

COP8™ FLASH ISP HANDBOOK – Parallel Port Programming Adapter

National Semiconductor
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ABSTRACT

This application note describes the construction of the COP8 ISP MICROWIRE Programming Adapter for the IBM PC compatible. A Bill of Material (BOM) will be presented and the cost of the items will be displayed. Total cost of the adapter is \$6.00 USD. Step by step instruction is presented and the final is circuit shown.

INTRODUCTION

This application note is targeted to both hobbyists and professionals. It serves two purposes. First, to allow the construction of an inexpensive programming adapter which would program the COP8 Flash microcontrollers. Second, to demonstrate the simplicity of interfacing and using of the MICROWIRE ISP boot ROM firmware. IBM compatible WIN95/98 software are located at the following address: 'http://www.national.com/cop8'. sources of the parts used in the construction are shown. Other application notes that relates to COP8 FLASH ISP software include AN-1150 (Introduction to In System Programming (ISP)), AN-1152 (FLASHDOS Programmer Source), AN-1153 (Virtual E² Guide), AN-1154 (Architecture and C++ source code to the COP8 FLASH ISP for the DOS/WIN3.1 Operating System), and AN-1161 (FLASHDOS Programmer's Guide).

1.0 GATHERING COMPONENTS

1.1 ADAPTER CONNECTOR

Begin by first gathering all the necessary components. All components may be obtained from the local Radio Shack(R) (<http://www.radioshack.com>). Suitable components may be found at parts distributor such as DigiKeyTM (<http://www.digikey.com>). Table 0-1 shows the necessary components to build the adapter connector head and cable. The parallel port connector is a standard EIA 6 pin connector. The 5.6K OHM resistor is used enable the open collector circuit of the parallel port. The cabling mechanism is a generic telephone wire with spaded ends. Refer to Figure 0-6 for the diagram relating to the connector and telephone cable.

Bill Of Materials (BOM) For The ISP-MICROWIRE Adapter

Quantity	Radio Shack Part #	Description
1	276-140	Modular/EIA adapter
1	279-391	Telephone modular connector to apade line cord
1	271-1125	Pack of 5.6kΩ resistors, 5% tolerance

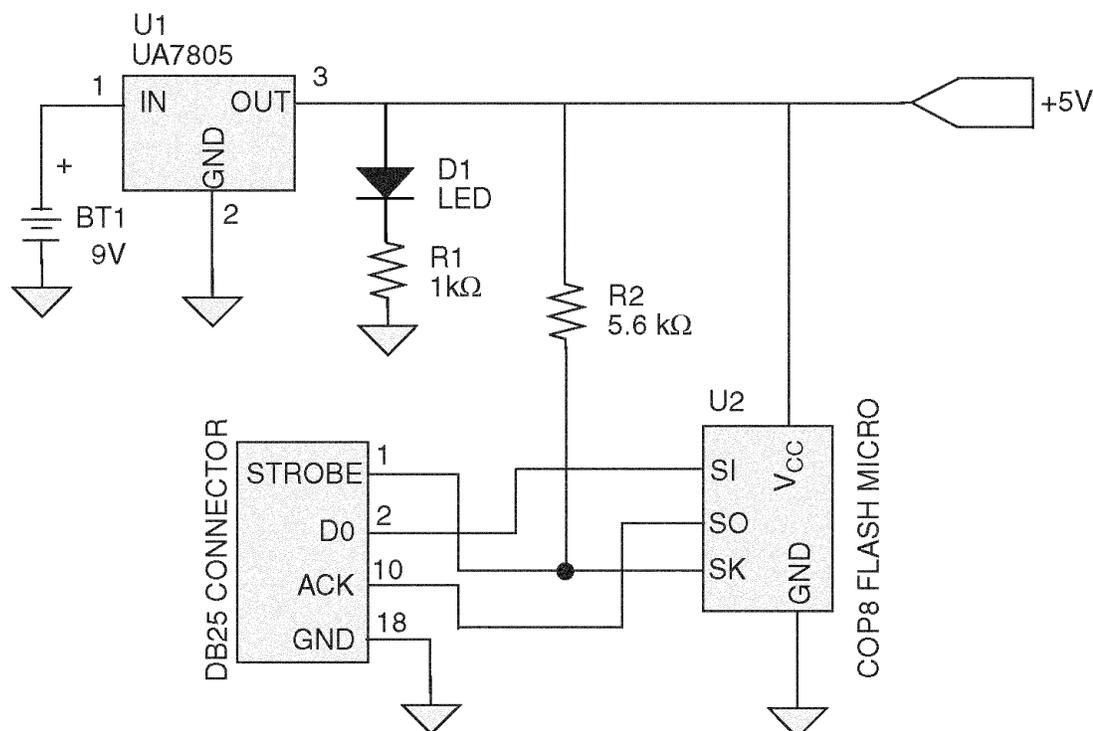
1.2 SAMPLE APPLICATION CIRCUIT

The sample circuit is included to give the reader the ability to interface directly to a COP8 FLASH ISP microcontroller (e.g., COP8CBR/CCR/CDR). Table 0-2 shows the necessary components to build the sample application circuit. A 9V battery and clip is necessary to power up the target microcontroller. The LM7805 voltage regulator is used to reduce the 9 volts to 5 volts for the target microcontroller. A low current LED is used to determine if the regulator is working properly. The 1K OHM resistor is used to limit current to the LED. Refer to Figure 0-1 for the schematic showing to the completed sample application circuit.

Bill Of Materials (BOM) For The Sample Circuit

Quantity	Radio Shack Part #	Description
1	276-1770	9V battery clips
1	276-310	Low current red LED
1	271-1118	1kΩ resistors 5% tolerance
1	23-553	9V battery

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FIGURE 1. Schematic of the Sample Application Circuit

2.0 CONNECTING IT ALL UP

In this section, we will discuss the attachment of the wire and connector to the DB25 connectors. Specific wire connections are discussed. And assembly techniques will be utilized.

2.1 ADAPTER CONNECTOR

Begin by first un-screwing the two screws on the adapter hood. Attach wire 2 (black) of the modular female end to pin 18 of the DB25 connector. Connect wire 4 (green) of the modular end to pin 2 of the DB25. Then attach wire 3 (red) of the female modular end to pin 10 of the DB25 connector. Finally, attach wire 5 (yellow) of the female modular end to pin 1 of the DB25. Wires 1 (white) and 6 (blue) will not be used. Refer to Figure 0-3 for the picture of how every thing is supposed to look like. Finally, attach the telephone cable (modular end) to the adapter head as shown in Figure 0-6.

2.2 SAMPLE APPLICATION CIRCUIT

This sample application circuit requires the use of a generic bread board. Begin by inserting the LED, 1K OHM resistor, and 5 volt regulator to the breadboard. Solder the wires to the ends of the spade plugs (all 4 of them). Compare Figure 0-4 for similarity. Attach necessary wires to form the circuit shown in Figure 0-1. Finally, compare Figure 0-5 for similarity. Insert the 9V battery clip's red wire into location X (+VCC strip) of the breadboard. The red wire will be used for the in-

put signal to the 5V regulator. Insert the battery clip's black wire into location Y (GND strip) of the bread board. The black wire will be used for the ground signal to the 5V regulator. Finally, attach the battery clip to the 9V battery. The LED should light up, thus showing the regulator is working properly.

Port Connections Name	Pin #	Modular Pin #	Lead Color
Strobe	1	1	Yellow
DO	2	3	Green
/ACK	10	2	Red
GND	18	4	Black

2.3 VERIFYING WITH SOFTWARE

For instructions on using the windows software for the FLASH ISP adapter refer to appnote AN-1154 (Introduction to the In System Programming software for the Windows 95/98 Environment).

2.4 CONCLUSION

The construction the ISP-FLASH adapter is easily accomplished and is inexpensive. Any components (with the same component value) may be substituted for. Cabling length is not critical and the COP8 FLASH ISP software does not require a high tolerance 5.6K Ohm resistor.

Notes

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