From Typewriter to Hard Copy Printer

Rochester Data's Dynatyper Mechanic

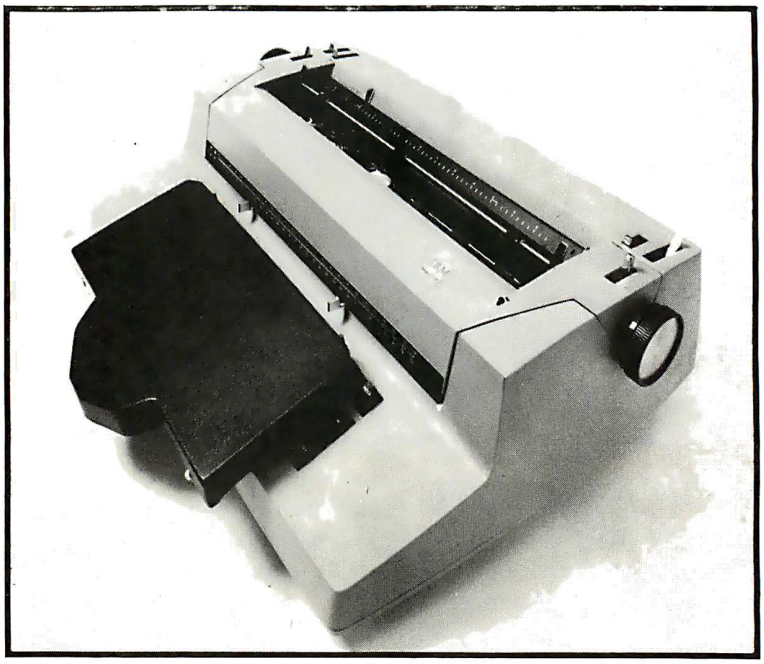

Photo 1. Dynatyper mounted on an IBM Selectric

by Roger H. Edelson

For those computer enthusiasts with champagne tastes but a beer budget, the Rochester Data Dynatyper may be just the ticket. If you have any conventional typewriter with a powered carriage return or an IBM Selectric machine, the Dynatyper will allow you to produce impact printer quality from your computer at the price of a dot-matrix unit.

The unit consists of unlikely assemblage of 52 solenoids driving plungers, which in turn depress the keys of your typewriter. All of this mechanical gadgetry is enclosed in a low profile case which is easily mounted (non-permanently) to the typewriter keyboard. Photo 1 provides an overall view of the unit mounted on an IBM Selectric, and photo 2 illustrates the bottom where the plungers exit.

The wonder of all this is that it really works, reliably, and can be purchased for around $500, including the power supply and microprocessor interface. Once installed and interfaced to the host computer, you can start producing output at any rate consistent with your typewriter—approximately 10 to 18 CPS.

With drastic reductions occurring in the prices of good quality dot-matrix printers, why should this mechanical add-on be selected? In cases where it is necessary to have variable type fonts available, or many copies must be made, or a legal type style is a must, the Dynatyper combined with the already present office typewriter is a cost-effective solution.

Two models are available, one for any IBM Selectric with a U.S. keyboard (model 1) and another for any powered carriage return portable or office typewriter if it had a U.S. keyboard (model 2). Both models are very nearly the same, the only difference being the length of the solenoid plungers. If there is a need to use the Dynatyper on both Selectric and non-selectric typewriters, a conversion kit is available (for less than $20), consisting of plungers of the other length.

It only takes about 2 minutes to convert from one model to the other. The mounting technique is simplicity itself; using the supplied template, two plastic buttons are cemented to the typwriter keyboard and the height of the Dynatyper is adjusted using the four adjusting screws. Once this is completed, the cover is replaced and the locknuts are tightened to finish the job. The mounting of the washers on the typewriter is seen in photo 3, while photo 4 shows the inside with the plunger installed.

The Dynatyper provides the means to actuate 44 alpha-numeric keys plus 6 function keys (carriage return, space, backspace, tab, case lock, and case shift), which must be powered. The energizing solenoids drive these keys through non-marring delryn plungers.

The solenoids will provide an operating force of about 3 oz., which closely matches the operating force of a normal typist. The timing must be adjusted through the software to match the acuation and delay times of the particular typewriter.

For those microcomputers for which Rochester Data provides driving software, this timing is easy to adjust through self-prompting software. Currently, software is provided for the TRS-80 and Apple computers. An RS 232/Centronics interface and an HPIB interface will be available later.

The company also makes a general purpose interface (GPIB) designed to plug into an 8-bit output port, or a 2708/2716 EPROM socket. The GPIB is designed to accept 3 bits for X-select and 3 bits for Y-select. Also required to enable this interface is a one-bit address latch signal that's used to trigger the Dynatyper one-shot beginning the solenoid timing cycle. Software drivers available enable the Dynatyper to work with either a 6502, 8080, or Z80 based system. When connected to the EPROM socket, the Dynatyper operates as a memory mapped device even with Z80 or 8080 microprocessors.

The RS 232C interface reportedly will employ a Z80 based slave microprocessor with a 2K RAM buffer. Top-of-form positioning will be implemented and auto carriage return (CR) after 80 characters. This interface will also provide switch selectable type rates for easier interfacing with different typewriters.

The circuitry is simplicity itself. There are 50 solenoids arranged to fill most of an 8 by 7 matrix. There are eight solenoid drivers in the X axis of this matrix and seven in the Y axis. Actually, eight Y-lines are implemented, but there are no solenoids on the Yo line. The solenoids are connected between the X and Y lines using selection diodes. The circuitry that interfaces with the X and Y drivers must be designed to select only one X and Y line at a time.

The interface circuit uses two 7445 binary to 1-of-8 decoders driven by a 6-bit data bus. Because the X-Y drivers operate from plus and minus 18 volt supplies, the interface decoders must be high-voltage open-collector types. The TRS-80 and Apple interface is quite imaginatively packaged on a single dual purpose card. Depending on the computer to be used, the appropriate end/side of this card is plugged into the computer bus.

Software "bang" prevented

To enhance the operating reliability of the Dynatyper, tested at over 10 millon strokes per plunger, the interface circuitry has been designed using a one-shot circuit that sets the solenoid actuation time. With this implementation, a software "hang" will not result in constant current through the solenoid and subsequent damage to the coil. If, per chance, a coil does fail it is a simple task to remove it and drop in a new one.

Rochester Data will repair or furnish replacement parts at no cost for the first year (its up to you, however, to pay the transportation costs). After that the replacement parts are available at a nominal cost.

The company has indicated that they have made a few modifications on the Dynatyper since they shipped the unit I tested, in order to eliminate some field problems. A slight change in the manufacturing and assembly was made to reduce the chance of the

plungers sticking, though throughout my test, I never experienced this problem. They have also made a circuit change such that when there is a command to actuate the SHIFT LOCK key, the typewriter SHIFT key is actuated simultaneously. This improves the

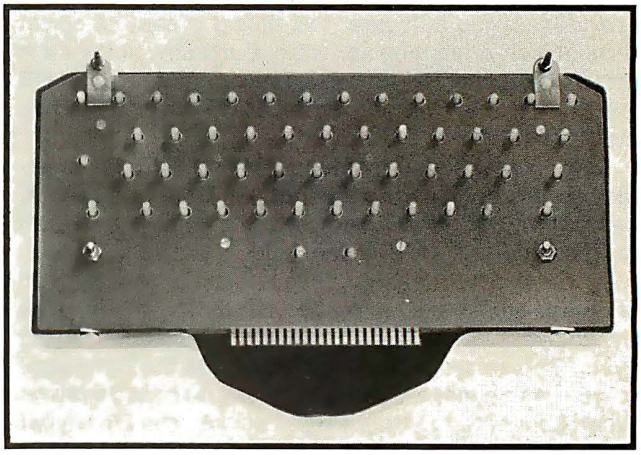

Photo 2. Bottom view of unit where plungers exit

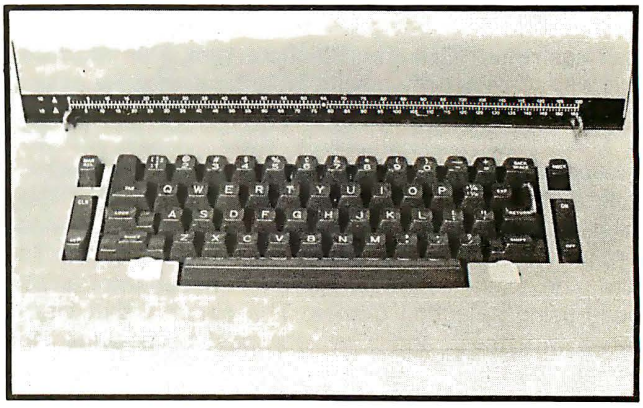

Photo 3. Mounting of washers

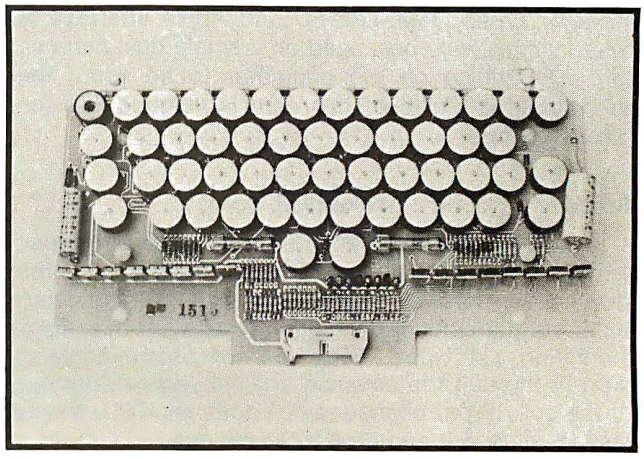

Photo 4. Interior view with plungers installed

response and operation on some typewriters where somewhat larger key forces are required.

I can readily recommend the unit. If you already have a powered standard or IBM Selectric typewriter, however, the unit does lose some of its cost-effective appeal. □

CIRCLE INQUIRY NO. 2