



POCKET REFERENCE

**CIPRICO®
RIMFIRE® 3500
VMEbus
SCSI HOST ADAPTER**

NOTE: 1 = true for all bits unless otherwise specified.
All commands and error codes are in hexadecimal form.

COMMANDS

COMMANDS

Start Command List	01	General Options	07
Stop Command List	02	Unit Options	08
Identify	05	Diagnostic/Self-Test	09
Board Statistics	06		

FLOPPY SCSI COMMANDS

Test Unit Ready	00	Reserve Unit	16
Request Sense	03	Release Unit	17
Format Unit	04	Send Diagnostic	1D
Read	08	Read Capacity	25
Write	0A	Read Extended	28
Inquiry	12	Write Extended	2A

OPTIONAL COMMANDS

Rezero Unit	01	Receive Diagnostic	1C
Seek	0B	Results	
Mode Select	15	Seek Extended	2B
Mode Sense	1A		

STANDARD PARAMETER BLOCK

	31	COMMAND IDENTIFIER				0
		RESERVED	FLAGS	ADDR MOD	TARGET ID	
		VME MEMORY ADDRESS				
		TRANSFER COUNT				
SCSI	0	1	2	3		
COMMAND	4	5	6	7		
BLOCK	8	9	10	11		

COMMAND IDENTIFIER - (designated by host)
TARGET ID - 0-7 = SCSI bus devices
FE = Command for onboard floppy controller
FF = Rimfire 3500-specific command

FLAGS BYTE

	7	IRSDIRDATSGO				0
		DBV	0	0	0	

SGO: Scatter/Gather Operation - 1 = active
DAT: Data successfully transferred - 1 = active
(vendor-unique commands only)
DIR: Direction of data transferred -
1 = to target 0 = from target
IRS: Inhibit Request Sense -
1 = host issues Request Sense
0 = adapter issues Request Sense
DBV: Data Bit Valid - 1 = active

STATUS BLOCK

	31	COMMAND IDENTIFIER				0
		RESERVED	SCSI STATUS	ERROR	FLAGS	
		CLASS/CODE	SEGMENT	SCSI FLAGS	INFO BYTE 3	
		INFO BYTE 4	INFO BYTE 5	INFO BYTE 6	EX LENGTH	

FLAGS BYTE

	7	CCERRRTYDTT				0
		CC	ERR	RTY	DTT	0

CC - Command Complete RTY - Retries required
ERR - Command error status DTT - Data transfer truncated

COMMAND IDENTIFIER - (same as this field in parameter block)
ERROR - Adapter-specific error code

TYPE 0 PARAMETER BLOCK

	31	STANDARD PARAMETER BLOCK				0
		RESERVED	INTERRUPT			
		RESERVED				
		STANDARD STATUS BLOCK				

INTERRUPT FIELD

	15	IL2IL1ILO				8	USER-DEFINED STATUS/ID				0
		0	0	0	0	0	0	0	0	0	

ILO-IL2 - 0 = no interrupt generated
nonzero = interrupt level
USER-DEFINED STATUS/ID - acknowledge code

COMMAND LIST DATA STRUCTURE

	31	PARAMETER BLOCK IN POINTER				0
		PARAMETER BLOCK OUT POINTER				
		STATUS BLOCK IN POINTER				
		STATUS BLOCK OUT POINTER				
		PARAMETER BLOCK AREA SIZE				
		STATUS BLOCK AREA SIZE				
		RESERVED				
		RESERVED				
		PARAMETER BLOCKS				
		STATUS BLOCKS				

FLOPPY DISK ID BYTES

	31	LENGTH SECTOR SIDE TRACK				0
		LENGTH	SECTOR	SIDE	TRACK	
		0	0	CRC 1	CRC 0	

LENGTH BYTE TABLE

Value of Length Byte	Sector Length
00	128 bytes
01	256 bytes
02	512 bytes
03	1024 bytes

ADDRESS REGISTERS

8-Bit 16/32 bit R/W

Address Buffer Port	--	0H	W
Channel Attention	9H	8H	W
Board Status	11H	10H	R
Controller Reset	19H	18H	W

Address modifier -
29 = non-privileged 16-bit address space access
2D = privileged 16-bit address space access

ADDRESS BUFFER PORT

	15	CONTROL				AM BITS FOR PB	0
		PB ADDRESS: MSW					
		PB ADDRESS: LSW					

first write
second write
third write

CONTROL FIELD

	15	SET				0	WID WSW BSW				8
		0	0	0	0	0	0	0	0	0	

SET - 0 = ignore control field
1 = apply control field
WID - Width of data transfers:
0 = 16 bit 1 = 32 bit
WSW - Word swap control
0 = VME ordering 1 = swap words
BSW - Byte swap control
0 = VME ordering 1 = swap bytes

BOARD STATUS PORT

	15	BOARD ID				8	BOARD STATUS				RDY BSY	0
--	----	----------	--	--	--	---	--------------	--	--	--	---------	---

BOARD ID - 02 = Rimfire 3500
BOARD STATUS - 0 = normal operation
RDY - 1 = Board ready for commands
0 = Reset/error condition
BSY - Busy (type 0 channel attention only)

COMMAND LIST PARAMETER BLOCKS

START COMMAND LIST PARAMETER BLOCK

	31	COMMAND IDENTIFIER				0
		RESERVED	ADDR MOD	TARGET=FFH		
		COMMAND LIST MEMORY ADDRESS				
		RESERVED	INTERRUPT			
		COMMAND=01H	RESERVED			
		RESERVED				

STOP COMMAND LIST PARAMETER BLOCK

	31	COMMAND IDENTIFIER				0
		RESERVED	TARGET=FFH			
		RESERVED				
		RESERVED				
		COMMAND=02H	RESERVED			
		RESERVED				

SCATTER/GATHER DESCRIPTOR BLOCK

	31	NEXT SG DESCRIPTOR BLOCK ADDRESS				0
		ADDR MOD 1	DATA LENGTH 1			
		DATA ADDRESS 1				
		ADDR MOD 2	DATA LENGTH 2			
		DATA ADDRESS 2				
		(Descriptor Blocks 3 - 7)				
		ADDR MOD 8	DATA LENGTH 8			
		DATA ADDRESS 8				

ERROR CODES

CODE	ERROR
01	Invalid board command
02	Bad unit or ID number
03	Floppy disk option not installed
0B	Reserved field not zero
0E	Command list stopped
0F	Bad command list size field
11	List already active
14	Bus timeout
15	Bus error
16	Scatter/gather descriptor block read error
1E	SCSI select timeout
1F	SCSI disconnect timeout
20	SCSI parity error
21	Unexpected SCSI disconnect
22	General SCSI bus error
23	SCSI device returned bad status
24	Unexpected SCSI phase encountered
25	Bad byte seen by SCSI controller chip
26	Error in synchronous transfer negotiation
27	Error in scatter/gather operation
61	Static RAM error
62	PROM checksum error
63	Undefined diagnostic specified
80	Firmware errors (report to Ciprico)

STARTUP CHECKLIST

- Set board jumpers:
 - I/O space base address
 - Bus request/Bus grant levels
 - Floppy disk ready line
- Install board in rack. Connect SCSI and floppy cables to board and drives. Apply power. Reset board by activating /INIT signal or writing to Reset port in adaptor address space.
- Examine status word in adaptor address space: value 0202H should appear within 2 seconds of board reset, and red and green LED indicators should be turned off.
- Execute a command: build type-0 parameter block in memory, write block address to Address Buffer port, and write 0 to Channel Attention port. Wait for specified interrupt, and examine status block to verify command completion.
- Set up command list: clear memory area for desired number of status/parameter blocks (maximum 64 K blocks), set variable fields, execute Start Command List command as shown in Step 4.

For immediate assistance with installing/operating the Rimfire 3500, call CIPRICO Support Engineering at:

(612)559-2034

or write: CIPRICO Inc.
2955 Kenium Lane
Plymouth, MN 55441

NOTE: The information in this document is subject to change without notice.

DIAGNOSTIC BLOCKS

DIAGNOSTIC/SELF-TEST PARAMETER BLOCK

31	COMMAND IDENTIFIER			0
	RESERVED	TARGET=FFH		
	RESERVED			
	RESERVED			
	RESERVED			
	COMMAND=09H	TEST FLAGS	RESERVED	
	RESERVED			
	RESERVED			

TEST FLAGS BYTE

7							0
0	0	0	0	0	0	PCS	SRT

SRT: Static RAM test PCS: PROM checksum test

DIAGNOSTIC STATUS BLOCK

31	COMMAND IDENTIFIER			0
	RESERVED	ERROR	FLAGS	
	ERROR ADDRESS	EXPECTED	FOUND	
	RESERVED			

EXPECTED, FOUND, ERROR - Address of error and expected/found pattern at that location

IDENTIFY COMMAND STATUS BLOCK

31	COMMAND IDENTIFIER				0
	FW REV	ENG REV	ERROR	FLAGS	
	OPT FLAGS	DAY	MONTH	YEAR	
	RESERVED				

FW REV - Last two digits of firmware PROM part number
ENG REV - Engineering revision level (Ciprico use only)
DAY, MONTH, YEAR - Date of PROM firmware

OPTION FLAGS BYTE

7							0
0	0	0	0	0	0	0	FDO

FDO - Floppy Disk Option present

GENERAL OPTIONS PARAMETER BLOCK

31	COMMAND IDENTIFIER				0
	OPT FLAGS	THROTTLE	OWN ID	TARGET=FFH	
	RESERVED				
	RESERVED				
	COMMAND=07H	RESERVED			
	RESERVED				
	RESERVED				

OPTION FLAGS BYTE

7							0	
0	0	0	0	0	0	BMT	PAR	DIS

BMT: Perform block mode transfers
PAR: Use parity report parity errors on SCSI bus
DIS: Allow disconnect/reselect in SCSI operations

THROTTLE BYTE

7							0
B/T	THROTTLE COUNT						

B/T - 0 = Transfer Count 1 = Byte Count

FLOPPY DISK ERROR STATUS BLOCK

31	COMMAND IDENTIFIER			0
	STATUS=02H	ERROR=23H	FLAGS	
	0	CODE	0	
	0	0	0	

FLAGS - See Status Block format
STATUS - 02H (CHECK CONDITION)

CODE FIELD VALUES

Code	Description
20	Bad command issued to floppy disk
21	Bad block number specified
25	Bad logical unit number specified (not 0 - 3)
26	Bad parameter specified
29	Device not configured
40	Format table overrun
41	Timeout waiting for command complete
42	Drive not ready
43	Seek error
44	ID CRC error
45	Write fault
46	Data CRC error.
47	Sector not found
48	Floppy disk data lost
49	Data underrun during operation

BYTE ORDERING

Byte Offset	Double Word Bits, Motorola	Double Word Bits, Intel/National/AT&T
0	24-31 (MSW)	0-7 (LSW)
1	16-23	8-15
2	8-15	16-23
3	0-7 (LSW)	24-31 (MSW)

UNIT OPTIONS PARAMETER BLOCK

31	COMMAND IDENTIFIER			0
	DISCONNECT TIMEOUT	UNIT ID	TARGET=FFH	
	SELECT TIMEOUT	RETRY CNTL	RETRY LIMIT	
	RESERVED			
	COMMAND=08H	RESERVED		
	RESERVED			
	RESERVED			

UNIT ID - (0 - 7 permissible)
DISCONNECT TIMEOUT - (.1 second increments)
RETRY LIMIT - maximum number of retries attempted

RETRY CONTROL BYTE

7							0	
0	0	0	0	RBE	RCE	RPE	ISB	INT

UNIT FLAGS BYTE (bits 0,1; all other bits 0)

2	1	0
0	SYN	IDI

RBE: Retry SCSI Bus Errors
RCE: Retry Command Errors
RPE: Retry Parity Errors
ISB: Issue status block/each retry
INT: Issue interrupt/each retry
SYN: Enable synchronous transfers
IDI: Prevent disconnect during command

SELECT TIMEOUT - Time limit specified for target response to selection (specified in milliseconds)