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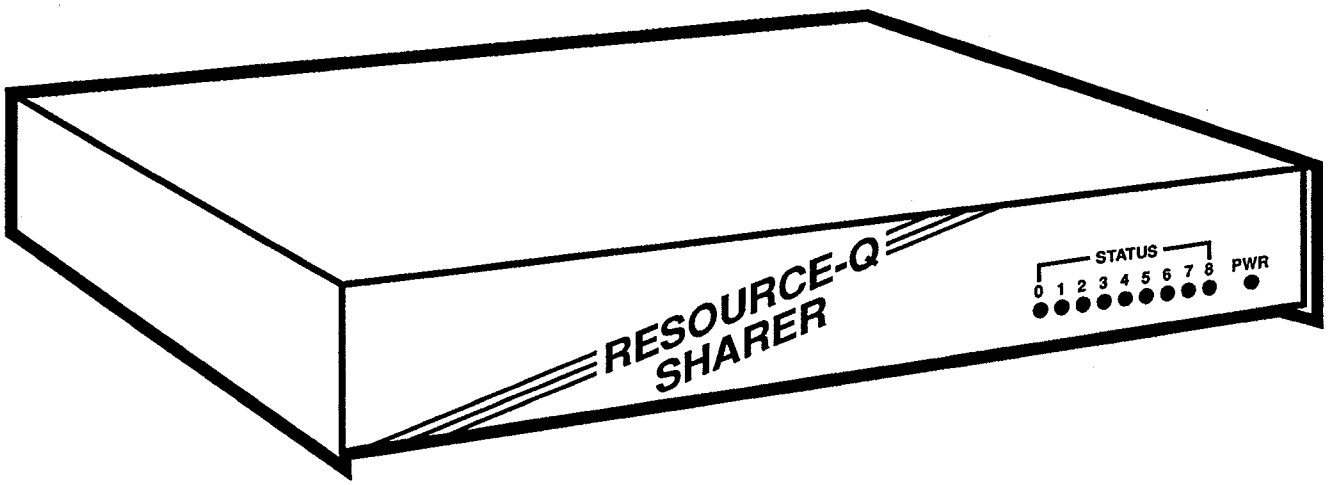
JANUARY 1993
TL251A
TL251AE
TL251C

Resource-Q Sharer



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1.0 Specifications

Contention Type ..... Data

Channels ..... 5 or 9 (configurable in any combination)

Speed ..... 110, 300, 600, 1200, 2400, 4800, 9600, or 19,200 bps; 14,400 bps with modified hardware

Data Format ..... 7 or 8 ASCII data bits; even, odd, or no parity

Flow Control ..... Hardware, software (X-ON/X-OFF), or no flow control*

Memory ..... 32K RAM buffer, 8K battery-backed-up RAM

Interface ..... EIA RS-232 serial asynchronous, DTE or DCE (user-selectable)**

Connectors ..... (5) or (9) DB25 female**

Power ..... 115 or 230 VAC (as specified), 50-60 Hz, 5 watts

Size ..... 2.3"H x 12.1"W x 11.2"D (5.8 x 30.7 x 28.4 cm)

Weight: Base model ..... 8.0 lb. (3.6 kg)

With 4-Port Expansion Board installed ..... 8.6 lb. (3.9 kg)

Wallmount power supply unit ..... 2.1 lb. (1 kg)

Enclosure ..... Steel

Operating Temperature ..... 32° to 113° F (0° to 45° C)

Storage Temperature ..... –4° to 158° F (–20° to 70° C)

Humidity ..... 0 to 95% noncondensing

Mean Time Between Failures (ground benign environment):

Base model ..... 20,000 hours

With 4-Port Expansion Board installed ..... 16,000 hours

***Hardware Flow Control Configuration:**

Port Jumpered As	Drive	Monitor
DTE	DTR	CTS
DCE	CTS	DTR

****EIA RS-232 Pins Supported:**

1	Frame Ground
2	Transmit Data
3	Receive Data
4	Request to Send
5	Clear to Send
6	Data Set Ready
7	Signal Ground
8	Received Line Signal Detector
20	Data Terminal Ready
22	Ring Indicator

Additional equipment that may be useful to you:

If you need to rackmount the Resource–Q Sharer (TL251A), use the TL485 Rackmount Kit.

If you need to expand the Resource–Q Sharer to its maximum nine-port capacity, use the optional 4-Port Expansion Board (TL251C).

2.0 Introduction

The Resource-Q Sharer is an automatic, microprocessor-driven, full-featured port-contention device that enables groups of local users of asynchronous terminals or PCs, as well as remote users calling in over modems, to:

- access a limited number of ports on an asynchronous host computer,
- share a limited number of modems for transmitting async data,
- send data to a limited number of printers,
- send data, one-to-one or broadcast, to each other, or
- share any type of async device.

Using the Sharer's software, you can group like devices together. Requests to link to a printer, for example, would be routed to whichever member of the "printer group" was available. The Sharer manages access to a particular port, or to the first available port of a particular group, on a first come, first served basis.

The basic Resource-Q Sharer features five total ports; an available expansion board (TL251C) lets you expand the original unit 's capacity to a total of nine ports.

The Resource-Q Sharer features:

- port contention for efficient access to system resources,
- port queuing for equitable access to resources,
- independent port configuration for flexible resource use,
- timeout circuitry to keep ports from monopolizing resources,
- auto logoff strings to ensure proper disconnection and readiness of devices, and
- a 32KB data buffer for efficient, safe data transfers at varying speeds.

The Resource-Q Sharer's features generally require no manual intervention by the end user; most user functions can be initiated by simple keyboard commands.

2.1 Benefits, Features, and Functions

2.1.1 Equitable and Efficient Access to ResourceS Ports for System Users.

The Resource-Q Sharer features queuing service to schedule access to limited system resources for each user. A user on a terminal or running a terminal emulation requests access to resources by simply pressing the key representing:

- the number (0-8) of a particular device, or
- the letter (A-I) of a device group.

If the selected device, or any member of the selected group, is available, the Resource-Q Sharer grants access to the user. If the selected device or all members of the selected group are occupied, the Resource-Q Sharer places the user's request in a queue, a consecutive list of requests to use resources. This contention technique allows as many as eight infrequent or "low-end" system users to share one or more resources when there are few ports to go around.

Requests move to the head of the queue on a first-in/first-out basis as resources become available. When a resource is freed, the linkable user/device with a request for that resource that's closest to the head of the queue is linked. A status message is sent to the user's terminal, indicating the link when it has been made.

If users' link requests are placed in the queue, status messages are sent to their terminals or PCs that indicate their positions in the queue; these queue positions are updated on a "real-time" basis (as their requests move up the queue, the Sharer indicates each new position with a new status message).

Once in the queue, users can press any key other than 0-9, A-I, ?, or * (which are Sharer commands) and they'll receive status messages indicating their requests' current queue positions. (If they have not made a link request, they'll get a help screen instead.) If they change their minds, they can

delete their requests for access to resources from the queue.

2.1.3 Individually Configurable Ports

You can configure each port independently of all other ports for data rates, flow control, word structure, and DTE or DCE mode. The Resource-Q Sharer accommodates the following data rates for each of its ports: 110 (or, if you have special-ordered a unit with the required hardware and software modifications, 14,400), 300, 600, 1200, 2400, 4800, 9600, and 19,200 bps. Chapter 3 explains how to configure these options when you install the Resource-Q Sharer.

Figure 2-1 (below) shows the Resource-Q Sharer in a typical system consisting of an asynchronous host computer, shared printer, shared modem, and many end-user terminals and PCs. In this example, the Resource-Q Sharer is providing inter-user communication and shared access to two host ports, the printer, and remote resources (through the modem) for five users. If the Sharer below is configured to enable group ports to make links, the host (with some programming) can print jobs or access the modem for users on its dedicated ports, and users at remote sites can access the local resources through the modem.

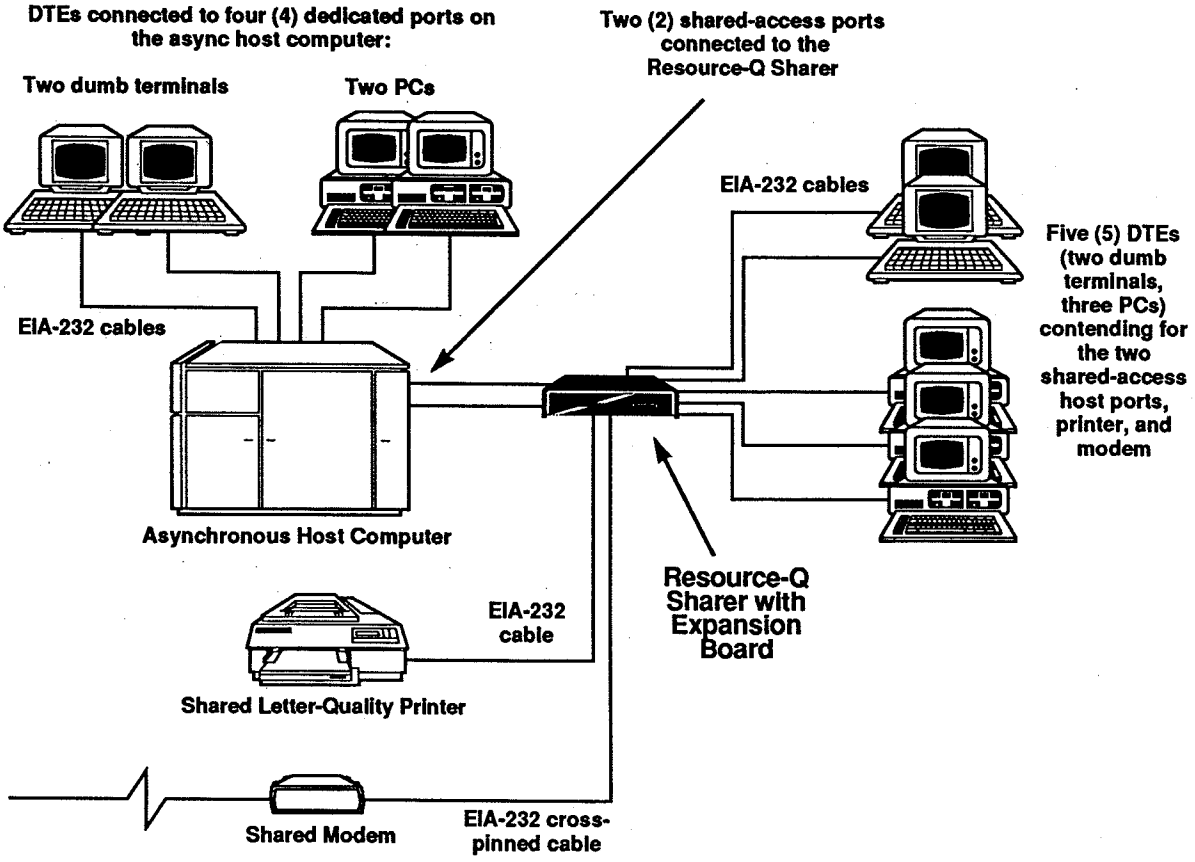

Figure 2-1. Typical use of Resource-Q Sharer to provide shared access of asynchronous devices for a number of users.

2.1.4 Automatic Prevention of Common Resource-Sharing Problems

- The Resource-Q Sharer won't let your system users waste their shared resources. Users can break links that they've established by sending the Sharer the "break-link character," a character that the Sharer is set to recognize at installation time as the command to end a link session. (Chapter 3 explains how to set the break-link character and Section 4.2.6 details its use.) If users leave their keyboards, get involved in something else, or otherwise stop doing anything with links they've established, the Sharer's link-abort and link-inactivity timeout features automatically break links between users and resources when no user activity is detected over a set period of time. (See Sections 4.2.5 and 4.2.7.) Whenever a link is broken, the Sharer sends an appropriate status message to the user and moves on to the next link request in the queue.

- The Resource-Q Sharer's 32-KB buffer is spacious enough for very large files or very large differences in device communication speeds. Used in conjunction with the Sharer's user-configured per-port flow control, the buffer prevents data loss during transit.

- The Sharer will turn off its flow control and even overflow its buffer during the break-link procedure to flush data from a transmitting resource. This makes it virtually certain that no data intended for one user will be transmitted to the next user in the queue.

- You and your system users can work with the Resource-Q Sharer's software to define special, automatic processing for any resource, to be performed whenever a link with that device is broken, whether by a user or by a timeout. Such special programming might include sending a logoff string to a host, sending a form feed to a printer, dropping DTR to hang up a modem, and many other possibilities. See Section 4.6.

3.0 Installation

What you'll need to install the Resource-Q Sharer:

- two small screwdrivers (one flathead, one Phillips head)
- a list of information about your PCs/terminals and shared devices
- the necessary EIA RS-232 cables for each port
- a logical and convenient location for the unit

and

- an hour (or less) of your time.

1. Select a convenient site for the Resource-Q Sharer.

You should install the Resource-Q Sharer in a readily accessible place for easy monitoring and management of the unit itself and the various ports it is serving. You can locate the Resource-Q Sharer near the highest concentration of ports. Or you can install the Resource-Q Sharer in your building's wiring closet or data-communication center.

2. For each port, determine which device you want to assign and the port configuration that will be necessary.

Use the PAC Template (Appendix A) to record the port configuration information, which you will need to complete Steps 4 through 8 of this installation. Record the following information for each device to be attached to the Resource-Q Sharer:

- What port number you want to assign. This is not very important, but since the help screen lists ports in numerical order, from 0 (first) to 8 (last), you may want to assign the lowest-numbered ports to your shared devices, so they will appear first, then assign the remaining ports, as necessary, to your system PCs or terminals.
- Name of the device (16 characters maximum; if a PC or terminal, perhaps the name of the user) and its location.
- DTE or DCE.
- Word structure (number of data bits and type of parity); the Sharer can automatically adjust to different numbers of stop bits.
- Flow control—DTR/CTS for hardware, X-ON/X-OFF for software, or no flow control.
- Data rate (bits/second).
- If a shared device, whether you want to assign it to a group (with similar devices or all by itself); if so, what group letter (A-I) and name (16 chars. max) is assigned to that group (for example, 2 printers in group A, "Printers," a single modem in group B, "MODEMS," etc.). A device may not be assigned to more than one group at a time.
- Special break-link procedures, if any, that would be desirable for the device or group, such as dropping DTR to a modem or sending a form-feed (<Ctrl> <L>) to any member of a printer group. See Section 4.6.3 for a complete list of available logoff commands.

3. Remove the cover of the Resource-Q Sharer.

You'll need a small Phillips head screwdriver. Six (6) screws are used to attach the cover to the chassis, three on each side of the unit.

4. Set the DIP shunt jumpers to configure each port as DTE or DCE. (If you are installing the 4-Port Expansion Board, set the DIP shunts for ports 5-8 now.)

Dual Inline Package (DIP) Shunt Jumpers

Each port has a DIP shunt jumper located behind its connector on the rear of the circuit board (refer to Fig. 3.1 and 3.2). These shunt jumpers allow each port to be configured as either Data Terminal Equipment (DTE) or Data Communication Equipment (DCE). This feature eliminates the need for a "crossover" or "null modem" cable to connect your equipment (terminals, host computers, modems, etc.) to the Resource-Q Sharer.

Standard straight-through EIA RS-232 cable is all

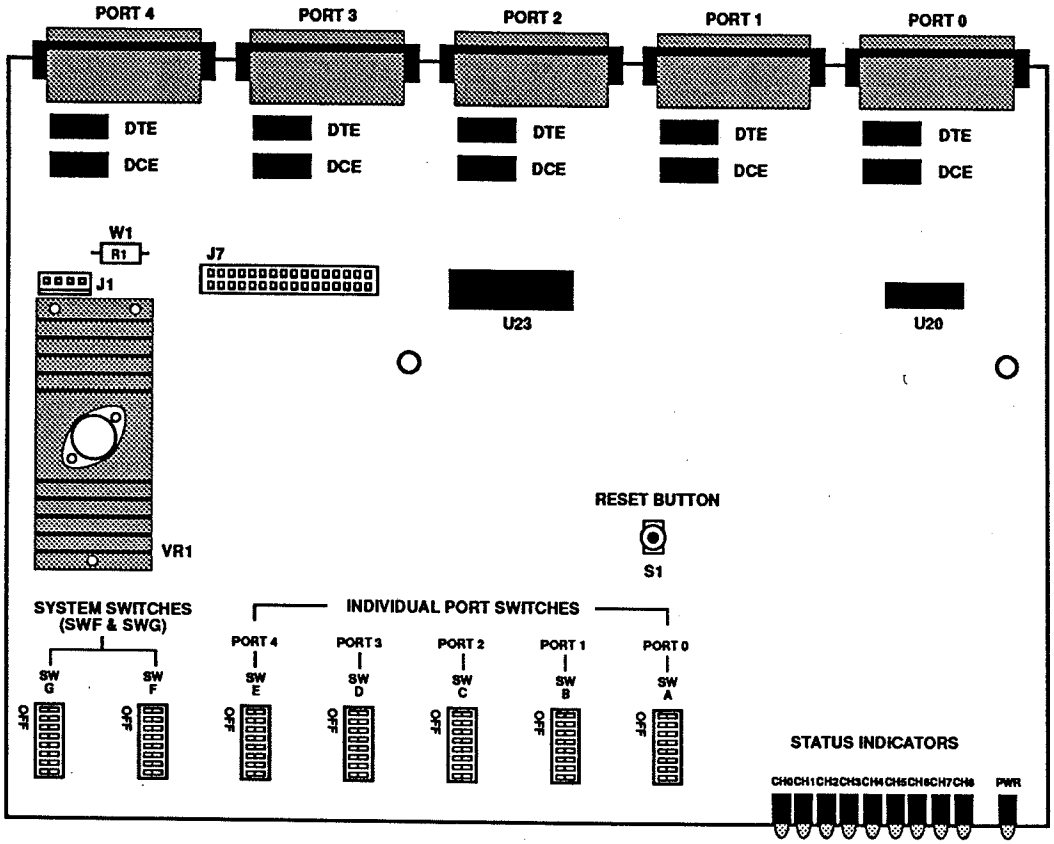

Figure 3-1. Resource-Q Sharer switch and DIP shunt jumper locations.

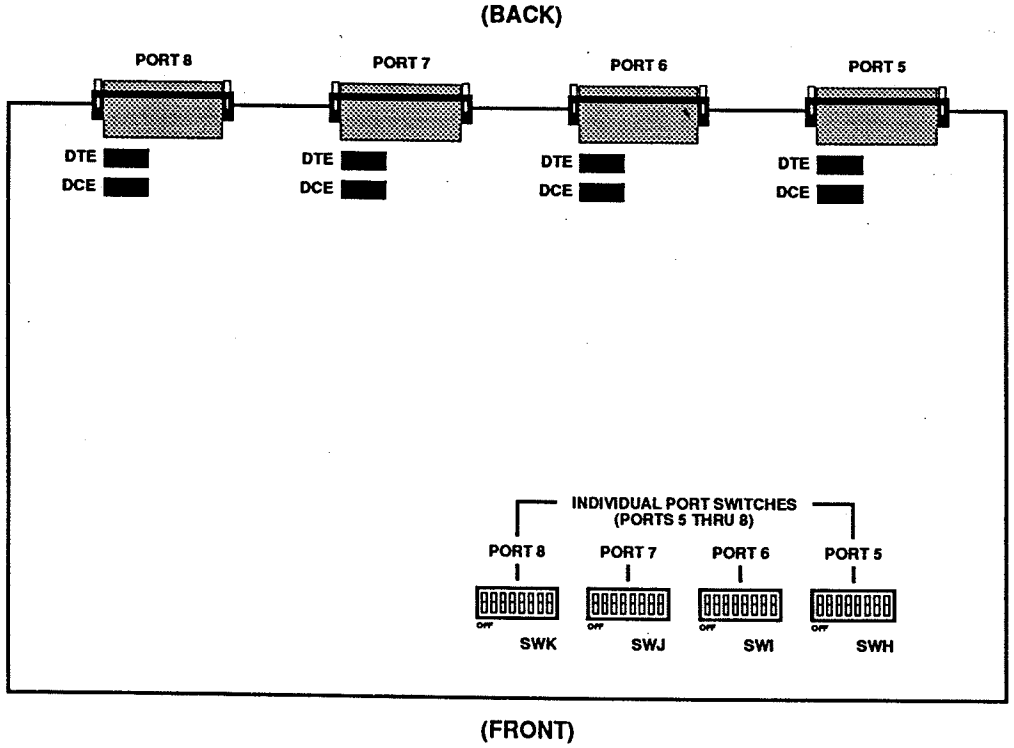

Figure 3-2. 4-Port Expansion Board switch and DIP shunt jumper locations.

that's needed to connect your equipment to the Resource-Q Sharer ports. (If necessary, you can use crossover cables to connect equipment to the Resource-Q Sharer; see below.)

NOTE

The default setting for each port is DCE.

DTE or DCE? It Depends on Your Cables

Table 3.1, below, shows the leads and signal directions used by each of the configurations. There are two common cabling possibilities used with them. If your equipment is using a different cabling scheme, refer to the pinning schematic for your equipment, or contact qualified technical support personnel to help you determine DTE/DCE configuration for your Resource-Q Sharer ports.

- Straight-Through Cable

  When using a straight-through-pinned EIA RS-232 cable:

  — If you are attaching a DTE device to port x, set port x as DCE.

  — If you are attaching a DCE device to port x, set port x as DTE.

- Crossover Cable

  When using an EIA RS-232 cable, and that cable is pinned end-to-end as a "crossover cable" or "null modem cable" (that is, pin #2 is crossed to pin #3):

  — If you are attaching a DTE device to port x, set port x as DTE.

  — If you are attaching a DCE device to port x, set port x as DCE.

Table 3-1. DTE Versus DCE Signal Directions.

RESOURCE-Q SHARER PORT CONFIGURED AS:		
DTE	DCE	Signal Direction
TXD (pin 2)	RXD (pin 3)	Output from Sharer
RXD (3)	TXD (2)	Input to Sharer
RTS (4)	DCD (8)	Output from Sharer
CTS (5)	DTR (20)	Input to Sharer
N/A	DSR (6)	Output from Sharer
DCD (8)	RTS (4)	Input to Sharer
DTR (20)	CTS (5)	Output from Sharer
RI (22)	N/A	Input to Sharer

Moving DIP Shunts

To remove a DIP shunt, use either a small flathead screwdriver or an IC (integrated circuit) remover; either tool will work fine. If you use a small screwdriver, insert the flat end under one end of the DIP shunt and gently pry up from the socket.

When installing a shunt jumper, place it directly over the socket so that all pins are immediately above their respective holes. Press gently; the shunt jumper should slide into the socket.

CAUTION!

DIP shunts are fragile. If you bend the pins on a DIP shunt, you many not be able to complete a proper port configuration. Work carefully when removing or replacing DIP shunts.

5. Install the 4-Port Expansion Board (TL251C).

(Go to step 6 if you're not installing the TL251C.)

The 4-Port Expansion Board includes the following hardware:

- two (2) spacers (standoffs)
- eight (8) screwlocks
- one (1) screw

Refer to Figure 3-3 (facing page) while installing the expansion board.

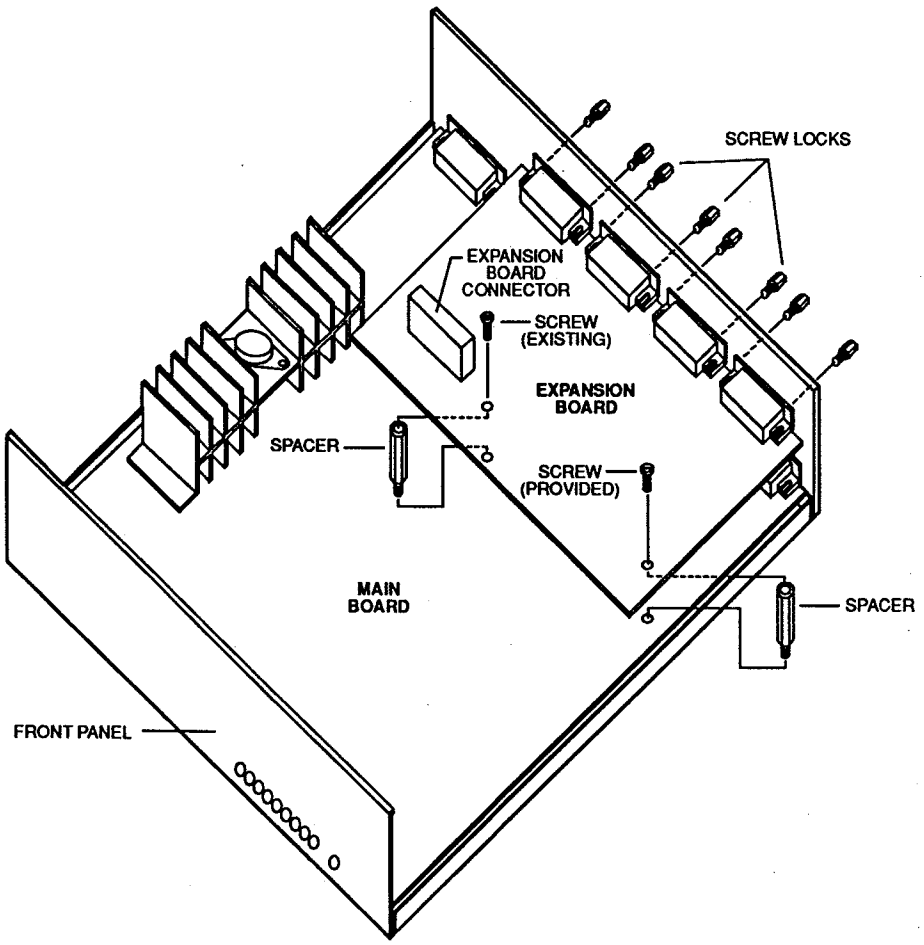

Figure 3-3. Installing the 4-Port Expansion Board.

A. Remove the screw located near IC chip U23 on the main circuit board. Do not discard this screw; you will need it for complete installation of the expansion card.

B. Insert a spacer in the hole left vacant by the screw that was removed in Step A.

C. Insert the second spacer in the hole located near IC U20 on the main circuit board.

D. Align the 4-Port Expansion Board's port connectors with the holes in the rear panel of the Resource-Q Sharer chassis. Make sure the connector plug on the bottom of the expansion card is aligned properly with the connector socket on the main circuit board (see Figure 3-3). Carefully press the connector plug into the connector socket; this electrically unites the expansion card and the main circuit board of the Resource-Q Sharer.

CAUTION!

Do not force the connectors together. Excessive force may damage the pins. If the connectors do not fit together easily the first time, align the connectors and try again.

E. Install the eight (8) screw locks. Thread two (2) each through the back panel into the holes beside each port's DB25 connector on the 4-Port Expansion Board. Do not overtighten the screw locks!

F. Install the screw from Step A through the expansion card into either spacer.

G. Install the screw provided with the expansion card through the card and into the other spacer.

The 4-Port Expansion Board is now installed.

6. Set the 8-position DIP switches for the ports and the Resource-Q Sharer system.

Configuring the ports is a three-part process.

A. Set the configuration DIP switch for each port.

The numbered ports on the rear panel of the Resource-Q Sharer are served by the 8-position DIP switches at the front of the main circuit board. Table 3-2, below, shows the correlation between the ports and the DIP switches.

Table 3-2. Port-to-Switch Correlation in the Resource-Q Sharer.

Port 0 — Switch A
Port 1 — Switch B
Port 2 — Switch C
Port 3 — Switch D
Port 4 — Switch E
Port 5 — Switch H ....(on optional expansion card)
Port 6 — Switch I .....(on optional expansion card)
Port 7 — Switch J .....(on optional expansion card)
Port 8 — Switch K .....(on optional expansion card)

NOTE

Unused Resource-Q Sharer ports should be disabled (set positions 4 and 5 of the port's DIP switch to ON) to prevent operating problems.

NOTE

Switches F and G are system-option switches and have no port correlation.

NOTE

Each Resource-Q Sharer port is compatible with any stop-bit setting on your data equipment.

Refer to Table 3-3, page 12, to configure each port for your equipment.

- Switch positions 1–3 are used to set the data rate in bits per second (bps).
- To configure word structure, switch positions 4 and 5 are used to set parity bits for your data, and switch position 6 is used to determine data bits (8 or 7) per word and to enable or disable the port.
- Switch positions 7 and 8 are used to set flow control (hardware, software, or no flow control).

B. Set the two configuration DIP switches for the Resource-Q Sharer system options.

Refer to Tables 3-4 and 3-5, starting on page 13, to configure the Resource-Q Sharer system option switches (Switches F and G).

- Switch F is used to set break-link characters for the Resource-Q Sharer. Refer to Table 3-5.
- Switch G is used to set five system options: inactivity timeouts, lead control, status messages, link requests from group ports, and abort timer. Refer to Table 3-4.

C. Power up the Resouce-Q Sharer and press the reset button. The Sharer reads and stores the changes you've made to the port and system option switches. (You must reset the unit after any change of a DIP switch.)

Now unplug the Sharer.

7. Connect a dumb terminal or a PC running a communications package to any Resource-Q Sharer port. This terminal or PC will be the temporary "Resource-Q Sharer console" through which you will enter the software configuration elements for all the ports you will be using. Use one of the PCs or terminals that will be permanently attached to the Sharer if it's near enough to the Sharer for you to go back and forth or for two-person cooperation. Otherwise, place a PC or terminal nearby and run DB25-male-terminated EIA RS-232 cable from it to either:

- an unused port (you'll have to configure the port switches and then reconfigure them when you're through to disable the port, but you can

attach and test all your devices without having to remove the "console"), or

- a port that you've already assigned to, and configured for, a terminal or PC (no switch resetting required, but when it comes time to plug the permanent PC or terminal cable into that port, you'll have to disconnect the "console" and test the permanent connection from somewhere else).

These two alternatives let you avoid having to configure a port twice before you can attach an assigned initial-setup device.

8. Enter port and group names and assignments and break-link procedures.

Plug the power supply into an outlet to power up the Resource-Q Sharer; power up the "console"; and if the "console" is a PC, boot its communications software. Press <?> on the console keyboard to get to the Sharer's command menu. Press <8> to select the port/group naming/assigning command; an (empty) name/assignment help screen will be displayed (see Figure 4.1 in the next chapter), followed by a series of prompts.

As the prompts direct you, enter the port number of the first port you'd like to assign, the group letter (if the device belongs to a group), and the port's name. When you've finished, the Sharer will cycle back and show you the help screen and first prompt again; the screen should now include the port's name and (if any) group assignment (but not the group name yet). If you've entered something wrong, try again. If everything's OK, move on to the next port, and so on, until all ports are named and assigned.

Then, back at the first prompt again, enter the letter of your first group, and then at the second prompt enter its name. After this, the help screen should show the group name in the appropriate column. As before, if you've entered something wrong, try again. If everything's OK, move on to the next group, and so on, until all groups are named.

At this point, press <Esc> to return to the command menu, then press <1> to start programming logoff commands into the break-link procedure for any port or group for which this would be useful. Figure 4.3 in the next chapter reproduces the "possible imbedded commands" help screen which the Sharer will display for you. You will be prompted to enter a port number or group letter, then the logoff sequence you want for that port or group. Any nonprintable characters in the logoff command string will be echoed to your console as dashes. When you've finished, press <Esc>, press <2>, and follow the prompts if you want to review any of the logoff commands you've entered; otherwise, unplug the Resource-Q Sharer and proceed to step 9.

9. One at a time, connect EIA RS-232 cables from your equipment to the DB25 female connectors on the rear panel of the Resource-Q Sharer. After each cable is properly seated, power up the Sharer and the newly-attached device, run a few tests from the console and/or the device to make sure the connection is working (trial links, getting to the command menu if the device is a PC or terminal, etc.), then power down the Sharer again. When you've finished with the console, disconnect it and disable its port if it's not going to be used any further. When you've completely finished attaching and testing devices, unplug the Sharer and proceed to step 10.

10. Replace the cover and screws.

11. Power up the Resource-Q Sharer and any attached devices that should be on.

12. Photocopy the PAC Template and store it with the Resource-Q Sharer. If you need to contact technical support services, have this information handy for quick reference. Monitor the performance of each device during the first hours of use to make sure of proper port configuration. Depending on your equipment, changes to port configuration may be necessary. We recommend that you try the Resource-Q Sharer under heavy traffic conditions to verify your settings. Typically, incorrect port settings will become apparent during such situations.

We recommend that you give all new Resource-Q Sharer users a quick class or some notes on how to use the basic functions of the unit. The Quick Help Sheet (Appendix C) can be filled out, photocopied, and distributed as part of this effort.

Table 3-3.
Individual Port Switch Settings
(SWA–SWE and SWH–SWK).

OPTION	SWITCH POSITION SETTINGS							
	1	2	3	4	5	6	7	8
Baud Rate								
110 or 14400*	ON	ON	ON					
300	OFF	ON	ON					
600	ON	OFF	ON					
1200	OFF	OFF	ON					
2400	ON	ON	OFF					
4800	OFF	ON	OFF					
9600	ON	OFF	OFF					
19200	OFF	OFF	OFF					
Port disable/Parity								
Port disabled				ON	ON			
Even parity				OFF	ON			
Odd parity				ON	OFF			
No parity				OFF	OFF			
Data bits/word								
8 data bits						ON		
7 data bits						OFF		
Flow control								
Load Defaults**							ON	ON
Switch A Only!								
(battery-backed-up memory is cleared; clear all names, groups, and logoffs)								
No Flow Control							OFF	ON
Hardware (DTR/CTS)							ON	OFF
Software (X-ON/X-OFF)							OFF	OFF

* 14,400 baud requires a hardware/software modification order (special quote).

** When loading defaults, turn Switch A positions 7 and 8 ON and reset the unit. Then, after a few seconds, reconfigure positions 7 and 8 to your desired flow-control settings and reset the unit again.

Table 3-4. DIP Switch G Settings.

OPTION	SWITCH POSITION SETTINGS 1	2	3	4	5	6	7	8
Inactivity Time Period Before Breaking Link								
DISABLED	ON	ON	ON	ON				
1 second	OFF	ON	ON	ON				
3 seconds	ON	OFF	ON	ON				
10 seconds	OFF	OFF	ON	ON				
15 seconds	ON	ON	OFF	ON				
25 seconds	OFF	ON	OFF	ON				
1 minute	ON	OFF	OFF	ON				
3 minutes	OFF	OFF	OFF	ON				
5 minutes	ON	ON	ON	OFF				
7 minutes	OFF	ON	ON	OFF				
10 minutes	ON	OFF	ON	OFF				
15 minutes	OFF	OFF	ON	OFF				
20 minutes	ON	ON	OFF	OFF				
30 minutes	OFF	ON	OFF	OFF				
45 minutes	ON	OFF	OFF	OFF				
55 minutes	OFF	OFF	OFF	OFF				
Lead Control								
Normal (RTS/DCD pass-through unless data in buffer, then RTS/DCD up)					ON			
RTS/DCD pass-through					OFF			
Transmit Status Messages To Terminals								
Enabled						ON		
Disabled						OFF		
Link Requests From Group Ports								
Enabled							ON	
Disabled							OFF	
One-Minute Abort Timer								
Enabled								ON
Disabled								OFF

SWITCH F SETTINGS FOR BREAK-LINK CHARACTERS

All the "break-link characters" (see Section 4.2.6) that can be set with Switch F are listed below. If the break-link character option is enabled, entering the break-link character will break links between devices or remove link requests from the system queue.

The characters in the extended ASCII range, indicated by an asterisk "*", may vary, according to your equipment. Therefore, the characters for these switch settings are not listed.

In the ASCII column , a caret "^" followed by a character means that you press the Control key and the character key at the same time. Characters' ASCII control names are indicated within parentheses "( )".

Parity and word structure will not affect these switch settings if each port is configured correctly for its options (for example, if you are running 7 bits per word, set your port for 7 bits, not 8, and make sure switch position 8 of switch F is OFF)

Table 3-5. DIP Switch F Settings.

Break-Link Character			Switch Position Settings							
DECIMAL	HEX	ASCII	1	2	3	4	5	6	7	8
DISABLED			ON	ON	ON	ON	ON	ON	ON	ON
(Do not use; triggers manufacturer test)			OFF	ON	ON	ON	ON	ON	ON	ON
253	FD	*	ON	OFF	ON	ON	ON	ON	ON	ON
252	FC	*	OFF	OFF	ON	ON	ON	ON	ON	ON
251	FB	*	ON	ON	OFF	ON	ON	ON	ON	ON
250	FA	*	OFF	ON	OFF	ON	ON	ON	ON	ON
249	F9	*	ON	OFF	OFF	ON	ON	ON	ON	ON
248	F8	*	OFF	OFF	OFF	ON	ON	ON	ON	ON
247	F7	*	ON	ON	ON	OFF	ON	ON	ON	ON
246	F6	*	OFF	ON	ON	OFF	ON	ON	ON	ON
245	F5	*	ON	OFF	ON	OFF	ON	ON	ON	ON
244	F4	*	OFF	OFF	ON	OFF	ON	ON	ON	ON

Table 3-5. DIP Switch F Settings (continued).

Break-Link Character			Switch Position Settings							
DECIMAL	HEX	ASCII	1	2	3	4	5	6	7	8
243	F3	*	ON	ON	OFF	OFF	ON	ON	ON	ON
242	F2	*	OFF	ON	OFF	OFF	ON	ON	ON	ON
241	F1	*	ON	OFF	OFF	OFF	ON	ON	ON	ON
240	F0	*	OFF	OFF	OFF	OFF	ON	ON	ON	ON
239	EF	*	ON	ON	ON	ON	OFF	ON	ON	ON
238	EE	*	OFF	ON	ON	ON	OFF	ON	ON	ON
237	ED	*	ON	OFF	ON	ON	OFF	ON	ON	ON
236	EC	*	OFF	OFF	ON	ON	OFF	ON	ON	ON
235	EB	*	ON	ON	OFF	ON	OFF	ON	ON	ON
234	EA	*	OFF	ON	OFF	ON	OFF	ON	ON	ON
233	E9	*	ON	OFF	OFF	ON	OFF	ON	ON	ON
232	E8	*	OFF	OFF	OFF	ON	OFF	ON	ON	ON
231	E7	*	ON	ON	ON	OFF	OFF	ON	ON	ON
230	E6	*	OFF	ON	ON	OFF	OFF	ON	ON	ON
229	E5	*	ON	OFF	ON	OFF	OFF	ON	ON	ON
228	E4	*	OFF	OFF	ON	OFF	OFF	ON	ON	ON
227	E3	*	ON	ON	OFF	OFF	OFF	ON	ON	ON
226	E2	*	OFF	ON	OFF	OFF	OFF	ON	ON	ON
225	E1	*	ON	OFF	OFF	OFF	OFF	ON	ON	ON
224	E0	*	OFF	OFF	OFF	OFF	OFF	ON	ON	ON
223	DF	*	ON	ON	ON	ON	ON	OFF	ON	ON
222	DE	*	OFF	ON	ON	ON	ON	OFF	ON	ON

Table 3-5. DIP Switch F Settings (continued).

Break-Link Character			Switch Position Settings							
DECIMAL	HEX	ASCII	1	2	3	4	5	6	7	8
221	DD	*	ON	OFF	ON	ON	ON	OFF	ON	ON
220	DC	*	OFF	OFF	ON	ON	ON	OFF	ON	ON
219	DB	*	ON	ON	OFF	ON	ON	OFF	ON	ON
218	DA	*	OFF	ON	OFF	ON	ON	OFF	ON	ON
217	D9	*	ON	OFF	OFF	ON	ON	OFF	ON	ON
216	D8	*	OFF	OFF	OFF	ON	ON	OFF	ON	ON
215	D7	*	ON	ON	ON	OFF	ON	OFF	ON	ON
214	D6	*	OFF	ON	ON	OFF	ON	OFF	ON	ON
213	D5	*	ON	OFF	ON	OFF	ON	OFF	ON	ON
212	D4	*	OFF	OFF	ON	OFF	ON	OFF	ON	ON
211	D3	*	ON	ON	OFF	OFF	ON	OFF	ON	ON
210	D2	*	OFF	ON	OFF	OFF	ON	OFF	ON	ON
209	D1	*	ON	OFF	OFF	OFF	ON	OFF	ON	ON
208	D0	*	OFF	OFF	OFF	OFF	ON	OFF	ON	ON
207	CF	*	ON	ON	ON	ON	OFF	OFF	ON	ON
206	CE	*	OFF	ON	ON	ON	OFF	OFF	ON	ON
205	CD	*	ON	OFF	ON	ON	OFF	OFF	ON	ON
204	CC	*	OFF	OFF	ON	ON	OFF	OFF	ON	ON
203	CB	*	ON	ON	OFF	ON	OFF	OFF	ON	ON
202	CA	*	OFF	ON	OFF	ON	OFF	OFF	ON	ON
201	C9	*	ON	OFF	OFF	ON	OFF	OFF	ON	ON
200	C8	*	OFF	OFF	OFF	ON	OFF	OFF	ON	ON

Table 3-5. DIP Switch F Settings (continued).

Break-Link Character			Switch Position Settings							
DECIMAL	HEX	ASCII	1	2	3	4	5	6	7	8
199	C7	*	ON	ON	ON	OFF	OFF	OFF	ON	ON
198	C6	*	OFF	ON	ON	OFF	OFF	OFF	ON	ON
197	C5	*	ON	OFF	ON	OFF	OFF	OFF	ON	ON
196	C4	*	OFF	OFF	ON	OFF	OFF	OFF	ON	ON
195	C3	*	ON	ON	OFF	OFF	OFF	OFF	ON	ON
194	C2	*	OFF	ON	OFF	OFF	OFF	OFF	ON	ON
193	C1	*	ON	OFF	OFF	OFF	OFF	OFF	ON	ON
192	C0	*	OFF	OFF	OFF	OFF	OFF	OFF	ON	ON
191	BF	*	ON	ON	ON	ON	ON	ON	OFF	ON
190	BE	*	OFF	ON	ON	ON	ON	ON	OFF	ON
189	BD	*	ON	OFF	ON	ON	ON	ON	OFF	ON
188	BC	*	OFF	OFF	ON	ON	ON	ON	OFF	ON
187	BB	*	ON	ON	OFF	ON	ON	ON	OFF	ON
186	BA	*	OFF	ON	OFF	ON	ON	ON	OFF	ON
185	B9	*	ON	OFF	OFF	ON	ON	ON	OFF	ON
184	B8	*	OFF	OFF	OFF	ON	ON	ON	OFF	ON
183	B7	*	ON	ON	ON	OFF	ON	ON	OFF	ON
182	B6	*	OFF	ON	ON	OFF	ON	ON	OFF	ON
181	B5	*	ON	OFF	ON	OFF	ON	ON	OFF	ON
180	B4	*	OFF	OFF	ON	OFF	ON	ON	OFF	ON
179	B3	*	ON	ON	OFF	OFF	ON	ON	OFF	ON
178	B2	*	OFF	ON	OFF	OFF	ON	ON	OFF	ON

Table 3-5. DIP Switch F Settings (continued).

Break-Link Character			Switch Position Settings							
DECIMAL	HEX	ASCII	1	2	3	4	5	6	7	8
177	B1	*	ON	OFF	OFF	OFF	ON	ON	OFF	ON
176	B0	*	OFF	OFF	OFF	OFF	ON	ON	OFF	ON
175	AF	*	ON	ON	ON	ON	OFF	ON	OFF	ON
174	AE	*	OFF	ON	ON	ON	OFF	ON	OFF	ON
173	AD	*	ON	OFF	ON	ON	OFF	ON	OFF	ON
172	AC	*	OFF	OFF	ON	ON	OFF	ON	OFF	ON
171	AB	*	ON	ON	OFF	ON	OFF	ON	OFF	ON
170	AA	*	OFF	ON	OFF	ON	OFF	ON	OFF	ON
169	A9	*	ON	OFF	OFF	ON	OFF	ON	OFF	ON
168	A8	*	OFF	OFF	OFF	ON	OFF	ON	OFF	ON
167	A7	*	ON	ON	ON	OFF	OFF	ON	OFF	ON
166	A6	*	OFF	ON	ON	OFF	OFF	ON	OFF	ON
165	A5	*	ON	OFF	ON	OFF	OFF	ON	OFF	ON
164	A4	*	OFF	OFF	ON	OFF	OFF	ON	OFF	ON
163	A3	*	ON	ON	OFF	OFF	OFF	ON	OFF	ON
162	A2	*	OFF	ON	OFF	OFF	OFF	ON	OFF	ON
161	A1	*	ON	OFF	OFF	OFF	OFF	ON	OFF	ON
160	A0	*	OFF	OFF	OFF	OFF	OFF	ON	OFF	ON
159	9F	*	ON	ON	ON	ON	ON	OFF	OFF	ON
158	9E	*	OFF	ON	ON	ON	ON	OFF	OFF	ON
157	9D	*	ON	OFF	ON	ON	ON	OFF	OFF	ON
156	9C	*	OFF	OFF	ON	ON	ON	OFF	OFF	ON

Table 3-5. DIP Switch F Settings (continued).

Break-Link Character			Switch Position Settings							
DECIMAL	HEX	ASCII	1	2	3	4	5	6	7	8
155	9B	*	ON	ON	OFF	ON	ON	OFF	OFF	ON
154	9A	*	OFF	ON	OFF	ON	ON	OFF	OFF	ON
153	99	*	ON	OFF	OFF	ON	ON	OFF	OFF	ON
152	98	*	OFF	OFF	OFF	ON	ON	OFF	OFF	ON
151	97	*	ON	ON	ON	OFF	ON	OFF	OFF	ON
150	96	*	OFF	ON	ON	OFF	ON	OFF	OFF	ON
149	95	*	ON	OFF	ON	OFF	ON	OFF	OFF	ON
148	94	*	OFF	OFF	ON	OFF	ON	OFF	OFF	ON
147	93	*	ON	ON	OFF	OFF	ON	OFF	OFF	ON
146	92	*	OFF	ON	OFF	OFF	ON	OFF	OFF	ON
145	91	*	ON	OFF	OFF	OFF	ON	OFF	OFF	ON
144	90	*	OFF	OFF	OFF	OFF	ON	OFF	OFF	ON
143	8F	*	ON	ON	ON	ON	OFF	OFF	OFF	ON
142	8E	*	OFF	ON	ON	ON	OFF	OFF	OFF	ON
141	8D	*	ON	OFF	ON	ON	OFF	OFF	OFF	ON
140	8C	*	OFF	OFF	ON	ON	OFF	OFF	OFF	ON
139	8B	*	ON	ON	OFF	ON	OFF	OFF	OFF	ON
138	8A	*	OFF	ON	OFF	ON	OFF	OFF	OFF	ON
137	89	*	ON	OFF	OFF	ON	OFF	OFF	OFF	ON
136	88	*	OFF	OFF	OFF	ON	OFF	OFF	OFF	ON
135	87	*	ON	ON	ON	OFF	OFF	OFF	OFF	ON
134	86	*	OFF	ON	ON	OFF	OFF	OFF	OFF	ON

Table 3-5. DIP Switch F Settings (continued).

Break-Link Character			Switch Position Settings							
DECIMAL	HEX	ASCII	1	2	3	4	5	6	7	8
133	85	*	ON	OFF	ON	OFF	OFF	OFF	OFF	ON
132	84	*	OFF	OFF	ON	OFF	OFF	OFF	OFF	ON
131	83	*	ON	ON	OFF	OFF	OFF	OFF	OFF	ON
130	82	*	OFF	ON	OFF	OFF	OFF	OFF	OFF	ON
129	81	*	ON	OFF	OFF	OFF	OFF	OFF	OFF	ON
128	80	*	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON
127	7F	(DEL) delete	ON	ON	ON	ON	ON	ON	ON	OFF
126	7E	~	OFF	ON	ON	ON	ON	ON	ON	OFF
125	7D	}	ON	OFF	ON	ON	ON	ON	ON	OFF
124	7C	|	OFF	OFF	ON	ON	ON	ON	ON	OFF
123	7B	{	ON	ON	OFF	ON	ON	ON	ON	OFF
122	7A	z	OFF	ON	OFF	ON	ON	ON	ON	OFF
121	79	y	ON	OFF	OFF	ON	ON	ON	ON	OFF
120	78	x	OFF	OFF	OFF	ON	ON	ON	ON	OFF
119	77	w	ON	ON	ON	OFF	ON	ON	ON	OFF
118	76	v	OFF	ON	ON	OFF	ON	ON	ON	OFF
117	75	u	ON	OFF	ON	OFF	ON	ON	ON	OFF
116	74	t	OFF	OFF	ON	OFF	ON	ON	ON	OFF
115	73	s	ON	ON	OFF	OFF	ON	ON	ON	OFF
114	72	r	OFF	ON	OFF	OFF	ON	ON	ON	OFF
113	71	q	ON	OFF	OFF	OFF	ON	ON	ON	OFF
112	70	p	OFF	OFF	OFF	OFF	ON	ON	ON	OFF

Table 3-5. DIP Switch F Settings (continued).

Break-Link Character			Switch Position Settings							
DECIMAL	HEX	ASCII	1	2	3	4	5	6	7	8
111	6F	o	ON	ON	ON	ON	OFF	ON	ON	OFF
110	6E	n	OFF	ON	ON	ON	OFF	ON	ON	OFF
109	6D	m	ON	OF	ON	ON	OFF	ON	ON	OFF
108	6C	l	OFF	OFF	ON	ON	OFF	ON	ON	OFF
107	6B	k	ON	ON	OFF	ON	OFF	ON	ON	OFF
106	6A	j	OFF	ON	OFF	ON	OFF	ON	ON	OFF
105	69	i	ON	OFF	OFF	ON	OFF	ON	ON	OFF
104	68	h	OFF	OFF	OFF	ON	OF	ON	ON	OFF
103	67	g	ON	ON	ON	OFF	OFF	ON	ON	OFF
102	66	f	OFF	ON	ON	OFF	OFF	ON	ON	OFF
101	65	e	ON	OFF	ON	OFF	OFF	ON	ON	OFF
100	64	d	OFF	OFF	ON	OFF	OFF	ON	ON	OFF
99	63	c	ON	ON	OFF	OFF	OFF	ON	ON	OFF
98	62	b	OFF	ON	OFF	OFF	OFF	ON	ON	OFF
97	61	a	ON	OFF	OFF	OFF	OFF	ON	ON	OFF
96	60	`	OFF	OFF	OFF	OFF	OFF	ON	ON	OFF
95	5F	_	ON	ON	ON	ON	ON	OFF	ON	OFF
94	5E	^	OFF	ON	ON	ON	ON	OFF	ON	OFF
93	5D	]	ON	OFF	ON	ON	ON	OFF	ON	OFF
92	5C	\	OFF	OFF	ON	ON	ON	OFF	ON	OFF
91	5B	[	ON	ON	OFF	ON	ON	OFF	ON	OFF
90	5A	Z	OFF	ON	OFF	ON	ON	OFF	ON	OFF

Table 3-5. DIP Switch F Settings (continued).

Break-Link Character			Switch Position Settings							
DECIMAL	HEX	ASCII	1	2	3	4	5	6	7	8
89	59	Y	ON	OFF	OFF	ON	ON	OFF	ON	OFF
88	58	X	OFF	OFF	OFF	ON	ON	OFF	ON	OFF
87	57	W	ON	ON	ON	OFF	ON	OFF	ON	OFF
86	56	V	OFF	ON	ON	OFF	ON	OFF	ON	OFF
85	55	U	ON	OFF	ON	OFF	ON	OFF	ON	OFF
84	54	T	OFF	OFF	ON	OFF	ON	OFF	ON	OFF
83	53	S	ON	ON	OFF	OFF	ON	OFF	ON	OFF
82	52	R	OFF	ON	OFF	OFF	ON	OFF	ON	OFF
81	51	Q	ON	OFF	OFF	OFF	ON	OFF	ON	OFF
80	50	P	OFF	OFF	OFF	OFF	ON	OFF	ON	OFF
79	4F	O	ON	ON	ON	ON	OFF	OFF	ON	OFF
78	4E	N	OFF	ON	ON	ON	OFF	OFF	ON	OFF
77	4D	M	ON	OFF	ON	ON	OFF	OFF	ON	OFF
76	4C	L	OFF	OFF	ON	ON	OFF	OFF	ON	OFF
75	4B	K	ON	ON	OFF	ON	OFF	OFF	ON	OFF
74	4A	J	OFF	ON	OFF	ON	OFF	OFF	ON	OFF
73	49	I	ON	OFF	OFF	ON	OFF	OFF	ON	OFF
72	48	H	OFF	OFF	OFF	ON	OFF	OFF	ON	OFF
71	47	G	ON	ON	ON	OFF	OFF	OFF	ON	OFF
70	46	F	OFF	ON	ON	OFF	OFF	OFF	ON	OFF
69	45	E	ON	OFF	ON	OFF	OFF	OFF	ON	OFF
68	44	D	OFF	OFF	ON	OFF	OFF	OFF	ON	OFF

Table 3-5. DIP Switch F Settings (continued).

Break-Link Character			Switch Position Settings							
DECIMAL	HEX	ASCII	1	2	3	4	5	6	7	8
67	43	C	ON	ON	OFF	OFF	OFF	OFF	ON	OFF
66	42	B	OFF	ON	OFF	OFF	OFF	OFF	ON	OFF
65	41	A	ON	OFF	OFF	OFF	OFF	OFF	ON	OFF
64	40	@	OFF	OFF	OFF	OFF	OFF	OFF	ON	OFF
63	3F	?	ON	ON	ON	ON	ON	ON	OFF	OFF
62	3E	>	OFF	ON	ON	ON	ON	ON	OFF	OFF
61	3D	=	ON	OFF	ON	ON	ON	ON	OFF	OFF
60	3C	<	OFF	OFF	ON	ON	ON	ON	OFF	OFF
59	3B	;	ON	ON	OFF	ON	ON	ON	OFF	OFF
58	3A	:	OFF	ON	OFF	ON	ON	ON	OFF	OFF
57	39	9	ON	OFF	OFF	ON	ON	ON	OFF	OFF
56	38	8	OFF	OFF	OFF	ON	ON	ON	OFF	OFF
55	37	7	ON	ON	ON	OFF	ON	ON	OFF	OFF
54	36	6	OFF	ON	ON	OFF	ON	ON	OFF	OFF
53	35	5	ON	OFF	ON	OFF	ON	ON	OFF	OFF
52	34	4	OFF	OFF	ON	OFF	ON	ON	OFF	OFF
51	33	3	ON	ON	OFF	OFF	ON	ON	OFF	OFF
50	32	2	OFF	ON	OFF	OFF	ON	ON	OFF	OFF
49	31	1	ON	OFF	OFF	OFF	ON	ON	OFF	OFF
48	30	0	OFF	OFF	OFF	OFF	ON	ON	OFF	OFF
47	2F	/	ON	ON	ON	ON	OFF	ON	OFF	OFF
46	2E	.	OFF	ON	ON	ON	OFF	ON	OFF	OFF

Table 3-5. DIP Switch F Settings (continued).

Break-Link Character			Switch Position							
DECIMAL	HEX	ASCII	1	2	3	4	5	6	7	8
45	2D	-	ON	OFF	ON	ON	OFF	ON	OFF	OFF
44	2C	,	OFF	OFF	ON	ON	OFF	ON	OFF	OFF
43	2B	+	ON	ON	OFF	ON	OFF	ON	OFF	OFF
42	2A	*	OFF	ON	OFF	ON	OFF	ON	OFF	OFF
41	29	)	ON	OFF	OFF	ON	OFF	ON	OFF	OFF
40	28	(	OFF	OFF	OFF	ON	OFF	ON	OFF	OFF
39	27	'	ON	ON	ON	OFF	OFF	ON	OFF	OFF
38	26	&	OFF	ON	ON	OFF	OFF	ON	OFF	OFF
37	25	%	ON	OFF	ON	OFF	OFF	ON	OFF	OFF
36	24	$	OFF	OFF	ON	OFF	OFF	ON	OFF	OFF
35	23	#	ON	ON	OFF	OFF	OFF	ON	OFF	OFF
34	22	"	OFF	ON	OFF	OFF	OFF	ON	OFF	OFF
33	21	!	ON	OFF	OFF	OFF	OFF	ON	OFF	OFF
32	20	(SP) space	OFF	OFF	OFF	OFF	OFF	ON	OFF	OFF
31	1F	(US) or ^_	ON	ON	ON	ON	ON	OFF	OFF	OFF
30	1E	(RS) or ^^	OFF	ON	ON	ON	ON	OFF	OFF	OFF
29	1D	(GS) or ^]	ON	OFF	ON	ON	ON	OFF	OFF	OFF
28	1C	(FS) or ^\	OFF	OFF	ON	ON	ON	OFF	OFF	OFF

Table 3-5. DIP Switch F Settings (continued).

Break-Link Character			Switch Position							
DECIMAL	HEX	ASCII	1	2	3	4	5	6	7	8
27	1B	(ESC) escape or ^[	ON	ON	OFF	ON	ON	OFF	OFF	OFF
26	1A	(SUB) or ^Z	OFF	ON	OFF	ON	ON	OFF	OFF	OFF
25	19	(EM) or ^Y	ON	OFF	OFF	ON	ON	OFF	OFF	OFF
24	18	(CAN) or ^X	OFF	OFF	OFF	ON	ON	OFF	OFF	OFF
23	17	(ETB) or ^W	ON	ON	ON	OFF	ON	OFF	OFF	OFF
22	16	(SYN) or ^V	OFF	ON	ON	OFF	ON	OFF	OFF	OFF
21	15	(NAK) or ^U	ON	OFF	ON	OFF	ON	OFF	OFF	OFF
20	14	(DC4) or ^T	OFF	OFF	ON	OFF	ON	OFF	OFF	OFF
19	13	(DC3) or ^S	ON	ON	OFF	OFF	ON	OFF	OFF	OFF
18	12	(DC2) or ^R	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF
17	11	(DC1) or ^Q	ON	OFF	OFF	OFF	ON	OFF	OFF	OFF
16	10	(DLE) or ^P	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF
15	0F	(SI) or ^O	ON	ON	ON	ON	OFF	OFF	OFF	OFF
14	0E	(SO) or ^N	OFF	ON	ON	ON	OFF	OFF	OFF	OFF

Table 3-5. DIP Switch F Settings (continued).

Break-Link Character			Switch Position							
DECIMAL	HEX	ASCII	1	2	3	4	5	6	7	8
13	OD	(CR) return or ^M	ON	OFF	ON	ON	OFF	OFF	OFF	OFF
12	0C	(FF) or ^L	OFF	OFF	ON	ON	OFF	OFF	OFF	OFF
11	0B	(VT) or ^K	ON	ON	OFF	ON	OFF	OFF	OFF	OFF
10	0A	(LF) or ^J	OFF	ON	OFF	ON	OFF	OFF	OFF	OFF
9	09	(HT) or ^I	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF
8	08	(BS) backspace or ^H	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF
7	07	(BEL) or ^G	ON	ON	ON	OFF	OFF	OFF	OFF	OFF
6	06	(ACK) or ^F	OFF	ON	ON	OFF	OFF	OFF	OFF	OFF
5	05	(ENQ) or ^E	ON	OFF	ON	OFF	OFF	OFF	OFF	OFF
4	04	(EOT) or ^D	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF
3	03	(ETX) or ^C	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF
2	02	(STX) or ^B	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF
1	01	(SOH) or ^A	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF
0	00	(NUL) or ^@	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF

4.0 Operation

4.1 Applications of the Resource-Q Sharer

The Resource-Q Sharer physically connects up to nine EIA RS-232 devices so they can logically link to each other for asynchronous communications, making possible more efficient allocation of access to scarce system resources like async computer ports, modems, printers, or other devices.

You can logically group together devices that are similar. This allows users to request a link with the next available member of a group. For example, you can configure the Resource-Q Sharer to place host ports in one group, modems in another, and printers in a third. Any attached device can request to link to a specific device or to the next available host, modem or printer.

All requests to link will be saved in a queue by the Resource-Q Sharer until the two devices can be logically linked together or the user aborts the request. The Resource-Q Sharer uses a First-In, First-Out (FIFO) protocol; the first device that requests to link to a member of a particular group or specific port will be the first device linked when that resource is available. Later requests will wait their turns.

Because each port can be configured for independent word structure, baud rate, and flow control, the Resource-Q Sharer can do word-structure conversion, baud-rate conversion, and flow-control conversion between linked devices.

A link can be broken in one of four ways:

- the Resource-Q Sharer is reset (via the reset command, push-button reset, or a power down reset);
- the Sharer processes a "break-link" character received from the port that originally requested the link followed by a period of receive-data inactivity from this port;
- the "No Activity" timeout occurs; or
- the "Abort" timeout occurs.

In all cases except for a reset of the unit, the Resource-Q Sharer can perform special processing when the link is being broken. You can program different break-link procedures for each port. For example, you could set the Sharer to drop the EIA RS-232 DTR lead, which would hang up an attached modem, or to send the string "LOGOFF" to a host port, which would log off the currently linked user before another user is linkedto the same host port.

Limited broadcasting capabilities are also provided by the Resource-Q Sharer. See Section 4.3.

4.2 Initiating and Breaking Links to Ports

4.2.1 How to Request a Link or Link-Related Help Information

When a user on an unlinked port enters a valid port number (0-8) or group letter (A-I), the Resource-Q Sharer will place a request to link in the internal queue. If the resource is available the link will be immediately created. If status messages are enabled (via DIP switch selection), the user will receive one of the following:

```
Port x now linked to port y
```

or

```
Port(s) busy, your request to link is
in queue position x
    (enter BREAK to abort request)
```

When an unlinked port enters an invalid link request or command, a help screen will be displayed (unless the port is a group port and link requests for group ports have been disabled). This screen will contain valid port numbers or group letters along with the user-supplied names of each port and group to choose from. Figure 4-1 (next page) is a sample showing what this help screen looks like.

4.2.2 How the Resource-Q Sharer Handles Link Requests

Requests in the sytem queue are granted on a First-In, First-Out (FIFO) basis. When a request is

```
PORT #:    PORT NAME:          |  GROUP #:  GROUP NAME:     GROUP MEMBERS:
                               |
  0        host port           |       A    PRINTERS          1 (draft printer)
  1        draft printer       |                              2 (graphics printer)
  2        graphics printer    |       B    MODEMS            3 (2400 baud modem)
  3        2400 baud modem     |                              4 (1200 baud modem)
  4        1200 baud modem     |
  5        Jane Smith          |
  6        John Deer           |
  7        Jim McDonald        |
  8        Beth Allen          |

Enter PORT # or GROUP # from above to request a link!
  (or enter ? to enter the command menu)
```

Figure 4-1. Sample Help Screen for Linking.

granted, a bidirectional link is created between the two ports. All ports can request a link, even group ports, unless you choose to disable group ports from making links by setting Switch G position 7 to OFF. If a request has been queued, the user that made the request will receive additional status messages:

- each time the request's queue position changes,
- when the link is made, or
- if the user enters any character except the user-defined break-link character.

4.2.3 How to Abort a Link Request

A user's request to link can be removed from the system queue. If the user enters a break sequence (sent via the <break> key on some terminals) or the "break-link" character his request will be removed from the system queue. This is useful when users select the wrong device or determine that they no longer require the selected device. If status messages are enabled, a user who aborts a link request will receive the message:

```
Request removed from queue
```

4.2.4 New Links

When the link a user has requested is made, a bidirectional connection is created between the user's device and the selected device. Any data that either device sends will be buffered in the internal memory of the Resource-Q Sharer and then transmitted to the other device using the word structure, baud rate, and flow control settings configured for that port. A port's Status LED will light when the port transmits or receives data.

Any break sequence received will be passed through the unit and have priority over any data currently being transmitted or buffered. Break sequences generated by different devices can have wildly different lengths, and some sharing equipment has trouble properly reproducing them. But a regenerated break sequence that the Sharer sends to another port will be approximately as long as the break sequence it received; there is a better chance that users will be able to halt, exit, or cancel processes that have been started on linked devices.

The EIA RS-232 signals RTS/DCD will also appear to pass through the Resource-Q Sharer, so a user can monitor the state of one lead of the other device. Some PC software packages perform such monitoring, especially of DCD, which is lowered by direct-connect modems as a signal confirming that they have hung up. The other EIA RS-232 leads are under program control of the Resource-Q Sharer (see Section 4.8 for more information on EIA RS-232 lead protocol).

4.2.5 The Link "Abort Timer"

The Resource-Q Sharer can be configured at installation time to enable its "One-Minute Abort Timer" (see Table 3.4). When this timer is enabled, any device that requests a link must transmit its first data character within one minute after the link is established. If the device doesn't meet this timing requirement, the Resource-Q Sharer will automatically break the link. If status messages are enabled, the user will then receive the message:

```
Abort timeout, link disconnected
```

The "abort timer" is useful when a device's request to link has been processed after a long wait (during which the user has left his terminal or PC). In practical situations, it will be almost a necessity, especially when a long "No Activity" timeout (as much as 55 minutes—see Section 4.2.7) has been selected; otherwise, forgotten link requests may be granted uselessly, allowing an idle device to tie up the system.

When the timeout occurs but there are no other link requests in the system queue, the Sharer will start "stretching" the timeout; it will wait to receive the first data character from the inactive port, but every 50 ms it will check the system queue again. If any other user requests a link with the device selected by the idle port before the idle port becomes active, the inactive link will be broken.

4.2.6 How to Break a Link

1. All links will be broken on a reset of the Resource-Q Sharer. The unit can be reset by sending the "`*@reset*@`" command to the Sharer from an attached device (see Section 4.6), selecting option #6 from the command menu (see Section 4.6.1), pushing the internal reset button, or powering down (temporarily unplugging the Sharer's power supply).

2. The device that initiated the link can break the link by sending a "break-link character" and then remaining inactive for at least two seconds. You can select the break-link character for your Resource-Q Sharer by setting a DIP switch (Switch F—see Table 3.5 and accompanying text). The requirement that a period of inactivity must follow the break-link character allows users to safely transmit files containing data bytes equal to the break-link character through the Resource-Q Sharer.

When users want to break **their link only**, they should enter the break-link character and (assuming status messages are enabled) wait for the status message indicating that the link has been disconnected before attempting to make a new link or sending any other character. Under optimal conditions users should receive this "link disconnected" status message in slightly more than two seconds:

```
Break character processed, link
disconnected
```

If they don't receive the message within that period of time, it indicates that the break-link character could not be immediately processed because other, preceding data (still buffered inside the Resource-Q Sharer) has not been transmitted to the device in link. Buffered data is normal and is nothing to be alarmed about. Data can be buffered in the Resource-Q Sharer's internal buffer for a variety of reasons. Three of the most common:

- the attached device is configured for a longer word structure or slower baud rate
- the attached device has exercised flow control (the printer, for example, when it runs out of paper)
- the Resource-Q Sharer is receiving a lot of data, which is slowing down transmission to the attached device

When all preceeding data is processed, the Resource-Q Sharer will start a two-second "No Receive delay timer" (unless otherwise programmed—see Section 4.2.9, part 4). If the Sharer receives another character (or finds one in the "receive" buffer) within two seconds of processing the break-link character, it will send the break-link character and the characters that follow it as data to the logically linked device. Follow two simple rules to avoid possible problems:

1) **When sending a data character equal to the selected break-link character,** send the next data byte within two seconds. If the break-link "lookalike" should happen to be the last data character you want to send to that device, send a real, intentional break-link character within two seconds.

2) When actually breaking the link, send the break-link character and wait for the status message that indicates that the link is broken before sending any other character.

4.2.7 Automatic Link-Breaking with the Inactivity Timer

The Resource-Q Sharer can be configured at installation time to monitor links between devices for inactivity and to break links if nothing happens within a period of time ranging from 1 second to 55 minutes (see Table 3.4). A link is considered inactive if the port that requested the link does not transmit or receive any data for the specified time period and if all data previously entered by the user has been transmitted to the device in link (no data is buffered in the Resource-Q Sharer's internal memory). This "inactivity timer" is useful when a terminal user gets sidetracked and leaves the terminal unattended. If status messages are enabled, the port that requested the link that is now inactive will receive the message:

```
No Activity timeout, link disconnected
```

As with the "Abort" timeout (see Section 4.2.5), when the "No Activity" timeout occurs but there are no other link requests in the system queue, the Sharer will start "stretching" the timeout; it will maintain the inactive link, but every 50 ms it will check the system queue again. If any other user requests a link with the device selected by the idle port before the idle port becomes active again, the inactive link will be broken.

CAUTION!

You can disable the Inactivity timer (with the appropriate Switch G setting) or the break-link character (with the appropriate Switch F setting), but if you disable one, make sure the other is on. If the Inactivity timer and the break-link character are both disabled, the only way links can be broken after any data is sent is to reset the unit.

4.2.8 The Programmable Break-Link Procedure: General Overview

Attached resources may not be able to sense that they are connected to the Resource-Q Sharer and are being shared by different users. To avoid problems associated with sharing devices, special logoff-type features can be programmed into the Resource-Q Sharer's break-link procedure. Some link-related problems that the Sharer handles, or can be programmed to handle, automatically:

- a new user switches to a shared device and immediately starts receiving data that was destined for the previously linked user
- a new user switches to a shared host port and has access to applications that are only available to the previously linked user (but the previous user forgot to log off of the host before the switch)
- a user breaks his link to a modem but forgets to hang up the modem (unnecessary phone charges start piling up)
- a shared printer may not be at the top of form when a new user is linked (previous user forgot to send <Ctrl> <L> form-feed character)

The Sharer is factory-programmed to flush shared devices of any data during the break-link procedure, before switching them to the next queued user. You can program additional features for each port that can also take place at this time (see Section 4.7.1 for more information on this "*@set logoff*@" command). For example, if port 1 has a modem on it, you can program the Resource-Q Sharer to drop DTR on port 1, which will cause the modem to hang up if it hasn't already, preventing any unnecessary telephone charges.

4.2.9 The Programmable Break-Link Procedure: A Detailed Run-Through

When it is time to break a link between two ports, the Resource-Q Sharer will perform this procedure:

1. First, the connection between the port that originally requested the link (called the "FROM" port) and the port it selected (called the "TO" port) is broken at the "FROM" port end; the "FROM" port is regarded as "unlinked" while the

"TO" port is still "linked to FROM port," no matter whether it is inactive, transmitting data, or receiving previously buffered data. From this point, no additional data buffered or received from the "FROM" port is transmitted to the "TO" port. Instead, the Sharer checks any additional data sent from the "FROM" port for valid link requests and other Sharer commands. If the "FROM" port immediately requests a different link, the Sharer breaks the old connection at the "TO" port end; otherwise, the "TO" port is regarded as "linked to the FROM port" until the break-link procedure is completely finished.

2. If the "TO" port device has been flow-controlled OFF by the Resource-Q Sharer, it is now flow-controlled ON (the Sharer raises DTR/CTS output or transmits an X-ON). The Sharer then waits while the "TO" port transmits any remaining data it had pending for the previously linked "FROM" port. All data received at this time is buffered (if buffer space is available) and the Sharer attempts to transmit the data to the "FROM" port until the "FROM" port is relinked to another resource. The "TO" port will not be turned OFF even if it transmits too much data for the Sharer's buffer (the Sharer temporarily disables its own flow control and buffer overflow checking). In this way the Sharer flushes any data the "TO" port device may be holding that was destined for the "FROM" port, preventing the next device that links to the "TO" port from accidentally receiving that data.

NOTE

The Resource-Q Sharer will flush the "TO" port of data even though it may not have enough buffer space to store it all. A buffer overflow, in this case, is normal and does not indicate flow-control trouble; the LED indicator for the "TO" port will NOT become steadily lit, as it would if there were a problem.

CAUTION!

If "no flow control" has been selected, data which the "FROM" port fails to flush may go to the next user who links to the "TO" port; the Resource-Q Sharer can't flow-control ON the "TO" port device if the "FROM" port device flow-controls it OFF before the break-link procedure. (Other than this, there are no differences between a no-flow-control break-link and the described procedure.)

3. If you have set the Resource-Q Sharer to do any special processing through the "TO" port when links to the "TO" port device are broken, the Sharer begins the special processing now. You might set it to do any combination of the following (see Section 4.6.3):

- Transmit any sequence of ASCII characters (printable or nonprintable) out the "TO" port. Example: Transmit the string "LOGOFF"to a host.
- Toggle EIA RS-232 output leads of the "TO" port. Example: Lower DTR output to hang up a modem.
- Wait for EIA RS-232 input leads to be in a certain state. Example: Wait until a modem lowers DCD input, confirming that it has hung up
- Transmit a 250-ms break sequence. Example: Transmit a break sequence to exit from an application program.
- Delay until a "No Receive" timeout of 0-9 seconds occurs on receive data from the "TO" port (that is, wait until it stops sending data).
- Delay 1 or more seconds before doing any of the above. Example: Delay 2 seconds before raising DTR output.

4. If you don't program a "No Receive" delay into the break-link procedure for the "TO" port, the Resource-Q Sharer forces a delay. If and when the "TO" port stops transmitting, the Sharer starts its No Receive timer with a default two-second timeout; if the "TO" port doesn't start transmitting again during these two seconds, the Sharer assumes that it has completely finished and continues the break-link procedure. The No Receive timeout can be programmed for any whole number of seconds between 0 and 9.

CAUTION!

You can program any port for a "No Receive" timeout of 0 seconds (no delay). This may be necessary if an attached device regularly continues to

send data even after links are broken, because when it doesn't stop, the default No Receive timeout never occurs, and the Sharer gets stuck in the break-link procedure indefinitely. However, this setting should be avoided for most devices; the Sharer will interpret any instant during a break-link data flush in which it senses less than a full character in its buffer as the end of the data. Disabling the No Receive delay can, in such situations, increase the possibility of data loss or misdirection.

5. The Sharer makes sure DTR/CTS output on the "TO" port is still active in case you programmed the break-link procedure to lower DTR/CTS output.

6. The Sharer restores flow control to the "TO" port device. It then waits 500 ms before proceeding to step #7. This 500 ms gives the Resource-Q Sharer enough time to detect the "buffer full" condition, if the data flush has overflowed the buffer, and to request the attached device to stop transmitting.

7. Any data still in the "TO" port's receive buffer is discarded and normal buffer overflow detection is re-enabled. Data received from the "TO" port after this point will be processed for command or link requests when the break-link procedure is concluded (unless the "TO" port is a group port and you have disabled link requests from group ports); if the "TO" port continues to transmit and overflows the buffer now, the Sharer will illuminate the "TO" port's LED to indicate that there may be a problem with the flow-control configuration.

8. Finally, if the "FROM" port hasn't already forced a complete unlinking by requesting a different link, the Resource-Q Sharer breaks the link at the "TO" port end. The "TO" port is regarded as "unlinked" (a free resource) and the break-link procedure is completed.

4.3 Broadcasting Capabilities

"Broadcasting," in Resource-Q Sharer terms, means transmitting data to multiple ports at the same time. The Resource-Q sharer provides broadcasting capabilites, but these are limited because users can't select which ports they can broadcast to. A port will not receive a user's broadcast data if the port is linked, disabled, or receiving broadcast data from somebody else. Users on unlinked ports can get into "broadcast mode" by entering the "`*@broadcast*@`" command or by selecting option #3 from the command menu (see Section 4.6.1 for entering menu mode).

For testing, or in emergencies when you must send a message to all ports, reset the Resource-Q Sharer before entering broadcast mode.

Any data entered by a user in broadcast mode should be broadcast to all receptive ports. If a given port's LED doesn't flash when a user is broadcasting, it indicates that either:

- there is no device attached to that port,
- the port is disabled,
- some device made a link through that port before you entered broadcast mode and the link has not yet been broken, or
- the device attached to that port uses hardware flow control and is preventing the Sharer from sending it anything.

CAUTION!

Do not use broadcast mode to send a given message if there are any devices attached to the Sharer that could be adversely affected by data in that message. For example, if an unlinked modem receives a memo containing a phone number, it may dial that number.

One way to minimize link-related broadcast blocking has been pointed out before: devices can be prevented from making links by placing them in groups and disabling link requests from group ports. This will hardly be an option, of course, if the "blocking" is caused by links made from peers' PCs or terminals.

During broadcast mode command strings are still recognized, so broadcast data cannot be totally transparent. Two command strings are used to

exit broadcast mode. The command string "*@abort*@" (or option #5 from the command menu) will abort broadcast mode; once it is entered, any data in the Sharer's internal buffer that has not yet been broadcast will be purged. If status messages are enabled you will receive the message:

```
leaving Broadcast mode
```

The command string "*@exit*@" (or option #4 from the command menu) will exit broadcast mode only after all internally buffered data has been transmitted to all devices. If data is still in the internal buffer you will receive the message:

```
unable to process your request at
this time
```

Any data entered after the "*@exit*@" command will be processed for further commands, but the data will not be broadcast or processed for link requests until all buffered data is broadcast and this message is displayed:

```
leaving Broadcast mode
```

You can purge buffered data and abort broadcast mode at any time (even after executing the "*@exit*@" command) by entering "*@abort*@."

4.4 The Resource-Q Sharer's Buffer and Other Memory

The Resource-Q Sharer has 32K of Random Access Memory (RAM). Part of this memory must be reserved for the microprocessor program that drives the unit. The remaining memory is used for buffering incoming data when, for whatever reason (see Section 4.2.6), the device intended to receive the data can't accept it as quickly as it is being sent. The Sharer is programmed to divide this buffer memory among all its ports using a technique called dynamic allocation, which works like this:

Buffer memory is broken down into 256-byte memory segments (3 bytes for control information and 253 for buffering). Each of the Resource-Q Sharer's ports is assigned its own four-segment receive buffer (where data received is stored until it can be processed) when the Sharer is first turned ON or when it's reset; the rest of the segments are not initially assigned (a "free pool"). When a particular port sends enough data to the Resource-Q Sharer to fill up the first of its four segments, the Sharer gives it an additional segment; if the port fills up its second segment, the Sharer gives it another empty one; and so on, for as long as segments are available. Maintaining four empty segments at all times for each attached device assures that whenever devices need buffer space they have at least a little; assigning segments based on ports' current levels of activity prevents inactive devices from wasting memory.

If multiple ports need segments at the same time, they don't contend with, or queue behind, each other; the Sharer treats them with equal priority. It performs round-robin polling and allocates segments to needy ports on a "first found, first served" basis.

If the Resource-Q Sharer should run out of available segments in the "free pool" (that is, if its buffer is almost full), it can no longer stay four segments ahead of devices that continue to fill segments. What happens next depends on the flow control option that's been selected for each port. If *hardware* or *software flow control* is in effect for a port that the Sharer can't give any more memory, the Sharer waits until the attached device has filled all but one of its assigned segments (253 bytes) and then flow-controls the device OFF. When enough received data has been processed to empty a second segment for it, the Sharer flow-controls the device ON again. If, however, *"no flow control"* has been selected for that port, the Sharer can't stop it from continuing to send data; the buffer will probably overflow.

When a port is unlinked, data is only buffered until it can be processed for valid commands; when a port is linked, data is only buffered until it can be transmitted to the selected device.

Beyond the 32K buffer RAM, an additional 8K battery-backed-up memory chip is used to save user-programmed control information like logoff strings, port names, and group names. The memory in this chip will retain its data when the Sharer loses power. To clear all saved values:

- turn ON positions 7 & 8 of DIP switch A,
- reset the unit,
- wait a few seconds,

Table 4-1. Incoming Flow Control to the Resource-Q Sharer.

FLOW CONTROL TYPE	REQUEST TO STOP TRANSMISSION	REQUEST TO START TRANSMISSION
Hardware flow control		
DTE device	drop RS-232 lead DTR	raise RS-232 lead DTR
DCE device	drop RS-232 lead CTS	raise RS-232 lead CTS
Software flow control	transmit an X-OFF byte	transmit an X-ON byte

- move these positions back to their original settings, and
- reset the unit again to resume normal operation.

4.5 Description of Flow Control

4.5.1 Incoming Flow Control to the Resource-Q Sharer

Your equipment may stop the Resource-Q Sharer unit from sending data to it by exercising flow control. You have three options for flow control: Each port can be individually configured for hardware, software (X-ON/X-OFF), or no flow control via the appropriate setting of the port's DIP switch positions 7 and 8. If you choose "no flow control," the equipment on that port can't directly stop the Resource-Q Sharer from sending data to it, but it can use any kind of software flow control method (or an EIA RS-232 hardware flow control signal passed through the unit via the RTS/DCD leads) to control the flow of data to/from other devices that it is logically linked to. This method will work if the typical data streams passed through the Resource-Q Sharer are not larger than 20K (single-link maximum; substantially less for commuunication through two or more links simultaneously). Spoolers placed logically in front of or logically behind the Sharer would greatly increase your system's buffering capability.

Table 4-1, above, shows how devices may exercise flow control to the Resource-Q Sharer.

NOTE

Even if your terminal exercises flow control to the Sharer, the "inactivity" timeout will still occur if it is enabled.

4.5.2 Outgoing Flow Control from the Resource-Q Sharer

If you select either hardware or software flow control, the Resource-Q Sharer can exercise flow control to prevent an internal buffer overflow problem (no more buffer to store received data); see Section 4.4. If data received from a certain port completely fills the Resource-Q Sharer's buffer, the Sharer will turn on that port's LED to indicate that there may be a problem with flow-control configuration. Any more data received before this port is allocated another memory segment will be lost.

See Section 4.2.9 for special outgoing flow control that the Sharer performs during the break-link procedure.

NOTE

Program-generated status messages (for example, "`Port 1 linked to Port 3`") are transmitted without regards to flow control.

4.6 Valid Commands

Resource-Q Sharer commands can be entered from any unlinked port. There are eight different commands, which can be executed in one of two different ways. Commands can be entered from a command menu by selecting one of options #1-8 (command #9 exits menu mode), or commands can be entered as command strings. The menu is probably easier for human users, and the command strings may be safer and easier for programmed computers to use.

```
MENU (version X.XX)
   (1)  Set a logoff string for a port
   (2)  See a port's current programmed logoff string
   (3)  Make broadcast links to all available ports
   (4)  Break broadcast links after buffered data transmitted
   (5)  Break broadcast links now (purge any buffered data)
   (6)  Reset the unit (break all links)
   (7)  Display all valid command string formats
   (8)  See or Set Port/Group Names and Group assignments
   (9)  Exit from menu mode
Please enter a number (1-9):
```

Figure 4-2. The Command Menu Display.

4.6.1 Menu Mode

To enter menu mode from an unlinked port type "*@menu*@" or, if you're not in broadcast mode, just "?". The menu in Figure 4-2, above, will be displayed on your screen; enter a number from 1 to 9 to start executing a command. Some commands require additional input from the user, but in menu mode you will be prompted for what to enter, and additional help text will be displayed to assist you.

Another feature of menu mode is that data entered will be echoed for verification (nonprintable characters are echoed as a dash "-" character). When data is echoed, you can correct typing errors with the backspace key and you can abort the command by presing the <Esc> (escape) key. If entering a "set logoff" command, data is terminated (the endpoint specified) with the two characters "*C". Otherwise, data input is terminated (and verified if necessary) with a carriage return (the <Enter> key). When any of the broadcast commands (options 3-5) are executed you will automatically leave menu mode.

NOTE

Commands 1, 2, and 8 ("set logoff," "see logoff," and "set port/group name") can be executed by only one user at a time and can't be executed at all if anyone is currently linked through the Resource-Q Sharer.

4.6.2 Command Strings

To enter a command via a command string, follow EXACTLY the format listed in Figure 4-3 on the next page (displayed on screen when the command string "*@help*@" is entered or menu option #7 is selected).

NOTE

If you enter a command string incorrectly, no error messages will be displayed. The Sharer will display the help screen that shows all port and group names (see Figure 4-1) if it finds a character other than a valid port number or group letter when it's expecting one of these. Any other error will probably cause the Sharer to process the data for link requests.

4.6.3 Command Descriptions

@SET LOG OFF@

Use this command to program a logoff procedure for the Resource-Q Sharer to use when a link is broken for any given port or group (see Sections 4.2.8 and 4.2.9 for more information on the break-link procedure). The data entered as a logoff procedure for a particular device or devices can be a mix of ASCII characters and/or special imbedded commands. The data must be 250 bytes or less in length or it must be terminated with the imbedded command "*C" (terminate input). Possible imbedded commands are listed in Figure 4-4 on page 37, which is displayed when you enter the "set logoff" or "see logoff" command from within the command menu.

Nonprintable characters can be entered as data, but they will be echoed in the "set log off" command sequence, and viewed with the "see log off" command, as a dash "-" character. To enter nonprintable characters, you can use the control key in combination with other keys on the keyboard. For example, depressing the <A> key while holding down the <Ctrl> key will enter the nonprintable character 01 hex, called a start-of-header (SOH) character. Holding the control key when any ASCII character key is pressed enters the binary equivalent of that character with bit 7 set to zero; ASCII <A> = 41 hex or 0100 0001 binary, <Ctrl> & <A> = 01 hex or 0000 0001. See the ASCII chart in Appendix D to see bit patterns for other nonprintable characters.

If one logoff string is entered for a port and a different string for the group it belongs to, the one that is entered last will take precedence, as far as that port goes. In other words, if a port has been programmed with a logoff string and then its group is programmed differently, the group string will overwrite the port string; but if a group has previously been programmed with a string and one of the member ports is given a new one, the Sharer will apply the new string to that port and the old group string to all other group members.

If you add a port to a group with a different logoff string, the group string will not automatically overwrite the one the port was programmed with. If you want a group string to apply to new members, it must be re-entered after the new members have been assigned to the group.

@SEE LOG OFF@
This command will display the programmed logoff string for a particular port. Nonprintable characters are displayed as a dash.

@BROADCAST@
This command will change the mode of the port to Broadcast mode. In this mode, all data that is received after the command will be broadcast to all available ports. See Section 4.3 for more information.

@EXIT@
This command will take the port out of Broadcast mode. No data received after this command will be broadcast, but any broadcast data that's still buffered in the Sharer's internal memory will be. See Section 4.3.

Figure 4-3. The Command String Help Screen.

```
Command Summary:
 *@set log off*@<port/group#, data> - logoff = data (ended by *C or max 255)
 *@see log off*@<port#> - see this port's user-programmed logoff string
 *@broadcast*@ - make broadcast links to all available ports
 *@exit*@ - break broadcast links after buffered data transmitted
 *@abort*@ - break broadcast links now and purge any buffered data
 *@reset*@ - reset the unit (break all links)
 *@help*@ - display all valid command string formats
 *@menu*@ - enter menu-driven command mode
 *@name*@<group (A-I), data, CR> - name group/port (assign ports to groups)
      or <port  (0-8), group assignment (A-I or space character), data, CR>
```

NOTE: The items listed between "<" and ">", above, are command arguments (variable data) to be entered as ASCII characters (except "CR" = press carriage return / enter key). Descriptions:
port/group = enter port # 0-8 or group letter A-I
port = enter port # 0-8
group = enter group letter A-I
group assignment = enter letter A-I of group which this port belongs in, or press the space bar if this port does not belong to any group (must be preceded by port #)
data = enter any ASCII characters for logoff string, port/group name; if executing the "set log off" command, these characters can include imbedded commands (see the "set log off" command description)

@ABORT@
This command will take the port out of Broadcast mode. Any data received from this port and still buffered in internal memory will be purged. See Section 4.3.

@RESET@
This command will cause a software reset of the unit. The Resource-Q Sharer will drop its DTR (or CTS if configured as DCE) outputs on all ports until the unit is completely reset and ready to receive more data. If status messages are enabled this message will be displayed:

```
A software reset of the unit is now
being performed!
```

@HELP@
This command will cause a help screen to be displayed. This help screen will list the proper format of all the command strings. See Figure 4-3.

@MENU@
This command will display a command menu. The user can enter option number 1-9 to start executing a command. See Figure 4-2 on page 35. The menu can also be accessed (on nonlinked, nonbroadcasting, nonqueued ports) by entering "?".

@NAME@
This command allows the user to do two things at the same time:
(1) program a name for each port or group (maximum 16 printable characters) and
(2) assign ports to groups.

If the port being named doesn't belong to a group, just depress the space bar at the group prompt (in menu mode) or at the appropriate location (when entering the command string). See Note 4 under Figure 4-3 for information on clearing port names and group assignments.

NOTE

Any time you change a port's group assignment you will also be prompted to enter the port's name. If you do not re-enter the ports name, the port will be nameless even though it is assigned to a group.

4.7 System Status Information

4.7.1 Light-Emitting Diodes (LEDs)

(1) A power LED will light to indicate that the Resource-Q Sharer is powered on.

Figure 4-4. Screen Display of Logoff String Commands.

```
DESCRIPTION OF POSSIBLE IMBEDDED LOGOFF STRING COMMANDS:
*0  send Asterisk character out port  | *9  delay until DCD/RTS input is down
*1  delay one second before proceed   | *A  delay until CTS/DTR input is down
*2  raise RTS/DCD output on port      | *Bx delay until no receive data for
*3  raise DTR/CTS output on port      |     x seconds (0-9) from port
*4  lower RTS/DCD output on port      | *C  exit logoff input mode
*5  lower DTR/CTS output on port      | *D  send Escape character out port
*6  send 250 ms break seq. out port   | *E  send Backspace character out port
*7  delay until DCD/RTS input up      | *F  send Null character out port
*8  delay until CTS/DTR input is up   |  x  send character x out port
```

NOTES:
(1) The *1 command can be used in succession to delay more than one second between operations.
(2) A 250-ms break sequence (command *6) is the same as depressing the <break> key on most terminals.
(3) The commands *7-*A will debounce the EIA-232 input lead for 50 ms to assure that it is really in the requested state before proceeding.
(4) All programmed logoffs can be cleared (as well as all port names and group assignments) by setting Switch A positions 7 and 8 both on and resetting the unit. After a few seconds, reconfigure these switches to their original positions and reset the unit again.