

USR-310  
ORIGINATE ACOUSTIC COUPLER  
THEORY OF OPERATIONS MANUAL

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## GENERAL INFORMATION

Modems are used for transmitting digital data (such as from a computer or terminal) over analog channels (such as the telephone network) as shown in figure 1. The modem from which a call is being placed is said to be working in the originate mode. The modem which answers the call is said to be in the answer mode. A modem in the originate mode transmits a logical 1 or "mark" as a frequency of 1270Hz, and a logical 0 or "space" as a frequency of 1070Hz. Simultaneously, the originate modem receives signals from the answer modem, treating a frequency of 2225Hz as a mark and 2025Hz as a space. During periods when either modem is not actively transmitting data, it sends a constant mark. If data is being sent simultaneously in both directions, a system is said to be "full-duplex". If data is sent in only one direction at a time a system is "half-duplex". In many cases, full-duplex means that when a terminal is linked to a computer, the computer echoes back what the person at the terminal is typing. Likewise, half-duplex usually means that the terminal itself echoes back what the person at the terminal is typing and the computer doesn't. The USR-310 has a half/full duplex switch which can be used to echo back what you type if your particular terminal cannot. If you are signed on to a half-duplex system and your terminal or modem is in the full-duplex position, you will not see what you type. If you are signed on to a full-duplex system and your terminal or modem is in the half-duplex mode, you will see everything you type printed twice.

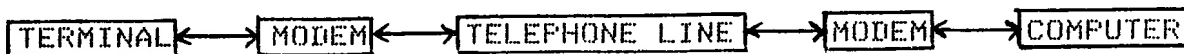


FIGURE 1

## INTERFACE TO THE TERMINAL DEVICE

The USR-310 connects to the computer or terminal via the 25 pin RS-232C female connector on the case-backpanel. If your device does not have a 25 pin RS-232C connector consult the manufacturer of the device, Appendix B, and/or U.S. Robotics for further hook up information.

## OPERATION

To operate the USR-310:

1. Plug the 25 pin connector from your terminal or other device into the receptacle on the USR-310 backpanel.
2. Select the appropriate half or full duplex settings.
3. Turn on the USR-310 and your terminal or other device.
4. Dial the appropriate telephone number and listen for a high-pitched tone, then insert the telephone handset into the rubber cups on top of the USR-310. The "cord" end of the handset should be on the left as you face the USR-310 front panel. (For best results, insert the handset into one cup first, then pull gently in the direction of the other cup and insert the other end of the handset. For removal, move the handset gently toward the end of the modem with the half/full duplex switch and remove the handset from one cup first, then the other. Removal is made easier if one gently pries the wall of the rubber cup away from the handset so as to remove any vacuum created by the insertion of the handset into the cups. These techniques work better than trying to force the handset into or out of both cups simultaneously.
5. The communications link is now established and you're ready to send and receive data.
6. To end the session, remove the handset and hang up the telephone. It is recommended that the USR-310 be turned off whenever it is not in use.

NOTE: The USR-310 has an adjustable transmit level which can be used to make the tone sent from the speaker louder or softer. This level has been set at the factory to serve the widest number of applications, however, if you experience difficulties in reliable communication, adjusting the transmit level may help. The adjustment is accessible from a hole in the baseplate on the bottom of the case. A few guidelines may be of help:

If the modem on the other end of your transmission link does not hear your carrier, or receives data improperly, you may want to make your USR-310 transmit louder.

If the USR-310 is having difficulty receiving data properly, you will want to make your transmit level softer.

## APPENDIX B

## DEFINITION OF PINS ON EIA RS-232C 25 PIN CONNECTOR

- 1 Protective ground, this pin is hardwired to earth ground within the modem.
- 2 Transmit data, data to be transmitted by the modem. -3 to -25 volts for a logical 1, +3 to +25 volts for a logical 0.
- 3 Received data, data received from the other modem, -12 volts for a logical 1, +12 volts for a logical 0.
- 4
- 5 Carrier detect (clear to send), positive level when detecting a carrier from other modem.
- 6 Data set ready.
- 7 Signal ground, same as pin 1.
- 8 Clear to send, same as pin 5.
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## WARRANTY COVERAGE AND SERVICING ARRANGEMENTS

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+ WARRANTY
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+ U.S. Robotics, Inc. warrants to the original purchaser
+ that it shall either repair or replace (at its option)
+ this product if it should prove defective in material or
+ workmanship under normal operating conditions within 90
+ days from date of original purchase. This warranty is
+ void if the product is modified, tampered with, misused
+ or subjected to abnormal working conditions.
+
+ This warranty stands in lieu of all other warranties
+ either express, implied or statutory.
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### SERVICING

In all the following cases, U.S. Robotics will pay for one way shipping charges to the purchaser. If the malfunctioning product is a modem-data coupler combination, then both modem and data coupler must be returned to U.S. Robotics.

#### Annual Maintenance Package

Any acoustic coupler, modem, data coupler, or modem-data coupler combination purchased from U.S. Robotics may be placed under a maintenance agreement for a fee of \$25.00 per year. Under this agreement, U.S. Robotics will repair the product at no additional charge to the purchaser should it prove defective under normal operating conditions.

If the purchaser elects not to subscribe to the Annual Maintenance Package before the expiration of the 90 day warranty period and subsequently wishes to subscribe, or if the purchaser elects not to resubscribe to an existing Annual Maintenance Package agreement before its expiration and subsequently wishes to resubscribe, then the purchaser must ship the product to be covered to U.S. Robotics, Inc. for an evaluation and certification that the unit is in good working order. If the product is functioning improperly or is inoperative, it shall be repaired. The fee for the necessary repair and certification service is \$30.00 in addition to the \$25.00 Annual Maintenance Package fee.

Products not covered by the Annual Maintenance Package will be serviced on a \$30.00 per repair basis.

## Express Repair Service

For purchasers who have established credit with U.S. Robotics, we offer an Express Repair Service. Under this plan, we will ship a replacement acoustic coupler, modem, data coupler, or modem-data coupler combination via air freight the same day we are notified of the purchaser's product failure. The purchaser must ship the inoperative product to U.S. Robotics within three days of the product failure notification. The exchange shall be permanent unless the purchaser requests that the original product be returned, in which case the original product and the U.S. Robotics replacement product shall be exchanged upon repair of the purchaser's original product. Under the Express Repair Service option, the Annual Maintenance Package fee is \$35.00 and products not covered by the Package will be serviced on a \$40.00 per repair basis.

Any acoustic coupler, modem or data coupler which has been modified in any way by the purchaser, or has been subjected to abnormal operating conditions or abuse will not be serviced under any of the plans listed above. Instead, such product may be serviced at the rate of \$25.00 per hour for labor plus parts costs.

In all cases of product failure, contact U.S. Robotics for shipping instructions to the appropriate servicing center.

Fees subject to change without notice after 1978.