGHKEEPSIE METROPOLITAN AREA

JAN 25 1970

He Builds Computer To Do Tasks At Home

PITTSBURGH (AP) — Some old junk Jim Sutherland brought home from the office is now regulating the furnace in his home, selecting channels on his television, typing papers for his wife and helping his children with their homework.

Sutherland, a computer designer for Westinghouse Electric Corp., bought some obsolete parts from the company and built Echo IV, an electronic computer for home operation, in the basement of his home.

It took Jim six months to design and build Echo IV, housed in a white cabinet along one wall of his basement work room. Since he completed it about three years ago, he's been busy writing programs to make it operate various appliances in his home.

"The real fun of a home computer," Sutherland says, "is when you can tie into the apparatus you're using."

"For instance, I plan to hook up the television picture tube to the system so that Echo can communicate with the family through an unused channel," he explained. "On school nights, the set will switch to that channel at a certain time and remind the children to go to bed."

Jim's three children, including 4-year-old Jay, are learning about computer operations through their father's hobby. Sally, 9 was able to explain the lights and buttons on the small television control board.

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Since the system retains only the last thing typed in a certain space, she can simply go back and type over errors, then direct the computer to reprint, producing a perfect copy.

Mrs. Sutherland, a home economist, also plans to program recipes into the machine so she can call for one from the memory bank whenever she needs it.

"It won't be long until the computer will be taking care of the bookkeeping for our household," Mrs. Sutherland said.

LAFAYETTE, LA.
ADVERTISER
D. 22,972 — S. 23,218
LAFAYETTE METROPOLITAN AREA

JAN 23 1970

Designer Builds Computer For Use In His Home

PITTSBURGH (AP) — Some old junk Jim Sutherland brought home from the office is now regulating the furnace in his home, selecting channels on his television, typing papers for his wife and helping his children with their homework.

Sutherland, a computer designer for Westinghouse Electric Corp., bought some obsolete parts from the company and built Echo IV, an electronic computer for home operation, in the basement of his home.

Six Months

It took Jim six months to design and build Echo IV, housed in a white cabinet along one wall of his basement work room. Since he completed it about three years ago, he's been busy writing programs to make it operate various appliances in his home.

"The real fun of a home computer," Sutherland says, "is when you can tie into the apparatus you're using."

Unused Channel

"For instance, I plan to hook up the television picture tube to the system so that Echo can communicate with the family through an unused channel," he explained. "On school nights,

Problems Quickly

nel at a certain time and remind the children to go to bed."

Jim's three children, including 4-year-old Jay, are learning about computer operations through their father's hobby. Sally, 9 was able to explain the lights and buttons on the small television control board.

"When they all light up, it mean's it's messed up," she said. And she knew which button would remedy the problem. the set will switch to that chan-

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Since the system retains only the last thing typed in a certain space, she can simply go back and type over errors, then direct the computer to reprint, producing a perfect copy.

Mrs. Sutherland, a home economist, also plans to program recipes into the machine so she can call for one from the memory bank whenever she needs it.

"It won't be long until the computer will be taking care of the bookkeeping for our household," Mrs. Sutherland said.

WILLINGBORO, N.J.
COUNTY TIMES
— D. 27,315 —
PHILADELPHIA METROPOLITAN AREA

JAN 26 1970

Home Computer Handles Chores For Design Man

By Jacqueline Snyder

PITTSBURGH (AP) — Some old junk Jim Sutherland brought home from the office is now regulating the furnace in his home, selecting channels on his television, typing papers for his wife and helping his children with their homework.

Sutherland, a computer designer for Westinghouse Electric Corp., bought some obsolete parts from the company and built Echo IV, an electronic computer for home operation, in the basement of his home.

It took Jim six months to design and build Echo IV, housed in a white cabinet along one wall of his basement work room. Since he completed it about three years ago, he's been busy writing programs to make it operate various appliances in his home.

"The real fun of a home computer," Sutherland says, "is when you can tie into the apparatus you're using."

"For instance, I plan to hook up the television picture tube to the system so that Echo can communicate with the family through an unused channel," he explained. "On school nights, the set will switch to that channel at a certain time and remind the children to go to bed."

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Mrs. Sutherland, a home economist, also plans to program recipes into the machine so she can call for one from the memory bank whenever she needs it.

"It won't be long until the computer will be taking care of the bookkeeping for our household," Mrs. Sutherland said.

SHREVEPORT, LA.
JOURNAL
— D. 45,722 —
SHREVEPORT METROPOLITAN AREA

JAN 23 1970

Built in Basement—

Home Computer Helps Regulate Household

PITTSBURGH (AP) — Some old junk Jim Sutherland brought home from the office is now regulating the furnace in his home, selecting channels on his television, typing papers for his wife and helping his children with their homework.

Sutherland, a computer designer for Westinghouse Electric Corp., bought some obsolete parts from the company and built Echo IV, an electronic computer for home operation, in the basement of his home.

It took Jim six months to design and build Echo IV, housed in a white cabinet along one wall of his basement work room. Since he completed it about three years ago, he's been busy writing programs to make it operate various appliances in his home.

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Since the system retains only the last thing typed in a certain space, she can simply go back and type over errors, then direct the computer to reprint, producing a perfect copy.

ST. MARY'S, PA.
PRESS
D. 4,546

JAN 24 1970

Man Built Computer To Help At Home

Designer Made Device Out Of Obsolete Parts

By JACQUELINE SNYDER
Associated Press Writer

PITTSBURGH (AP) — Some old junk Jim Sutherland brought home from the office is now regulating the furnace in his home, selecting channels on his television, typing term papers for his wife and helping his children with their homework.

Sutherland, a computer designer for Westinghouse Electric Corp., bought some obsolete parts from the company and built ECHO IV, an Electronic Computer for Home Operation, in the basement of his split-level home in suburban Plum Borough.

It took Jim six months to design and build Echo IV, housed in a white cabinet along one wall of his basement work room. Since he completed it about three years ago, he's been busy writing programs to make it operate various appliances in his home.

"The real fun of a home computer," Sutherland says, "is when you can tie into the apparatus you're using."

"For instance, I plan to hook up the television picture tube to the system so that Echo can communicate with the family through an unused channel," he explained. "On school nights, the set will switch to that channel at a certain time and remind the children to go to bed."

Jim's family—including four-year-old Jay—already uses the computer to turn their television on and off, select channels and regulate volume from a portable oiled walnut control board.

The children are learning about computer operations through their father's hobby. Nine-year-old Ann was able to explain the lights and buttons on the small television control board.

"When they all light up, it mean's it's messed up," she said. And she knew which button would remedy the problem.

Jay is learning to tell time from the flashing lights of the foot-long narrow walnut "clocks" installed throughout the house.

The computer even helps the school-age Sutherlands with their homework.

It can analyze math problems quickly for 13-year-old Ann and Mrs. Sutherland said the editing feature of the computer typewriter in her kitchen came in handy when she was preparing a term paper for a night-school course in computers.

Since the system retains only the last thing that was typed in a certain space, she could simply go back and type over errors, then direct the computer to reprint, producing a perfect copy.

Mrs. Sutherland, a home economist, has used Echo's reprinting capabilities to address labels and prepare invitations. She also plans to program recipes into the machine so she can call for one from the memory bank whenever she needs it.

"It won't be long until the computer will be taking care of the bookkeeping for our household," Mrs. Sutherland added.

She says her job "takes a good deal of my time each month and I'm looking forward to the computer typing out checks, keeping an itemized account of expenditures and recording the expenses needed for income tax purposes."

"Since it can subtract accurately," she explained, "I will never get another note from the bank saying my account is overdrawn."

Jim hopes to use the computer to monitor the weather, issue short-term forecasts, inventory groceries and make up shopping lists for the family.

But writing programs for all these things takes time and Jim says it will be at least ten years before he can bring Echo up to its full capability.

"When you build a computer, it's like having a car in the driveway, but no roads or highways to drive it on," he said. "You have to build your own highways by programming the computer for various tasks. This takes time, but it's my hobby."

He doesn't see a market for home computers unless "common highway is found for programming them."

But he said the day may come when programmed cassette tapes might be inserted into a home model to complete any given household task.

Of his own version he added: "It never will make us any money, but it sure has been fun."

ST. JOSEPH, MO.
NEWS-PRESS
D. 45,455 — S. 50,812
ST. JOSEPH METROPOLITAN AREA

JAN 23 1970

Computer Made at Home Performs Variety of Chores

PITTSBURGH (AP) — Some old junk Jim Sutherland brought home from the office is now regulating the furnace in his home, selecting channels on his television, typing papers for his wife and helping his children with their homework.

Sutherland, a computer designer for Westinghouse Electric Corp., bought some obsolete parts from the company and built Echo IV, an electronic computer for home operation, in the basement of his home.

It took Jim six months to design and build Echo IV, housed in a white cabinet along one wall of his basement work room. Since he completed it about three years ago, he's been busy writing programs to make it operate various appliances in his home.

Tieing Into Apparatuses

"The real fun of a home computer," Sutherland says, "is when you can tie into the apparatus you're using."

"For instance, I plan to hook up the television picture tube to the system so that Echo can communicate with the family through an unused channel," he explained. "On school nights, the set will switch to that channel at a certain time and remind the children to go to bed."

Jim's three children, including 4-year-old Jay, are learning about computer operations through their father's hobby. Sally, 9 was able to explain the lights and buttons on the small television control board.

"When they all light up, it means it's messed up," she said. And she knew which button would remedy the problem.

Analyzes and Edits

The computer can analyze math problems quickly for 13-year-old Ann and Mrs. Sutherland said the editing feature of the computer typewriter in her kitchen came in handy when she was preparing a term paper for a night-school course in computers.

Since the system retains only the last thing typed in a certain space, she can simply go back and type over errors, then direct the computer to reprint, producing a perfect copy.

Mrs. Sutherland, a home economist, also plans to program recipes into the machine so she can call for one from the memory bank whenever she needs it.

"It won't be long until the computer will be taking care of the bookkeeping for our household," Mrs. Sutherland said.

PHILADELPHIA, PA.
BULLETIN
D. 671,525 — S. 728,276
PHILADELPHIA METROPOLITAN AREA

JAN 23 1970

Smart Junk

Some old junk Jim Sutherland brought home from the office is now regulating the furnace in his home, typing papers for his wife and helping his childre.. with their homework. Sutherland, a computer designer for Westinghouse Electric Corp., in Pittsburgh, brought home some old leftover parts and built Echo IV in his basement. It took him six months, but now the computer sits in a white cabinet along one wall of the basement, whirring, humming and lighting up as it helps run the Sutherland household. Even the three kids know about the lights and buttons. "When they all light up, it means it's messed up," said Sutherland's nine-year-old daughter. But she knew which button to push to correct the mess.

NEW BRITAIN, CONN.
HERALD
— D. 33,321 —
HARTFORD METROPOLITAN AREA

JAN 2 3 1970

Even Reminds of Bedtime:

Computer Built of Junk Now Operates His Home

By JACQUELINE SNYDER

PITTSBURGH (AP) — Some old junk Jim Sutherland brought home from the office is now regulating the furnace in his home, selecting channels on his television, typing papers for his wife and helping his children with their homework.

Sutherland, a computer designer for Westinghouse Electric Corp., bought some obsolete parts from the company and built Echo IV, an electronic computer for home operation, in the basement of his home.

It took Jim six months to design and build Echo IV, housed in a white cabinet along one wall of his basement work room. Since he completed it about three years ago, he's been busy writing programs to make it operate various appliances in his home.

His Greatest Fun

"The real fun of a home computer," Sutherland says, "is when you can tie into the apparatus you're using."

"For instance, I plan to hook up the television picture tube to the system so that Echo can communicate with the family through an unused channel," he explained. "On school nights, the set will switch to that channel at a certain time and remind the children to go to bed."

Jim's three children, including 4-year-old Jay, are learning about computer operations through their father's hobby. Sally, 9, was able to explain the lights and buttons on the small television control board.

"When they all light up, it means it's messed up," she said. And she knew which button would remedy the problem.

Helps Girl With Math

The computer can analyze math problems quickly for 13-year-old Ann and Mrs. Sutherland said the editing feature of the computer typewriter in her kitchen came in handy when she was preparing a term paper for a night-school course in computers.

Since the system retains only the last thing typed in a certain space, she can simply go back and type over errors, then direct the computer to reprint, producting a perfect copy.

Mrs. Sutherland, a home economist, also plans to program recipes into the machine so she can call for one from the memory bank whenever she needs it.

"It won't be long until the computer will be taking care of the bookkeeping for our household," Mrs. Sutherland said.

TOLEDO, OHIO
TIMES
— D. 31,347 —
TOLEDO METROPOLITAN AREA

JAN 26 1970

—AP Wirephoto

Computer Controls Home Appliances

Jim Sutherland, a computer designer for Westinghouse Electric Corp., shows his wife, Ruth, a logic board from a computer he designed and built from obsolete parts he bought from the company. The system controls the television and stereo in their Pittsburgh home. Mr. Sutherland hopes to program it to play games with Jay, 4, Sally, 9, and Ann, 13.

MARYVILLE-ALCOA, TENN.
TIMES
— D. 13,746 —
KNOXVILLE METROPOLITAN AREA
JAN 26 1970

Home made computer does work

PITTSBURGH (AP) — Some old junk Jim Sutherland brought home from the office is now regulating the furnace in his home, selecting channels on his television, typing papers for his wife and helping his children with their homework.

Sutherland, a computer designer for Westinghouse Electric Corp., bought some obsolete parts from the company and built Echo IV, an electronic computer for home operation, in the basement of his home.

It took Jim six months to design and build Echo IV, housed in a white cabinet along one wall of his basement work room. Since he completed it about three years ago, he's been busy writing programs to make it operate various appliances in his home.

"The real fun of a home computer," Sutherland says, "is when you can tie into the apparatus you're using."

"For instance, I plan to hook up the television picture tube to the system so that Echo can communicate with the family through an unused channel," he explained. "On school nights, the set will switch to that channel at a certain time and remind the children to go to bed."

Jim's three children, including 4-year-old Jay, are learning about computer operations through their father's hobby. Sally, 9, was able to explain the lights and buttons on the small television control board.

"When they all light up, it mean's it's messed up," she said. And she knew which button would remedy the problem.

The computer can analyze math problems quickly for 13-year-old Ann and Mrs. Sutherland said the editing feature of the computer typewriter in her kitchen came in handy when she was preparing a term paper for a night-school course in computers.

Since the system retains only the last thing typed in a certain space, she can simply go back and type over errors, then direct the computer to reprint, producing a perfect copy.

Mrs. Sutherland, a home economist, also plans to program recipes into the machine so she can call for one from the memory bank whenever she needs it.

"It won't be long until the computer will be taking care of the bookkeeping for our household," Mrs. Sutherland said.

HOUSTON, TEXAS
POST
D. 280,368 — S. 318,984
HOUSTON METROPOLITAN AREA

JAN 24 1970

Jim Sutherland, a computer designer for Westinghouse Electric Corp, shows his wife Ruth a logic board from a computer he designed and built from obsolete parts he bought from the company. The system controls the television and stereo in his home. Sutherland hopes to program it to play games with his children.

PHOENIXVILLE, PA.
REPUBLICAN
— D. 6,660 —
PHILADELPHIA METROPOLITAN AREA

JAN 26 1970

Home Computer Aids Kid with Homework

By JACQUELINE SNYDER
Associated Press Writer

PITTSBURGH (AP) — Some old junk Jim Sutherland brought home from the office is now regulating the furnace in his home, selecting channels on his television, typing term papers for his wife and helping his children with their homework.

Sutherland, a computer designer for Westinghouse Electric Corp., bought some obsolete parts from the company and built ECHO IV, an Electronic Computer for Home Operation, in the basement of his split-level home in suburban Plum Borough.

6 MONTHS TO DESIGN

It took Jim six months to design and build Echo IV, housed in a white cabinet along one wall of his basement work room. Since he completed it about three years ago, he's been busy writing programs to make it operate various appliances in his home.

"The real fun of a home computer," Sutherland says, "It's when you can tie into the apparatus you're using."

"For instance, I plan to hook up the television picture tube to the system so that Echo can communicate with the family through an unused channel," he explained. "On school nights, the set will switch to that channel at a certain time and remind the children to go to bed."

Jim's family—including four-year-old Jay—already uses the computer to turn their television on and off, select channels and regulate volume from a portable oiled walnut control board.

The children are learning about computer operations through their father's hobby. Nine-year-old Ann was able to explain the lights and buttons on the small television control board.

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Jay is learning to tell time from the flashing lights of the foot-long narrow walnut "clocks" installed throughout the house.

The computer even helps the school-age Sutherlands with their homework.

It can analyze math problems quickly for 9-year-old Ann and Mrs. Sutherland said the editing feature of the computer typewriter in her kitchen came in handy when she was preparing a term paper for a night-school course in computers.

Since the system retains only the last thing that was typed in a certain space, she could simply go back and type over errors, then direct the computer to reprint, producing a perfect copy.

Mrs. Sutherland, a home economist, has used Echo's reprinting capabilities to address labels and prepare invitations. She also plans to program recipes into the machine so she can call for one from the memory bank whenever she needs it.

BOOKKEEPING

"It won't be long until the computer will be taking care of the bookkeeping for our household," Mrs. Sutherland added.

She says her job "takes a good deal of my time each month and I'm looking forward to the computer typing out checks, keeping an itemized account of expenditures and recording the expenses needed for income tax purposes."

"Since it can subtract accurately," she explained, "I will never get another note from the bank saying my account is overdrawn."

COLUMBUS, OHIO
DISPATCH
223,673 — S. 318,040
COLUMBUS METROPOLITAN AREA

JAN 23 1970

COMPUTER CONTROL — Jim Sutherland, a computer designer for Westinghouse Electric Corp., shows his wife, Ruth, a logic board from a computer he designed and built from obsolete parts he bought from the company. The system controls the television and stereo, among other things in the home. Sutherland hopes to program it to play games with Ann, 13, Sally, 9, and Jay, 4. (AP)

Handles Homework

COMPUTER DOES HOME CHORES

PITTSBURGH (AP) — Some old junk Jim Sutherland brought home from the office is now regulating the furnace in his home, selecting channels on his television, typing papers for his wife and helping his children with their homework.

Sutherland, a computer designer for Westinghouse Electric Corp., bought some obsolete parts from the company and built Echo IV, an electronic computer for home operation, in the basement of his home.

IT TOOK JIM six months to design and build Echo IV, housed in a white cabinet along one wall of his basement work room. Since he completed it about three years ago, he has been busy writing programs to make it operate various appliances in his home.

"The real fun of a home computer," Sutherland says, "is when you can tie into the apparatus you're using."

"For instance, I plan to hook up the television picture tube to the system so that Echo can communicate with the family through an unused channel," he explained. "On school nights, the set will switch to that channel at a certain time and remind the children to go to bed."

JIM'S THREE children, including 4-year-old Jay, are learning about computer operations through their father's hobby. Sally, 9, was able to explain the lights and buttons on the small television control board.

"When they all light up, it means it's messed up," she said. And she knew which button would remedy the problem.

The computer can analyze math problems quickly for 13-year-old Ann, and Mrs. Sutherland said the editing feature of the computer typewriter in her kitchen came in handy when she was preparing a term paper for a night-school course in computers.

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Mrs. Sutherland, a home economist, also plans to program recipes into the machine so she can call for one from the memory bank whenever she needs it.

"It won't be long until the computer will be taking care of the bookkeeping for our household," Mrs. Sutherland said.

ROCHESTER, N.Y.
TIMES UNION
— D. 143,855 —
ROCHESTER METROPOLITAN AREA

JAN 23 1970

—AP Wirephoto to The Times-Union

Jim Sutherland shows his wife a logic board from a computer he designed for use in his home. The Sutherland children, playing a game on the floor, are (from left) Ann, 13; Sally, 9, and Jay, 4.

People of the Times

And Now--Computer in the Home

Some old junk Jim Sutherland brought home from the office in Pittsburgh is now regulating the furnace in his home, selecting channels on his television, typing papers for his wife and helping his children with their homework.

Sutherland, a computer designer for Westinghouse Electric Corp., bought some obsolete parts from the company and built Echo IV, an electronic computer for home operation, in the basement of his home.

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SOUTH BEND, IND.
TRIBUNE
D. 120,288 — S. 126,433
SOUTH BEND METROPOLITAN AREA
JAN 23 1970

'Old Junk' Functions as Home Computer

* * *

PITTSBURGH (AP) — Some old junk Jim Sutherland took home from the office is now regulating his furnace, selecting channels on his television, typing papers for his wife and helping his children with their homework.

Sutherland, a computer designer for Westinghouse Electric Corp., bought obsolete parts from the company and built Echo IV, an electronic computer for home operation, in the basement of his home.

It took Jim six months to design and build Echo IV, housed in a white cabinet along one wall of his basement workroom. Since he completed it about three years ago, he's been busy writing programs to make it operate various appliances in his home.

Uses TV Channel

"The real fun of a home computer," Sutherland says, "is when you can tie into the apparatus you're using."

"For instance, I plan to hook up the television picture tube to the system so that Echo can communicate with the family through an unused channel," he explained. "On school nights, the set will switch to that channel at a certain time and remind the children to go to bed."

Jim's three children, including 4-year-old Jay, are learning about computer operations through their father's hobby. Sally, 9, was able to explain the lights and buttons on the small television control board.

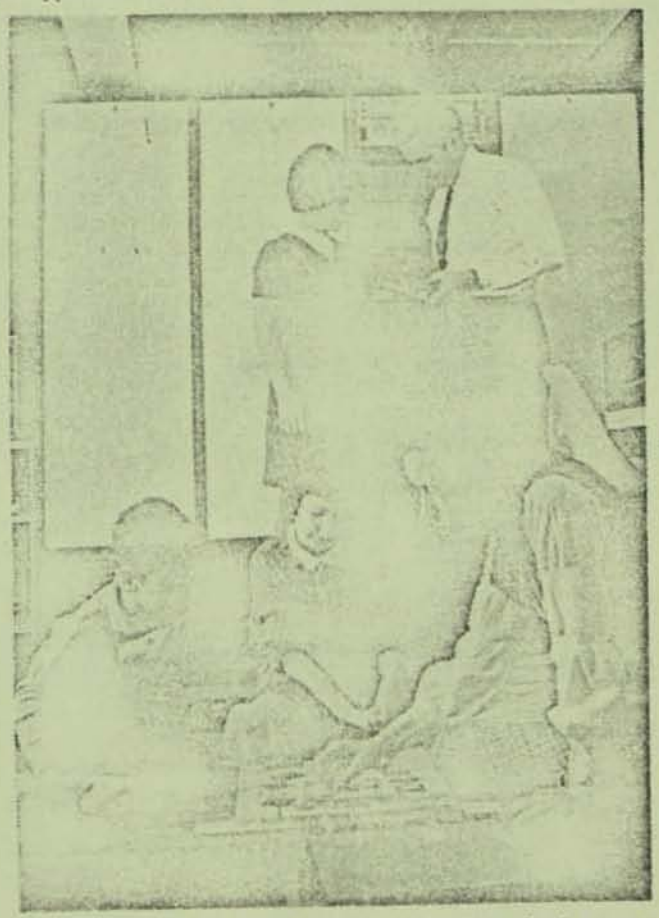
Analyzes Math Problems

"When they all light up, it means it's messed up," she said. And she knew which button would remedy the problem.

The computer can analyze math problems quickly for 13-year-old Ann. Mrs. Sutherland said the editing feature of the computer typewriter in her kitchen came in handy when she was preparing a term paper for a night-school course in computers.

Since the system retains only the last thing typed in a certain space, she can simply go back and type over errors, then direct the computer to reprint, producing a perfect copy.

Mrs. Sutherland, a home economist, also plans to program recipes into the machine so she can call for one from the memory bank whenever she needs it. And, she said, "it won't be long until the computer will be taking care of the bookkeeping for our household."



COMPUTER IN THE HOME — Jim Sutherland, a computer designer for the Westinghouse Electric Corp., shows his wife Ruth a logic board from a computer he designed and built from obsolete parts he bought from the company. The computer controls appliances in the Sutherland's Pittsburgh house. The Sutherland children play in foreground.

—Associated Press Wirephoto

LOS ANGELES, CALIF.
TIMES
D. 917,082 — S. 1,219,382
ANGELES METROPOLITAN AREA

JAN 24 1970

HELPS DO HOMEWORK, TOO

Computer Built From Junk Runs Appliances in Home

TSBURGH (AP)—Some old junk Jim Sutherland brought home from the office is now regulating the furnace in his home, selecting channels on his television, typing papers for his wife and helping children with their homework.

Sutherland, a computer designer for Westinghouse Electric Corp., bought some obsolete parts from the company, and built Echo IV, an electronic computer for home operation, in the basement of his home.

It took Jim six months to design and build Echo IV, housed in a cabinet along one wall of his ment work room. Since he completed it about three years ago, he has been busy writing programs to make it operate various appliances in his home.

The real fun of a home computer," Sutherland says, "is when you can tie into the apparatus you're using."

"For instance, I plan to hook up the television picture tube to the system so that Echo can communicate with the family through an unused channel," he explained. "On school nights, the set will switch to channel at a certain time and remind the children to go to bed."

Jim's three children, including 4-year-old Jay, are learning about computer operations through their 's hobby. Sally, 9, able to explain the lights and buttons on the small television control board.

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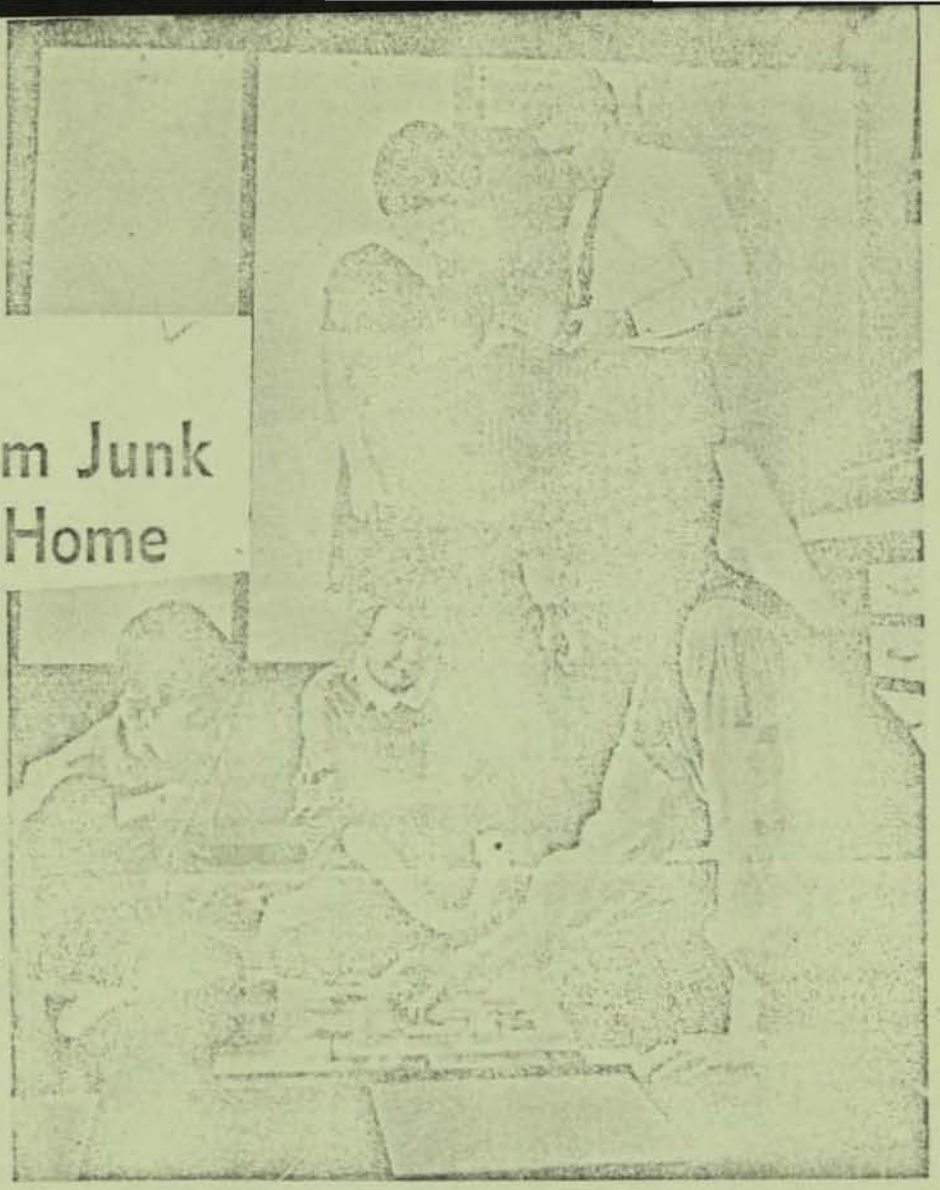

COMPUTERIZED HOME—Computer designer Jim Sutherland shows wife, Ruth, logic board from computer he built to control home appliances. He hopes to program it to play games with their children, Jay, 4; Sally, 9, and Ann, 13. (P) Wirephoto

HARTFORD, CONN.
TIMES
D. 155,812 — S. 135,812
HARTFORD METROPOLITAN AREA
JAN 23 1970

—[Associated Press Photo

COMPUTER CONTROLS HOME APPLIANCES
... Sutherland family has its own homemade computer

Home Is Run By Computer

PITTSBURGH (AP) — Some old junk Jim Sutheralnd brought home from the office is now regulating the furnace in his home, selecting channels on his television, typing papers for his wife and helping his children with their homework.

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"The real fun of a home computer," Sutherland says, "is when you can tie into the apparatus you're using."

"For instance, I plan to hook up the television picture tube to the system so that Echo can communicate with the family through an unused channel," he explained. "On school nights, the set will switch to that channel at a certain time and remind the children to go to bed."

Jim's three children, including 4-year-old Jay, are learning about computer operations through their father's hobby. Sally, 9, was able to explain the lights and buttons on the small television control board.

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Mrs. Sutherland, a home economist, also plans to program recipes into the machine so she can call for one from the memory bank whenever she needs it.

"It won't be long until the computer will be taking care of the bookkeeping for our household," Mrs. Sutherland said.

HARRISBURG, PA.
PATROIT
D. 45,299 — S. 159,880
HARRISBURG METROPOLITAN AREA
JAN 24 1970

Makeshift Computer Becomes Family's 'Jack of All Trades'

★ ★ ★ ★ ★ ★

By JACQUELINE SNYDER

PITTSBURGH (AP) — Jim Sutherland's been tinkering with junk in his basement for about four years now and he's created a monster — but a useful one.

A computer designer for Westinghouse Electric Corp., Jim bought some obsolete parts from the company and built ECHO IV, short for Electronic Computer for Home Operation.

"The real fun of a home computer," Jim says, "is when you tie it into the apparatus you're using."

So, ever since he completed the ECHO about three years ago Jim's been busy programming it to regulate the volume and channels of the family TV set, control the furnace, regulate clocks, and play the stereo.

"I plan to hook up the television picture tube to the system so that ECHO can communicate with the family through an unused channel," he explained. "On school nights, the set will switch to that channel at a certain time and remind the children to go to bed."

Jim's three children and his wife, Ruth, enjoy having the computer live with them.

Four-year-old Jay is learning to tell time from the flashing lights of the foot-long narrow walnut clocks installed throughout the house.

Nine-year-old Ann can explain the lights and buttons on the small television control board.

"When they all light up, it means it's messed up," she said, pointing out the button that would remedy the situation.

ECHO helps 13-year-old Ann analyze math problems for school and Mrs. Sutherland said the editing feature of the typewriter was useful in typing a term paper for a course she took in computers.

Since the system retains only the last thing that is typed in a certain space, Mrs. Sutherland could simply type over errors, then direct the computer to reprint, producing a perfect copy.

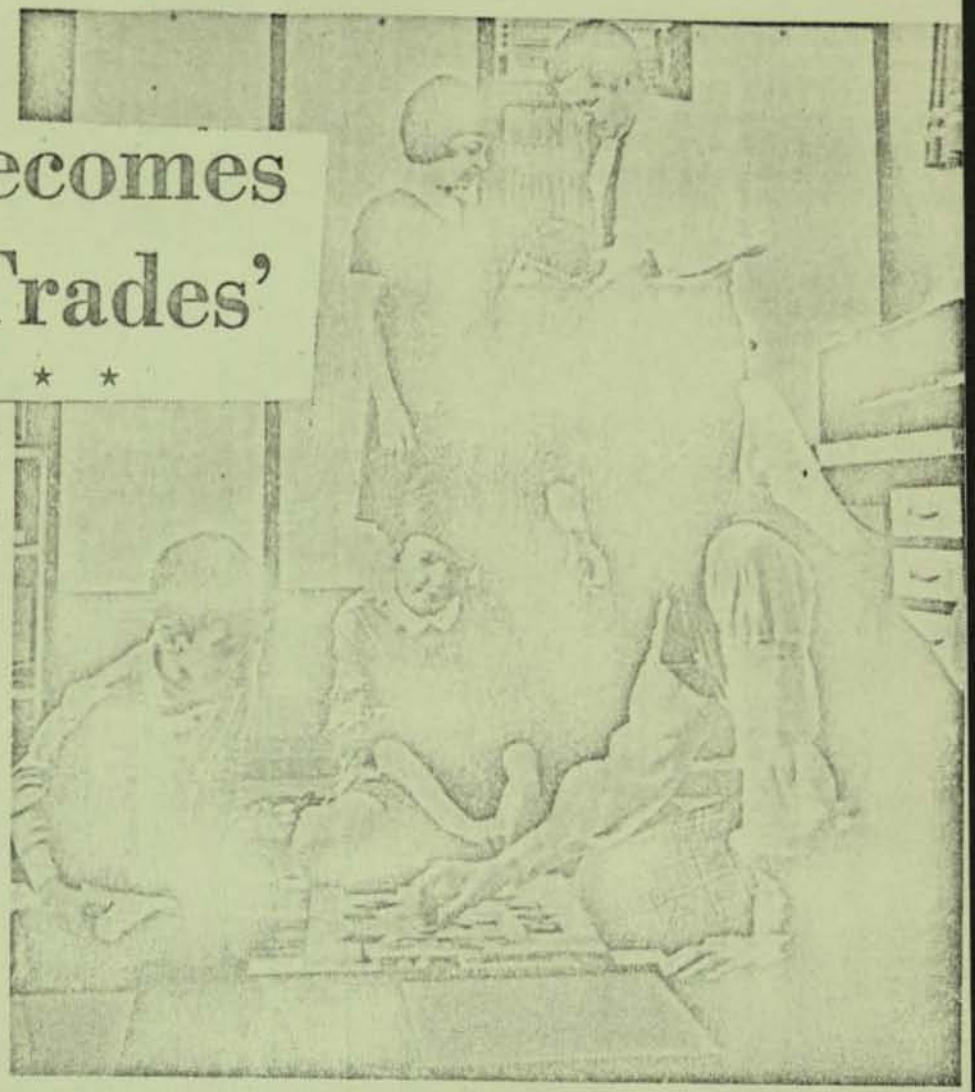
"It won't be long until the computer will be taking care of the bookkeeping for our household," she added. It will keep records of expenses for monthly budgets, write checks and retain records for income tax purposes.

Jim says he hopes to program the computer to monitor the weather and issue short-term forecasts, inventory groceries and make up shopping lists.

But writing programs is very time consuming, although once written they save much time and energy, Jim says.

He says it will take at least 10 years to bring ECHO up to its full capabilities. "But it's my hobby, I enjoy it," he says.

"It will never make us any money," Jim adds, "but it sure has been fun."



—Patriot-AP Wirephoto

Computer Designed to Control Home Appliances

James Sutherland, computer designer for Westinghouse Electric Corp., shows his wife Ruth a logic board from a computer he fashioned from parts purchased from the company in Pittsburgh. The system controls the television and stereo among other things in the home. Sutherland hopes to program it to play games with his children, from left, Jay,4; Sally,9, and Ann, 13.

GRAND RAPIDS, MICH.
PRESS
D. 133,419 — S. 138,539
GRAND RAPIDS METROPOLITAN AREA

JAN 24 1970

—AP Wirephoto

JIM SUTHERLAND, a computer designer for Westinghouse Electric Corp., shows his wife, Ruth, a logic board from a computer he designed and built to control the television and stereo among other things in the home. Sutherland hopes to program it to play games with children Ann, 13, Sally, 9, and Jay, 4.

His Computer Runs Home

PITTSBURGH (AP)—Some old junk Jim Sutherland brought home from the office is now regulating the furnace in his home, selecting channels on his television, typing papers for his wife and helping his children with their homework.

Sutherland, a computer designer for Westinghouse Electric Corp., bought some obsolete parts from the company and built Echo IV, an electronic computer for home operation, in the basement of his home.

It took Jim six months to design and build Echo IV, housed in a white cabinet along one wall of his basement work room. Since he completed it about three years ago, he's been busy writing programs to make it operate various appliances in his home.

"The real fun of a home computer," Sutherland says, "is when you can tie into the apparatus you're using.

"For instance, I plan to hook up the television picture tube to the system so that Echo can communicate with the family through an unused channel," he explained. "On school nights, the set will switch to that channel at a certain time and remind the children to go to bed."

Jim's three children, including 4-year-old Jay, are learning about computer operations through their father's hobby. Sally, 9 was able to explain the lights and buttons on the small television control board.

"When they all light up, it means it's messed up," she said. And she knew which button would remedy the problem.

The computer can analyze math problems quickly for 13-year-old Ann and Mrs. Sutherland said the editing feature of the computer typewriter in her kitchen came in handy when she was preparing a term paper for a night-school course in computers.

Since the system retains only the last thing typed in a certain space, she can simply go back and type over errors, then direct the computer to reprint, producing a perfect copy.

Mrs. Sutherland, a home economist, also plans to program recipes into the machine so she can call for one from the memory bank whenever she needs it.

"It won't be long until the computer will be taking care of the bookkeeping for our household," Mrs. Sutherland said.

NEW HAVEN, CONN.
REGISTER
D. 104,849 — S. 122,459
NEW HAVEN METROPOLITAN AREA

JAN 23 1970

AP

Jim Sutherland, shows his wife Ruth a logic board from a computer he designed and built from obsolete parts. The system controls the television and stereo among other things in the home. Sutherland hopes to program it to play games with Ann, 13, Sally, 9, and Jay, 4.

Computer Made From Junk Picks TV, Does Homework

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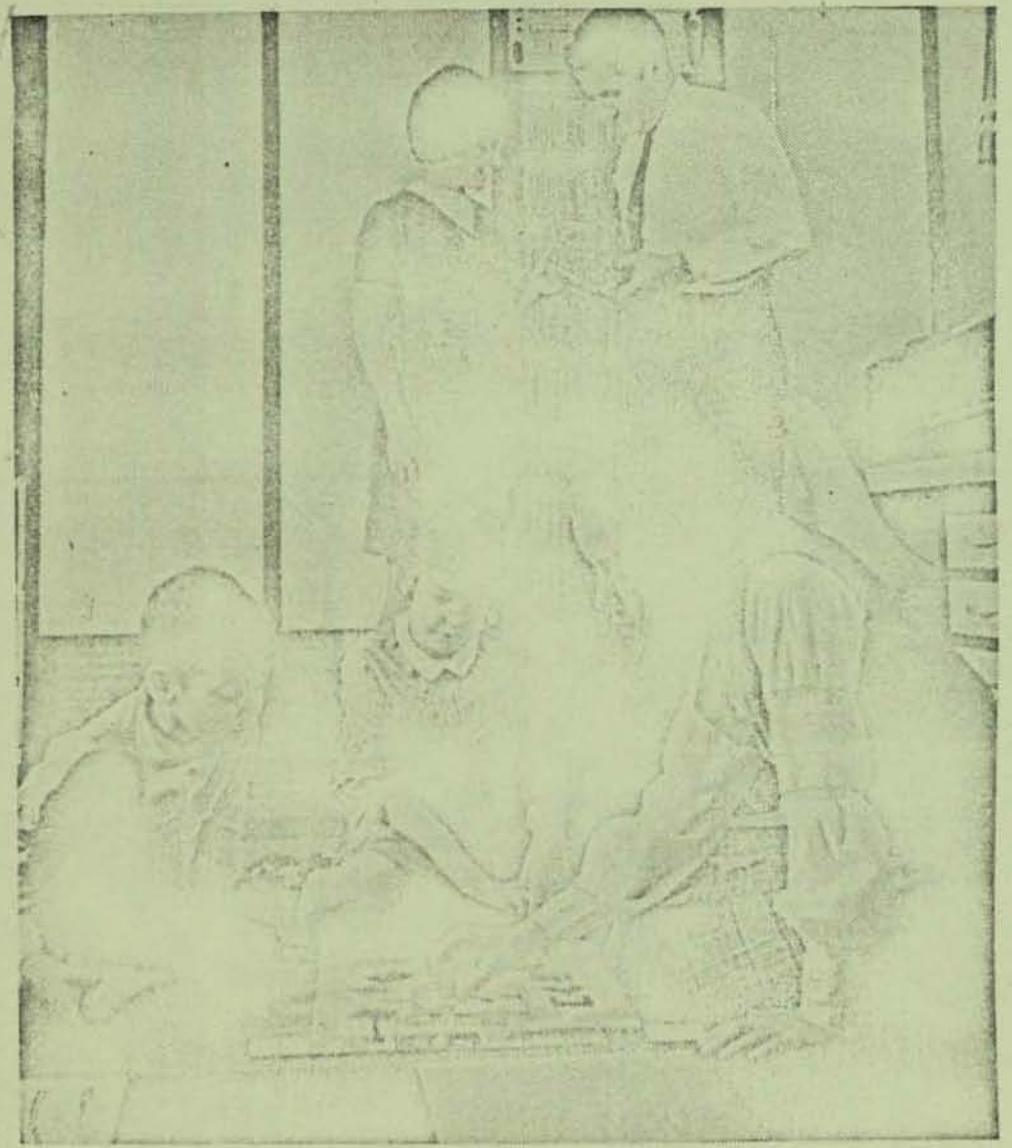
CHICAGO, ILL.
CHICAGO TODAY
D. 436,893 — S. 483,418
CHICAGO METROPOLITAN AREA
JAN 23 1970



AP Wirephoto

Computer designer Jim Sutherland shows his wife, Ruth, a logic board from a computer he designed and built from obsolete parts at his job. The system controls the television and stereo and he hopes to program it to play games with [his children] Ann, 13; Sally, 9, and Jay, 4.

Computing—home style

Some junk—this is living!

BY JACQUELINE SNYDER

PITTSBURGH (AP) — Some old junk Jim Sutherland brought home from the office is regulating the furnace in his home, selecting channels on his television, typing papers for his wife, and helping his children with their homework.

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It took Jim 6 months to design and build Echo IV, housed in a white cabinet along one wall of his basement work room. Since he completed it about 3 years ago, he has been busy writing programs to make it operate appliances.

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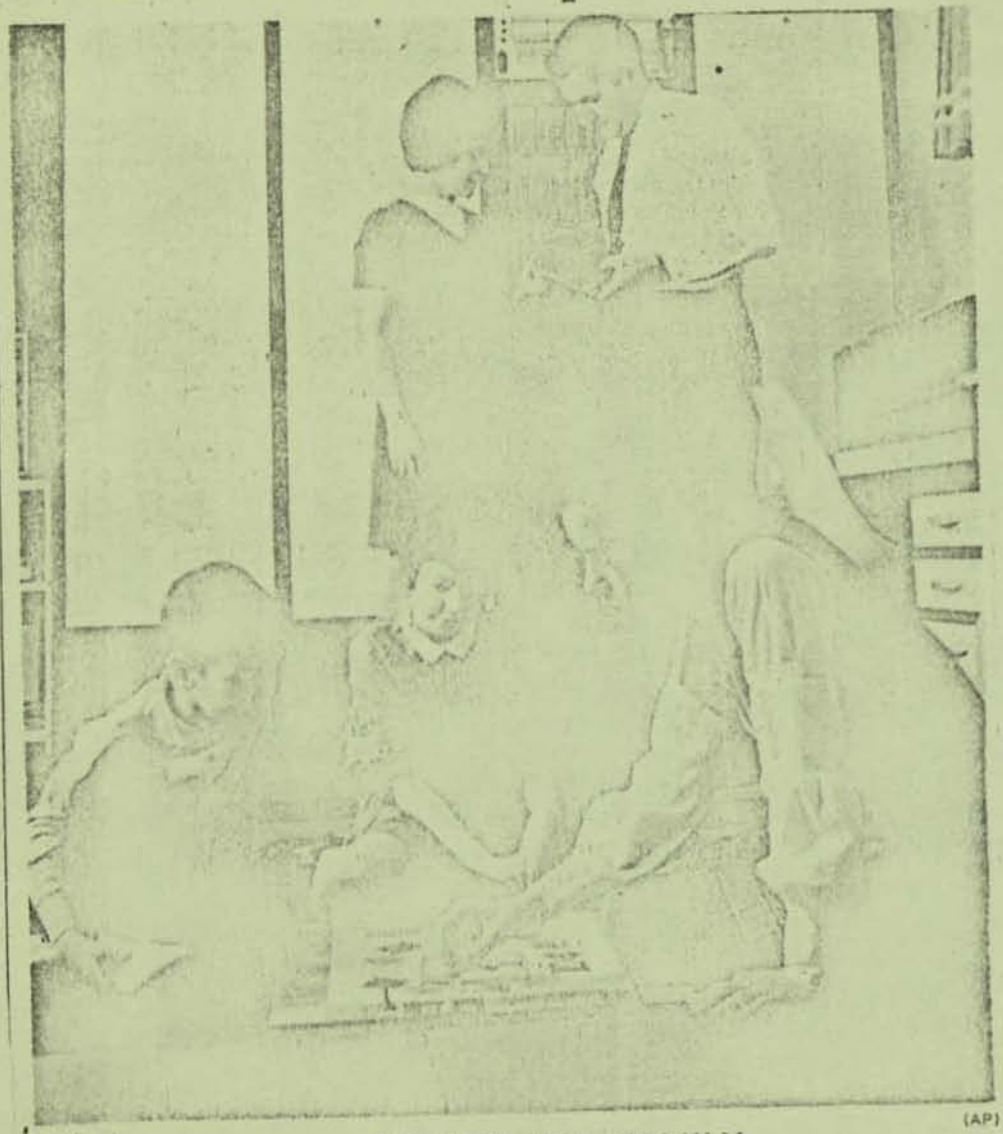
The computer can analyze math problems quickly for 13-year-old Ann and Mrs. Sutherland said the editing of the computer typewriter in her kitchen came in handy when she was preparing a term paper for a night school course in . . . computers, of course.

Since the system retains only the last thing typed in a certain space, she can simply go back and type over errors, then direct the computer to reprint, producing a perfect copy.

MRS. SUTHERLAND, a home economist, also plans to program recipes into the machine so she can call for one from the memory bank whenever she needs it.

"It won't be long until the computer will be taking care of the bookkeeping for our household," Mrs. Sutherland said.

Home Computer Handles Chores



(AP)

SUTHERLAND, FAMILY
. . . . Some old junk

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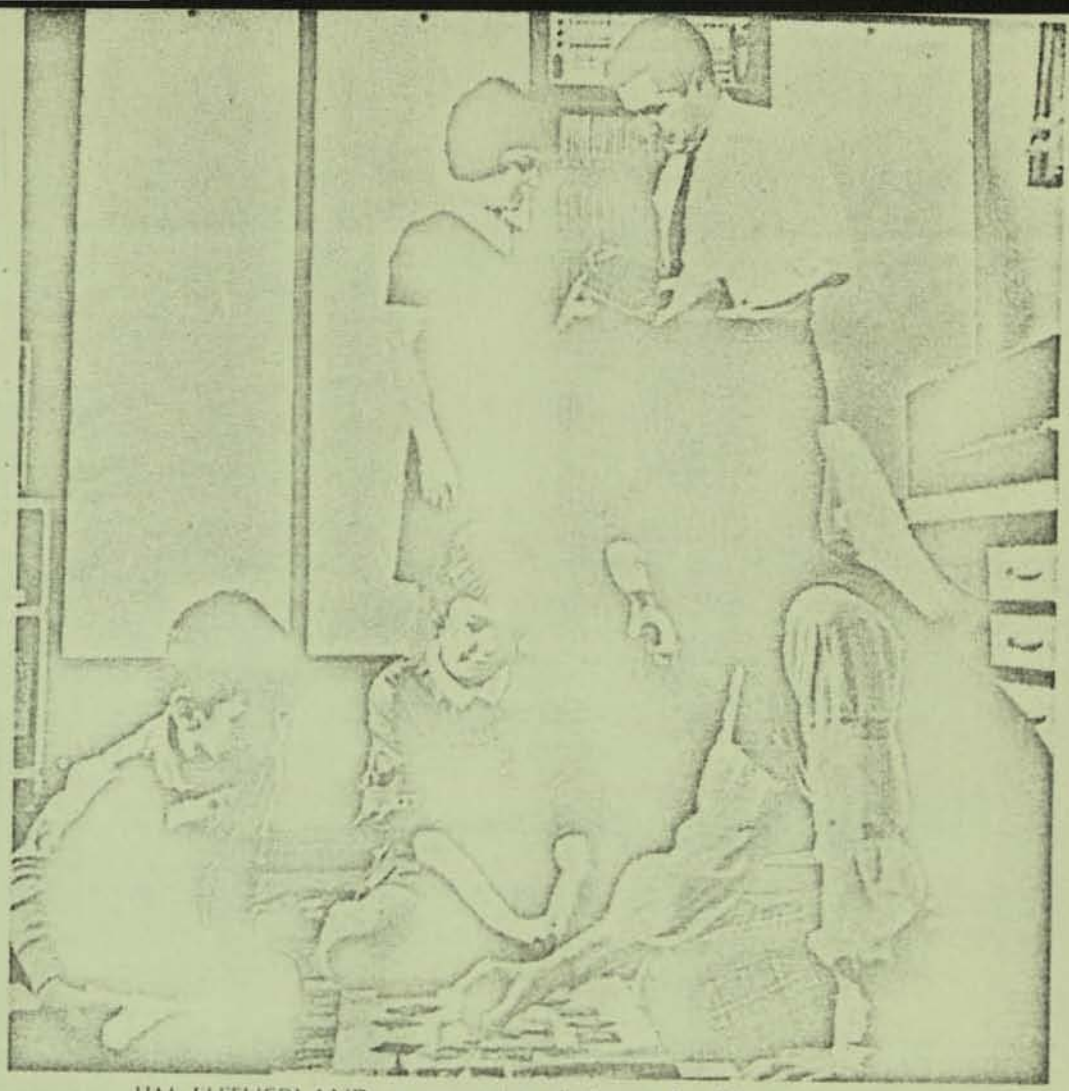
MIDLAND, MICH.
NEWS
D. 14,714

JAN 24 1970



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Computer controls home appliances

By JACQUELINE SNYDER
Associated Press Writer

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FT. LAUDERDALE, FLA.
NEWS
D. 76,108 — S. 77,265
FT. LAUDERDALE METROPOLITAN AREA
JAN 23 1970

Electronics Whiz Converts Junk Into Computer Servant At Home

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REAL FUN

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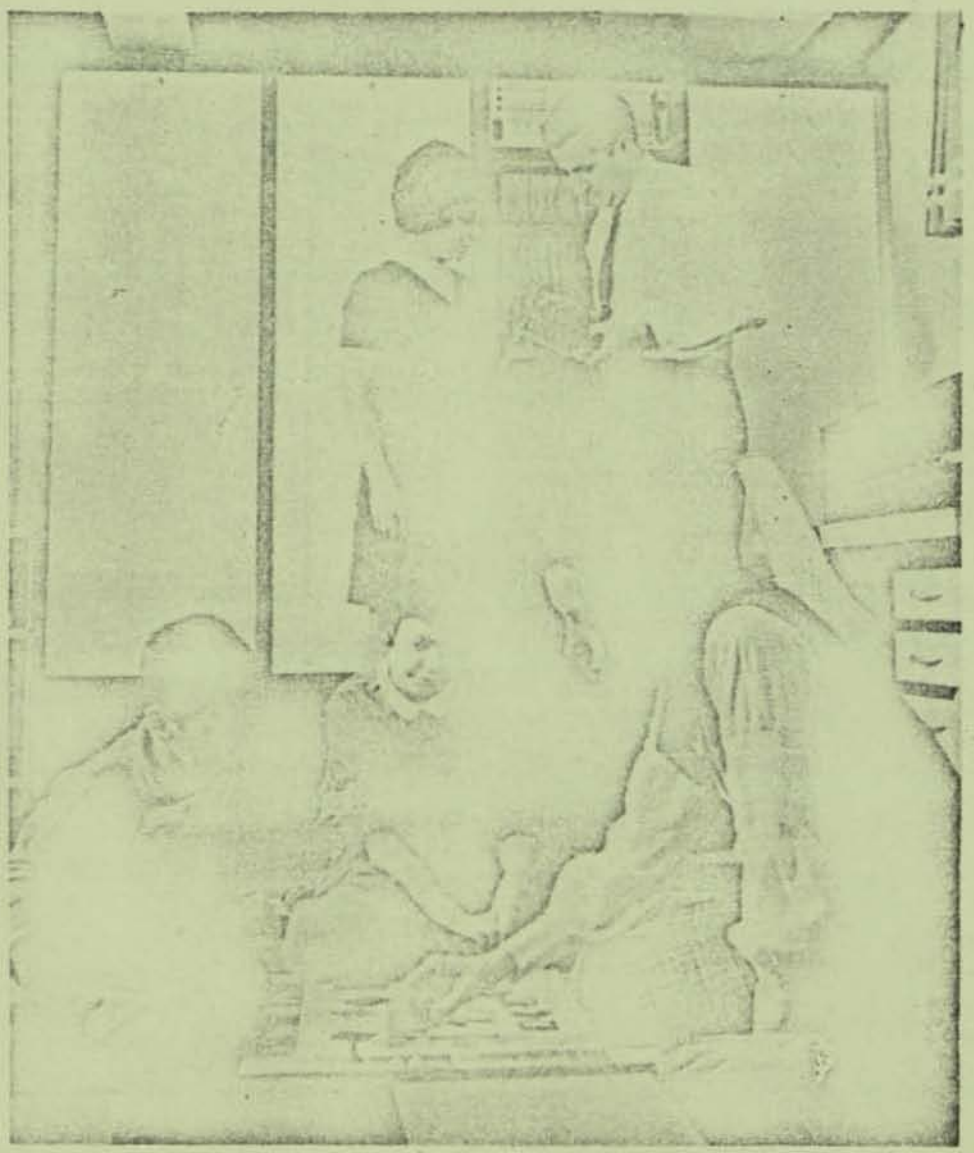
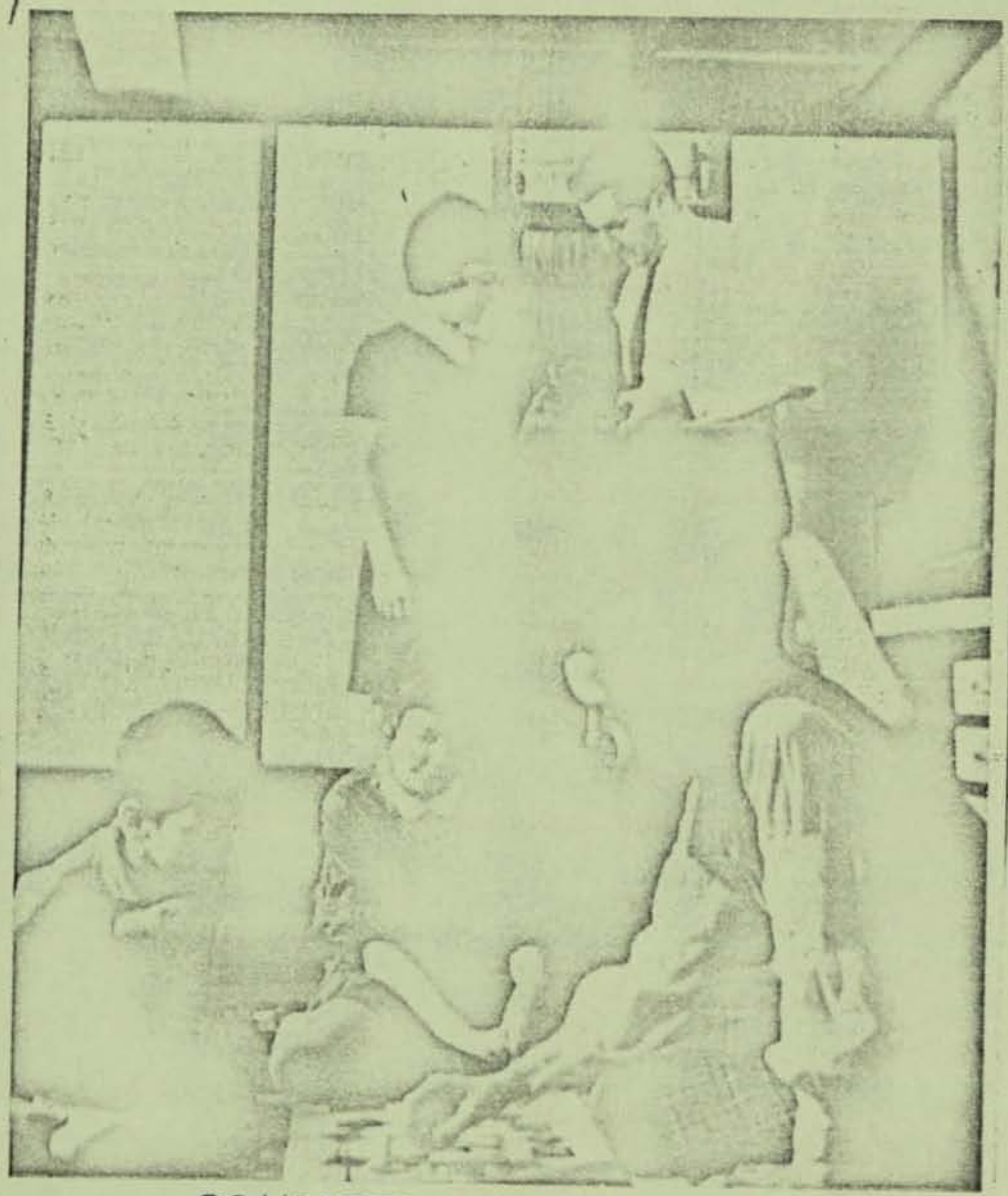


(AP Wirephoto)

JIM SUTHERLAND SHOWS CONTROLS TO HIS FAMILY
. . . for computer he built from junk

MUNCIE, IND.
PRESS
— D. 21,636 —
MUNCIE METROPOLITAN AREA
JAN 24 1970



COMPUTER FOR THE HOME

PITTSBURGH — Jim Sutherland, a computer designer for Westinghouse Electric Corp., shows his wife, Ruth, a logic board from a computer he designed and built from obsolete parts he bought from the company. The system controls the television and stereo, among other things, in the home. Sutherland hopes to program it play games with Ann, 13; Sally, 9, and Jay, 4.—AP Wirephoto.

Old Junk Takes Over This Household

—AP Wirephoto

COMPUTER DESIGNER Jim Sutherland of Pittsburgh who works for Westinghouse Electric Corp., shows his wife Ruth a logic board from a computer he designed and built from obsolete parts he bought from the company. The system controls the television and stereo among other things in the home. Sutherland hopes to program it to play games with Ann, 13; Sally, 9, and Jay, 4.

PITTSBURGH (AP) — Some old junk Jim Sutherland brought home from the office is now regulating the furnace in his home, selecting channels on his television, typing term papers for his wife and helping his children with their homework.

Sutherland, a computer designer for Westinghouse Electric Corp., bought some obsolete parts from the company and built ECHO IV, an Electronic Computer for Home Operation, in the basement of his split-level home in suburban Plum Borough.

It took Jim six months to design and build Echo IV, housed in a white cabinet along one wall of his basement work room. Since he completed it about three years ago, he's been busy writing programs to make it operate various appliances in his home.

"The real fun of a home computer," Sutherland says, "is when you can tie into the apparatus you're using."

"For instance, I plan to hook up the television picture tube to the system so that Echo can communicate with the family through an unused channel," he explained. "On school nights, the set will switch to that channel at a certain time and remind the children to go to bed."

Jim's family—including four-year-old Jay—already uses the computer to turn their television on and off, select channels and regulate volume from a portable oiled walnut control board.

The children are learning about computer operations through their father's hobby. Nine-year-old Ann was able to explain the lights and buttons on the small television control board.

"When they all light up, it mean's it's messed up," she said. And she knew which button would remedy the problem.

Jay is learning to tell time from the flashing lights of the foot-long narrow walnut "clocks" installed throughout the house.

The computer even helps the school-age Sutherlands with their homework.

It can analyze math problems quickly for 13-year-old Ann and Mrs. Sutherland said the editing feature of the computer typewriter in her kitchen came in handy when she was preparing a term paper for a night-school course in computers.

Since the system retains only the last thing that was typed in a certain space, she could simply go back and type over errors, then direct the computer to reprint, producing a perfect copy.

Mrs. Sutherland, a home economist, has used Echo's reprinting capabilities to address labels and prepare invitations. She also plans to program recipes into the machine so she can call for one from the memory bank whenever she needs it.

"It won't be long until the computer will be taking care of the bookkeeping for our household," Mrs. Sutherland added.

She says her job "takes a good deal of my time each month and I'm looking forward to the computer typing out checks, keeping an itemized account of expenditures and recording the expenses needed for income tax purposes."

"Since it can subtract accurately," she explained, "I will never get another note from the bank saying my account is overdrawn."

EASTON, PA.
EXPRESS
— D. 51,063 —
ALLENTOWN METROPOLITAN AREA
JAN 23 1970

GETTYSBURG, PA.
TIMES
— D. 10,010 —
YORK METROPOLITAN AREA

JAN 26 1970

Computer Controls Home Appliances

PITTSBURGH—Jim Sutherland, a computer designer for Westinghouse Electric Corp., shows his wife, Ruth, a logic board from a computer he designed and built from obsolete parts he bought from the company. The system controls the television and stereo among other things in the home. Sutherland hopes to program it to play games with Ann, 13, Sally, nine, and Jay, four. (AP Wirephoto)

NASHVILLE, TENN.
BANNER
— D. 96,629 —
NASHVILLE METROPOLITAN AREA
JAN 23 1970

'Junk' Computer Does Work For 5

By JACQUELINE SNYDER
Associated Press Writer

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"When they all light up, it said. And she knew which button would remedy the problem.

Math

The computer can analyze math problems quickly for 13-year-old Ann and Mrs. Sutherland said the editing feature of the computer typewriter in her kitchen came in handy when she was preparing a term paper for a night-school course in computers.

Since the system retains only the last thing typed in a certain space, she can simply go back and type over errors, then direct the computer to reprint, producing a perfect copy.

Mrs. Sutherland, a home economist, also plans to program recipes into the machine so she can call for one from the memory bank whenever she needs it.

"It won't be long until the computer will be taking care of the bookkeeping for our household," Mrs. Sutherland said.

Now, This One . . .

—AP Wirephoto

Jim Sutherland, a computer designer for Westinghouse Electric Corp., shows his wife Ruth a logic board from obsolete parts he bought from the company. The system controls the television and stero among other things in the home. Sutherland hopes to program it to play games with Ann, 13, Sally, 9, and Jay, 4.

WICHITA FALLS, TEXAS
TIMES
— D. 20,773 —
WICHITA METROPOLITAN AREA

JAN 23 1970

—AP Wirephoto

SUTHERLANDS WITH HOME COMPUTER
. . . Ann, 13; Sally, 9, and Jay, 4, may get homework help

OPERATE APPLIANCES

Computer Built To Do Homework

By JACQUELINE SNYDER
Associated Press Writer

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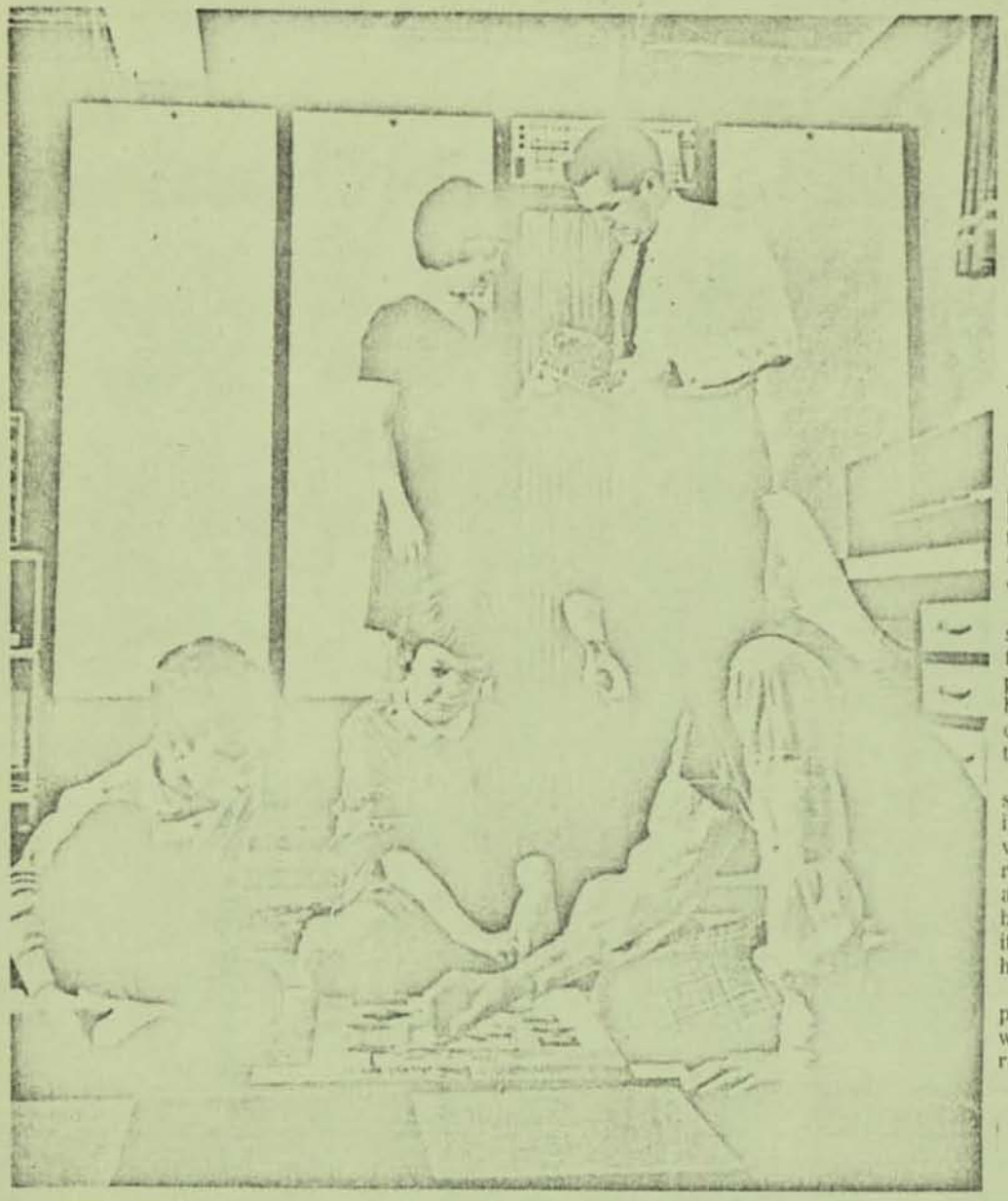

JIM SUTHERLAND, a computer designer for Westinghouse Electric Corp., Pittsburgh, shows his wife, Ruth, a logic board from a computer he designed and built from obsolete parts he bought from the company. The system controls the television and stereo among other things in the home. Sutherland hopes to program it to play games with Ann, 13, Sally, 9, and Jay, 4.—AP

WATERBURY, CONN.
AMERICAN
— D. 40,827 —
NEW HAVEN METROPOLITAN AREA
JAN 23 1970

Man Builds Computer In His Home

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Sutherland, a computer designer for Westinghouse Electric Corp., bought some obsolete parts from the company and built Echo IV, an electronic computer for home operation, in the basement of his home.

It took Jim six months to design and build Echo IV, housed in a white cabinet along one wall of his basement work room. Since he completed it about three years ago, he's been busy writing programs to make it operate various appliances in his home.

"The real fun of a home computer," Sutherland says, "is when you can tie into the apparatus you're using."

"For instance, I plan to hook up the television picture tube to the system so that Echo can communicate with the family through an unused channel," he explained. "On school nights, the set will switch to that channel at a certain time and remind the children to go to bed."

Jim's three children, including 4-year-old Jay, are learning about computer operations through their father's hobby. Sally, 9 was able to explain the lights and buttons on the small television control board.

"When they all light up, it mean's it's messed up," she said. And she knew which button would remedy the problem.

The computer can analyze math problems quickly for 13-year-old Ann and Mrs. Sutherland said the editing feature of the computer typewriter in her kitchen came in handy when she was preparing a term paper for a night-school course in computers.

Since the system retains only the last thing typed in a certain space, she can simply go back and type over errors, then direct the computer to reprint, producing a perfect copy.

Mrs. Sutherland, a home economist, also plans to program recipes into the machine so she can call for one from the memory bank whenever she needs it.

"It won't be long until the computer will be taking care of the bookkeeping for our household," Mrs. Sutherland said.

STATE COLLEGE, PA.
MIRROR
D. 5,000

JAN 24 1970

Uses it to regulate his home

Pittsburgh man builds computer

PITTSBURGH (AP) — Jim Sutherland's been tinkering with junk in his basement for about four years now and he's created a monster-but a useful one.

A computer designer for Westinghouse Electric Corp., Jim bought some obsolete parts from the company and built ECHO IV, short for Electronic Computer for Home Operation.

"The real fun of a home computer," Jim says, "is when you tie it into the apparatus you're using."

So, ever since he completed the ECHO about three years ago Jim's been busy programming it to regulate the volume and channels of the family TV set, control the furnace, regulate clocks, and play the stereo.

"I plan to hook up the television picture tube to the system so that ECHO can communicate with the family through an unused channel," he explained. "On school nights, the set will switch to that channel at a certain time and remind the children to go to bed."

Jim's three children and his wife, Ruth, enjoy having the computer live with them. Four-year-old Jay is learning to tell time from the flashing lights of the foot-long narrow walnut clocks installed throughout the house.

Nine-year-old Ann can explain the lights and buttons on the small television control board.

"When they all light up, it means it's messed up," she said, pointing out the button that would remedy the situation.

ECHO helps 13-year-old Ann analyze math problems for school and Mrs. Sutherland said the editing feature of the typewriter was useful in typing a term paper for a course she took in computers.

Since the system retains only the last thing that is typed in a certain space, Mrs. Sutherland could simply type over errors, then direct the computer to reprint, producing a perfect copy.

"It won't be long until the computer will be taking care of the bookkeeping for our household," she added. It will keep records of expenses for monthly budgets, write checks and retain records for income tax purposes.

Jim says he hopes to program the computer to monitor the weather and issue short-term forecasts, inventory groceries and make up shopping lists.

NEW BRUNSWICK, N.J.
HOME NEWS
D. 50,927 — S. 52,421
NEW YORK CITY METROPOLITAN AREA

JAN 23 1970

HANDY HOME COMPUTER—Jim Sutherland, a computer designer for Westinghouse Corp., shows his wife Ruth a logic board from a computer he designed and built from obsolete parts. The system controls the television, stereo, furnace and other home appliances, handles typing for his wife and helps his children with their homework. He calls the system Echo II. It took six months to build. (AP Wirephoto)

LOWELL, MASS.
SUN
D. 48,843 — S. 39,576
BOSTON METROPOLITAN AREA
JAN 23 1970

AP Wirephoto

Logic board

Jim Sutherland, a computer designer for Westinghouse Electric Corp., shows his wife Ruth a logic board from a computer he designed and built from obsolete parts he bought from the company. The system controls the television and stereo among other things in the home. Sutherland hopes to program it to play games with Ann, 13, Sally, 9, and Jay, 4.

Computer helps run appliances, and do homework

By JACQUELINE SNYDER
Associated Press Writer

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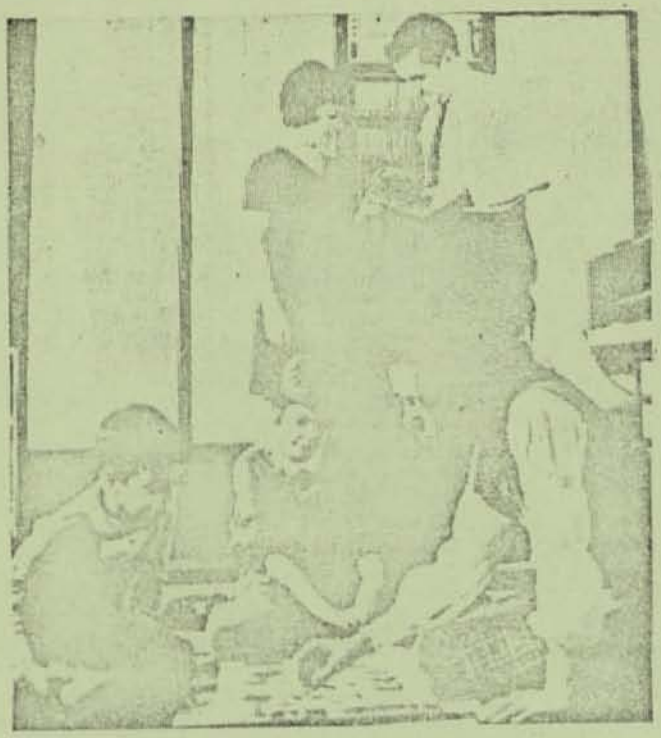
BATTLE CREEK, MICH.
ENQUIRER & NEWS
D. 40,908 — S. 44,235
BATTLE CREEK METROPOLITAN AREA

JAN 23 1970



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It's so nice to have a computer around the house

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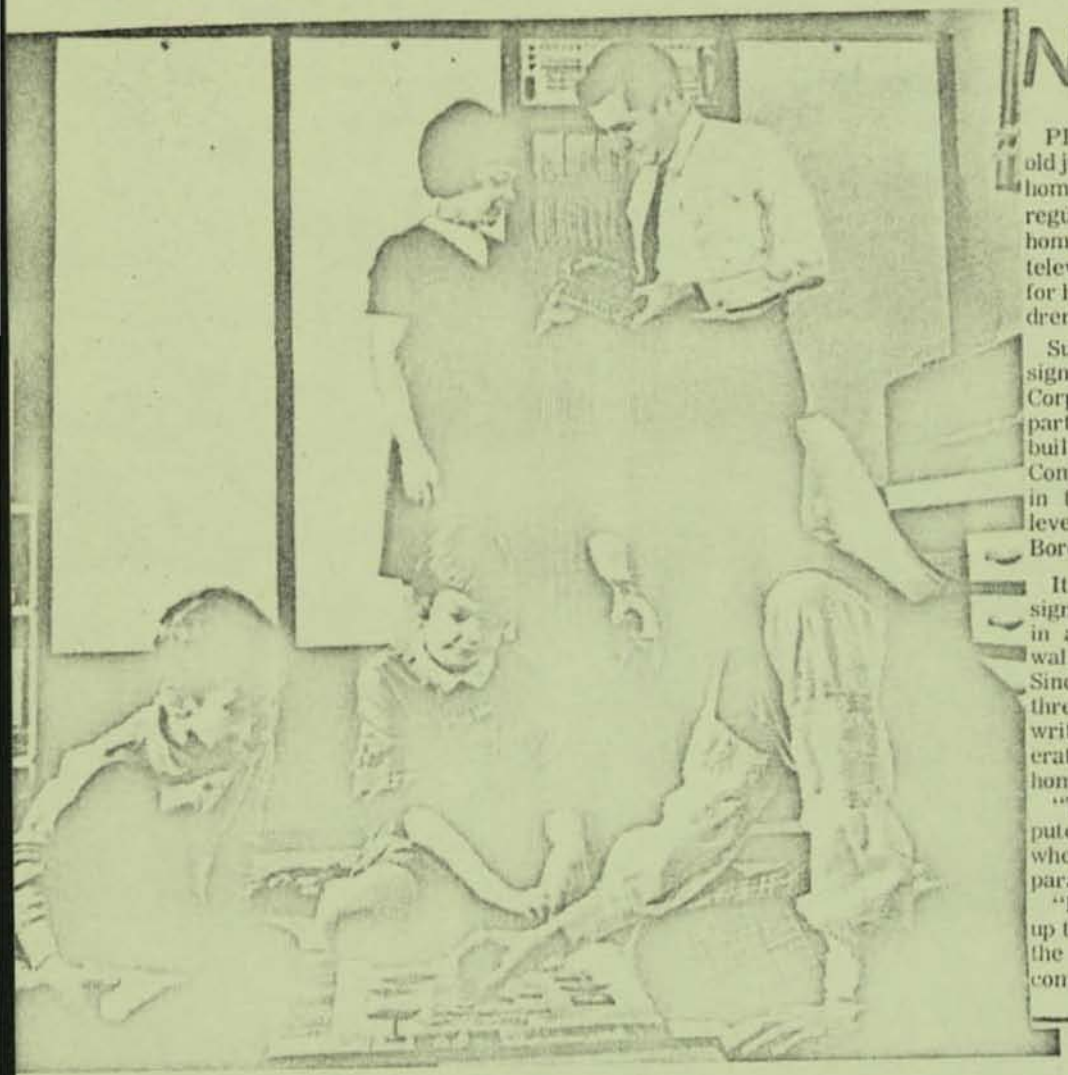
WAYNESBORO, PA.
RECORD HERALD
D. 9,437

JAN 23 1970

New help for the housewife



COMPUTER CONTROLS HOME APPLIANCES — Jim Sutherland, a computer designer for Westinghouse Electric Corp., shows his wife Ruth a logic board from a computer he designed and built from obsolete parts he bought from the company. The system controls the television and stereo among other things in the home. Sutherland hopes to program it to play games with Ann, 13, Sally, 9, and Jay, 4. (AP Wirephoto)

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Jim's family—including four-year-old Jay—already uses the computer to turn their television on and off, select channels and regulate volume from a portable oiled walnut control board.

The children are learning about computer operations through their father's hobby. Nine-year-old Ann was able to explain the lights and buttons on the small television control board.

"When they all light up, it mean's it's messed up," she said. And she knew which button would remedy the problem.

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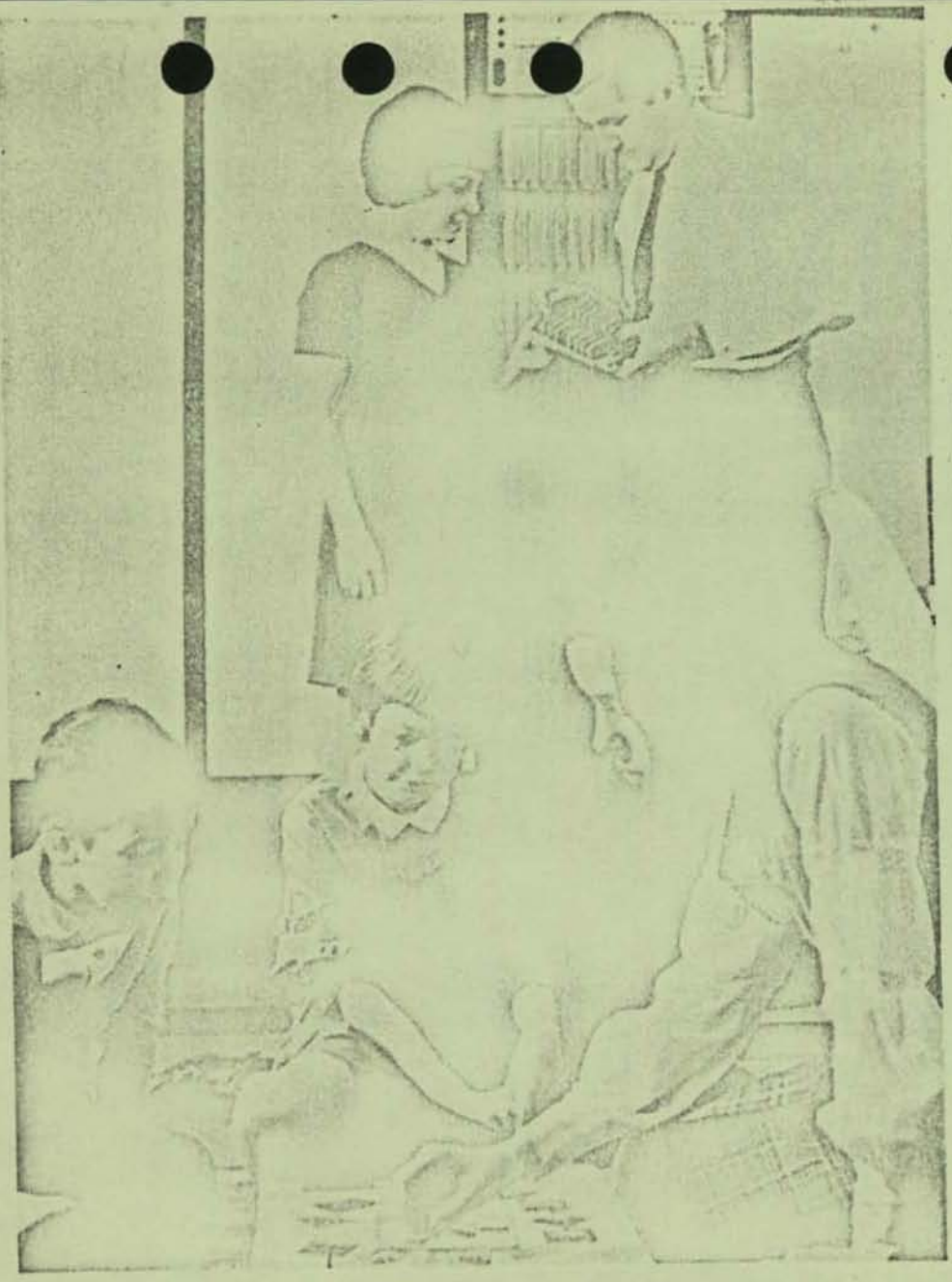
She says her job "takes a good deal of my time each month and I'm looking forward to the computer typing out checks, keeping an itemized account of expenditures and recording the expenses needed for income tax purposes."

"Since it can subtract accurately," she explained, "I will never get another note from the bank.

COLUMBIA, S.C.
RECORD
— D. 32,000 —
COLUMBIA METROPOLITAN AREA
JAN 23 1970



Computer Controls Appliances

Jim Sutherland, a computer designer for Westinghouse Electric Corp., Pittsburgh, Pa., shows his wife Ruth a logic board from a computer he designed and built from obsolete parts he bought from the company. The system controls the television and stereo among other things in the home. Sutherland hopes to program it to play games with Ann, 13, Sally, 9, and Jay, 4. (AP Wirephoto)

Computer Gives A Hand On Every Level Of Family

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LANCASTER, PA.
NEW ERA
— D. 56,533 —
LANCASTER METROPOLITAN AREA

JAN 23 1970

CONTROLS APPLIANCES, DOES HOMEWORK

Computer Built from Obsolete Parts Runs Pittsburgh Designer's Home

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SIX MONTHS

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LEARN THROUGH HOBBY

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AP Wirephoto

Jim Sutherland, a computer designer, shows his wife Ruth a logic board from computer he designed and built for his home from obsolete parts he bought.

LONG BEACH, CALIF.
PRESS TELEGRAM
D. 110,623 — S. 149,381
LOS ANGELES METROPOLITAN AREA

FEB 19 1970

We are not so sure that we're ready

WE LIKE TO THINK we have an eye for the story that's a harbinger of the future. There have been a frightening lot of them recently. We don't mean the big, going to the moon kind. We mean those that reflect impending change in our everyday life.

There was the one about General Electric building a near wall-size TV screen. The one about the Westinghouse employe who bought his company's computer leftovers and now they're regulating his furnace, selecting his television channels, typing papers for his wife and helping his kids with their homework.

THEN THERE were all those about the 747 Jumbo Jet that carried over 300 people to Europe in just a few hours. And just the other day Los Angeles' Councilman Bradley called for decentralized airline terminals throughout the county's metropolitan area.

So, the amount of leisure time is going to grow ever more abundant, the TV screens are going to grow ever bigger and the family of nations is going to grow ever closer. We'd say it's going to call for a strong nervous system and a lot of love and understanding.

The Charlotte Observer
Sat., Jan. 24, 1970 9A
Spotlight

Basement Computer Does Homework, Mom's Typing

Associated Press

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LEWISTOWN, PA.
SENTINEL
D. 14,312

JAN 24 1970

Takes Over Management of Home:

Computer Does Chores

PITTSBURGH (AP) — Some old junk Jim Sutherland brought home from the office is now regulating the furnace in his home, selecting channels on his television, typing term papers for his wife and helping his children with their homework.

Sutherland, a computer designer for Westinghouse Electric Corp., bought some obsolete parts from the company and built ECHO IV, an Electronic Computer for Home Operation, in the basement of his split-level home in suburban Plum Borough.

It took Jim six months to design and build Echo IV, housed in a white cabinet along one wall of his basement work room. Since he completed it about three years ago, he's been busy writing progarms to make it operate various appliances in his home.

"The real fun of a home computer," Sutherland says, "Is when you can tie into the apparatus you're using."

"For instance, I plan to hook up the television picture tube to the system so that Echo can communicate with the family through an unused channel," he explained. "On school nights, the set will switch to that channel at a certain time and remind the children to go to bed."

Jim's family—including four-year-old Jay—already uses the computer to turn their television on and off, select channels and regulate volume from a portable oiled walnut control board.

The children are learning about computer operations through their father's hobby. Nine-year-old Ann was able to explain the lights and buttons on the small television control board.

"When they all light up, it mean's it's messed up," she said. And she knew which button would remedy the problem.

Jay is learning to tell time from the flashing lights of the foot-long narrow walnut "clocks" installed throughout the house.

The computer even helps the school-age Sutherlands with their homework.

It can analyze math problems quickly for 13-year-old Ann and Mrs. Sutherland said the editing feature of the computer typewriter in her kitchen came in handy when she was preparing a term paper for a night-school course in computers.

Since the system retains only the last thing that was typed in a certain space, she could simply go back and type over errors, then direct the computer to reprint, producing a perfect copy.

Mrs. Sutherland, a home economist, has used Echo's reprinting capabilities to address labels and prepare invitations. She also plans to program recipes into the machine so she can call for one from the memory bank whenever she needs it.

"It won't be long until the computer will be taking care of the bookkeeping for our household," Mrs. Sutherland added.

She says her job "takes a good deal of my time each month and I'm looking forward to the computer typing out checks, keeping an itemized account of expenditures and recording the expenses needed for income tax purposes."

"Since it can subtract accurately," she explained, "I will never get another note from the bank saying my account is overdrawn."

CORPUS CHRISTI, TEX.
TIMES
— D. 35,013 —
CORPUS CHRISTI METROPOLITAN AREA

JAN 23 1970

HOBBY TAKES OVER

Computer Helping To Run Household

PITTSBURGH. (AP) — Some old junk Jim Sutherland brought home from the office is now regulating the furnace in his home, selecting channels on his television, typing papers for his wife and helping his children with their homework.

Sutherland, a computer designer for Westinghouse Electric Corp., bought some obsolete parts from the company and built Echo IV, an electronic computer for home operation, in the basement of his home.

It took Jim six months to design and build Echo IV, housed in a white cabinet along one wall of his basement work room. Since he completed it about three years ago, he's been busy writing programs to make it operate various appliances in his home.

"The real fun of a home computer," Sutherland says, "is when you can tie into the apparatus you're using."

"For instance, I plan to hook up the television picture tube to the system so that Echo can communicate with the family through an unused channel," he explained. "On school nights, the set will switch to that channel at a certain time and remind the children to go to bed."

Jim's three children, including 4-year-old Jay, are learning about computer operations through their father's hobby. Sally, 9, was able to explain the lights and buttons on the small television control board.

"When they all light up, it mean's it's messed up," she said. And she knew which button would remedy the problem.

The computer can analyze math problems quickly for 13-year-old Ann and Mrs. Sutherland said the editing feature of the computer typewriter in her kitchen came in handy when she was preparing a term paper for a night-school course in computers.

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DANVILLE, VA.
BEE
— D. 15,951 —
DANVILLE METROPOLITAN AREA

JAN 23 1970

Household Chores Done By Computer

PITTSBURGH (AP) — Some old junk Jim Sutherland brought home from the office is now regulating the furnace in his home, selecting channels on his television, typing papers for his wife and helping his children with their homework.

Sutherland, a computer designer for Westinghouse Electric Corp., bought some obsolete parts from the company and built Echo IV, an electronic computer for home operation, in the basement of his home.

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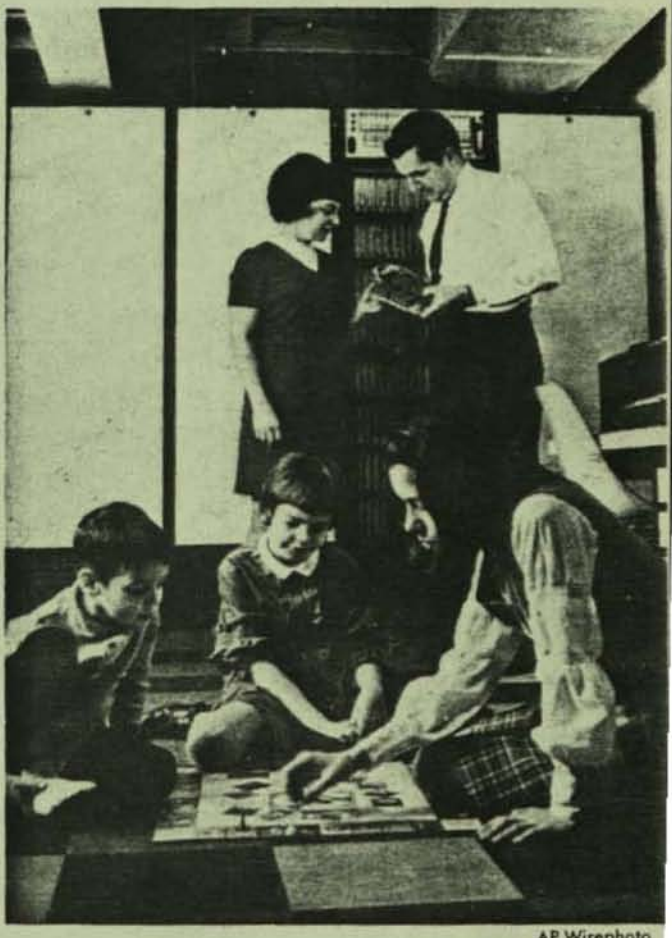
FREDERICKSBURG, VA.
FREE LANCE-STAR
D. 15,274

JAN 23 1970



AP Wirephoto

Appliance Computer

Jim Suterhland, a computer designer for Westinghouse Electric Corp., shows his wife, Ruth, a logic board from a computer he designed and built from obsolete parts he bought from the company. The system controls the television and stereo among other things in the home. Sutherland hopes to program it to play games with Ann, 13, Sally, 9, and Jay, 4.

BOSTON, MASS.
CHRISTIAN SCIENCE MONITOR
(New England Edition)
— D. 212,765 —
BOSTON METROPOLITAN AREA

JAN 27 1970

There's just no housekeeper like a homemade computer!

By the Associated Press

Pittsburgh

Some old junk Jim Sutherland brought home from the office now is regulating the furnace in his home, selecting channels on his television, typing papers for his wife, and helping his children with their homework.

Mr. Sutherland, a computer designer for Westinghouse Electric Corporation, bought some obsolete parts from the company and built Echo 4, an electronic computer for home operation, in the basement of his home.

It took him six months to design and build Echo 4, housed in a white cabinet along one wall of his basement workroom. Since he completed it about three years ago, he's been busy writing programs to make it operate various appliances in his home.

Where real fun lies

"The real fun of a home computer," Mr. Sutherland says, "is when you can tie into the apparatus you're using."

"For instance, I plan to hook up the television-picture tube to the system so that Echo can communicate with the family through an unused channel," he explained. "On school nights, the set will switch to that channel at a certain time and remind the children to go to bed."

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The computer can analyze math problems quickly for 13-year-old Ann, and Mrs. Sutherland said the editing feature of the computer typewriter in her kitchen came in handy when she was preparing a term paper for a night-school course in computers.

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NEWSPAPERS KNOWN TO HAVE PRINTED ASSOCIATED PRESS
ARTICLE BY Jarate Kazickas (June/July 1970)
(June 28, 1970 was Mother's Day...)

City	Newspaper	Date	Headline
AL Selma	Times-Journal	7/08	"A Woman's Work Is Never Done"
AR Eldorado	News	6/28	Gadgets Fail To Give Mom Extra Time
AR Little Rock	Gazette	7/02	Home Labor-saving Appliances
AR Texarkana	Gazette-News	7/15	C. K. For The Wife Who Has Everything
AZ Phoenix	Republic	7/05	C.ized K. Is Still No Time Saver
AZ Tucson	Star	6/28	Labor Saving Devices
CA Hollywood	Citizen-News	7/01	Push Buttons No Boon To Housewife
CA Los Angeles	Times	6/28	"Woman's Work Is Never Done"
CA Riverside	Enterprise	6/22	Do Time-Savers Save Time?
CA San Francisco	Examiner-Chronicle	7/05	Kitchen's New Brain
CA Santa Anna	Eve. Register	7/22	A C. Kitchen - Where Will It End?
CO Greeley	Tribune	6/30	Space Age Appl.: Where Will It End?
CT Waterbury	Republican	7/02	Amazing Kitchen Computers, Gadgets
DC Washington	Post-Times-Herald	7/19	Kitchen Gadgets Take A Lot Of Work
FL Clearwater	Sun	6/28	C.-Controlled Appl. Edging Into K.
FL Daytona Beach	News-Journal	6/28	Gadgets Add To Kitchen Trouble
FL De Land	Sun News	6/28	Despite Gadget, WWIND
FL Sarasota	Herald Tribune	6/28	Future Kitchens Need Women--Sometimes
FL St. Petersburgh	Times	10/15	For Homes, Another Dingbat?
FL West Palm Beach	Post	6/28	Drawing Boards Crammed With Designs
IA Cedar Falls	Record	8/31	C. Kitchen No Guarentee Of Less Work
IA Cedar Rapids	Gazette	6/28	Do They Really Save Time
IA Davenport	Times-Democrat	6/28	Computer Kitchen: A Boon Or A Bane?
IA Dubuque	Telegraph-Herald	7/07	You're Needed At The Controls
IA Sioux City	Morn. Journal	7/05	Introducing The Computer Kitchen
IL Champaign-Urbana	Courier	7/03	Women Spend More Time In Kitchen
IL Chicago	Sun Times	6/28	The C. K. Is Here, But...
IL East St.Louis	Metro-East Journal	7/01	1970 Housewife Does More Work
IL Kankakee	Journal	6/25	C. K. A Pain In The Neck To Program
IN Bedford	Times Mail	7/13	Push Buttons Can't Do All The Work
IN Bloomington	Courier & Tribune	7/01	C. K. Not The End Of Women's Work
IN Ft. Wayne	Journal-Gazette	6/28	Gadgets Haven't Shortened Her Day
IN Indianapolis	Star	6/28	Aim Of C. K. Is Less Work For Mother
IN Kokomo	Tribune	6/28	In Spite Of Labor Savers WWIND
IN South Bend	Tribune	6/28	Modern C. K. Still Requires Housewife
KS Great Bend	Tribune	6/29	K. Devices Good Deal For Manufacturer
KS Salina	Journal	7/12	Mach. May Be Most Demanding Children
KS Wichita	Eagle	7/07	Even With C. Mom Finds Clutter Prob.
KY Paducah	Sun-Democrat	7/09	Even With All The Labor Savers,...
LA Monroe	World	6/28	Gadgets Help Make Living More Complex
MD Cumberland	News	7/30	Despite All The Labor Saving Devices
MD Frederick	Post	6/30	Modern Kitchens Need Women
MD Hagerstown	Herald	6/25	Women Devote More Time To Their Homes
MI Bay City	Times	6/28	Kitchen Computer Gets In Act
MI Flint	Journal	6/30	Labor Saving Devices: Are They Worth
MI Kalamazoo	Gazette	7/05	Woman's Work Is Never Done Despite C.
MI Midland	News	7/01	C. Comes To Aid Of Amer. Housewives
MI Utica	Sentinel	6/30	C.ized K. Of Future Is Almost Here
MO Joplin	Globe	11/04	"A Woman's Work Is Never Done"
MO Springfield	Leader/Press	6/28	WWND Stands Today More Than Ever
MS Natchez	Democrat	6/25	C.ized K. Still Hold Many Problems

MT	Havre	News	7/22 Computer Kitchen Adds Complexities
NC	Durham	Herald	6/28 The K. C., Gadgetry At Its Peak
ND	Fargo-Moorhead	The Sunday Forum	6/28 Home C. Are Not Always Timesaving
NE	Scottsbluff	Star-Herald	7/01 Gals: Your Work Won't Become Easier
NJ	New Brunswick	Home News	6/28 And Now The C. Is Invading The K.
NM	Grants	Beacon	6/23 Computer Kitchen Newest Wrinkle
NM	Hobbs	News & Sun	7/30 Wonder Appliances For The Home
NM	Santa Fe	New Mexican	6/28 Computers Not Always Helpful
NY	Lockport	Union Sun/Journal	7/03 Gadgetry Fails To Change Adage
NY	Poughkeepsie	Journal	7/19 A Woman's Work Is Never Done
NY	Syracuse	Herald American	6/28 Do Gadgets Free Housewives?
NY	Utica	Observer-Dispatch	6/28 Housewives, You're Safe (For Now)
OH	Dover-New Phila.	Times-Reporter	7/06 Elect. Gadgets Not Rest For Housewife
OH	Ironton	Tribune	7/08 Laborsaving Appl. Still Need Hand
OK	Altus	Times-Democrat	6/28 "Woman's Work Never Done" Still True
OK	Ponca City	News	6/28 WWIND Despite Space Age Appliances
OK	Shawnee	News Star	7/01 Will Space Age K. Ever Free Mom?
OR	Salem	Statesman	6/28 Wives Work Grows Despite New Machines
PA	Allentown	Call	7/05 C. May Become Another K. Appliance
PA	Erie	News	7/07 Computer Gets Into Appliance Act
PA	Greensburg	Tribune-Review	7/23 C. K. Will Need Mom Running Controls
PA	Harrisburg	Patriot	6/28 Latest Kitchen Appliance: Computer
PA	Philadelphia	Inquirer	6/30 Appliances Save Time - Not Much
SC	Florence	News	6/28 Even With Gadgets, AWWIND
TN	Memphis	Commercial Appeal	6/28 Gadget Maintenance May Enslave Women
TN	Nashville	Tennessean	6/28 Woman's Work Is Still Never Done
TX	Amarillo	News	7/03 Do K. Appliances Really Save Work?
TX	Athens	Review	6/30 C.ized K. Not Labor Saving
TX	Brownwood	Bulletin	6/28 Kitchen Labor-Savers Myth?
TX	Dallas	News	6/28 Labor Saving Devices-Ogres or Angels?
TX	Kilgore	News-Herald	6/28 Computer or No, Homemaking Hard
TX	Lubbock	Avalanche-Journal	7/23 A Look Into The Kitchen Of The Future
TX	Lufkin	News	7/08 Labor-saving Devices Often Add Chores
TX	Marshall	News Messenger	6/28 C. Kitchens May Not Help Housewife
TX	Mexia	News	6/20 Woman's Work Is Never Done
TX	Stephenville	Empire	7/05 Helpful Appliance Hints For Homemaker
TX	Victoria	Advocate	6/28 Woman's Work Is Done...By Computer
VA	Lynchburg	News	6/30 Introducing The Computer Kitchen
VA	Norfolk	Virginian Pilot	6/28 Hey! Computer In The Kitchen
VA	Roanoke	Times	6/28 WWIND Despite Push Buttons
WI	Green Bay	Press-Gazette	7/01 Computer Inches Into Homes
WI	Madison	State Journal	6/28 Is The Housewife Obsolete?
WV	Fairmont	Times	6/21 Where Will It End?
WV	Huntington	Advertiser	7/02 Kitchen Appliances Go Space-Age

Drawing Boards Crammed With Labor Saving Designs

But Women's Work Is Still Never Done

By JURATE KAZICKAS

NEW YORK (AP) — For all the push buttons, miracle agitators, infrared whoozits and eight-speed dingbats, America's appliance makers have yet to outmode that old, old adage: "A woman's work is never done."

Labor saving often turns out to be only saving time to work on the next kitchen machine — or to call the repair man. And the kitchens of the future, although they may be far out, are still going to need a housewife at the controls. Sometimes.

There is Ruth Sutherland who has one of the first household computers in Pittsburgh, Pa., and, indeed, on the planet.

"It's a lot of trouble to program the computer. And you have to be aware of its limitations," says Mrs. Sutherland, mother of three. "The computer is not at the point where it really saves me any time."

One recently published survey showed that for all the imaginative and useful appliances plugged into the home in the past 40 years, the American woman spends as much time, if not more, now as she did then.

In a 1967 study of 1,296 women in the Syracuse, N.Y., area, Dr. Kathryn Walker's figures show that the amount of time a woman devotes to her house, shopping, care of the children and the like actually has increased 30 minutes a day since 1927.

The housewife does less physically exhausting labor, says Dr. Walker, an associate professor at the College of Human Ecology at Cornell University. "But all we've done is change the type of activities we're involved in."

The Survey Research Center at Ann Arbor, Mich., interviewed women in 44 American cities in 1965 and found they spent close to seven hours for cooking, cleaning, other home chores and child care.

Determined To Lighten Load

Meanwhile, research and marketing departments of the nation's major appliance manufacturers, determined to lighten the work load of American housewives, are cranking up for new escalation in the appliance war.

Yet there doesn't seem any assurance that the home computer, or garbage shredder, or ultrasonic dishwasher or dial-a-steak-medium rare-appliances in the works will indeed free women from the home.

The Association of Home Appliance Manufacturers says there's every indication that Americans will buy more and more new products for the home.

But questions are being raised as to the practi

Given the cost, the question is raised as to just how much is it worth to junk the household adding machine, recipe boxes, the grocery list on the kitchen wall and save a few dozen steps to turn down the stereo or raise the garage door.

"What I really want is the white tornado," says Mrs. Sutherland wryly. "Someone who will go through the house and pick up all the family clutter. I went to a seminar on robots for the home. But I just don't see how, mechanically, it can ever be done."

Home Computer

Husband James' home computer may be the only one in use, but it is not the only one around. Honeywell Industries of Framingham, Mass., produced one that is supposed to plan menus, balance checkbooks, and figure out weekly budgets and such chores.

Stocked by Neiman Marcus of Dallas, the luxury department store which often features and sells huge price tag novelties, none of the $10,600

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>
> ....*"All these products and more are billed to save time and work for the homemaker. Some are here today and might be gone tomorrow."*

One spokesman for the appliance industry said, "There's no question that appliances have become more complex. But if there is a feeling among consumers that there are more repairs being done, it's just because there's been an increase in appliances being used."

More and more appliances. Where will it all end? Since the first woman began tying clumps of straw together to sweep out her hut thousands of years ago, the idea has been that each new generation of labor-saving devices would free her more to get out of the home. But homes get bigger, appetites more sophisticated, money more available, and dirt, the original pollution, dirtier.

Housewives may well be doubly enslaved because they must add to the care and feeding of their families, the care and feeding of their gadgets and machines, whose very sophistication may make them the most demanding children of all.

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The Association of Home Appliance Manufacturers says there's every indication that Americans will buy more and more new products for the home.

But questions are being raised as to the practicality of some of the innovations being dreamed up by designers and manufacturers.

A home dry cleaner in the works for several companies sounds great until the housewife finds out that she has to be there on the spot to remove clothes instantly once the process is finished, to prevent wrinkling.

A garbage shredder, it is said, will crunch, rip, and compress the family garbage, including bottles and cans, into neat little packets you would only have to carry out once a week. But, given current waste production figures in America, with the average person accumulating more than four pounds of waste a day, someone would have to cart out a family of four's 125-pound bag when he does empty the garbage. The price: about $235.

Who Will Adjust?

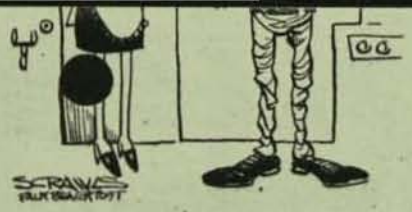
Microwave ovens can't be used for the aluminum-packaged instant dinners and the food industry will have to adjust their preparations to fit the oven. Or will Americans have to alter their tastes to use their machines?

An ultrasonic dishwasher, still in early stages of development, will definitely get the prongs of a fork cleaner, but it won't do it any quicker than a regular dishwashing machine.

Many of these new products already are being tested and used in large institutions, while engineers fight the technical problems and manufacturers the economic feasibility to adapt them for home use.

James Sutherland, a computer designer for Westinghouse Electrical Corp. in Pittsburgh, used spare parts and spare time to put one in his home. It has a memory system, programmer's console, and a remote station keyboard in the kitchen

At present the computer's vast and complicated



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Stocked by Neiman Marcus of Dallas, the luxury department store which often features and sells huge price tag novelties, none of the $10,600 minicomputers — "For the women who has everything . . ." — has sold, even with the included two-week course at Framingham on how to use the computer.

"We didn't really expect to sell any," said a Honeywell spokesman. "What's more likely to catch on in the future is a small terminal in the home that will communicate with larger computers elsewhere. Up-to-the-minute news reports, grocery prices, and sports results will be flashed on a visual display screen."

Though the home computer seems to be a remote possibility for the average consumer, there is no end to the cornucopia of space age appliances to meet America's demands for the new and unconventional.

American Telephone and Telegraph hopes to permit housewives to dial their home phones with special codes and turn on the roast already on a stove that can be made into a freezer to "hold" the meat until the time for cooking.

There are no firm cost figures on such a system, or even a production date.

Other futuristic ideas include small washer-driers for the bedroom — to save a trip to the laundry room with small wash loads — and portable or multiple refrigerators so husband will not have to stir from his TV football game even during commercials.

There'll be small cooking units distributed throughout the home, along with cookware with built-in heating units so that every room might well become a mini-kitchen.

Home designers envision a modular approach to kitchen design. No longer will the kitchen have to look the same year after year. There'll be a series of free-standing appliances and multiappliance modules placed on pedestals equipped to receive electrical and plumbing fittings that can be arranged around the room. Such appliances also could move from house to house for mobile Americans.

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Tours for Club Members

Manner of Speaking

By Amy Vanderbilt

"DEAR MISS VANDERBILT: I am a member of a small garden club (there are usually about 25 members). Each year we like to go on an unusual and interesting garden tour, or even a tour of houses, museums or art galleries, but find it difficult to locate properly guided tours. Is there someone who handles such things and would give us a choice of tours in the New York-New Jersey-Connecticut area? — Mrs. D.M.R., New Haven, Conn."

There is one organization I know of that offers just such tours to groups such as yours, or to individuals. It is called Gallery Passport, Ltd. and provides experienced lecturers, motor coach service and lunch in well-known country restaurants in the areas visited.

Any woman accompanying her husband on a business trip to New York would enjoy one of these tours to places of interest in the surrounding area. There are also, of course, many tours of museums and art galler-

tions. An honored guest or two would receive handwritten invitations, written on club stationery if you have it, or on the personal stationery of the person (probably an officer or committee chairman) designated to issue such invitations.

DEAR MISS VANDERBILT: I was interested in your 'yes, ma'am, 'no, ma'am' column. Although I am a

clothes instantly once the process is finished, to prevent wrinkling.

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James Sutherland, a computer designer for Westinghouse Electrical Corp. in Pittsburgh, used spare parts and spare time to put one in his home. It has a memory system, programmer's console, and a remote station keyboard in the kitchen.

At present, the computer's vast and complicated circuitry is called upon only to act as a typewriter and duplicating machine. Mrs. Sutherland hopes in the future, with new, complex programming, the machine will keep household financing straight, produce shopping lists, analyze menus, store recipes with automatic printout, control the family stereo and garage door.

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Consumer Discontent

And there is sufficient discontent among consumers that a residential task force under President Johnson generated a 217-page report on appliance warranties and service, calling for the improvement of durability of products and improved communications with consumers.

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Tours for Club Members

Manner of Speaking

By Amy Vanderbilt

"DEAR MISS VANDERBILT: I am a member of a small garden club (there are usually about 25 members). Each year we like to go on an unusual and interesting garden tour, or even a tour of houses, museums or art galleries, but find it difficult to locate properly guided tours. Is there someone who handles such things and would give us a choice of tours in the New York-New Jersey-Connecticut area? — Mrs. D.M.R., New Haven, Conn."

There is one organization I know of that offers just such tours to groups such as yours, or to individuals. It is called Gallery Passport, Ltd. and provides experienced lecturers, motor coach service and lunch in well-known country restaurants in the areas visited.

Any woman accompanying her husband on a business trip to New York would enjoy one of these tours to places of interest in the surrounding area. There are also, of course, many tours of museums and art galleries in and out of New York City. Write for full information and a schedule of events to Gallery Passport, Ltd., Dept. 10, 220 Fifth Ave., New York, N.Y. 1001.

DEAR MISS VANDERBILT: My grandfather lives in Wisconsin at the Elks Club. We can't be together on his birthday but I am arranging with the manager of the club to have a birthday dinner for him, including drinks, everything and anything he wants. The manager said he would take care of everything and that I would be billed.

When the bill comes should I just enclose enough money to cover it plus the 15 per cent tip for the waiter, or what about the bar tip, if any? Do I enclose a tip for the manager for helping to arrange it? If so, how much should he get and how do I specify which amount is for each person?

The manager is going to arrange that the dinner for Grandpa be a surprise. He is also arranging for him to have a friend as a guest. He will be told a day or so before his birthday that the dinner has been arranged, but he is not to know until after it is over who arranged it. — Mrs. T. J., St. Paul, Minn.

I think it is a very nice idea. The manager would not expect a tip at such a club. Just add 15 per cent of the bill which should be all-inclusive and write the manager thanking him for his kindness in handling the arrangements.

DEAR MISS VANDERBILT: Some members of a club social group feel that invitations should not be sent to the membership (that they should only be notified) whereas other members feel that a proper invitation should be issued — 'You are cordially invited and so on.' What is the correct procedure for a country club? — C.D., Jackson, Miss."

Country clubs usually do not send individual invitations but merely announcements of coming events and perhaps flyers urging members to make their reservations. An honored guest or two would receive handwritten invitations, written on club stationery if you have it, or on the personal stationery of the person (probably an officer or committee chairman) designated to issue such invitations.

DEAR MISS VANDERBILT: I was interested in your 'yes, ma'am, 'no, ma'am' column. Although I am an Easterner, I have a daughter who lives in Little Rock, Ark. Whenever she visits me here in Connecticut or New York, she says 'Everyone up here is so rude. What's the matter with them? They all seem so annoyed with what they are doing.'

I must admit it was very, very nice when visiting her to go into an ordinary supermarket in Little Rock and be given my change with a big smile and a 'thank you, ma'am, call again' (or even that typically Southern form of goodby, 'you-all come back!') — Mrs. M.M., Westport, Conn."

And I must admit that I, too, enjoy all of this in the South. What I am saying is that Northern children should not be required to say "yes, ma'am" and "no, ma'am" and that Northerners infiltrating the South seem not to be requiring their children to use these phrases, thus I feel there is much less stress even in the South in this old-fashined form of courtesy.

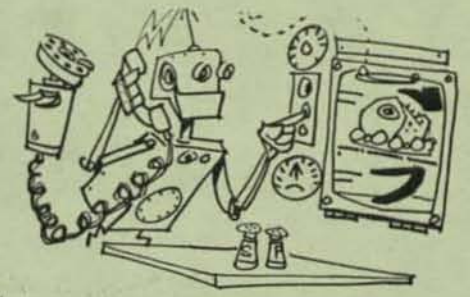
A pleasant "yes" or "no" or a "yes, thank you" or "no, thank you" would have the same effect as "yes, m'am" and "no, ma'am." And you don't quite have that phrase right: I believe it is "you-all come back, heah?" In the North that is translated to "please come again" or just a pleastant "come again," if we're lucky.

DEAR MISS VANDERBILT: I will be going to Germany during the middle of July. What clothing would be appropriate to take for day and evening wear? — J. D., Westwood, Mass.

Summer in Germany is never warm but in July the temperature can vary from 55 degrees to a high of perhaps 74 degrees but the average is only 65 degrees. You can figure on about half the days being sunny. Knits, wool dresses, the kind of things that girls your age wear at home will be just right for Germany, which in the summertime is full of Americans.

To Program The Computer

Mom Will Be Needed In Kitchen - Sometime



(Continued from Page 1E)

have to alter their tastes to use their machines?

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Many of these new products already are being tested and used in large institutions, while engineers fight the technical problems and manufacturers the economic feasibility to adapt them for home use.

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Given the cost, the question is raised as to just how much is it worth to junk the household adding machine, recipe boxes, the grocery list on the kitchen wall and save a few dozen steps to turn down the stereo or raise the garage door.

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Husband James' home computer may be the only one in use, but it is not the only one around. Honeywell Industries of Framingham, Mass., produced one that is supposed to plan menus, balance checkbooks, and figure out weekly budgets and such chores.

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SAN FRANCISCO, CALIF.
EXAMINER-CHRONICLE
— S. 648,231 —
SAN FRANCISCO METROPOLITAN AREA

JUL 5 1970

KITCHEN'S NEW BRAIN

By Jurate Kazickas

NEW YORK — (AP) — For all the push buttons, miracle agitators, infrared whoozits and eight-speed dingbats, American's appliance makers have yet to outmode that old, old adage: "A woman's work is never done."

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"It's a lot of trouble to program the computer. And you have to be aware of its limitations," says Mrs. Sutherland, mother of three. "The computer is not at the point where it really saves me any time."

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But housewives may well be doubly enslaved because they must add to the care and feeding of their families, the care and feeding of their gadgets and machines, whose very sophistication may make them the most demanding children of all.

INSTRUCTIONS to home computer given by Mrs. Sutherland in top photo with husband and daughter, Sally. Computer brains are in basement.

BALTIMORE, MD.
NEWS AMERICAN
D. 217,383 — S. 314,266
BALTIMORE METROPOLITAN AREA

JUN 23 1970

Her Kitchen Is Computerize

Continued from Page 1F.

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One survey states that the average couple starts married life with 23 appliances and the figure goes up to 42 for the family with two children. With such items as special bacon cookers, infrared ovens, electric knives and the like, the chances of service calls on one of these products grows yearly.

One spokesman for the appliance industry said, "There's no question that appliances have become more complex. But if there is a feeling among consumers that there are more repairs being done, it's just because there's been an increase in appliances being used."

More and more appliances. Where will it all end? Since the first woman began tying clumps of straw together to sweep out her hut thousands of years ago, the idea has been that each new generation of labor-saving devices would free her more to get out of the home. But homes get bigger, appetites more sophisticated, money more available, and dirt, the original pollution, dirtier.

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COMPUTERIZED KITCHEN . . . James Sutherland and family with the basement computer he designed.

COOKING BY TRANSISTOR . . . Ruth Sutherland prepares dinner with daughter, Sally, and her husband, James, the computer's designer.

PRESS GAZETTE
D. 47,880 — S. 59,238
GREEN BAY METROPOLITAN AREA

JUL 1 1970

Computer Inches Into Homes

By JURATE KAZICKAS
Associated Press Writer

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Still Aid to Kitchen

One recently published survey showed that for all the imaginative and useful appliances plugged into the home in the past 40 years, the American woman spends as much time, if not more, now as she did then.

In a 1967 study of 1,296 women in the Syracuse, N.Y., area, Dr. Kathryn Walker's figures show that the amount of time a woman devotes to her house, shopping, care of the children and the like actually has increased 30 minutes a day since 1927.

The housewife does less physically exhausting labor, says Dr. Walker, an associate professor at the College of Human Ecology at Cornell University. "But all we've done is change the type of activities we're involved in."

The Survey Research Center at Ann Arbor, Mich., interviewed women in 44 American cities in 1965 and found they had close to seven hours for cooking, cleaning, other home chores and child care.

Escalating War

Meanwhile, research and marketing departments of the nation's major appliance manufacturers, determined to lighten the work load of American housewives, are cranking up for new escalation in the appliance war.

Yet there doesn't seem any assurance that the home computer, or garbage shredder, or ultrasonic dishwasher or dial-a-steak—medium or rare—appliance in the works will indeed free women from the home.

The new appliances of the '70s, while often more portable and decorative, seem studded with still more buttons and contain more switches, wires and transistors. And costs versus function and practicality often indicate a good idea should have been left just that—an idea.

One suburban housewife may have been speaking as much for the future as the past when she said: "Labor-saving devices? Ha! Money-earning machines for the repairman, you mean."

Costs Are Rising

Although appliance prices have declined over the last few years, the cost of components is now rising, workers are demanding higher wages, and warranty costs are higher.

The $33-billion home goods industry now expects to make $37 billion in 1971 and accounts for 18 per cent of total consumer spending on all goods, excluding food, the Department of Commerce reports.

The Association of Home Appliance Manufacturers says there's every indication that Americans will buy more and more new products for the home.

But questions are being raised as to the practicality of some of the innovations being dreamed up by designers and manufacturers.

Weighted Argument

A home dry cleaner in the works for several companies sounds great until the housewife finds out that she has to be there on the spot to remove clothes instantly once the process is finished, to prevent wrinkling.

A garbage shredder, it is said, will scrunch, rip, and compress the family garbage, including bottles and cans, into neat little packets you would only have to carry out once a week. But, given current waste production figures in America, with the average person accumulating more than four pounds of waste a day, someone would have to cart out a family of four's 125-pound bag when he does empty the garbage. The price: about $235.

Microwave ovens can't be used for the aluminum-packaged instant dinners and the food industry will have to adjust their preparations to fit the oven. Or will Americans have to alter their tastes to use their machines?

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Designs for Home

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On the Market

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In the Workings

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Billed To Save Time

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—AP Newsfeatures Photo

Computer Helps Homemaker 'Cook With Gas'
Sally Sutherland observes while Mrs. Sutherland operates computer designed by husband James

Computer May Become Another Kitchen Appliance

EDITOR'S NOTE —Less work for mother. That's been the goal of labor-saving kitchen appliances since mom first slaved over a hot stove. Now, the computer is getting into the appliance act, along with ultrasonic dishwashers and microwave ovens.

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Survey Findings

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Practicality Questioned

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Calculating Computer

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Stocked by Neiman Marcus of Dallas, the luxury department store which often features and sells huge price tag novelties, none of the $10,600 minicomputers—"For the woman who has everything . . ." — has sold, even with the included two-week course at Framingham on how to use the computer.

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Appliance Cornucopia

Though the home computer seems to be a remote possibility for the average consumer, there is no end to the cornucopia of space age appliances to meet America's demands for the new and unconventional.

American Telephone and Telegraph hopes to permit housewives to dial their home phones with special codes and turn on the roast already on a stove that can be made into a freezer to "hold" the meat until the time for cooking.

There are no firm cost figures. Such appliances also could move from house to house for mobile Americans.

All these products—and more —are billed to save time and work for the homemaker. Some are here today, and might be gone tomorrow, like the electric can opener doomed to obsolescence by easy-open cans.

While 95 per cent of appliance buying homemakers rate the industry good or excellent in the styling and appearance of its products, according to a January 1969 survey in the trade magazine Appliance Manufacturer, they still complain about washers that overflow, freezers that don't freeze, and complicated instruction manuals.

Although the Association of Home Appliance Manufacturers says that service calls for washing machines during the first year of service were three times more numerous in 1968 than 10 years later, repair shops for refrigerators, washers, ranges and portable appliances had revenues of close to $2 billion for 1967, the Department of Commerce Census of Business reports.

And there was sufficient discontent among consumers that a presidential tax force under President Johnson generated a 217-page report on appliance warranties and service, calling for the improvement of durability of products and improved communications with consumers.

Repairs Mounting

One survey states that the average couple starts married life with 23 appliances and the figure goes up to 42 for the family with two children. With such items as special bacon cookers, infrared ovens, electric knives and the like, the chances of service calls on one of these products grows yearly.

One spokesman for the appliance industry said, "There's no question that appliances have become more complex. But if there is a feeling among consumers that there are more repairs being done, it's just because there's been an increase in appliances being used."

More and more appliances. Where will it all end? Since the first woman began tying clumps of straw together to sweep out her hut thousands of years ago, the idea has been that each new generation of labor-saving devices would free her more to get out of the home. But homes get bigger, appetites more sophisticated, money more available, and

BRAINS IN BASEMENT — The brains of Mrs. Sutherland's kitchen computer are kept in the basement of her Pittsburgh home. Mr. Sutherland, who designed and built the device, points out details of the inner workings, background, while their children play on the floor. Wires run through the ceiling to the control board in the kitchen above. The children are Jay, 4; Sally, 9; and Ann, 13, right.

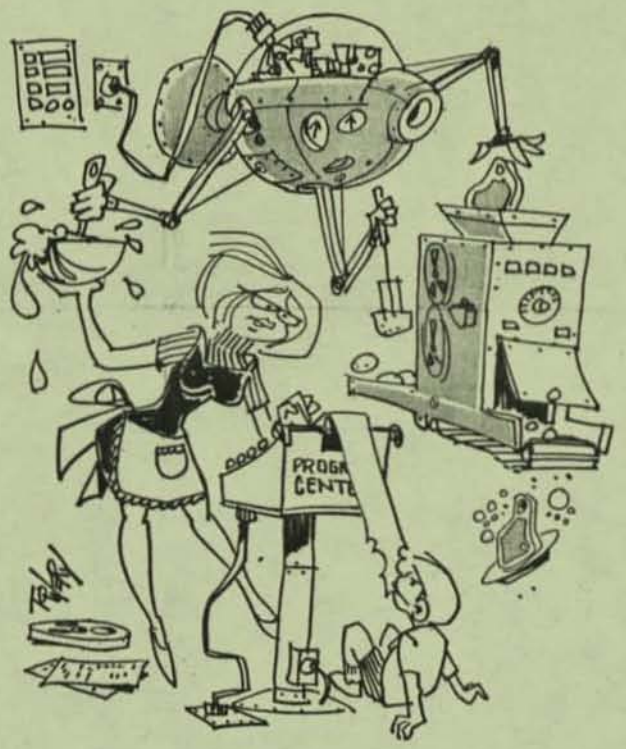
SARASOTA, FLA.
HERALD TRIBUNE
D. 30,700 — S. 35,253
SARASOTA METROPOLITAN AREA

JUN 28 1970

To Program The Computer

Future Kitchens Need Women--Sometimes

EDITOR'S NOTE—Less work for mother — that's been the goal of labor-saving kitchen appliances since mom first slaved over a hot stove. Now, the computer is getting into the appliance act, along with ultrasonic dishwashers and microwave ovens.



By JURATE KAZICKAS
Associated Press Writer

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Yet there doesn't seem any assurance that the home computer, or garbage shredder, or ultrasonic dishwasher or dial-a steak — medium rare — appliances in the works will indeed free women from the home.

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(Continued on Page 8E)

SECTION 5 'Punch' Lines—Betty Beale

The Indianapolis Star

Robbie DuBois, Women's Editor

SUNDAY, JUNE 28, 1970

ULTRASONIC DISHWASHER COMING

Aim Of Computer Kitchen Is Less Work For Mother

By JURATE KAZICKAS

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An ultrasonic dishwasher, still in early stages of development, will definitely get the prongs of a fork cleaner, but it won't do it any quicker than a regular dishwashing machine.

MANY OF THESE new products already are being tested and used in large institutions, while engineers fight the technical problems and manufacturers the economic feasibility to adapt them for home use.

James Sutherland, a computer designer for Westinghouse Electrical Corporation at Pittsburgh, used spare parts and spare time to put one in his home. It has a memory system, programmer's console, and a remote station keyboard in the kitchen.

At present, the computer's vast and complicated circuitry is called upon only to act as a typewriter and duplicating machine. Mrs. Sutherland hopes in the future, with new, complex programming, the machine will keep household financing straight, produce shopping lists, analyze menus, store recipes with automatic printout, control the family stereo and garage door.

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TUCSON, ARIZ.
STAR
D. 42,069 — S. 72,623
TUCSON METROPOLITAN AREA

JUN 28 1970

Labor-Saving Devices Leave Time To Call In Repairmen

By JURATE KAZICKAS
Associated Press Writer

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Though the home computer seems to be a remote possibility for the average consumer, there is no end to the cornucopia of space age appliances to meet America's demands for the new and unconventional.

Other futuristic ideas include small washer-driers for the bedroom — to save a trip to the laundry room with small wash loads — and portable or multiple refrigerators so husband will not have to stir from his TV football game even during commercials.

There'll be small cooking units distributed throughout the home, along with cookware with built-in heating units so that every room might well become a mini-kitchen.

Home designers envision a modular approach to kitchen design. No longer will the kitchen have to look the same year after year. There'll be a series of free-standing appliances and multiappliance modules placed on pedestals equipped to receive electrical and plumbing fittings that can be arranged around the room. Such appliances also could move from house to house for mobile Americans.

All these products — and more — are billed to save time and work for the homemaker. Some are here today, and might be gone tomorrow, like the electric can opener doomed to obsolescence by easy-open cans.

While 95 per cent of appliance buying homemakers rate the industry good or excellent in the styling and appearance of its products, according to a January 1968 survey in the trade magazine Appliance Manufacturer, they still complain about washers that overflow, freezers that don't freeze, and complicated instruction manuals.

And there is sufficient discontent among consumers that a presidential task force under President Johnson generated a 117-page report on appliance warranties and service, calling for the improvement of durability of products and improved communications with consumers.

One survey states that the average couple starts married life with 23 appliances and the figure goes up to 42 for the family with two children. With such items as special bacon cookers, infrared ovens, electric knives and the like, the chances of service calls on one of these products grows yearly.

One spokesman for the appliance industry said, "There's no question that appliances have become more complex. But if there is a feeling among consumers that there are more repairs being done, it's just because there's been an increase in appliances being used."

More and more appliances. Where will it all end? Since the first woman began tying clumps of straw together to sweep out her hut thousands of years ago, the idea has been that each new generation of labor-saving devices would free her more to get out of the home. But homes get bigger, appetites more sophisticated, money more available, and dirt, the original pollution, dirtier.

Housewives may well be doubly enslaved because they must add to the care and feeding of their families, the care and feeding of their gadgets and machines, whose very sophistication may make them the most demanding children of all.

CEDAR RAPIDS, IOWA
GAZETTE
D. 72,399 — S. 76,563
CEDAR RAPIDS METROPOLITAN AREA

JUN 23 1970

Labor-Saving Devices

Do They Really Save You Time?

Editor's Note—Less work for Mother. That's been the goal of labor-saving kitchen appliances since Mom first slaved over a hot stove. Now, the computer is getting into the appliance act, along with ultrasonic dishwashers and microwave ovens.

By Jurate Kazickas

NEW YORK (AP) — For all the push buttons, miracle agitators, infrared whoozits and eight-speed dingbats, America's appliance makers have yet to outmode that old, old adage: "A woman's work is never done."

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Ruth Sutherland has one of the first household computers in Pittsburgh, Pa., and, indeed, on the planet, "It's a lot of trouble to program the computer. And you have to be aware of its limitations," says Mrs. Sutherland, mother of three. "The computer is not at the point where it really saves me any time."

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—AP Photo

Ruth Sutherland practices talking things over with her kitchen computer before whipping up dinner for her family in their Pittsburgh home. Her husband, James, right, is a computer designer who worked up the device in his spare time. Daughter Sally, 9, watches the operation. Despite the introduction of new appliances, a survey shows that women spend more time at wifely chores than they did forty years ago.

Less Exhausting

The housewife does less physically exhausting labor, says Dr. Walker, an associate professor at the College of Human Ecology at Cornell university. "But all we've done is change the type of activities we're involved in."

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Meanwhile, research and marketing departments of the nation's major appliance manufacturers, determined to lighten the work load of American housewives, are cranking up for new escalation in the appliance war.

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One suburban housewife may have been speaking as much for the future as the past when she said: "Labor-saving devices? Money-earning machines for the repairman, you mean."

Costs Rise

Although appliance prices have declined over the last few years, the cost of components is now rising, workers are demanding higher wages, and warranty costs are higher.

The $30-billion home goods industry now expects to make $37 billion in 1971 and accounts for 18 percent of total consumer spending on all goods, excluding food, the department of commerce reports.

The Assn. of Home Appliance Manufacturers says there's every indication that Americans will buy more and more new products for the home.

But questions are being raised as to the practicality of some of the innovations being dreamed up by designers and manufacturers.

A home dry cleaner in the works for several companies sounds great until the housewife finds out that she has to be there on the spot to remove clothes instantly once the process is finished, to prevent wrinkling.

Shredder

A garbage shredder, it is said, will scrunch, rip, and compress the family garbage, including bottles and cans, into neat little packets you would only have to carry out once a week. But, given current waste production figures in America, with the average person accumulating more than four pounds of waste a day, someone would have to cart out a family of four's 125-pound bag when he does empty the garbage. The price: about $295.

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Future Uses

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EVENING JOURNAL
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LINCOLN METROPOLITAN AREA

A[illegible] 1970

Mrs. Sutherland practices on the computer as her husband James and daughter Sally, 9, watch.

Brains of the kitchen computer are in the basement. The children seem uninterested in Mr. Sutherland's discussion of details.

Appliances: Not Time Savers

By JURATE KAZICKAS, AP

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At Least As Much

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'Cranking Up'

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Continued on Page 4C

Kitchens G[illegible]

Continued from Page 1C

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There is no end to the cornucopia of space age appliances to meet America's demands for the new and unconventional.

DAVENPORT, IOWA
TIMES-DEMOCRAT
D. 59,126 S. 74,019
DAVENPORT METROPOLITAN AREA

JUN 28 1970

'The amount of time a woman devotes . . . actually has increased 30 minutes a day since 1927.'

computer kitchen: a boon or a bane?

By JURATE KAZICKAS

NEW YORK (AP) — For all the push buttons, miracle agitators, infrared whoozits and eight-speed dingbats, America's appliance makers have yet to outmode that old, old adage: "A woman's work is never done."

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The Association of Home Appliance Manufacturers says there's every indication that Americans will buy more and more new products for the home.

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Aim Of Computer Kitchen Is Less Work For Mother

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One suburban housewife may have been speaking as much for the future as the past when she said: "Labor-saving devices? Ha! Money-earning machines for the repairman, you mean."

Although appliance prices have declined over the last few years, the cost of components is now rising, workers are demanding higher wages, and warranty costs are higher.

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INDIANAPOLIS, IND.
STAR
D. 228,852 — S. 378,395
INDIANAPOLIS METROPOLITAN AREA

JUN 28 1970

Ruth Sutherland practices talking things over with her kitchen computer before whipping up dinner for her family. Her husband, James (right), and daughter, Sally, watch the operation.

MONROE, LA.
WORLD
D. 31,698 — S. 45,057
MONROE METROPOLITAN AREA

JUN 28 1970

Household Computer Added To Gadgets Which Help Make Living More Complex

Less work for mother. That's been the goal of labor-saving kitchen appliances since mom first slaved over a hot stove. Now the computer is getting into the act, along with ultrasonic dishwashers and microwave ovens.

By Jurate Kazickas

NEW YORK (AP) — For all the push buttons, miracle agitators, infrared whoozits and eight-speed dinghats, America's appliance makers have yet to outmode that old, old adage: "A woman's work is never done."

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Results Of Study

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Yet there doesn't seem any assurance that the home computer, or garbage shredder, or ultrasonic dishwasher or dial-a-steak-medium rare-appliances in the works will indeed free women from the home.

Still More Buttons

The new appliances of the '70s, while often more portable and decorative, seem studded with still more buttons and contain more switches, wires and transistors. And costs versus function and practicality often indicate a good idea should have been left just that—an idea.

One suburban housewife may have been speaking as much for the future as the past when she said: "Labor-saving devices? Ha. Money-earning machines for the repairman, you mean."

Although appliance prices have declined over the last few years, the cost of components is now rising, workers are demanding higher wages, and warranty costs are higher.

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Microwave ovens can't be used for the aluminum - packaged instant dinners and the food industry will have to adjust their preparations to fit the oven. Or will Americans have to alter their tastes to use their machines?

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Given the cost, the question is raised as to just how much is it worth to junk the household adding machine, recipe boxes, the grocery list on the kitchen wall and save a few dozen steps to turn down the stereo or raise the garage door.

"What I really want is the white tornado," says Mrs. Sutherland wryly. "Someone who will go through the house and pick up all the family clutter. I went to a seminar on robots for the home. But I just don't see how, mechanically, it can ever be done."

Husband James' home computer may be the only one in use, but it is not the only one around. Honeywell Industries of Framingham, Mass., produced one that is supposed to plan menus, balance checkbooks, and figure out weekly budgets and such chores.

Stocked by Neiman Marcus of Dallas, the luxury department store which often features and sells huge price tag novelties, none of the $10,600 minicomputers — "For the woman who has everything . . ." — has sold, even with the included two - week course at Framingham on how to use the computer.

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Though the home computer seems to be a remote possibility for the average consumer, there is no end to the cornucopia of space age appliances to meet America's demands for the new and unconventional.

Dial A Roast

American Telephone and Telegraph hopes to permit housewives to dial their home phones with special codes and turn on the roast already on a stove that can be made into a freezer to "hold" the meat until the time for cooking.

There are no firm cost figures on such a system, or even a production date.

Other futuristic ideas include small washer - driers for the bedroom — to save a trip to the laundry room with small wash loads — and portable or multiple refrigerators so husband will not have to stir from his TV football game even during commercials.

There'll be small cooking units distributed throughout the home, along with cookware with built - in heating units so that every room might well become a mini - kitchen.

Home designers envision a modular approach to kitchen design. No longer will the kitchen have to look the same year after year. There'll be a series of free - standing appliances and multi-appliance modules placed on pedestals equipped to receive electrical and plumbing fittings that can be arranged around the room. Such appliances also could move from house to house for mobile Americans.

Ruth Sutherland practices talking things over with her kitchen computer before whipping up dinner for her family in their Pittsburgh home. Her husband, James, right, is a computer designer who worked up the device in his spare time. Despite the introduction of new appliances a survey shows that women spend more time at wifely chores than they did more than 40 years ago. (AP Newsfeatures Photo)

MEMPHIS, TENN.
COMMERCIAL APPEAL
D. 221,857 — S. 274,655
MEMPHIS METROPOLITAN AREA

JUN 28 1970

Gadget Maintenance May Enslave Women

By JURATE KAZICKAS

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Labor saving often turns out to be only saving time to work on the next kitchen machine—or to call the repair man. And the kitchens of the future, although they may be far out, are still going to need a housewife at the controls.

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THE HOUSEWIFE DOES less physically exhausting labor, says Dr. Walker, an associate professor at the College of Human Ecology at Cornell University. "But all we've done is change the type of activities we're involved in."

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Yet there doesn't seem any assurance that the home computer, or garbage shredder, or ultrasonic dishwasher or dial-a-steak-medium-rare appliances in the works will indeed free women from the home.

The new appliances of the '70s seem studded with still more buttons and contain more switches, wires and transistors. And costs vs. function and practicality often indicate a good idea should have been left just an idea.

Although some appliance prices have declined over the last few years, the cost of components is now rising, workers are demanding higher wages, and warranty costs are higher.

The 30-billion dollar home goods industry now expects to make 37 billion in 1971 and accounts for 18 per cent of total consumer spending on all goods, excluding food, the Department of Commerce reports.

The Association of Home Appliance Manufacturers says there's every indication that Americans will buy more and more new products for the home.

BUT QUESTIONS are being raised as to the practicality of some of the innovations being dreamed up by designers and manufacturers.

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But, given current waste production figures in America, with the average person accumulating more than four pounds of waste a day, someone would have to cart out a family of four's 125-pound bag when he does empty the garbage. The price: about $235.

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WHILE 95 PER CENT of appliance-buying homemakers rate the industry good or excellent in the styling and appearance of its products, they still complain about washers that overflow, freezers that don't freeze, and complicated instruction manuals.

Although the Association of Home Appliance Manufacturers says that service calls for washing machines during the first year of service were three times more numerous in 1958 than 10 years later, repair shops for refrigerators, washers, ranges and portable appliances had revenues of close to 2 billion dollars for 1967, the Department of Commerce Census of Business reports.

And there is sufficient discontent among consumers that a residential task force under President Johnson generated a 217-page report on appliance warranties and service, calling for the improvement of durability of products and improved communications with consumers.

NEW BEDFORD, MASS.
STANDARD-TIMES
D. 71,238 — S. 62,154
NEW BEDFORD METROPOLITAN AREA

JUN 28 1970

Computers Newest Kitchen Appliance

(EDITOR'S NOTE — Less labor, that's been the goal of labor-saving kitchen appliances since mom first slaved over a hot stove. Now, the computer is getting into the appliance act, along with ultrasonic dishwashers and microwave ovens.)

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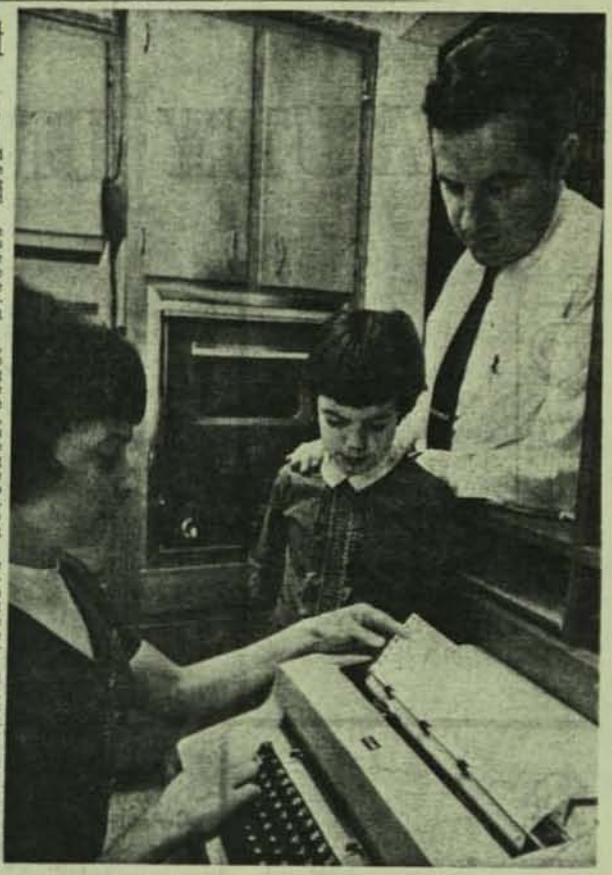

COOKING ON THE FRONT TRANSISTOR —Ruth Sutherland practices talking things over with her kitchen computer before whipping up dinner for her family in their Pittsburgh home. Her husband, James, right, is a computer designer who worked up the device in his spare time. Daughter Sally, 9, watches the operation. Despite the introduction of new appliances a survey shows that women spend more time at wifely chores than they did more than forty years ago.

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There are no firm cost figures on such a system, or even a production date.

Other futuristic ideas include small washer-driers for the bedroom — to save a trip to the laundry room with small wash loads —and portable or multiple refrigerators so husband will not have to stir from his TV football game even during commercials.

There'll be small cooking units distributed throughout the home, along with cookware with built-in heating units so that every room might well become a mini-kitchen.

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All these poducts — and more — are billed to save time and work for the homemaker. Some are here today, and might be gone tomorrow, like the electric can opener doomed to obsolescence by easy-open cans.

While 95 per cent of appliance buying homemakers rate the industry good or excellent in the styling and appearance of its products, according to a January 1969 survey in the trade magazine Appliance Manufacturer, they still complain about washers that overflow, freezers that don't freeze, and complicated instruction manuals.

Although the Association of Home Appliance Manufacturers says that service calls for washing machines during the first year of service were three times more numerous in 1968 than 10 years later, repair shops for refrigerators, washers, ranges and portable appliances had revenues of close to $2 billion for 1967, the Department of Commerce Census of Business reports.

And there is sufficient discontent among consumers that a residential task force under President Johnson generated a 217-page report on appliance warranties and service, calling for the improvement of durability of products and improved communications with consumers.

One survey states that the average couple starts married life with 23 appliances and the figure goes up in 42 for the family with two children. With such items as special bacon cookers, infrared ovens, electric knives and the like, the chances of service calls on one of these products grows yearly.

Computer Living Seen In The Future

(Continued From Page 3)
small terminal in the home that will communicate with larger computers elsewhere. Up-to-the-minute news reports, grocery prices, and sports results will be flashed on a visual display screen."

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One spokesman for the appliance industry said, "There's no question that appliances have become more complex. But if there is a feeling among consumers that there are more repairs being done, it's just because there's been an increase in appliances being used."

MORE and more appliances. Where will it all end? Since the first woman began tying clumps of straw together to sweep out her hut thousands of years ago, the idea has been that each new generation of labor-saving devices would free her more to get out of the home. But homes get bigger, appetites more sophisticated, money more available, and dirt, the original pollution, dirtier.

Housewives may well be doubly enslaved because they must add to the care and feeding of their families, the care and feeding of their gadgets and machines, whose very sophistication may make them the most demanding children of all.

RUTH SUTHERLAND practices talking things over with her kitchen computer before whipping up dinner for her family in their Pittsburgh home. Her husband, James, right, is a computer designer who worked up the device in his spare time. Daughter Sally, 9, watches the operation. Despite the introduction of new appliances a survey shows that women spend more time at wifely chores than they did more than forty years ago.

Despite Push Buttons, Infrared Whoozits, High Speed Dingbats, Women's Duties Never Finished

By JURATE KAZICKAS
Associated Press Writer

NEW YORK

FOR ALL the push buttons, miracle agitators, infrared whoozits and eight-speed dingbats, America's appliance makers have yet to outmode that old, old adage: "A woman's work is never done."

Labor saving often turns out to be only saving time to work on the next kitchen machine—or to call the repair man. And the kitchens of the future, although they may be far out, are still going to need a housewife at the controls. Sometimes.

There is Ruth Sutherland who has one of the first household computers in Pittsburgh, Pa., and, indeed, on the planet.

"It's a lot of trouble to program the computer. And you have to be aware of its limitations," says Mrs. Sutherland, mother of three. "The computer is not at the point where it really saves me any time."

ONE recently published survey showed that for all the imaginative and useful appliances plugged into the home in the past 40 years, the American woman spends as much time, if not more, now as she did then.

In a 1967 study of 1,296 women in the Syracuse, N.Y., area, Dr. Kathryn Walker's figures show that the amount of time a woman devotes to her house, shopping, care of the children and the like actually has increased 30 minutes a day since 1927.

The housewife does less physically exhausting labor, says Dr. Walker, an associate professor at the College of Human Ecology at Cornell University. "But all we've done is change the type of activities we're involved in."

The Survey Research Center at Ann Arbor, Mich., interviewed women in 44 American cities in 1965 and found they spent close to seven hours for cooking, cleaning, other home chores and child care.

MEANWHILE, research and marketing departments of the nation's major appliance manufacturers, determined to lighten the work load of American housewives, are cranking up for new escalation in the appliance war.

Yet there doesn't seem any assurance that the home computer, or garbage shredder, or ultrasonic dishwasher or dial-a-steak — medium rare — appliances in the works will indeed free women from the home.

The Association of Home Appliance Manufacturers says there's every indication that Americans will buy more and more new products for the home.

But questions are being raised as to the practicality of some of the innovations being dreamed up by designers and manufacturers.

A home dry cleaner in the works for several companies sounds great until the housewife finds out that she has to be there on the spot to remove clothes instantly once the process is finished, to prevent wrinkling.

A garbage shredder, it is said, will scrunch, rip, and compress the family garbage, including bottles and cans, into neat little packets you would only have to carry out once a week. But, given current waste production figures in America, with the average person accumulating more than four pounds of waste a day, someone would have to cart out a family of four's 125-pound bag when he does empty the garbage. The price: about $235.

Microwave ovens can't be used for the aluminum-packaged instant dinners and the food industry will have to adjust their preparations to fit the oven. Or will Americans have to alter their tastes to use their machines?

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MANY of these new products already are being tested and used in large institutions, while engineers fight the technical problems and manufacturers the economic feasibility to adapt them for home use.

James Sutherland, a computer designer for Westinghouse Electrical Corp. in Pittsburgh, used spare parts and spare time to put one in his home. It has a memory system, programmer's console, and a remote station keyboard in the kitchen.

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Given the cost, the question is raised as to just how much is it worth to junk the household adding machine, recipe boxes, the grocery list on the kitchen wall and save a few dozen steps to turn down the stereo or raise the garage door.

"What I really want is the white tornado," says Mrs. Sutherland wryly. "Someone who will go through the house and pick up all the family clutter. I went to a seminar on robots for the home. But I just don't see how, mechanically, it can ever be done."

HUSBAND James' home computer may be the only one in use, but it is not the only one around. Honeywell Industries of Framingham, Mass., produced one that is supposed to plan menus, balance checkbooks, and figure out weekly budgets and such chores.

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(Continued On Next Page)

THE BRAINS of Mrs. James Sutherland's kitchen computer are kept in the basement of her Pittsburgh home. Mr. Sutherland, who designed and built the device, points out details of the inner workings, background, while their children play on the floor. Wires run through the ceiling to the control board in the kitchen above. The children are Jay, 4; Sally, 9, and Ann, 12, right.

CHICAGO, ILL.
SUN TIMES
D. 545,570 — S. 712,175
CHICAGO METROPOLITAN AREA
JUN 28 1970

The computer kitchen is here, but . . .

By Jurate Kazickas

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THE NEW APPLIANCES of the '70s seem studded with still more buttons and contain more switches, wires and transistors. Costs measured against function often indicate a good idea should have been left just that — an idea.

One suburban housewife remarked: "Labor-saving devices? Ha! Money-earning machines for the repairman, you mean."

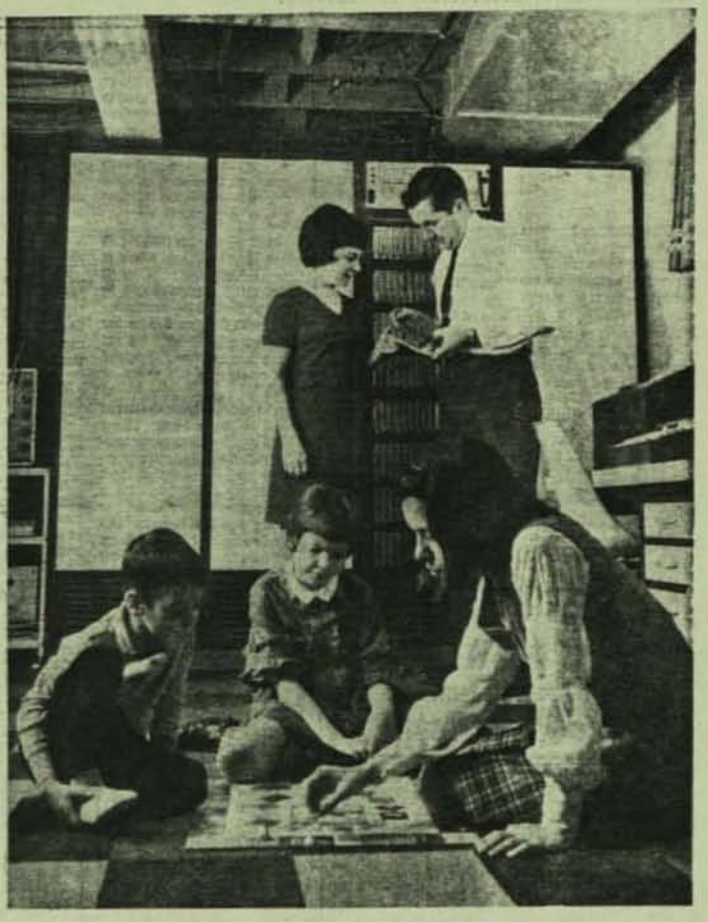
The Assn. of Home Appliance Manufacturers says there's every indication that Americans will buy more and more new products for the home.

BUT THE QUESTIONS ARE BEING RAISED as to the practicality of some of the innovations being dreamed up by designers and manufacturers. A home dry cleaner in the works sounds great until the housewife finds out that she has to be there on the spot to remove clothes instantly, once the process is finished, to prevent wrinkling.

A garbage shredder, it is said, will scrunch, rip and compress the family garbage, including bottles and cans, into neat little packets you would have to carry out only once a week. But with the average person accumulating four pounds of waste a day, someone would have to cart out a family of four's 125-pound bag when he does empty the garbage. The price: about $225.

Microwave ovens can't be used for the aluminum-packaged instant dinners and the food industry will have to adjust its preparations to fit the oven.

AN ULTRASONIC DISHWASHER, still in development, will get the prongs of a fork cleaner, but it won't do it any quicker than a regular dishwashing machine.



The brains of Mrs. James Sutherland's kitchen computer are kept in the basement of her Pittsburgh home. Her husband, who designed and built the computer, points out details of its inner workings. Their children (l. to r.), are Jay, 4; Sally, 9; and Ann, 13. (AP Photo)

Many of these new products already are being tested and used in large institutions, while engineers fight the feasibility of adapting them for home use.

James Sutherland, a computer designer for Westinghouse Electrical Corp. in Pittsburgh, used spare parts and spare time to put a computer in his home. It has a memory system, programmer's console and a remote station keyboard in the kitchen.

At present, the computer's complicated circuitry is called upon only to act as a typewriter and duplicating machine.

Mrs. Sutherland hopes, with new, complex programming, the machine will keep household financing straight, produce shopping lists, analyze menus, store recipes with automatic printout, control the family stereo and garage door.

Given the cost, the question is raised as to just how much is it worth to junk the household adding machine, recipe boxes, the grocery list on the kitchen wall and save a few dozen steps to turn down the stereo or raise the garage door.

"WHAT I REALLY WANT is the white tornado," says Mrs. Sutherland wryly. "Someone who will go through the house and pick up all the family clutter."

Husband James's home computer may be the only one in use, but it is not the only one around. Honeywell Industries of Framingham, Mass., produced one that is supposed to plan menus, balance checkbooks, and figure out weekly budgets and such chores.

Stocked by Neiman-Marcus of Dallas, the luxury department store which often features and sells huge-price-tag novelties, none of the $10,600 minicomputers—"for the woman who has everything"—has sold, even with the included two-week course at Framingham on how to use the computer.

"We didn't really expect to sell any," said a Honeywell spokesman. "What's more likely to catch on is a small terminal in the home that will communicate with larger computers elsewhere. News reports, grocery prices and sports results will be flashed on a screen."

THOUGH THE HOME COMPUTER seems to be a remote possibility, there is no end to the cornucopia of space-age appliances to meet America's demands for the new and unconventional.

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Other futuristic ideas include small washer-dryers for the bedroom — to save a trip to the laundry room with small wash loads—and portable or multiple refrigerators so husband will not have to stir from his TV footrest game even during commercials.

ALL THESE PRODUCTS — also new — are touted to save time and work for the homemaker. Some are here today, and might be gone tomorrow, like the electric can opener doomed to obsolescence by easy-open cans.

While 95 per cent of appliance-buying homemakers rate the industry good or excellent in the styling and appearance of its products, according to a January, 1969, survey in the trade magazine Appliance Manufacturer, they still complain about washers that overflow, freezers that don't freeze and complicated instruction manuals.

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One spokesman for the appliance industry said, "There's no question that appliances have become more complex. But if there is a feeling among consumers that there are more repairs being done, it's just because there's been an increase in appliances being used." (AP)

Appliance Fallout: Where Will It All End?

By Jurate Kazickas

NEW YORK (AP) — For all the push buttons, miracle agitators, infrared whoozits and eight-speed dingbats, America's appliance makers have yet to outmode that old, old adage: "A woman's work is never done."

Labor saving often turns out to be only saving time to work on the next kitchen machine — or to call the repair man. And the kitchens of the future, although they may be far out, are still going to need a housewife at the controls.

There is Mrs. James Sutherland who has one of the first household computers in Pittsburgh and, indeed, on the planet. Her husband, who works for Westinghouse, used spare time and parts to put it together.

"IT'S A LOT of trouble to program the computer. And you have to be aware of its limitations," says Mrs. Sutherland, mother of three. "The computer is not at the point where it really saves me time." Actually it now only types and serves as a duplicator. "What I need is the white tornado," said Mrs. Sutherland.

One recently published survey showed that for all the imaginative and useful appliances plugged into the home in the past 40 years, the American woman spends as much time, if not more, now as she did then.

In a 1967 study of 1,296 women in the Syracuse, N.Y., area, Dr. Kathryn Walker's figures show that the amount of time a woman devotes to her house, shopping, care of the children and the like actually has increased 30 minutes a day since 1927.

THE HOUSEWIFE does less physically exhausting labor, says Dr. Walker, an associate professor at the College of Human Ecology at Cornell University. "But all we've done is change the type of activities we're involved in."

The kitchen computer that Jack Sutherland built is examined by daughter Sally and puzzled over by Mrs. Sutherland. "It has its limitations," she said.

The new appliances of the 70s, while often more portable and decorative, seem studded with still more buttons and contain more switches, wires and transistors. And costs versus function and practicality often indicates a good idea should have been left just that — an idea.

One suburban housewife may have been speaking as much for the future as the past when she said: "Labor-saving devices? Ha! Money-earning machines for the repairman, you mean."

Although appliances prices have declined over the last few years, the cost of components is now rising, workers are demanding higher wages, and waranty costs are higher.

THE $30-billion home goods industry now expects to make $37 billion in 1971 and accounts for 18 per cent of total consumer spending on all goods, excluding food, the Department of Commerce reports.

The Association of Home Appliance Manufacturers says there's every indication that Americans will buy more and more new products for the home.

But questions are being raised as to the practicality of some of the innovations being dreamed up by designers and manufacturers.

A home dry cleaner in the works for several companies sounds great until the housewife finds out that she has to be there on the spot to remove clothes instantly once the process is finished, to prevent wrinkling.

A GARBAGE shredder, it is said, will scrunch, rip and compress the family garbage, including bottles and cans, into neat little packets you would only have to carry out once a week. But, given current waste production figures in America, with the average person accumulating more than four pounds of waste a day, someone would have to cart out a family of four's 125-pound bag when he does empty the garbage. The price: about $235.

Microwave ovens can't be used for the aluminum-packaged instant dinners and the food industry will have to adjust their preparations to fit the oven. Or will Americans have to alter their tastes to use their machines?

An ultrasonic dishwasher, still in early stages of development, will definitely get the prongs of a fork cleaner, but it won't do it any quicker than a regular dishwashing machine.

MANY OF these new products already are being tested and used in large institutions, while engineers fight the technical problems and manufacturers the economic feasibility to adapt them for home use.

Given the cost, the question is raised as to just how much is it worth to junk the household adding machine, recipe boxes, the grocery list on the kitchen wall and save a few dozen steps to turn down the stereo or raise the garage door. Housewives may well be doubly enslaved because they must add to the care and feeding of their families, the care and feeding of their gadgets and machines, whose very sophisitication may make them the most demanding children of all.

Sewing Boom

NEW YORK (AP) — Words like inflation and recession have affected the manufacturers of "big ticket" items such as automobiles and major household appliances.

But not so in the sewing machine industry, according to Giglio Reduzzi, executive in charge, North American Market, of Necchi Sewing Machines of Italy.

Following a tour of the United States, he said that sewing machine sales across the country increased 17½ per cent in the last half of 1969 and are still going up. The increase is attributed to the fact that sewing machines are money saving items, and that more women are sewing for the first time because of the economic pinch and demand simplified machines.

"During an inflation, when the value of money shrinks and the cost of goods rises, the housewife can stretch the value of her money by making her own clothing, draperies, and other items," Reduzzi said.

"During a recession, when people in general have less money to spend, the family sewing machine can be used to produce goods that could not be obtained otherwise."

Sign of Times

Cleans Cabinets

The same wax recommended for refrigerators and other appliances is excellent for cleaning steel cabinets.

STEPHENVILLE, TEX.
EMPIRE
D. 3,480 S. 3,480

JUL 5 1970

Helpful Appliance Hints for Homemakers

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GREAT BEND, KANSAS
TRIBUNE
D. 9,128 S. 10,398

JUN 29 1970

'Labor-saving' Kitchen Devices Good Deal for Manufacturers

By JURATE KAZICKAS
Associated Press Writer

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SPRINGFIELD, MO.
LEADER & PRESS
D. 42,217 — S. 72,755
SPRINGFIELD METROPOLITAN AREA

JUN 28 1970

30 Minutes More a Day Devoted to Family Than in '27

'Woman's Work Never Done' Stands Today More Than Ever

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UTICA, MICH.
SENTINEL
— D. 9,192 —
DETROIT METROPOLITAN AREA

JUN 30 1970

Is it a boon to housewives?

Computerized kitchen of the future is almost here

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By JURATE KAZICKAS
Associated Press Writer

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The Daily Sentinel
Family Living

RIVERSIDE, CALIF.
ENTERPRISE
D. 38,283 — S. 70,562
SAN BERNARDINO METROPOLITAN AREA

JUN 22 1970

Do time-savers save time?

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FREDERICK, MD.
POST
D. 13,566

JUN 30 1970

Modern Kitchens Need Women

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"It's a lot of trouble to program the computer. And you have to be aware of its limitations," says Mrs. Sutherland, mother of three. "The computer is not at the point where it really saves me any time."

One recently published survey showed that for all the imaginative and useful appliances plugged into the home in the past 40 years, the American woman spends as much time, if not more, now as she did then.

In a 1967 study of 1,296 women in the Syracuse, N.Y., area, Dr. Kathryn Walker's figures show that the amount of time a woman devotes to her house, shopping, care of the children and the like actually has increased 30 minutes a day since 1927.

The housewife does less physically exhausting labor, says Dr. Walker, an associate professor at the College of Human Ecology at Cornell University. "But all we've done is change the type of activities we're involved in."

The Survey Research Center at Ann Arbor, Mich., interviewed women in 44 American cities in 1965 and found they spent close to seven hours for cooking, cleaning, other home chores and child care.

Meanwhile, research and marketing departments of the nation's major appliance manufacturers, determined to lighten the work load of American housewives, are cranking up for new escalation in the appliance war.

Yet there doesn't seem any assurance that the home computer, or garbage shredder, or ultrasonic dishwasher or dial-a-steak– medium rare– appliances in the works will indeed free women from the home.

The Association of Home Appliance Manufacturers says there's every indication that Americans will buy more and more new products for the home.

But questions are being raised as to the practicality of some of the innovations being dreamed up by designers and manufacturers.

A home dry cleaner in the works for several companies sounds great until the housewife finds out that she has to be there on the spot to remove clothes instantly once the process is finished, to prevent wrinkling.

A garbage shredder, it is said, will scrunch, rip, and compress the family garbage, including bottles and cans, into neat little packets you would only have to carry out once a week. But, given current waste production figures in America, with the average person accumulating more than four pounds of waste a day, someone would have to cart out a family of four's 125-pound bag when he does empty the garbage. The price: about $235.

Microwave ovens can't be used for the aluminum-packaged instant dinners and the food industry will have to adjust their preparations to fit the oven. Or will Americans have to alter their tastes to use their machines?

An ultrasonic dishwasher, still in early stages of development, will definitely get the prongs of a fork cleaner, but it won't do it any quicker than a regular dishwashing machine.

Many of these new products already are being tested and used in large institutions, while engineers fight the technical problems and manufacturers the economic feasibility to adapt them for home use.

James Sutherland, a computer designer for Westinghouse Electrical Corp. in Pittsburgh, used spare parts and spare time to put one in his home. It has a memory system, programmer's console, and a remote station keyboard in the kitchen.

At present, the computer's vast and complicated circuitry is called upon only to act as a typewriter and duplicating machine. Mrs. Sutherland hopes in the future, with new, complex programming, the machine will keep household financing straight, produce shopping lists, analyze menus, store recipes with automatic printout, control the family stereo and garage door.

Given the cost, the question is raised as to just how much is it worth to junk the household adding machine, recipe boxes, the grocery list on the kitchen wall and save a few dozen steps to turn down the stereo or raise the garage door.

"What I really want is the white tornado," says Mrs. Sutherland wryly. "Someone who will go through the house and pick up all the family clutter. I went to a seminar on robots for the home.

Husband James' home computer may be the only one in use, but it is not the only one around. Honeywell Industries of Framingham, Mass., produced one that is supposed to plan menus, balance checkbooks, and figure out weekly budgets and such chores.

Stocked by Neiman Marcus of Dallas, the luxury department store which often features and sells huge price tag novelties, none of the $10,600 minicomputers– "For the woman who has everything...."– has sold, even with the included two– week course at Framingham on how to use the computer.

"We didn't really expect to sell any," said a Honeywell spokesman. "What's more likely to catch on in the future is a small terminal in the home that will communicate with larger computers elsewhere. Up-to-the-minute news reports, grocery prices, and sports results will be flashed on a visual display screen."

Though the home computer seems to be a remote possibility for the average consumer, there is no end to the cornucopia of space age appliances to meet America's demands for the new and unconventional.

American Telephone and Telegraph hopes to permit housewives to dial their home phones with special codes and turn on the roast already on a stove that can be made into a freezer to "hold" the meat until the time for cooking.

MAGAZINE ARTICLES ABOUT "ECHO-IV"

Date	Magazine	Page	Title
1966 Dec	HOUSE & GARDEN	30	"For The Future, A Household Computer"
1966 Dec	FAMILY WEEKLY	2	"Mother's Helper"
1967 Mar	EE THE ELECTRONIC ENGINEER	36	"Basement Computer"
1968 Apr	POPULAR MECHANICS	77	"A Computer In The Basement?"
1970 Feb	COMPUTERWORLD	12	"A Hobby That's Like Dope"
1970 Mar	DATAMATION	150	"First Homemade C.Sys...The Beginning?
1971 Feb	SCIENCE & MECHANICS	66	"Run Your Home By Computer"
1972 Jan	COMPUTERS & AUTOMATION	20	(mentioned in "Building Your Own C."
1978 Jul	BYTE	64	(mentioned in "The First Ten Years..."
1984 Nov	CREATIVE COMPUTING	10	(mentioned in "The Early Days")

answer. But it is often difficult to find something suitable and engaging that isn't too darned cute. A refreshing change from all those cunning cocktail roosters are the

invitations made by Fanfare: small die-cut foldovers in the shape of Christmas trees, pansies, butterflies, all in wonderful bright colors. Their envelopes, too, are in bright colors—not likely to get mixed up in the throwaway mail! Festoon Prints also makes charming place cards—whimsical but not corny.

When we went to the Greenes' for cocktails one cold Sunday afternoon recently, I noticed a tray of piping hot hors d'oeuvres sitting on a neat little black steel and copper food warmer. This nifty contrivance burns wood alcohol with a controllable flame in a ring construction like the burner on a gas range. In fact, you could accook your own hors d'oeuvres right on the tray. Mrs. Greene told me that she had found it at Bloomingdale's. Another of these Stockli Swiss warmers would be on our boat next summer, for heating precooked casseroles and the like. As you might guess, they are imported from Switzerland.

At this season of frothy nogs and rich food, it was very refreshing indeed to attend a luncheon party, as we did last week, at which a lovely dry sherry, poured over ice in a punch bowl, was the only prepprandial drink.

In the course of making the holiday rounds I noticed two fine new-to-me ways of keeping party foods warm. One was an impressive hot tray by G.E. that had a pull-out

drawer for keeping bread and rolls hot. Another, somewhat smaller tray I saw had a warming surface on one side and a cheeseboard on the other. This one was made by Morgan Designs.

FOR STORE ADDRESSES, SEE PAGE 204

WHAT'S NEW FOR LIVING *continued from page 11*

NEEDLEPOINT MADE EASY. People who have always wanted to do needlepoint but have been put off by its apparent complexity will be encouraged by a new book, *New Methods in Needlepoint*, by Hope Hanley, who contends that anyone can do it, including the finishing and blocking—two steps amateurs are loath to tackle. The book costs $5.95, is published by Charles Scribner's Sons, 597 Fifth Avenue, New York, N. Y., 10017.

FOR THE FUTURE, A HOUSEHOLD COMPUTER. At the moment "Echo-4" (Electronic Computer for Home Operation) exists only in the basement of its inventor, James Sutherland, a computer systems engineer with Westinghouse, who works on it in his spare time. As he sees it, his creation has potential as an indispensable household helper that will compute shopping lists, balance family finances, take messages, predict the weather, and control thermostats, among other chores. It may be ten years before the Echo-4 is ready, but it is something to think about.

DO-IT-YOURSELF ALUMINUM WALLCOVERING. An embossed aluminum foil that comes with a peel-off paper backing is now available by the yard in several colorful and decorative patterns: Paisley, block, marble, floral, and damask. This shimmery stuff is cleanable and waterproof, can be used to cover shelves and furniture tops, line drawers and cupboards, paper closets and wall areas, and wrap or trim myriad household accessories. It measures 18 inches wide, is 98 cents a yard. "Cling-Foil" by Columbus Coated Fabrics Corp., Seventh & Grant Avenues, Columbus, Ohio, 43216.

WHAT IN THE WORLD!

By ALLEN GARVIN

Christmas Cruise Persons on the Christmas cruise of the *Antilles* will pass the time today throwing messages into the Caribbean—to aid science! The messages (in plastic containers) ask finders to mail them to a research center, indicating location and date of the pickup. Purpose: to detect from oily deposits on the messages where ships are dumping fuel and thus dangerously polluting the ocean.

Church Duds Sonny and Cher boast the kookiest clothes—bell-bottom slacks, fur vests, and leopard-skin shorts. But once in a while, they confound critics by dressing in a perfectly normal fashion. The last time was during their tour of Europe when Cher finally climbed into a conservative dress and Sonny donned a coat and tie. The occasion: they had an audience with Pope Paul VI at the Vatican. There was no publicity—not even pictures.

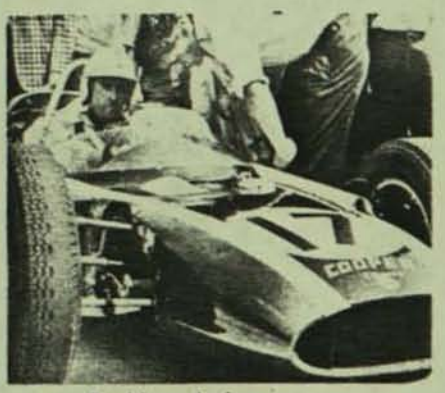
Cher and Sonny

Mother's Helper The dream of engineer Jim Sutherland of Pittsburgh is a computer in every cellar. He says a family-type computer that he is designing will inventory groceries on hand, keep track of family finances, predict the weather, turn on tv sets at preselected times, control household thermostats. Adds Sutherland: "Eventually I'll hook it up so that when my wife or one of our three kids wants to leave a message for someone, they'll simply type it into the computer, which will then display the message on our tv screen."

Sutherlands and their computer

Goal-Post Lore As you look at next weekend's bowl games, consider this tale. Some years ago the NCAA decided to widen football's goal posts to 26 feet. Reaction was ho hum—except from one small college in Washington. "Please don't change this rule," the president pleaded in a letter. "We've searched through all the lumberyards in town, and the longest 2x4 we can find is 24 feet." The rules committee had a heart, and that's why goal posts are still 24 feet apart.

No Letup At 40, when most men are quite content to pursue sedentary sports, "Gentleman Jack" Brabham, a quiet Australian, ranks as the best racing driver in the world. He has won his third world championship and is the first driver to do it in a car of his own design. Modestly he says: "It's just a combination of having the right engine and the right chassis at the right time."



Brabham before a race

Contest

Entries stress the local
many other services they

■ There's a great ocean of good
papers that carry FAMILY WEEKLY
the hundreds of entries received
Newspaper" contest, which was
FAMILY WEEKLY.

A cash prize of $25 has been a
whose entries were judged best
are the winning entries:

Denver Ewing Baughan *Gaines*

I like my local newspaper bec
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"Li'l Abner," "Steve Canyon," and
herself in "Women and the Family
Heloise, and the shopping bargain
I usually ferret out the national ne
gardener), "Voice of the People,"
the stock market—and of course
What a bargain for only 55 c

Debbie Long *Dubuque, Iowa*

I like my local newspaper beca
always given superb coverage to
the things most important to its
and all the small but cherished th

In addition to all this, a rema
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are treated in the Dubuque *Tele*
beautiful and sometimes spectac
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Mrs. Josephine Woodson *Sacr*

There are three main reasons

First, it offers valuable informa
that helps me meet the everyday
and stimulates my intellect by pr
humor, philosophy, inspiration, ar
with people all over the world,
standing of one another.

Mrs. Johnnie Geltemeyer *W*

I like my local newspaper bec
news, state news, local projects
activities in surrounding commun

Editorials are progressive in
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Center, attracting tourists to the
in politics. Enough syndicated co
look; schools are well covered t
porters do a tremendous job.

Add to these things an easy
ments, cartoons and other bits o
paper, the Waco *News-Tribune*

DEC 1966 FAMILY LIVING

New graduate (Concluded)

earth as they walk around in outer space. Engineers with specialized skills will be needed to support further exploration in space.

Two qualities of a good specialist are that he knows when his problem exceeds his capabilities, and he knows where to get reliable information. This does not mean that an engineer should specialize until he can no longer communicate with his fellow engineers in other fields. He must keep an open mind and must not limit his thinking.

Now, what about *your* first or second assignment? Your project manager has outlined his wants and maybe has suggested some possible solutions for you to explore. You want to do a good job in a reasonable time, but you also want to be careful about being tempted down the too-ovbious path to the solution. Study and analyze the problem. Keep a lookout for new ideas. A new method may produce results far better than an old one. If the going seems easy, you may be going downhill—ahead of time. We all know that what we get out of something is in direct proportion to what we put into it. Building a reputation is analogous to the growth of man.

Be inquisitive. When a man no longer wants to know the how and why of things, he has ceased to grow; perhaps he has even ceased to live. If you are able to use a new technology in conjunction with your present design, you can benefit in two ways. You may come up with a better design, and you will learn about a new field which may prove more interesting.

An engineer must accept change. A friend of mine took the same course of study I did in college. He came to IBM and started in product engineering. After eight months he transferred to reliability and serviceability. He was inquisitive, and he had shown an interest in programming. There was an opening in diagnostic programming and he got the job. He spent four years training to be a mechanical engineer and is now a programmer. His engineering background is now applied to machine diagnosis. A little of how and why and imagination changed my friend's career.

These attributes need a bonding agent—call it a sense of responsibility. When a man is not responsible for his actions, he is no man, but only a boy. To be responsible a man must commit himself. Although no one likes to be wrong, the fear of being wrong can be a deadly one. The only men who do not make mistakes are those who are dead and those who do nothing—both are equally useless to civilization.

Being responsible is not difficult. When you say you can do something, and then find that you can't, then tell someone about it. Knowing when to ask for help is an important attribute not taught in college. Has anyone ever heard of "Help 403"? Once you admit you are in trouble, usually you will find your management more than willing to help you.

I think that Emerson's plot to be tilled is a man's life, and only with diligent effort will he grow. Look again at Emerson—". . . The power which resides in him is new in nature, and none but he knows what that is which he can do, nor does he know until he has tried."

Dear Reader:
Any comments? Use the handy feedback card located between the cover and page 1.

Basement computer

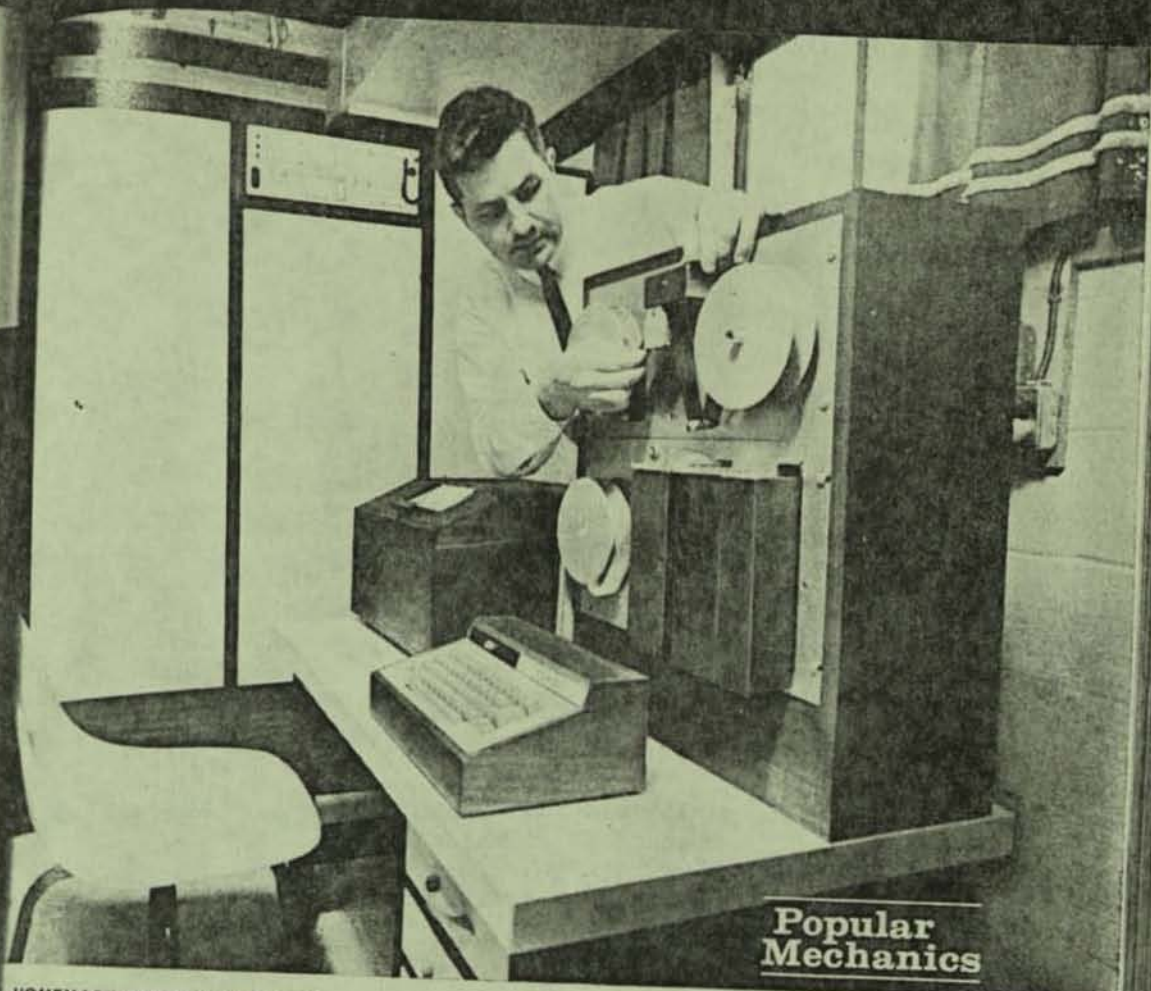
Tucked away in the basement of a home in suburban Pittsburgh is a homemade computer. Its creator, 33-year-old Jim Sutherland, appropriately calls it ECHO-4 for Electronic Computer for Home Operation. Think it a strange place for a computer? Well it's not to Jim, a Westinghouse Electric Corp. computer systems engineer. For him it's a dream he's making come true, diagram by diagram, wire by wire.

Building the hardware portion of ECHO-4 took a year and Jim is now programming it. The computer measures 7-ft. in length, 2-ft. in depth and 6-ft. in height. It is made almost entirely of discarded and obsolete parts.

Jim estimates that it will take 10 years of part-time work to program ECHO-4 to its full capacity. He feels that his computer will eventually: (1) produce shopping lists as well as inventory of groceries on hand, (2) keep track of the family finances, (3) predict the weather, (4) turn TV and radio sets on and off at pre-selected times, (5) print out recipes and (6) control the thermostats according to the time of day and the weather.

The number of things ECHO-4 will do around the home is almost unlimited according to Jim. He plans to eventually hook up CRTs to the system. When one of the family wants to leave a message for the others they'll simply type it into the computer which will display the message on the CRT.

Jim graduated from the University of Missouri in 1952 with a degree in electrical engineering. He also holds a degree in meteorology.



HOMEMADE PROGRAMMER'S DESK contains keyboard, page printer, paper tape punch and paper tape reader

A Computer in the *Basement?*

Jim Sutherland's home-built computer is not very sophisticated by today's standards—or tomorrow's. But as it takes on more tedious household tasks, it's proving what can be expected of the future home computer

By GLENN INFIELD

THERE HAVE BEEN many predictions that the home of tomorrow will be radically different from the home of today, because it will be run by a computer. But no one knew precisely what a computer could do in the home until Jim and Ruth Sutherland of Pittsburgh, Pa., designed, built and programmed "ECHO IV." ECHO means Electronic Computing Home Operator, and building it has been a family affair.

Jim is a computer-systems design engineer with Westinghouse Electric Corp., and his wife, Ruth, is a home economist. Their home-computer venture began two years ago when, as a hobby, Jim started buying obsolete computer parts and sketching logic circuit diagrams. Actual wiring of 11 printed-circuit module mounting panels began as soon as the design stage was completed. Within the year, ECHO was running simple programs but was limited by an inadequate input-output

SUTHERLAND goes over the intricate wiring required to build ECHO. Each of four units has such a panel

capability. To overcome that handicap, Jim produced a programmer's desk consisting of a keyboard, page printer, paper tape punch, and paper tape reader in oiled walnut enclosures.

Before the end of the second year what was formerly the family basement playroom had been taken over by the home computer and its peripheral equipment and Ruth was wondering, "Will it replace *me*?"

She isn't worried about this now, since she has learned that *home* computer programs must first be flowcharted by someone who knows *homemaking*. Flowcharts define the job graphically, so that the programmer and the user can understand each other.

Usually, shortcuts and time-saving features show up when the flowchart is prepared for a task prior to translating it into computer language. Later, if program revisions are needed, the flowchart provides a quick review of how the program operates. Changes and/or corrections in the flowchart can easily be inserted into the program listing of instructions.

The Sutherlands feel that if the homemaker programs some of her own

RUTH SUTHERLAND programs computer which can control temperature, set clocks, tabulate home bills

tasks, she will better understand how the computer operates and become skilled in determining best household applications.

Simple keyboard entry and printer output routines were the first ECHO programs the Sutherlands wrote. These were followed by the paper tape input and paper tape punching routines. Subsequently these programs permitted other, more complicated programs to be entered into the computer, verified on the printer, and stored permanently on paper tape. Jim is now devoting his time to writing such programs as multiply, divide, multiple precision add, subtract, and message writer routines.

As more jobs are loaded into ECHO,

INPUT-OUTPUT UNITS are made from an electric typewriter keyboard and a surplus teletype printer

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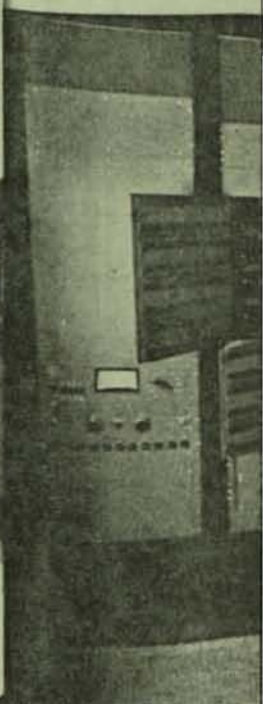

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PULAR MECHANICS

its core memory storage capacity of 8192 words may be exceeded, and that's when Jim will begin building some magnetic-tape auxiliary bulk memory units. The computer understands 18 commands—or machine language instructions—which can be arranged into computer programs and stored in memory for future use. Some of the larger programs will be stored on paper tape and loaded into the computer when needed.

Now that the basic routines are running in ECHO IV, the Sutherlands are planning to delegate the chores of bookkeeping to the computer. Tabulating monthly budgets and accounting for monthly expenditures is a time-consuming job that ECHO will reduce to simple end-of-the-month routine. Specifically, when April 15 rolls around, income-tax deductions can be identified and grouped so that tax forms can be filled out readily.

One important task which ECHO performs reliably is the updating of the hour portion of binary-coded decimal clock displays found in four different rooms of the Sutherland home. Jim designed and built the timepieces several years ago, and even though the clocks have no hands, the children learned to tell time by them before they understood ordinary clocks.

ECHO will also be programmed to keep track of real time so that events can be scheduled up to a year in advance with one-second accuracy. Ruth isn't interested in running their home on a second-by-second schedule, but she feels Jim won't be able to make excuses about forgetting birthdays and anniversaries ever again.

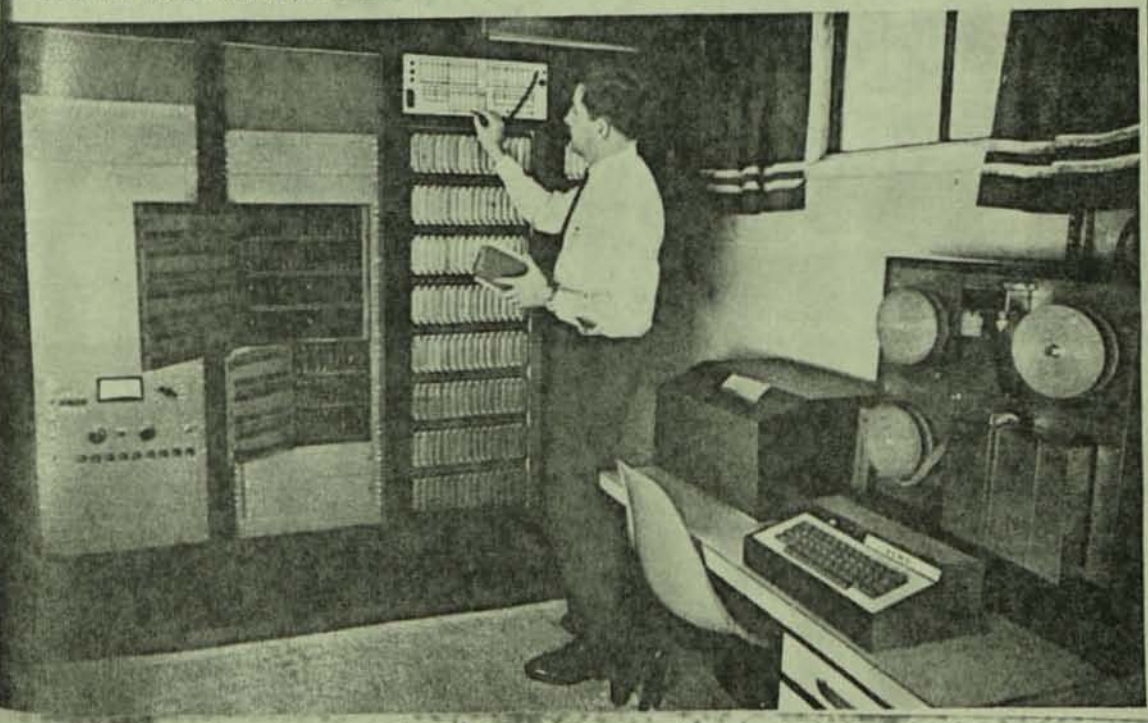
Ruth believes that the kitchen is where the computer will really perform well and save time in routine jobs. Recipes will be increased or decreased proportionately to provide any number of servings, with the necessary shopping lists printed out automatically.

"To be really effective," Jim says, "the computer must know how much and what kind of food is on hand so allowances can be made in shopping lists."

Jim plans to modify the kitchen cabinets to allow ECHO to take inventory automatically. Later, as more complex programs are tried, the computer will

(Please turn to page 209)

ECHO with two of the front panels removed. Computer takes about 20 square feet of basement floor space



COMPUTER IN HIS BASEMENT

(Continued from page 79)

generate balanced menus with specific calorie and nutrient content, from which the family can select their meals in advance.

ECHO provides the Sutherlands with a proving ground for experimental family games. The Sutherland children—Ann, 11; Sally, 7; and James Scott, 2—are looking forward to programming and playing games on the computer. As television displays are added to the system, many new games involving logic and strategy will provide family entertainment.

Recently Jim connected his color TV to a controller that will eventually allow ECHO to regulate the TV schedule. For instance, on a school night, the children might have to answer correctly some key questions via the keyboard before ECHO will switch on the set. The antenna rotator will also be controlled by ECHO to insure proper alignment of the antenna with the corresponding channel number entered through a control keyboard. This way, one manual entry directs both set and antenna to the desired channel.

Automatic temperature control

Jim will experiment with the computer as a temperature-controlling device for the home. After interrogating weather instruments on the outside of the house, the computer will be programmed to compensate for weather changes and make automatic temperature and humidity adjustments on the inside. Purely for his own interests, he hopes to use ECHO as an aid in short-term local weather prediction. Jim has a degree in meteorology from Penn State University, which was received while he was on active duty as a weather officer in the U.S. Air Force. He and Ruth also hold degrees from the University of Missouri which Jim attended through a Westinghouse scholarship won in a National 4-H Farm and Home Electric contest.

The Sutherlands are pioneers in the field of home computers and undoubtedly will discover that the best computer applications will evolve through everyday experiments. Although many of the uses planned for ECHO sound impractical and impossible, Jim notes that many of today's computers and their uses would have sounded farfetched to people 20 years ago.

For instance, at age 15, Jim constructed a model electrified farm to show various farm groups how they could do more work with the aid of electricity. "Several national magazines carried stories on the project; the one I value most appeared

(Please turn to page 229)

ARI

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BIG RISE OF LITTLE SINKERS

(Continued from page 220)

visibility, however, marine scientists and others with business in the deep are glad to pay substantial sums to use the small subs. The Navy, for one, leases a number of them for work on the development of military undersea techniques—submarine communication, detection and weaponry. Others use them as workboats for undersea construction, surveying, salvage, mineral prospecting and inspection of underwater equipment such as cables.

Daily rent $300 to $10,000

What does it cost to hire one? Prices vary, depending on the size, payload and depth capability, but a rough rule of thumb is $1 or $2 per foot of depth. The smallest, shallow-diving subs rent for $300 to $500 a day, but you could pay as much as $5000 to $10,000 a day for the deeper-diving vessels.

Obviously, it's too expensive for joy-riders, so the money goes for jobs that are worth doing and worth risking in the harsh, alien, unforgiving deep seas.

Remarkably, not one life nor one small sub has been lost to date. Let's hope no one gets overconfident. ★★★

COMPUTER IN HIS BASEMENT

(Continued from page 209)

in March, 1949, in *Popular Mechanics*," Jim reminisces.

In that same issue, there was an article describing the first electronic computer built by Echert and Mauchley at the University of Pennsylvania. One of the predictions made then was that "Computers in the future might have only 1000 vacuum tubes and perhaps weigh only one and one-half tons."

However, since that time, transistors have replaced tubes and today's integrated circuits are replacing transistors. To illustrate the radical reduction in size which has been made possible by molecular electronics, one need only note that space-age computers now weigh only a few pounds.

"Computers are capable of being programmed to perform important household tasks today, but when we look ahead 20 years, even our wildest expectations will probably seem pale when compared to what ECHO, 1987 version, may be doing for us." One thing is certain, the Sutherland family of Pittsburgh will know from firsthand experience how to get the most from an ECHO "genie." ★★★

A Hobby That's Like Dope

Homemade Computer Regulates Household Appliances

By Peter F. Carr
CW Staff Writer

PITTSBURGH, Pa. – A do-it-yourself homemade computer is presently operating various appliances in the home of a Westinghouse computer designer here.

Jim Sutherland, who designed and built the four-part electronic computer for home operating, which he calls Echo IV, began the project as a hobby four years ago.

"However, a hobby like this is a lot like dope," he said, "once you get hooked on it, you never get away from it."

The hobby now regulates the furnace in Sutherland's home, selects channels on the television, analyzes homework problems for the children, and will soon take care of the bookkeeping for the family.

Most of the equipment for Echo IV came from parts of old Westinghouse computers, which the company sold to Sutherland.

"This includes the individual logic boards from an old process control computer that was in use about ten years ago, but was replaced by a faster and more reliable unit.

"These modules were being scrapped, and along with them was a complete core memory system which was no longer useful. By borrowing the memory system, I was able to begin the project," he said.

Designing the system, checking for errors, and doing all the wiring took almost a year and a half, Sutherland said. And since the computer was of unique design, he had to do his own programming.

Simple as Possible

"I decided to make it as simple as possible and only put in the instructions I really needed, so I ended up with 17 machine language instructions.

"It's a 15-bit format with an 8K core memory. To this I'm adding 2K words of read-only memory to eliminate bootstrapping.

"Another expansion will consist of adding two tape drives which will give a million and a half characters of random access record blocks on each of the two drives.

"This means that we can do a random read or write of any of the records on the tape. Also, a paper tape punch will not be necessary although we have one.

"Since we do not have a compiler, we do our own assembly. But instead of punching up cards or tape we go directly from the keyboard to the core, and then transfer these programs onto the magnetic tape after the debug," he said.

"For peripheral equipment we have control keyboards that can be plugged in around the house. When we did the wiring, we put an 18-wire data trunk around the house with 16 receptacles scattered in different places.

"This means that the control keyboards can be plugged in to provide input/output control practically anywhere," he said.

Problems

The system, however, has presented some problems to Sutherland. The machine often failed two or three times a night, and since it also works as an alarm system, this meant that he had to chase down the problem each time.

But the computer is running very reliably now. The last problem occurred before Thanksgiving. Now it only comes on when it is called for, by pushing a key on any of the keyboards or typewriters.

"I've learned a lot over the last few years on this project that I didn't know when I started," he said.

"One thing that happened is that all the original ideas became more and more unattainable while new ideas became more practical," he said.

Sutherland's three children are rapidly learning about computer operations through their father's hobby, and his wife plans to program recipes into the machine so that she can call one from the memory bank when she needs it.

The computer analyzes math problems for the children, and Sutherland's wife used the editing feature of the computer typewriter in her kitchen when she was preparing a term paper for a night school course in computers – a course she would not have undertaken without her husband's homemade computer.

Sutherland plans to hook up the television picture tube to the system so that Echo can communicate with the family through an unused channel. On school nights, the set will switch to that channel at a certain time and remind the children to go to bed, he explained.

"Eventually, I feel that the machine will serve much better as a diary," Sutherland said, "where we can enter records of daily events, and by properly coding the headings we can automatically retrieve the records. An example of this would be automobile records over the course of a year."

Despite his success with his homemade computer, Sutherland does not see any widespread use for such a device, at least not in the near future.

"We are probably several years away from seeing such a computer on the

tv channels capable of being used for a wide variety of other services including high-speed data transmission. This system would serve either 48 states, or all 50 states plus Puerto Rico, depending on market interest. Comsat reportedly would like to lease one or both birds to individual users, but is also planning for multiple users and multiple applications.

Comsat's plan probably won't be launched until the FCC publicly announces the regulatory constraints it intends to impose. The White House gave its position on many of these issues, but the FCC is free to ignore the advice. The chances are better than even, according to FCC watchers, that the commission will go along with the report's major recommendations.

When the FCC pronouncement will be issued is anyone's guess. The only clue is Chairman Dean Burch's statement, shortly after release of the White House report, that "this matter warrants, and will receive, the highest priority before the Commission."

AT&T has also announced plans to integrate a domestic satellite system with its existing terrestrial facilities in a way that would permit satellite capacity to be shifted from point to point to match changing patterns of communications traffic. Within the dp industry, CDC, GE, University Computing, and MCI are all regarded as possible satellite system developers and/or users. One knowlegeable source sees the possibility of "several computer manufacturers getting together and forming a cooperative to either operate their own bird or lease capacity on someone else's."

If the FCC agrees with the White House report, it seems clear the domestic satellite development will become an extremely tricky poker game with multimillion dollar stakes. For the report suggests that many restraints on entrepreneurial imagination should be relaxed in order to develop maximum participation and interest. The antitrust laws should be waived, for example, to encourage satellite user cooperatives. Common carriers should be allowed to develop "specialized satellite services" on the same basis as others — i.e., without most of the regulations now applied to the carriers' terrestrial services. Cross-subsidization should be prevented, says the report, but this advice "should not be interpreted to preclude the legitimate economies of joint-use facilities."

Several other newsworthy telecommunications developments occurred more-or-less concurrently with release of the White House report:

The U.S. Circuit Court of Appeals refused to delay or enjoin (but didn't finally approve) increases in Telpak rates proposed earlier by AT&T. As a result, the increase — costing users about $64 million a year — went into effect Feb. 1. Opponents now face a protracted court fight.

The FCC told all of the nation's telephone companies that they can't operate CATV companies within their service territories; that independent CATV operators must be offered right-of-way facilities (pole attachments and conduit), and that present phone company rates for these items shouldn't be increased. The effect of the decision is to keep competition in the burgeoning CATV field wide open, and to encourage new entrants. Dp industry spokesmen welcomed the FCC pronouncement, saying it would help spur nonbroadcast applications of CATV facilities.

A TIROS-M (Television Infrared Observation Satellite) is shown in the foreground, backed up by a Varian 620/i, which buffers information from the satellite for processing on a 360/95. TIROS-M uses two vidicon tv cameras to send daylight picture coverage of the entire earth every 24 hours. The data is then used for meteorological purposes.

AT&T has agreed to consider letting its wideband private line customers supply their own data sets. The phone company also reported that it is making progress in developing wideband entrance facilities to connect with private microwave systems. This news surfaced at the latest in a series of meetings intended to resolve the foreign attachment hassle. If the two changes are actually made, the immediate impact will be limited, says a knowlegeable source. But in the long run, the effects will be widespread. For example, as the telephone company expands its 50 kilobit, Picturephone, and other wideband services, the appeal of customer-supplied data sets should grow.

"Next May or June," says an FCC source, the National Academy of Sciences should complete its study of network control signaling — the key issue in the foreign attachment controversy. The dp industry — users and suppliers — could be vitally affected by the NAS recommendations, for they may lead to new markets for the latter, new and/or lower-cost services for the former.

Meanwhile, two more companies announced their intention of setting up microwave systems offering specialized data transmission services like those proposed earlier by Microwave Communications of America, Inc., and by Data Transmission Corp., a UCC subsidiary. The new entrants are Nebraska Consolidated Communications Corp., which would operate in several Great Plains states, and United Video, Inc., Tulsa, Okla.

FIRST HOMEMADE COMPUTER SYSTEM ... THE BEGINNING?

The Sutherlands are a lovely family. Jim, Westinghouse engineer; Ruth, industrious housewife; Ann, precocious 13; Sally, computer-type 9; Jay, tv-watching 5; and Echo IV . . . sometimes-colicky 4-year-old computer in the basement.

Jim says: "The sleepless nights I've spent with that stupid machine. For a while there, I'd have given it to you. I'd hear it running in the middle of the night when it wasn't supposed to. So there I'd be, standing at the workbench in my pj's, groping for bugs."

Sutherland started building Echo IV around June of 1965. The acronym stands for Electronic Computer for Home Operation . . . "with four parts." He used second-generation logic boards, one of the old Telemeter Magnetics core memory systems, a rag, a bone and a hank o' hair, and an inordinate measure of patience.

Echo has an 8K core memory, 15-bit word, and Jim's getting ready to fire up 2K of read-only memory (to hold execs), and maybe a mag tape drive too, as the family uses the system more. The basic mainframe setup is not unusual. Accumulator, program counter and index register are in core. There's one index register, and every instruction (17 in all) can be indirectly addressed. A single synchronizing interrupt scans input service requests from peripherals.

A bit different, however: the refresh buffer for the crt is in the main memory; also, mag tape search is done without hardware (it's all software comparison). Thus, the cpu (flip-flop) registers are being time-shared with the mag tape controller. "And time-sharing all these registers keeps the cost of parts down," says Jim.

And how does Echo help around the house? The kitchen console (with an

IBM 735 Selectric) is mostly for Ruth (who just chalked up an A in an evening dp course). She keys-in recipes, types (and painlessly edits) term papers, and, according to Jim, will shortly be writing a routine to do a code translation to convert Selectric I/O code into ASCII internal. (Ruth has neither assembler nor compiler, but octal loader program and dump will help.)

Echo drives the four clocks in the house, and the clocks regulate the computer. The clock in the livingroom reads hours, minutes and seconds, " . . . and Jay learned that faster than the big-and-little-hand business." Echo changes tv channels. Jay was all set for Batman one evening when Echo switched channels on him. And naught could be done until Daddy showed up.

Echo regulates the furnace. Let the computer know when you want to get up, then it turns the thermostat up to daytime temperature a half hour before Echo trips the alarm clock. There's a control keyboard in the family room (mostly tv control), programmer's desk in the basement, and one data trunk (16 different plug-ins throughout the house) with all I/O multiplexed.

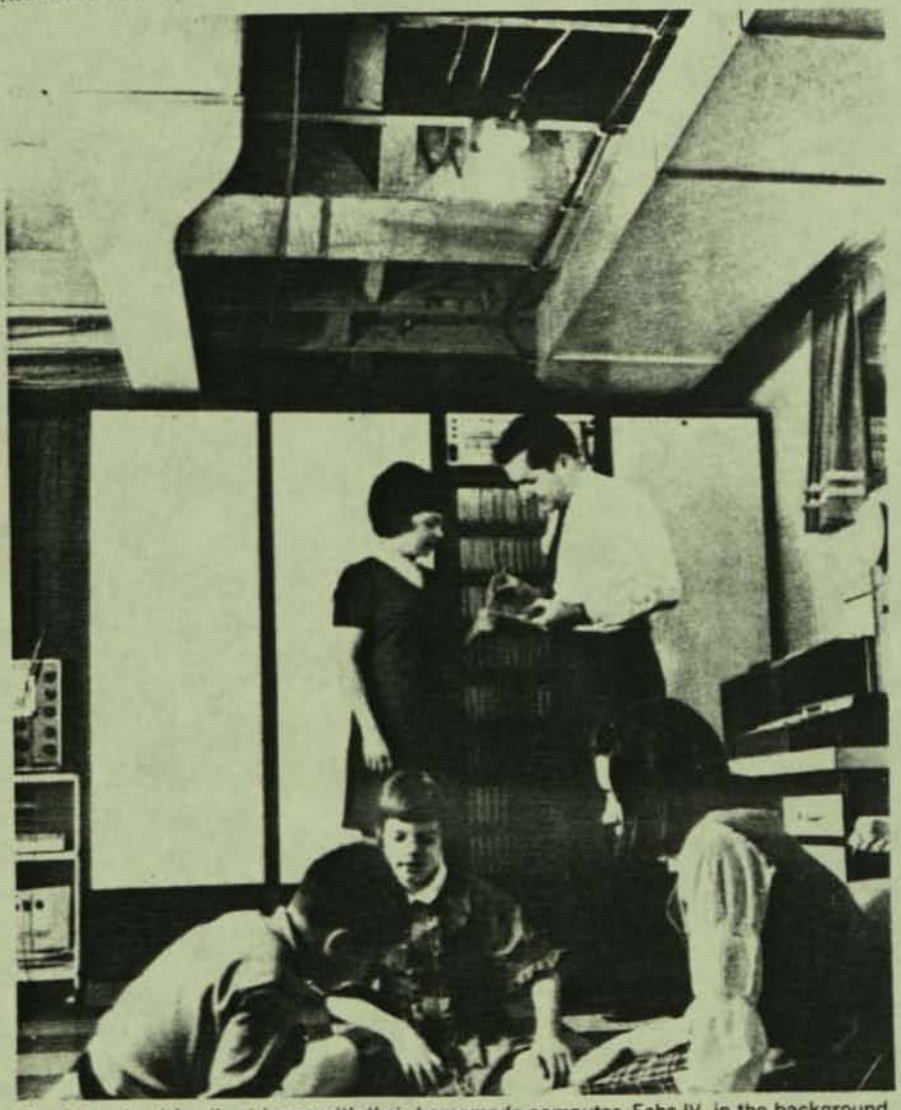
And Echo does homework. Like calculate two to the 144th power for Ann. The teacher spent several weekends on it, and, when he saw Ann's printout, compared, and found a boo-boo in his own, he said . . . "Ann, since mine was done by hand and yours by computer . . . mine's got to be right."

Was Echo expensive? Not really. Sutherland wanted 120 modules when he started, and he got those for less than $100. Since then, he's spent about $2,000 more, a good bit of that on testing equipment. What could really hurt is the electric bill: Echo draws about 3,000 watts. But with careful off-on supervision, the bill now runs a mere $2.50 a month.

Is it fun? Jim unhesitatingly affirms. "It's a hobby I love, though there were wee-hour moments when I'd have gladly chucked the whole thing." (One of the hard parts: Jim writes all his own execs.)

Was it worth it? "Definitely. We've just started to use Echo. We're going to enter and store all household bookkeeping. We'll know how much we're spending on what, and income tax will be much easier. And, as the children become better programmers, (and I expand memory), they will be able to use Echo more for homework. A minor thing, perhaps, but Echo reminds me when it's our anniversary, too!"

Can we look for a trend? Sutherland doubts it. "It's great fun and all, but it's like owning the only car and driveway in the world. There are just no roads or highways yet." Maybe "yet" ought to be underscored.



The Sutherland family at home with their homemade computer, Echo IV, in the background.

CROWD CONTROL AT THE NEXT SJCC

The Spring Joint Computer Conference registration chairman visited the FJCC in Las Vegas last year for a first-hand look at how it worked. It was a mess. Horrified at the long registration lines and chaotic crowds, he and AFIPS got together to formulate some new policies. . . .

Exhibitor guests will fill out their own badges (some 50,000 will be available) and need only hand in half of it to receive a badge holder and gain entrance. Exhibitor personnel will register in a separate area away from the regular registration booths. There will be no exhibits-only registration, which usually accounts for a few thou people. And although it was not the paying conferees who impacted the lines at FJCC, six full-registration areas will be operating at SJCC — one at the convention center and five at major hotels — throughout the conference, and early registration will be held at the hotels Monday evening, May 4.

The full registration fee has been raised to $40 from $30 for nonmembers. Those who know they will be going to the show (May 5-7) may write for advance registration materials to 1970 SJCC Registration, AFIPS, 210 Summit Ave., Montvale, N.J. 07645. (Members will automatically receive advance registration forms.) Registration kits are to be picked up at the conference. Cut-off date for return of the forms and fees is April 5.

ICL AND BARCLAYS COMBINE SERVICE BUREAU OPERATIONS

Agreement between International Computers Ltd. and Barclays Bank to collaborate in computer service bureau work in Britain can be taken as the starting gun for a rare old scramble for that part of the industry expected to rise in turnover in the next 10 years from $100 million to $1,250 million. In addition, it marks the beginning of a

Science & Mechanics
FEBRUARY 1971

Westinghouse computer designer Jim Sutherland built computer for his home from discarded parts. Shown at the kitchen keyboard at right, his wife uses her homemaking skills to program computer for certain tasks.

RUN YOUR HOME BY COMPUTER

Handy addition to your house could regulate your diet, maintain your budget, predict local weather, even remind you of birthdays. Possibilities are endless, as you may soon be finding out.

By Alan D. Haas

A computer for every family has been the prediction of science fiction writers for some time. Far-seeing engineers usually forecast them for that magical year 2000, but indications are that home computers may make their appearance well before then.

A small number of households across the U.S. already have them, mostly in instances where Pop is a computer engineer. Small, self-contained models are already coming on the market for around $8000, complete.

In Ardmore, Pa., Dr. Theodore Rodman, a lung specialist on the faculty of Temple University medical school, has a computer all to himself to write programs for diagnosing lung ailments through test readings. The computer is also programmed to help with the family budget, provide menus for the children, and offer a library of stored prepared programs from Black Jack to stock purchase calculations.

An accumulation of discarded parts that computer designer Jim Sutherland brought home from time to time from his job at Westinghouse Electric Corp. gradually evolved into "Echo IV," perhaps the granddaddy of prototype home computers. Sutherland assembled the obsolete parts in his basement over a six-month period, and Echo IV is now doing jobs like regulating the furnace, selecting channels on TV, typing papers for Mrs. Sutherland, and helping the kids with their school assignments.

Jim wired up 11 printed-circuit module mounting panels himself. Three Sutherland children use computer for homework assistance.

Since he completed the computer about three years ago, Jim Sutherland has been busy programming it to do various household jobs. The computer now understands some two dozen or so commands, or machine language instructions as they are known to the initiated, which can be arranged into programs and stored in the memory bank for future use.

Some of the more complex programs have been stored on paper tape and are loaded into the computer when needed. "The real fun of a home computer," says Sutherland, "is when you can tie it into various appliances in use in the household, like the TV, temperature thermostat, clocks, etc. Echo IV has a core memory storage capacity of 8192 words, and Sutherland has begun building some magnetic-tape auxiliary bulk memory units to expand that capacity.

Ruth Sutherland, a home economist, was beginning to worry that the machine might "replace me," but she soon found it was useful in her work as well. Now, it's like a member of the family.

When Jim Sutherland first got the idea for a home computer he began sketching logic circuit diagrams. Actual wiring of the 11 printed-circuit module mounting panels began as soon as he had completed the design phase. Within the first year, Echo IV was running simple programs, but was somewhat limited by inadequate input-output capability. To overcome this particular handicap, Jim produced a programmer's desk consisting of a keyboard, page printer, paper tape punch, and paper tape reader.

Ruth was delighted to find out that home computer programs must first be "flow charted" by someone who knows homemaking, making her essential as an Echo IV programmer. Flow charts define the job in specific terms, so that the programmer and the user can understand each other.

"Short-cuts and time-saving features tend to show up when the flow chart is prepared for a task prior to translating it into computer language," Jim Sutherland explained. "Later, if any program revisions are needed, the flow chart provides a quick review of how the program operates. Changes or corrections in the flow chart can easily be in-

serted into the program listing of instructions."

Sound complex? Well, even the Sutherland children—Ann, 13, Sally, 9, and Jay, 4—have learned to do certain things on Echo IV, and according to Sally, "When all the lights on the television control board light up, it means it's all messed up!"

Relatively simple entry and printer output routines were the first Echo IV programs the Sutherlands wrote. These were followed by the paper tape input and paper tape punching routines. Subsequently, these programs permitted other, more complicated programs to be entered into the computer, verified on the printer and stored permanently on paper tape. Currently, Sutherland is spending a good deal of time writing such programs as multiply, divide, multiple precision add, subtract and message writer routines.

The first chores the Sutherlands assigned to Echo IV were bookkeeping activities, including monthly budgets and expenditures, totaling of income tax deductions, etc. It has performed admirably, limiting these onerous tasks to a few finger exercises on the keyboard. Echo IV is a math whiz, and when daughter Ann had to calculate 2 to the 144th power it came up with the answer readily.

Echo also is hooked up to the temperature thermostat in the Sutherland household, and one-half hour before the family rises, Echo automatically switches from night time to day time temperature so that the house is warm when they arise.

Mrs. Sutherland has discovered that Echo likes to help write her term papers for a data processing course she is taking. She feeds her rough copy into the computer and it quickly prints out a clean copy, free of spelling errors and mistakes in grammar. "Echo and I got an A on my last effort," reports Mrs. Sutherland, "so we plan to keep collaborating."

Jim has connected his color TV to a control device that will one day permit Echo IV to regulate the TV schedule. As an example, on a school night, the kids would have to correctly answer some questions posed by their parents before Echo would switch on the set. TV would really be an educational medium with this setup. The antenna rotator would also be controlled by Echo to insure the proper alignment of the antenna with the corresponding channel number entered through the control keyboard.

It is even possible for Echo to be programmed to keep track of time so that events can be scheduled up to a year ahead with something like one-second accuracy. The way this is done is via the control console which has keys 0 to 9 and the letters R,S,T,V. Used in many different combinations, messages containing the time of day, day of month, etc., for a particular occasion would be programmed into Echo and at the prescribed moment it would feed back a reminder message on the control keyboard, or else on the typewriter keyboards the Sutherlands have in their living room and kitchen. No more forgotten birthdays and anniversaries for this household, once the system is operative. It could also feed up reminders on the day the mortgage or car payments are due. The Sutherlands would have to provide the cash—Echo can't do everything.

Using the same number and letter keys, Echo could be programmed to turn a minimum of 99 household appliances on and off—everything from the coffee pot to the outdoor lights. Echo could even solve the maid problem for a busy household.

The kitchen is the place where computer engineers expect the most revolutionary developments. Recipes, for instance, could be increased or decreased proportionately to provide any number of servings. Shopping lists outlining what has to be purchased at the market would be printed out automatically.

"To be really effective," Jim points out, "the computer must know how much and what kind of food is on hand." To accomplish this, sensing devices would be placed in storage bins, each of which would contain a different item. When the canned peas or soups were getting low, Echo would remind Mrs. Sutherland that she needed to do some shopping. A complete inventory of all food going in and out of the bins would be recorded and available for consulting. It is further conceivable that Echo could provide the Sutherland family with balanced menus, providing specific calorie and nutrient content, from which the family could select each meal in advance.

Many of these things, like menus, payment reminders, birthdays, etc., could be programmed to appear on the TV screen at the desired times, using an unused channel on the set.

Echo IV might also provide a new form of entertainment, since a variety of games

(Continued on page 110)

Home Computer

(Continued from page 68)

involving logic and strategy could be programmed into it. Chess, checkers, card games, or gambling could all be made available via computer.

Jim is hoping eventually to use Echo as an aid in short term local weather predictions, wherein the computer would interrogate various weather instruments outside the house. He has a degree in meteorology from Penn State University and he performed active duty as a weather officer in the U.S. Air Force. "The best computer applications," according to Jim Sutherland, "evolve through everyday experiments." One such event took place at Christmas, when Echo IV played an electronic version of Silent Night at various times during the holiday season. Each number of the keyboard corresponded to a musical note, and with a speaker hooked into the circuit Echo gave forth with its holiday song on command. "The neighbors flocked in regularly to hear it and were properly astounded," Jim chuckles.

For those who may want the services of a computer without actually owning one, it will one day be possible to rent the work capacity of a central computer by a time-sharing system, which now costs around $110 per month. Up to 200 remote terminals can use the central computer simultaneously because the actual time it needs to service each one is a fraction of a second. Once a program is stored, the cost is negligible. A menu program, for instance, would cost around 10¢ for a weekly run-through.

It is entirely conceivable that by the 1980s, most households will have some such arrangement, and a home computer will rival TV sets or refrigerators as a necessary ingredient of daily life. Only the high costs involved at present prevent firms like General Electric (for instance) which has a time-sharing service, from going into commercial production. G.E. already has a library of stored programs which it can offer to subscribers.

It was once thought that home computers would be too bulky and unwieldy, requiring 1000 or more vacuum tubes and weigh perhaps a ton or two. Today, however, integrated circuits have replaced transistors, which in turn replaced vacuum tubes, and space-age computers will weigh perhaps only a few pounds.●

BUILDING YOUR OWN COMPUTER Part II

Stephen Barrat Gray
Amateur Computer Society
260 Noroton Ave.
Darien, Conn. 06820

". . . I am against the idea of a commercially prepared computer kit. By placing a kit of t type on the market, amateur computer builders would not have any major problems, and fe new ideas would result. . . . If amateur radio gear were not produced commercially, we wo not have as many hams, but those hams together would make more contributions than all the hams make today."

Part One of this article, which appeared in the December issue, discussed the difficulties facing an amateur who wants to build his own computer. These include, among others, the limitations of existing books on computer schematics and the availability and adaptation of parts. As a result, 110 men joined together to form the Amateur Computer Society in response to the author's suggestion that they share information. The Society's survey of its members revealed the most common features of their models and showed that the average cost "so far" for a home-built computer was $650 and that most members had spent two years on their project.

Members Report on Their Plans

In their letters, the members of the Amateur Computer Society report on a wide variety of plans for hardware and software. For example, several design and etch their own printed-circuit cards, while others make their cards from Vector boards.

One member, while a Harvard sophomore, wrote this:

> If core is used, one can kill two birds with one stone by using the selection matrix decoder as the instruction interpretation decoder; if the memory selection decoder were for a 4K (12 x 12) memory plane, then one 12-bit decoder could be used to hold the op code, while the other could generate the timing signals.

Stephen Wiebking, a first lieutenant now attending the Air Force Institute of Technology in Fairborn, Ohio, is one of the members who haven't started building their computers, but are in the planning or collecting stages. He writes:

> I have done very little actual design work on a machine so far, since I am still in the parts collecting stage. So far, I have managed to collect several thousand ICs, which I am in the process of identifying and testing, and about 1-1/2 X 10**6 bits of core frames.

Steve has arranged with several semiconductor manufacturers to buy their reject-but-usable integrated circuits, if there is enough interest among ACS members to enable him to buy in large quantities and thus at low prices.

"Memory" for Cerebral Meningitis Victim

An ACS member in California has an unusual reason for wanting to build a computer. Some ye ago he had cerebral meningitis. Among other eff the accompanying fever damaged his memory consid erably, both in the ability to remember things, a the memories that were already in it, back to wh he was eleven. At first he couldn't remember the fact that he couldn't remember things. First he kept a journal of his activities, and copies of every letter and order he wrote. This worked fo ten years, but the problem of finding anything i the mountain of paperwork made him look for anot solution. He hopes to put all the things to be r membered on magnetic tape, and let a computer ke track of it. His trouble in building a computer that any suitable machine is so complex that whil he concentrates on what's going on in one area, activity elsewhere escapes him. So he has to de pend, much more than most people, on circuit dia grams. But these are usually so large that he g lost in the pages and pages of circuitry. He no

> However, it seems possible that the ty of limited-scope, single-purpose computer I have in mind might be encompassed in only a few drawings that I could eventually comprehend.

Completed Computers

Only two of those surveyed reported being a where near completion of their computers.

Jim Sutherland, now a Fellow engineer with Westinghouse in Pittsburgh, noted that his ECHO-4 took a year to build, and would require ten years program. ECHO-4 is seven feet long, one and a h feet deep, and six feet high. The central proce is complete, but, as with all amateur computers, the input/output system is still growing. ECHO-4 uses 2N404 transistors and RTL (resistor-transis logic) NOR logic elements. The NOR gates were o ginally used in process-control systems built by Westinghouse a dozen years ago, and had been de clared scrap. The gates were mounted on etched c cuit boards, with 35-pin connectors. A total of 120 boards was used in the entire system, but onl 16 types of boards were used, so "spare boards d not take up much room."

The memory unit, an Ampex 4096-RQ-30A, came from an obsolete process-control computer. Memory cycle time is six microseconds, but since the NOR gates require from one to three microseconds to switch, the add time is pushed down to 216 microseconds.

ECHO-4 has four flip-flop registers, and three registers in core memory. There are 8,192 words of 15-bit core memory; clock speed is 160 KHz, and there are 18 instructions.

Input is by six alphanumeric control keyboards, 8-channel paper tape reader, 15 interrupts, and 75 contact closures. Output includes two printers, 60 contact closures, 8-channel paper tape punch, and four digital clocks. Interconnections are wire-wrapped.

Another Completed Computer

Hans Ellenburger, a Swiss member, worked a year on his computer, and finished it in 1965. A small desk-top machine, looking something like the electronic desk calculators now available, the EL-65 had a separate keyboard for input, and Nixie-tube readout.

A serial-type computer, EL-65 had three registers, 30 words in flip-flip memory, and 15 instructions. Certainly a minimal computer, but within the ACS definition. According to the January 1968 ACS Newsletter:

> The cost of materials alone was 1500 Swiss francs, which is about $345. Hans tried to market his computer, calling it "der erste Schweizer Pult-Elektronenrechner," meaning the first Swiss desk-top electronic calculator. But the sales price of 6,000 SF ($1,380) seems to have put it beyond the means of most Swiss and also it may have been too much of a novelty on the market. As Hans notes, "It seems almost impossible for an amateur to build a computer that can compete with commercial machines. The amateur who can do that would be, before long, employed by a computer company."

When last heard from, Hans was working on a new model, with 16 registers, using Philips LTC cores.

Help From the Members

One of the helpful articles sent in by an ACS member was "What to do with cores of unknown origin," by Sal Zuccaro, who has been designing memories for a dozen years or more, has patents in core-diode logic, and is now a Research Scientist with Teledyne Systems in California. Sal devised a simple set-up using a bidirectional constant-current source, with a method that could take readings on a core in or out of a matrix.

There are many small areas of computer design and construction that the amateur does not recognize as important, or is not skilled enough to handle. A simple problem for the professional designer is RC decoupling filters. For the amateurs, Louis Frenzel, who lives in Maryland and is Assistant Director of Education at the National Radio Institute, wrote several hundred words on these filters, when and where to use them, and what component values are required. His good advice includes:

> In some systems the 100-mfd capacitor (shunted by a 0.01 to 0.1 disk) just isn't needed. The only way to find out is to experiment. Take a scope and look across your ground buss between the power supply terminal (scope ground) and a ground point in the system. You will probably see a lot of high-frequency junk here. Experiment by connecting capacitors at the point under observation and notice any change. Use the smallest capacitor that best minimizes the noise. A 0.1-mfd disk fixed my problem in a recent design.

A Computer Kit?

The April 1967 ACS Newsletter proposed a Standard Amateur Computer Kit, with the acronym of SACK. As expected, comments on SACK were a mixed bag. Don Fronek, now an instructor at the University of Idaho, commented, in part:

> A standard computer should have:
>
> 1. Plug-in cards (can buy ready-made cards, or cards without components).
> 2. Frame construction with card receptacles (allows the builder to locate his circuits as he wants them).
> 3. Power supplies to fit within the frame.
> 4. Universal front panel (pre-punched holes -- when using the kit-builder's approach).
> 5. Input/output (plugs should be available at rear for additional or special outputs).
>
> I find that two things are the most important: (1) printed-circuit boards and (2) frame chassis mounting hardware. With little exception, the rest of the machine can be expanded in bits and pieces.
>
> I would also use solderless connectors, in all the wiring between receptacles. I find that I am continuously changing circuits. With close pin spacing, a soldered connection gets very messy even when you are trying to keep things neat. The wires get burned, the solder slops over onto the adjacent pin, and on and on. This means added cost, but I'll have to vote for solderless connectors.

Jim Haynes, a development engineer at a university computer center in California, noted:

> Seems to be that the essential problem is trying to decide what you want to do with what you have. I guess memory is the pacing item. Anybody who goes in for core, even small core, is talking about money. Depending on the supply of delay lines, that is probably the way to go for a cheap machine ....
>
> Without some storage, there's little point in building up the instruction execution logic. And I would really hate to see the thing get mixed up in a formalized educational setup, because then a lot of professional education marketers would get into the act, and the price would go skyhigh.

An ACS member who was a high-school member when he joined the ACS, and is now with a California engineering consulting firm, wrote:

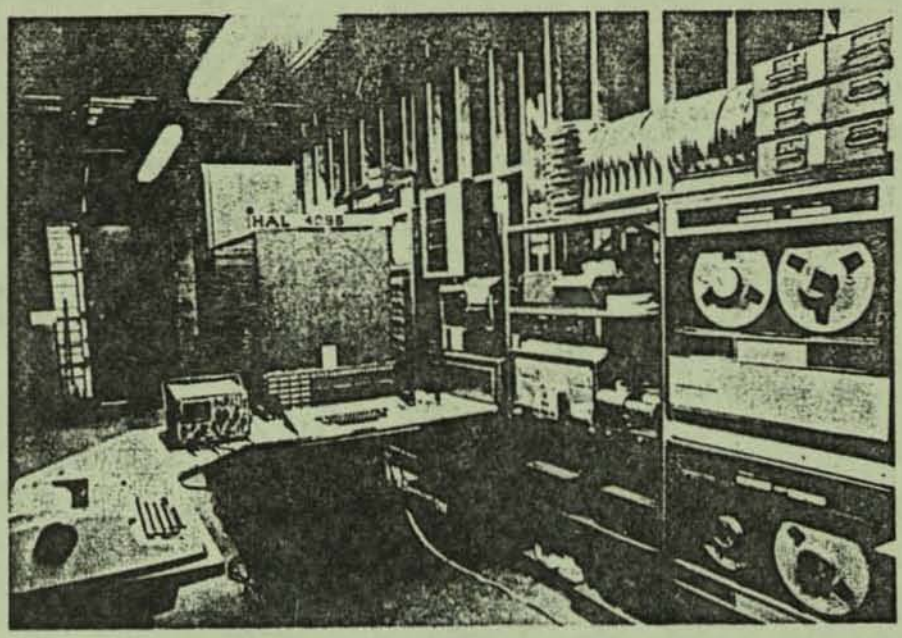


Photo 1: Hal Chamberlin's home built HAL-4096 computer system, built in 1972. This system, which is still in service handling IO for an IMP-16 microcomputer system, features TTL logic, a 16 bit word length, 16 registers, 4 K bytes of magnetic core memory (a surplus IBM 1620), and priority interrupt.

The First Ten Years of Amateur Computing

Sol Libes
President, Amateur Computer Group of New Jersey
995 Chimney Ridge
Springfield NJ 07081

If one could find a specific date for the birth of personal computing, it would be May 5 1966.

Most people I meet are under the mistaken notion that personal computing started only two or three years ago, with the introduction of the Altair 8800 by MITS. Nothing could be further from the truth. In fact, the amateur computing hobby was then almost ten years old.

I therefore decided to write this article to set the record straight, give credit to the early pioneers in this hobby and shed some light on the early history of microprocessors.

If one could find a specific date for the birth of personal computing, it would be May 5 1966. For it was on that date that Steven B Gray founded the Amateur Computer Society and began publishing a quarterly called the *ACS Newsletter.*

The newsletter exchanged information on where to get surplus computer gear, how to build not too complicated circuits, where to get integrated circuits, tips, experiences and where to get help. By the end of 1966, the Society reported that it had over 70 members.

1966 also saw the publication of the first books on how to build a home computer. Typical was *We Built Our Own Computers* by A B Bolt and published by Cambridge University Press.

In January 1968, a survey in the *ACS Newsletter* reported that two amateurs had their home built systems up and running and that many others were actively working on their systems. The survey indicated that programmable memory sizes ranged from 4 to 8 K with some as high as 20 K, all magnetic core of course. Teletypes and Flexowriters were popular for IO. Clock speeds ranged from 500 kHz to 1 MHz, with the average 500 kHz. Most used discrete transistors, and a few reported using those new and hard to come by RTL integrated circuits. Instruction sets were small, ranging from 11 to 34 instructions. Word sizes were from four to 32 bits, with 12 bits the typical number. Registers ranged from two to 11, with three most common. Most reported that they had been working on their machines for about two years.

The April 1968 issue of *Popular Mechanics* reported on ECHO IV (Electronic Computing Home Operator), a home built computer constructed by Jim Sutherland. It had four registers, used a 15-bit word, had 8 K bytes of core memory, 18 instructions and a clock speed of 160 kHz.

In December 1968 Don Tarbell (now

The seventh issue of the ACS Newsletter showed IBM computer cards adapted for use in homebrew computer.

type to register to memory and back. Delay line memory stability problems solved—successfully retrieved data after eight hours." Later, he had to drop the delay line memory, because of poor long term stability. It would work fine for a while, but later would shift by one or two bits, throwing it out of synchronization with the external clock. He tried core memory, then bought a used magnetic drum memory taken from an airborne computer for $100, giving him 8K words.

Innovate or Copy?

Many non-engineer ACS members, unable to design their own computers, tried copying existing designs. Several patterned their instruction set after that of the IBM 1401 or IBM 1620 computer. One Long Island member had software similar to that of the 1620 and hoped that his "IBM 1620 Model III" would be about 25 percent faster than IBM's 1620 Mod II, and would have all of its 60-plus instructions.

Most members who borrowed an instruction set already in use were copying that of the PDP-8 family, manufactured by Digital Equipment Corp. By that time, DEC had sold more than 10,000 of the PDP-8, which was attractive because of its comparatively low price, variety of programs available, and a simple yet powerful set of instructions.

Completed Computers

Only two of those surveyed reported being anywhere near completion of their computers.

Jim Sutherland, an engineer with Westinghouse in Pittsburgh, noted that his Echo IV took a year to build and would need ten years to program. Echo IV was seven feet long, one and a half feet deep, and six feet high. The central processor was complete but, as with all amateur computers, the input/output system was still growing.

Echo IV used 2N404 transistors and NOR logic elements; the NOR gates were originally used in process control systems built by Westinghouse a dozen years before, and had been declared scrap. The gates were mounted on etched circuit boards with 35-pin connectors. A total of 120 boards of 16 types was used in the entire system.

The memory unit, an Ampex 4096-RQ-30A, came from an obsolete process control computer. Memory cycle time was six microseconds, but since the NOR gates required from one to three microseconds to switch, the add time was pushed up to 216 microseconds.

Echo IV had four flip-flop registers, and three registers in core memory. There were 8K words of 15-bit core memory; clock speed was 160 KHz; and there were 18 instructions.

Input was by six alphanumeric control keyboards, eight-channel paper tape reader, 15 interrupts, and 75 relay-contact closures. Output included two printers, 60 relay-contact closures, eight-channel paper tape punch, and four digital clocks. Interconnections were wire wrapped.

The ACS Newsletter

The first volume of the ACS Newsletter (1966-68) provided information about computer trainers, Teletype equipment, circuit boards, ICs, kits, and details of computers built by members. The second volume (1969-72) included information about Nixie readout tubes, core memory, buying reject ICs, memory drums, and the MITS desk calculator kit. It also described the first commercial computer kit, the National Radio Institute NRI 832 (1971). This kit, designed by Lou Frenzel who later moved to Heathkit, had 52 TTL ICs, 17 storage locations, and 15 instructions. The memory consisted of slide switches to simplify the teaching of bit storage.

Volume III (1972-76) looked into Don Tarbell's computer (which multiplied a 140-digit number by itself in 40 seconds), Intel's 4004 and 8008 chips, the Scelbi-8H kit, Radio-Electronics Mark-8 kit, Hal Chamberlain's HAL-4096 computer, and several of the early commercial kits and boards. Only two issues were published of Volume IV in 1976; these dealt exclusively with commercial kits and peripherals as well as several products shown at the first personal computing show in Atlantic City.

A Flattering Accolade

An article by Sol Libes on "The First Ten Years of Amateur Computing" (*Byte*, July 1978, pp. 64-71) was taken largely from items in the ACS Newsletter. Written "to set the record straight," because many people thought personal computing "started only two or three years ago, with the introduction of the Altair 8800 by MITS," it continued:

"If one could find a specific date for the birth of personal computing, it would be May 5, 1966. For it was on that date that Stephen B. Gray founded the Amateur Computer Society and began publishing a quarterly called the ACS Newsletter."

Very flattering, but not true; it was like saying Henry Ford was the father of the automobile. If anything, the ACS Newsletter was the first publication in the world about personal computers. Apparently it is also the only detailed source about the early days; the Smithsonian Institution has asked for a set of the newsletters.

In 1966-67, hoping to get financial backing for full time operation of the Amateur Computer Society and for a projected lower level Amateur Digital Society, I wrote to several foundations and large computer manufacturers, but to no avail. The same thing happened