

## Description

The Sine Systems model MA-1 Modem Adapter is for use with the RFC-1/B Remote Facilities Controller. It consists of a small PC board which connects to the rear edge of the RFC-1 board with a jumper connector. A longer case and new rack panel are included to enclose the assembly.



The MA-1 adapter can be used to allow remote computer access or remote printing. In the latter case, several sites can share the same printer. The MA-1 adapter can be used to allow remote control and telemetry using a personal computer. Facilities control software can be custom written fairly quickly using a communications package like Procomm Plus or Telix. Using the RFC-1/B in the serial (modem) mode does not prevent the use of the voice (DTMF) mode.

RFC-1/B software version 4.00 or later is required to operate the MA-1 Modem Adapter. A software upgrade kit is available from Sine Systems as model SU-5. The upgrade kit will include a new microprocessor, instructions for installing the new microprocessor, a new speech chip, and a new Programming Instruction book.

## FCC Information

The Modem Adapter complies with Part 68 of the FCC rules. On the front of the Modem Adapter face plate is a label that contains, among other information, the FCC registration number and ringer equivalence number (REN) for this equipment. If requested, this information must be provided to the telephone company.

The Modem Adapter is designed for use with standard modular (RJ11C) telephone jacks.

The REN is used to determine the quantity of devices which may be connected to the telephone line. Excessive RENs on the telephone line may result in the devices not ringing in response to an incoming call. In most, but not all areas, the sum of the RENs should not exceed five (5.0). To be certain of the number of devices that may be connected to the line, as determined by the total RENs contact the telephone company to determine the maximum REN for the calling area.

The telephone company may make changes in its facilities, equipment, operations, or procedures that could affect the operation of the Modem Adapter. If this happens, the telephone company will provide advance notice in order for you to make the necessary modifications to maintain uninterrupted service.

If trouble is experienced with the Modem Adapter, please contact Sine Systems, Inc. (at the telephone number on the cover of the RFC-1/B instruction book), for repair and/or warranty information. If trouble with the Modem Adapter is causing harm to the telephone network, the telephone company may request you remove the equipment from the network until the problem is resolved. The telephone company will notify you in advance of service disconnection. But if advance notice isn't practical, the telephone company will notify the customer as soon as possible. Also, you will be advised of your right to file a complaint with the FCC if you believe it is necessary.

The Modem Adapter cannot be used on public coin service lines provided by the telephone company. Connection to Party Line Service is subject to state tariffs. Contact your state public utility commission, public service commission, or corporation commission for information.

The Modem Adapter is registered with the Federal Communications Commission and is certified to meet specific safety requirements. It is extremely important that the Modem Adapter not be modified in any way. Modification of this equipment will void the FCC certification, void the warranty, and perhaps pose a hazard to the user of this equipment or to maintenance personnel of your local telephone company.

Service of the Modem Adapter should be performed only by qualified technical personnel who are familiar with the implications of FCC Part 68 registration. Extreme caution should be used if the Modem Adapter case is opened without first being disconnected from the telephone line. High voltages may be present on telephone lines, and although the Modem Adapter is powered by 12 volts AC from a "wall plug" transformer, failure of this transformer could cause dangerous and potentially lethal voltages to become present. Only the supplied transformer should be used.

## **Installation**

Disconnect all cables from the RFC-1/B and remove it from the rack. Remove the two screws from the rear panel of the RFC-1/B. Remove the bezel and metal end panel. Slide the RFC-1 PC board out of the case.

The original rack panel and 6 inch long base/cover will not be reused. It is probably a good idea to save these, however, in case it is ever necessary to return the RFC-1/B to its original configuration.

Set the RFC-1/B board on a flat surface with the component side up. Set the MA-1 board down next to the rear edge of the RFC-1 board so that J1 on the MA-1 board is next to J4 on the RFC-1/B board. Install the jumper connector between the two boards to form one PC board assembly, now 8.5 inches long. It does not matter which way the jumper is installed as long as all the pins are in place.

Using the new panel and case supplied with the Modem Adapter, slide the assembly of the original RFC-1/B board and the MA-1 board into the case with the RJ-11 connector on the Modem Adapter sticking out through the front panel. Place the remaining bezel over the case and drop in the rear RFC-1 panel. Secure the end panel with two Phillips head screws.

The telephone line must be connected to both the RFC-1/B and the MA-1. This can be accomplished in two ways. The first way is to use a "T" connector to split the telephone line to both the RFC-1/B and the MA-1. The second way is to remove the 230VAC varistor (VR1) on the RFC-1/B board and using the supplied interface holes on the MA-1 board solder jumpers to the VR1 pads on the RFC-1/B. This should only be done by qualified technical personnel with the supplied cable or with cable that can sustain 1500 Volts to ground.

If a dual communications mode is used (both voice and serial data modes are used) and the RFC-1/B is set to try voice communications first, the calling modem may need to be set to wait at least 40 seconds for a carrier before hanging up. The normal default value of 30 seconds may not be enough time to allow for telephone ringing and the voice response attempt. Additionally, many of the newer high speed modems take more time after connection trying to negotiate error correction protocol. Lengthen the time allowed for connection and disable error correction by typing "ATS7=040" into the calling modem. Many communication programs allow you to modify the modem setup string to include this information.

## **Operating the RFC-1 through Serial Data Commands**

The RFC-1/B can be operated via a modem with commands sent from a personal computer. Operating in serial mode uses the same commands with the same keystrokes as in voice mode. The operating information is contained in the RFC-1/B Programming Instruction Book for software versions 4.00 and later.

## **Printer Installation (remote printing)**

Remote printing is made possible by inserting a telephone line between the MA-1 and a modem at the site with the printer. A serial printer can be connected directly to the RS-232 connector on the modem with the appropriate cable. However, most low cost printers currently available are parallel printers. Parallel printers can be used but the data must first be converted from serial data to parallel data. Some printer manufacturers offer this as an option on some models. The printer manufacturer can tell you if one is available for your printer.

Third party devices are also available that convert data from serial data to parallel. Your local computer superstore should have one. They usually cost between \$50 and \$100. A simple gender changer adapter is not the same as a serial to parallel converter and will not work. We recommend that you have considerable working knowledge of serial communications before attempting a setup with unknown third party devices.

A relatively new class of printers called Windows printers are now available. These printers have a parallel interface but they are not true parallel printers. Windows printers rely on the Microsoft Windows® operating system to operate so they will not work with the RFC-1/B on any of its data interface ports.

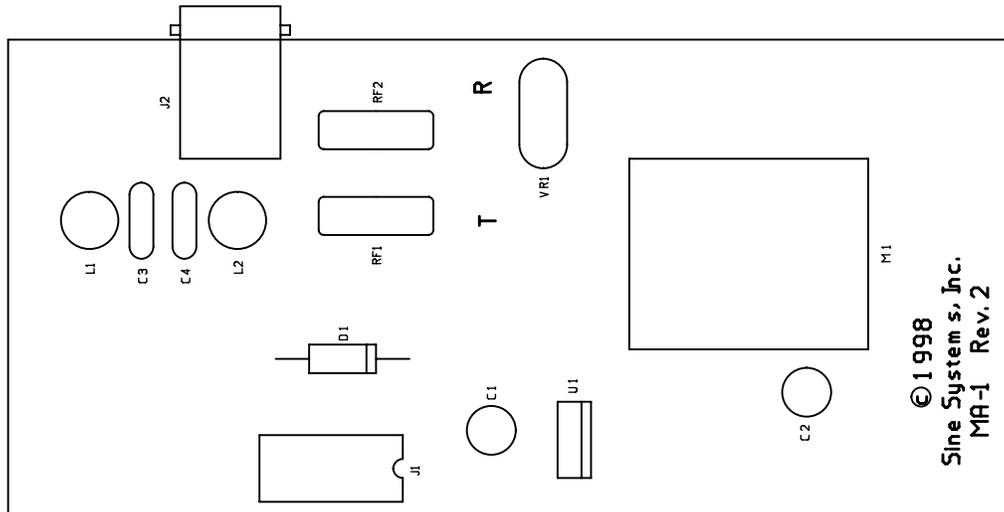
The setup for a parallel printer with a serial data adapter is as follows:

- 1) Verify that the DIP switches on the serial to parallel converter are set for 300 bps, 8 data bits, no parity, and software handshaking. If there is a DCE/DTE switch, select the DTE position.
- 2) Plug one end of a straight through cable to the RS-232 output of the receiving modem.
- 3) Plug the other end of the cable into the serial input side of the serial to parallel data converter.
- 4) Attach the parallel data output of the data converter to the parallel input of the printer.
- 5) Apply power to the printer and to the data adapter, if necessary.
- 6) The RFC-1/B should be set so that the baud rate is 300. This is done by programming a value of 5 at address 1005 using the Advanced Programming Mode of the RFC-1/B. For more information on programming, consult the Instruction Book that came with your RFC-1/B.

If the MA-1 Modem Adapter is to be used only for printing, set the communications speed to 300 baud. This will allow the printer to keep up with the output of the data adapter. Higher speeds may be used if the printer has a buffer.

- 7) Program the RFC-1/B to send readings to the printer at scheduled intervals by programming an action sequence and setting up the proper date and time triggers for that action sequence. For more information on programming, consult the RFC-1/B Instruction Book.

## Component Layout



## Parts List

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C1-2	capacitor, 100uF, 16V
D1	diode, zener, 5.1V, 5W, 1N5338B
J1	16 pin DIP connector
J2	RJ-11 modular connector
M1	modem module
RF1-2	resettable fuse rated at 600V @ 0.16A
U1	regulator, 5V, 500mA, TO-220, LM2937ET
VR1	varistor, 250VAC
jumper	16 conductor flat cable with two 16 pin male DIP connectors