

Computer Bits

By Leslie Solomon

MUSIC GENERATORS AND OTHER ITEMS

AS THE hobby computer field keeps growing, many "noncomputer" peripherals are starting to appear. The latest of these is the music generator.

Several music systems are now being offered on the market. We have "played" some of them—the most recent being the \$24.50 Music System from Software Technology, Box 5260, San Mateo, CA 94492 (Tel: 415-349-8080). This system has a four-octave range and can produce three notes simultaneously. The hardware is very simple. A small S-100 bus board mounts three resistors and two capacitors; the output drives an audio system. The bulk of the Music System is software, which comes in cassette form with 1200-baud CUTS on one side and 300-baud KC format on the other.

The computer requires 2k of RAM to support the music language and to play any of the six classical pieces (mostly Bach) provided on the cassette. The software includes a multifile editor that supports the standard 8080 source file structure, subroutines required to drive the hardware, and a high-level music language having a one-pass compiler located anywhere in memory.

All standard musical notation is supported, including key signatures, time signatures, clef notation, note values from whole notes to 1/64th notes, rests, dotted notes, triplets, staccato, articulation, and accidentals. There is also a full repeat support with the capability for second endings and refrains and the capability of transposing keys.

Interestingly, you do not have to be a musician to learn how to score music (your own or from sheet music). And, if you are a musician, you do not have to be a computer expert to use the system. It is that easy.

How does the Music System sound? With the original board, about the closest we can get is a reed-organ. However, experimenting with various forms

of filters to create different sounds, we've emulated some really strange "synthesizer" sounds.

Remote Control. Not long ago, we discussed a simple tone-system remote control that could be used over existing power lines. This, as you know, was followed by the Intelligent Remote Controller features in our December 1977 and January 1978 issues.

There is still one area of concern, however. What do you do when there is no common ac line between the controller and the remote device to be controlled? We encountered this problem recently. A little investigation led us to the Neil Henson Co., 1 Elmwood Lane, Westport, CT 06880 (Tel: 203-226-4482). This firm sells a small handheld transmitter that's powered by a conventional 9-volt battery and operates in the 300-MHz band. The associated receiver can be located 100 ft away from the transmitter and still have reliable control. As purchased, the system (Model AT-100 Remote Control Switch at \$39.95) has only one controlled power socket.

Since the transmitted signal is a tone, and the receiver uses tone demodulation, it is not difficult to install a couple of extra tone generators in the transmitter and some companion tone filters (the

567 works fine here) in the receiver. Each tone detector can then control its own power socket.

Although the transmitter and tone generator are turned on manually in the original circuit, an address decoder or some other form of digital signal can be used to turn on the different tones (and transmitter) from a computer.

Speaking of using the ac line to carry digital remote control information, Energy Technology, Inc., 1601 South Main St., Las Cruces, NM 88001 (Tel: 505-526-3358) has just announced their Coby 1 system. This stand-alone remote control uses an 8085 processor and features solid-state 7-segment readouts to indicate the time, date, and number of the remote unit being programmed. It has 24 keys to provide complete programming, review, and control. Each master control can direct the activity of 100 remotes. Each remote can be turned on or off at any time and date, in cycles as short as a second or as long as 100 hours. Each control contains 2k of RAM, 2k of ROM, the 8085 processor, a power cell and firmware operating system. The power cell backup keeps the clock and memory up during power failures or when moving the system.

Programming requires no knowledge of computers or computer languages. The remotes are available in three basic styles: standard 117 volts for conventional lights and appliances; standard wall-switch replacement; and 220 volts for high-power systems. The controls sell for \$399 and each remote (10-A models) is \$40 each.

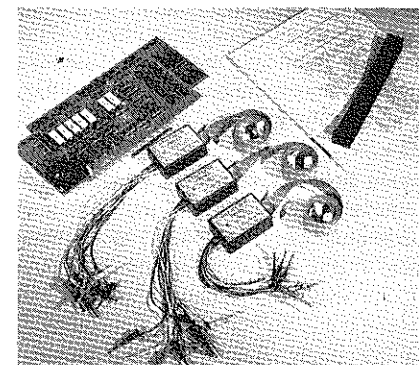
CRT Monitors. Many computer enthusiasts have "real" CRT monitors, but an even larger group uses a conventional TV receiver and some type of r-f modulator to inject a signal into the antenna terminals.

Recently, we had an opportunity to try

out the Super Mod-2 (\$29.95 plus \$1 postage/handling) from M & R Enterprises, Box 61011, Sunnyvale, CA 94088. The package comes as a built and tested modulator and r-f section tuned to channel 3, a 60-dB antenna isolation switch, and the necessary video and r-f coaxial cables. Power requirements are 6 to 12 volts dc at 2 mA. The r-f output is 800 microvolts into 75 ohms. The modulator is dc coupled and will accept a 0-to-2-volt video signal. Input impedance is 2.2 kilohms. The power and video cables are equipped with ferrite rings to reduce the level of extraneous signals that produce chromatic "worms" on the screen.

We tested Super Mod using the chroma output from our computer driving a conventional color-TV receiver. Despite the fact that we live in a very strong TV signal-strength area, the modulator performed quite well. The viewed image was stable, and the modulation and sync were excellent. Modulation level can be adjusted via an on-board level control. Flipping the 60-dB switch allows the TV receiver to operate in its normal mode. (Note: FCC rules require that modulators and/or isolation switches be approved together with the equipment with which it is to be used.)

New Hardware Things. Databyte Inc., Box 14, 7433 Hubbard Ave., Middleton, WI 53562 (Tel: 608-831-7666) recently introduced their 24-channel logic analyzer for the S-100 bus having 256-by-24 data sets, 10-MHz clock, and TTL logic level inputs. It can be used to disassemble a program exactly as it was executed, with triggering display formatting and operational modes controlled by the user input device. The trigger word is 16 bits; and the readout, on a CRT terminal, is in binary or hex. It has post-trigger, pre-trigger, or any trigger within 256 points. The monitor requires



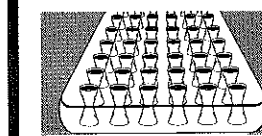
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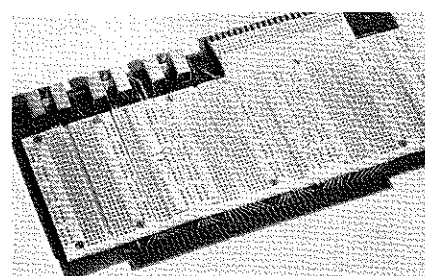
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Dealer Inquiries Invited



The Coby 1 Control has 24 keys to provide remote control information.

4k of the user's memory. The kit price is \$495; assembled, \$595. Included are three probe assemblies, system monitor on paper tape, and a comprehensive instruction manual.

If making S-100 prototype boards is part of your hobby, then you should take a look at what E & L Instruments, Inc., 61 First St., Derby, CT 06418 (Tel: 203-735-8774) has to offer. Their latest entry is an S-100 board that mounts three E & L Breadboarding (the solderless variety) and other sockets around



S-100 board for prototyping mounts E & L breadboards.

the board. There is also a 22-lead edge connector on the top for interfacing. Each board is equipped with a +5-, and ±12-volt regulators as well as pads for obtaining unregulated voltages. Price is \$75 per board.

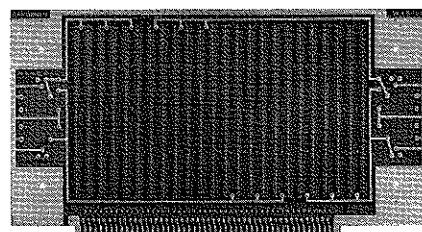
Another firm making S-100 prototyping boards is Sargents Dist. Co., 4209 Knoxville, Lakewood, CA 90713. This board has space for four regulators and can accommodate 14-, 16-, 18-, 24-, and 40-pin wire-wrap sockets. Maximum density is 48 sockets. Price is \$25.

For all you SS50 (SWTP) fans, the Personal Computing Co., 3321 Towardwood, Dallas, TX 75234 (Tel: 214-620-2776) is now making available two sizes of prototype boards for the SS50 bus—I/O or memory sizes. The cards can be used with Wire-Wrap or wiring pencil, and Molex-type edge connectors are used. Memory-size boards are \$19.95 and the I/O size is \$9.95 (both postpaid). This company also has an ACI-33 Cassette Interface for the SS50 system, or for use with any RS232 output port that also supplies +5 and ±12 volts. Price is \$59.95 assembled.

Xitex, Box 20887, Dallas, TX 75220 (Tel: 214-350-5291) has released its Model SCT-100 Video Terminal that plugs into the S-100 bus. The display features 64 characters by 16 lines, 128

character set, ASCII/ baudot operation (20- and 60-mA loops), full cursor control, an on-board power supply, and a modified RS232 serial port. It can also be used as a stand-alone terminal. Video output is 1.5 volts into 75 ohms. At this writing, kit price is \$135, partial kit (Mostek 3870 processor, character generator, crystal, pc board, and documentation) \$79. Assembled and tested, the price is \$179.

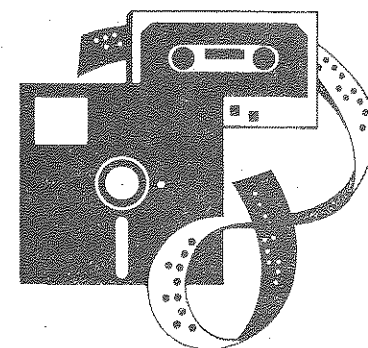
CQ CPU. Polaris Computer Systems, 3311 Richmond Suite 200, Houston, TX 77006 (Tel: 713-527-0348) offers a Morse code to S-100 bus interface board. The input connects to the communications receiver through the head-



Sargents' prototype S-100 uses sockets for Wire Wrap.

phone jack and to the computer through a parallel port. Provisions for audio and visual sync are available. The software adjusts for variations in the transmissions between 5 and 60 wpm. Final output is to an SIO port for display on a printer or CRT. Price is \$95 for the kit, object program, and documentation. Assembled and tested price is \$145.

Software Doings. It looks like a lot of people are jumping on the SWTP SS50 bus these days. Technical Systems Consultants, Box 2574, W. Lafayette, IN 47906 (Tel: 317-742-7509) is now making available its TSC Multi-User System, enabling four terminals to simultaneously use one SWTP 6800-based machine, all running separate programs. The board plugs into a memory slot and no machine modifications are required. When installed, simply load up the BASIC cassette and go! Suggested retail price is \$129.95; including the pc board, all parts, IC sockets, diagnostics, and documentation. The BASIC is on cassette. There are two versions of 8k BASIC for the TSC system. One version supports AC-30 Cassette Interfaces—one for each user—while the second version supports the Southwest Technical Mini-Floppy. ◇



Software Sources

8080 FORTRAN. FORTRAN-80 is a compiler for 8080 and Z-80 systems. Includes most features of ANSI standard FORTRAN X3.9-1966, except for double precision and complex data types. Versions now available for MITS DOS, CP/M and ISIS II floppy-disk operating systems. The system also includes some non-ANSI features, such as logical variables, logical DO loops, mixed-mode arithmetic, hex constants, logic operations on integer data, and read/write end-of-file or error conditions. FORTRAN-80 can compile several hundred statements per minute in one pass, and usually needs less than 16k memory. A relocating assembler and loader are included. Manuals available for \$15 (\$20 with relocating loader); the program itself, with documentation, is \$500. Write: Microsoft, 300 San Mateo, N.E., Suite 819, Albuquerque, NM 87108.

6800 BASIC Trainer. Your computer can teach you BASIC with "Learn BASIC" software. There are three packages of 4 lessons each, with lesson plans to coach and prompt you through BASIC commands and programming techniques. Part I, on fundamental commands, requires SWTP BASIC Version 1.02, a copy of which is provided, to run in 12k; Parts II and III run in Version 2.0, available at extra cost. The last 3 of the 12 lessons also cover the MIKBUG operating system. Learn BASIC is available on AC-30 cassette for \$14.95 per part and on Smoke-Signal disc for \$17.95; all three lessons together, on cassette or disc are \$39.95. SWTP BASIC 2.0 can be purchased at the same time for \$9.95 on cassette. Write: Computerware Software Systems, 830 First St., Encinitas, CA 92024.

6502 Assembler/Editor. This assembler/text editor for the 6502 processor and others in the family resides in less than 2½k of memory. Assembler is a one-pass type with source file, symbol table and object code resident in memory for greater speed (but with resulting limitations on source file size). Other features include an error message that flags out-of-range branches and a routine that prints the object code and source data on

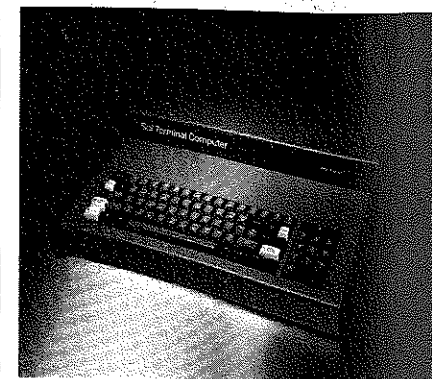
each line during assembly. The program, with source and documentation, is available for \$45 on KIM cassette or on paper tape, and as a hard-copy object listing for \$35. Write: Micro Software Specialists, Inc., 303 Place, Suite 40, 3301 E. Pioneer Pkwy., Arlington, TX 76010.

Enhancement for PT Software Package #1. Software Package 0.5 adds several features to Processor Technology Software Package #1 (itself available from Processor Technology or Tarbell). New features added include automatic inspection of line numbers, line-number re-ordering, multiple-section assembly from program source code files on tape, octal as well as hex assembly, extensible command table, new pseudo-operands (including ASCII text entry), global symbol table, and Tarbell/Dajen tape driver. The package may also be loaded in 6k PROM. Basic hardware requirements are 8080 or Z-80, with 12k memory. Source code and explanation are \$14.95; with object code on paper tape, \$19.95; with object code on Tarbell cassette, \$24.95. Write: Objective Design, Inc., Box 20325, Tallahassee, FL 32304.

BASIC Games. *Enigmas-1*, a book of computer games from the B. Erickson catalog, is available for \$8. Games included are "Gone Fishing," "Concentration" (for two players), "Craps," "Slot-Machine," "Starship," "Sherlock Holmes" and "Tank Attack." The programs have been written to run under Altair 4k or 8k and most other BASIC compilers and interpreters. They range in length from 93 lines and 1397 characters to 241 lines, 3315 characters. The games are also available as separate listings (\$3-\$4). Write: B. Erickson, Box 11099, Chicago, IL 60611.

SC/MP Assembler. A line-by-line assembler for the SC/MP is available as a 4k firmware package. The SUPAK kit includes assembler, paper-tape line editor, and tape-punch programs. \$300. Write: National Semiconductor, 2900 Semiconductor Dr., Santa Clara CA 95051 (Att: Hashmukh Patel).

8080-to-Z-80 Program Converter. Standard Intel 8080 assembly-language statements can be converted to equivalent Z-80 statements with a new FORTRAN program designed to run on any FORTRAN-speaking computer, regardless of word length. All required mnemonics and reserved names are provided for, and all required syntax conversions are performed. Other features include detection and flagging of certain 8080 input-statement errors, control of Z-80 output field formatting and output listing controls. Program is \$300 when purchased separately (\$50 with Microtec's Z-80 cross assembler) including source program on cards, magnetic tape or paper tape and user's manual. Write: Microtec, Box 69337, Sunnyvale, CA 94088.



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