

Optoelectronics, Inc.
X SweeperÔ
Serial Interface Specification

Interface Version 1.1

October 28, 2003

INTRODUCTION

This document describes the serial interface of the X Sweeper™, a hand-held test receiver with a graphical spectrum display capable of sweeping and locking on to near-field FM VHF and UHF transmissions. The X Sweeper™ is capable of capturing and storing up to 100 frequencies in each of 10 memory banks, along with the number of occurrences, or hits, of each frequency, the signal strength, the lockout status, the time and date the frequency was last detected, and the latitude and longitude of the X Sweeper™ when the frequency was last detected (optional internal or external GPS required). In addition, the X Sweeper™ can log over 1900 events, each containing frequency, signal strength, time and date, and latitude and longitude. This data can then be downloaded to a personal computer for storage and analysis. The X Sweeper™ can be remotely controlled by a host computer via the serial interface.

This document was written to assist the programmer in developing software applications for the X Sweeper™. Optoelectronics, Inc. assumes no responsibility for the accuracy of the information contained in this document, and is under no obligation to provide technical support on matters pertaining to this document, or to provide notification of changes or corrections to this document. To inquire about possible revisions, or to order copies of this document, contact the factory. A nominal fee may be charged to cover printing and shipping costs.

OPTOELECTRONICS, INC.
5821 N.E. 14th Avenue
Fort Lauderdale, FL 33334
Phone: (954) 771-2050
FAX: (954) 771-2052
www.optoelectronics.com

ABOUT THE INTERFACE

Unlike previous Optoelectronics products, the command structure of the X Sweeper™ serial interface is not based on the Icom CI-V standard. Instead, a new ASCII command set was developed to provide full control of the instrument, as well as the ability to download data stored in memory. A primary advantage of this new command scheme is that the X Sweeper™ can be tested under remote control using a personal computer running a common terminal emulator program, such as HyperTerminal™.

The X Sweeper™ serial interface is full-duplex with RS-232C compatible voltage levels. The communications parameters for the serial interface are listed in Table 1 below.

Table 1. Communications Parameters.

DATA RATE	19,200 bps
START BITS	1
DATA BITS	8
PARITY	NONE
STOP BITS	1

To connect the X Sweeper™ to a personal computer, a miniature (3.5 mm) stereo phone jack is provided on the top panel. The X Sweeper™ receives commands on the RING terminal and transmits responses on the TIP terminal of the stereo phone jack. Signal ground is provided on the SHIELD terminal of the phone jack. Since the X Sweeper™ serial interface is compatible with RS-232C voltage levels, no external interface converter box is required to connect the X Sweeper™ to a standard personal computer COM port. An interface cable for connecting the X Sweeper™ to a PC is available.

For ReactionTune™ applications, a subminiature (2.5 mm) phone jack is provided on the top panel. The TIP terminal provides the TTL equivalent of the RS-232 transmit data signal to drive ReactionTune™-capable receivers. Signal ground is provided on the SHIELD terminal of the phone jack.

COMMAND REFERENCE

The X Sweeper™ accepts commands over the serial interface when the INTERFACE TYPE is set to REMOTE CONTROL from the front panel. In this section, all command and response bytes are expressed as ASCII characters. The X Sweeper™ recognizes 35 different commands, which are summarized in Table 2 below.

The X Sweeper™ processes commands one at a time. After a command is issued, the host computer must wait for the complete response before transmitting a new command. Any further command characters transmitted while a previous command is being processed will be discarded.

Following the command summary table is a detailed description of each of the commands, including examples illustrating their use.

Table 2. X Sweeper™ Remote Control Command Summary.

COMMAND	DESCRIPTION
AF	Active Frequency
AH	Auto-Hold
AS	Auto-Skip
BK	Bank
CB	Clear Bank
CF	Center Frequency
CL	Clear Log Memory
DB	Display Backlight
DC	Display Contrast
DP	Display Polarity
FD	Frequency Display
FS	Frequency Span
HD	Hold
ID	Identification
LC	Log Memory Coordinates
LF	Log Memory Frequency
LM	Log Memory
LO	Lockout
LS	Log Memory Signal Strength
LT	Log Memory Time/Date
MC	Memory Coordinates
MD	Mode
MF	Memory Frequency
MH	Memory Hits
ML	Memory Lockout Status
MS	Memory Signal Strength
MT	Memory Time/Date
MY	Memory
SG	Signal Strength
SH	Signal/Hits Display
SK	Skip
SP	Setup Parameter
SQ	Squelch Status
TD	Time/Date
VF	VFO Frequency

ACTIVE FREQUENCY

Format:

COMMAND	RESPONSE
AF?<CR>	AFffff.fffff<CR>

Examples:

COMMAND	RESPONSE
Read Active Frequency AF?<CR>	162.475 MHz AF0162.475000<CR>

Description:

This command reads the current ACTIVE FREQUENCY.

The FREQUENCY data (**ffff.fffff**) is in the form of 11 characters, including decimal point, and represents the frequency in megahertz. The specified FREQUENCY must be in the range 30 MHz to 3 GHz.

If the command length is incorrect, then the command is ignored, and the ERROR response is returned. See the examples shown above.

AUTO-HOLD

Format:

COMMAND	RESPONSE
AH?<CR>	AHa<CR>
AHa<CR>	OK<CR>

Examples:

COMMAND	RESPONSE
Read Auto-Hold Setting AH?<CR>	Auto-Hold Disabled AH0<CR>
Select Auto-Hold Enabled AH1<CR>	Command Accepted OK<CR>
Select Invalid Auto-Hold Setting AH2<CR>	Command Error ERROR<CR>

Description:

This command either reads or selects the AUTO-HOLD setting.

The AUTO-HOLD data (**a**) is in the form of 1 character in the range 0 to 1. The AUTO-HOLD values are as follows:

- 0** = Auto-Hold Disabled
- 1** = Auto-Hold Enabled

If the command length is incorrect, or if the specified AUTO-HOLD value is out of range, then the command is ignored, and the ERROR response is returned. See the examples shown above.

AUTO-SKIP

Format:

COMMAND	RESPONSE
AS?<CR>	ASa<CR>
ASa<CR>	OK<CR>

Examples:

COMMAND	RESPONSE
Read Auto-Skip Setting AS?<CR>	Auto-Skip Disabled AS0<CR>
Select Auto-Skip Enabled AS1<CR>	Command Accepted OK<CR>
Select Invalid Auto-Skip Setting AS2<CR>	Command Error ERROR<CR>

Description:

This command either reads or selects the AUTO-SKIP setting.

The AUTO-SKIP data (**a**) is in the form of 1 character in the range 0 to 1. The AUTO-SKIP values are as follows:

0 = Auto-Skip Disabled

1 = Auto-Skip Enabled

If the command length is incorrect, or if the specified AUTO-SKIP value is out of range, then the command is ignored, and the ERROR response is returned. See the examples shown above.

BANK

Format:

COMMAND	RESPONSE
BK? <CR>	BKbb <CR>
BKbb <CR>	OK <CR>

Examples:

COMMAND	RESPONSE
Read Bank BK? <CR>	Bank 7 BK07 <CR>
Select Bank 0 BK00 <CR>	Command Accepted OK <CR>
Select Invalid Bank BK10 <CR>	Command Error ERROR <CR>

Description:

This command either reads or selects the BANK.

The BANK data (**bb**) is in the form of 2 characters in the range 00 to 09.

If the command length is incorrect, or if the specified BANK is out of range, then the command is ignored, and the ERROR response is returned. See the examples shown above.

CLEAR BANK

Format:

COMMAND	RESPONSE
CBssssssssbb<CR>	OK<CR>

Examples:

COMMAND	RESPONSE
Clear Bank 5 CB781593416705<CR>	Command Accepted OK<CR>
Clear Bank 9, Security Code Invalid CB012345678909<CR>	Command Error ERROR<CR>
Clear Invalid Bank CB781593416713<CR>	Command Error ERROR<CR>

Description:

This command clears all MEMORY locations in the specified BANK. This command has the same effect as clearing the specified BANK from the front panel.

The SECURITY CODE (sssssssss) is in the form of 10 characters. This unique 10-digit code (7815934167) must be correctly specified to clear the specified BANK.

The specified BANK data (bb) is in the form of 2 characters. The specified BANK must be in the range 00 to 09.

If the command length is incorrect, or if the SECURITY CODE is not valid, or if the specified BANK is out of range, then the command is ignored, and the ERROR response is returned. See the examples shown above.

CENTER FREQUENCY

Format:

COMMAND	RESPONSE
CF?<CR>	CFffff.fff<CR>
CFffff.fff<CR>	OK<CR>

Examples:

COMMAND	RESPONSE
Read Center Frequency CF?<CR>	445.000 MHz CF0445.000<CR>
Write Center Frequency 824.675 MHz CF0824.675<CR>	Command Accepted OK<CR>
Write Invalid Center Frequency 3000.001 MHz CF3000.001<CR>	Command Error ERROR<CR>

Description:

This command either reads or selects the CENTER FREQUENCY.

The CENTER FREQUENCY data (**ffff.fff**) is in the form of 8 characters, including decimal point, in the range 0000.000 MHz to 3000.000 MHz.

If the command length is incorrect, or if the specified CENTER FREQUENCY is out of range, then the command is ignored, and the ERROR response is returned. See the examples shown above.

CLEAR LOG MEMORY

Format:

COMMAND	RESPONSE
CLsssssssss<CR>	OK<CR>

Examples:

COMMAND	RESPONSE
Clear Log Memory CL8569204738<CR>	Command Accepted OK<CR>
Clear Log Memory, Security Code Invalid CL0123456789<CR>	Command Error ERROR<CR>

Description:

This command clears all LOG MEMORY locations. This command has the same effect as clearing the LOG MEMORY from the front panel.

The SECURITY CODE (sssssssss) is in the form of 10 characters. This unique 10-digit code (8569204738) must be correctly specified to clear the LOG MEMORY.

If the command length is incorrect, or if the SECURITY CODE is not valid, then the command is ignored, and the ERROR response is returned. See the examples shown above.

DISPLAY BACKLIGHT

Format:

COMMAND	RESPONSE
DB? <CR>	DBb <CR>
DBb <CR>	OK <CR>

Examples:

COMMAND	RESPONSE
Read Display Backlight Setting DB? <CR>	Display Backlight On DB1 <CR>
Select Display Backlight Off DB0 <CR>	Command Accepted OK <CR>
Select Invalid Display Backlight Setting DB2 <CR>	Command Error ERROR <CR>

Description:

This command either reads or selects the DISPLAY BACKLIGHT setting.

The DISPLAY BACKLIGHT data (**b**) is in the form of 1 character in the range 0 to 1. The DISPLAY BACKLIGHT values are as follows:

- 0** = Display Backlight Off
- 1** = Display Backlight On

If the command length is incorrect, or if the specified DISPLAY BACKLIGHT value is out of range, then the command is ignored, and the ERROR response is returned. See the examples shown above.

DISPLAY CONTRAST

Format:

COMMAND	RESPONSE
DC? <CR>	DCcc <CR>
DCcc <CR>	OK <CR>

Examples:

COMMAND	RESPONSE
Read Display Contrast Setting DC? <CR>	Display Contrast 35 DC35 <CR>
Select Display Contrast 41 DC41 <CR>	Command Accepted OK <CR>
Select Invalid Display Contrast Setting DC64 <CR>	Command Error ERROR <CR>

Description:

This command either reads or selects the DISPLAY CONTRAST setting.

The DISPLAY CONTRAST data (**cc**) is in the form of 2 characters in the range 00 to 63.

If the command length is incorrect, or if the specified DISPLAY CONTRAST value is out of range, then the command is ignored, and the ERROR response is returned. See the examples shown above.

DISPLAY POLARITY

Format:

COMMAND	RESPONSE
DP?<CR>	DPp<CR>
DPp<CR>	OK<CR>

Examples:

COMMAND	RESPONSE
Read Display Polarity Setting DP?<CR>	Display Polarity Normal DP0<CR>
Select Reverse Display Polarity DP1<CR>	Command Accepted OK<CR>
Select Invalid Display Polarity Setting DP2<CR>	Command Error ERROR<CR>

Description:

This command either reads or selects the DISPLAY POLARITY setting.

The DISPLAY POLARITY data (**p**) is in the form of 1 character in the range 0 to 1. The DISPLAY POLARITY values are as follows:

- 0** = Display Polarity Normal
- 1** = Display Polarity Reverse

If the command length is incorrect, or if the specified DISPLAY POLARITY value is out of range, then the command is ignored, and the ERROR response is returned. See the examples shown above.

FREQUENCY DISPLAY

Format:

COMMAND	RESPONSE
FD? <CR>	FDd <CR>
FDd <CR>	OK <CR>

Examples:

COMMAND	RESPONSE
Read Frequency Display Setting FD? <CR>	Channel Frequency Display FD0 <CR>
Select Measured Frequency Display FD1 <CR>	Command Accepted OK <CR>
Select Invalid Frequency Display Setting FD2 <CR>	Command Error ERROR <CR>

Description:

This command either reads or selects the FREQUENCY DISPLAY setting.

The FREQUENCY DISPLAY data (**d**) is in the form of 1 character in the range 0 to 1. The FREQUENCY DISPLAY values are as follows:

- 0** = Channel Frequency Display
- 1** = Measured Frequency Display

If the command length is incorrect, or if the specified FREQUENCY DISPLAY value is out of range, then the command is ignored, and the ERROR response is returned. See the examples shown above.

FREQUENCY SPAN

Format:

COMMAND	RESPONSE
FS?<CR>	FSs<CR>
FSs<CR>	OK<CR>

Examples:

COMMAND	RESPONSE
Read Frequency Span FS?<CR>	300 KHz Span FS1<CR>
Select 100 MHz Span FS6<CR>	Command Accepted OK<CR>
Select Invalid Span FSA<CR>	Command Error ERROR<CR>

Description:

This command either reads or selects the FREQUENCY SPAN.

The FREQUENCY SPAN data (s) is in the form of 1 character in the range 0 to 9. The FREQUENCY SPAN values are as follows:

- 0 = 100 KHz Span
- 1 = 300 KHz Span
- 2 = 1 MHz Span
- 3 = 3 MHz Span
- 4 = 10 MHz Span
- 5 = 30 MHz Span
- 6 = 100 MHz Span
- 7 = 300 MHz Span
- 8 = 1000 MHz Span
- 9 = 3000 MHz Span

If the command length is incorrect, or if the specified FREQUENCY SPAN is out of range, then the command is ignored, and the ERROR response is returned. See the examples shown above.

HOLD

Format:

COMMAND	RESPONSE
HD? <CR>	HDh <CR>
HD <CR>	OK <CR>

Examples:

COMMAND	RESPONSE
Read HOLD function HD? <CR>	HOLD function enabled HD1 <CR>
Enable HOLD function (SWEEP mode) HD <CR>	Command Accepted OK <CR>
Toggle HOLD function (SCAN mode) HD <CR>	Command Accepted OK <CR>
Invalid HOLD function (other mode) HD <CR>	Command Error ERROR <CR>

Description:

This command reads, enables, or toggles the HOLD function, depending on the current operating MODE. *This command is only valid in either SWEEP or SCAN mode.*

The HOLD data (**h**) is in the form of 1 character in the range 0 to 1. The HOLD values are as follows:

0 = Hold Disabled

1 = Hold Enabled

If SWEEP mode is selected, then HOLD is enabled. If SCAN mode is selected, then HOLD is toggled.

If the command length is incorrect, or if neither SWEEP nor SCAN mode is selected, then the command is ignored, and the ERROR response is returned. See the examples shown above.

IDENTIFICATION

Format:

COMMAND	RESPONSE
ID?<CR>	IDpppddrrii<CR>

Examples:

COMMAND	RESPONSE
Read Identification Information ID?<CR>	X Sweeper™, Digital Board version 1.8, RF Board version 1.3, Interface version 1.1 IDXSW181311<CR>

Description:

This command reads the IDENTIFICATION information.

The PRODUCT data (**ppp**) is in the form of 3 characters, which uniquely identify the product as follows:

XSW = X Sweeper™

The DIGITAL BOARD VERSION data (**dd**) is in the form of 2 characters in the range 00 to 99, which indicate the current Digital Board software version.

The RF BOARD VERSION data (**rr**) is in the form of 2 characters in the range 00 to 99, which indicate the current RF Board software version.

The INTERFACE VERSION data (**ii**) is in the form of 2 characters in the range 00 to 99, which indicate the current Serial Interface version.

If the command length is incorrect, then the command is ignored, and the ERROR response is returned. See the examples shown above.

LOG MEMORY COORDINATES

Format:

COMMAND	RESPONSE
LCmmmm?<CR>	LCaa:bb.bbc,ddd:ee.eef<CR>

Examples:

COMMAND	RESPONSE
Read Coordinates from Log Memory 0 LC0000?<CR>	27 Deg., 48.92 Min. N., 86 Deg., 12.45 Min., W. LC27:48.92N,086:12.45W<CR>
Read Coordinates from Log Memory 1378 LC01378?<CR>	10 Deg., 31.05 Min. S., 143 Deg., 58.22 Min., E. LC10:31.05S,143:58.22E<CR>
Read Coordinates from Invalid Log Memory LC22459?<CR>	Command Error ERROR<CR>

Description:

This command reads the COORDINATES stored in the specified LOG MEMORY location.

The specified LOG MEMORY data (**mmmmmm**) is in the form of 5 characters. The specified LOG MEMORY must be in the range 00000 to 01918.

The LATITUDE DEGREES data (**aa**) is in the form of 2 characters in the range 00 to 90.

The LATITUDE MINUTES data (**bb.bb**) is in the form of 5 characters, including decimal point, in the range 00.00 to 59.99.

The LATITUDE HEMISPHERE data (**c**) is in the form of 1 character, where 'N' represents North Latitude, and 'S' represents South Latitude.

The LONGITUDE DEGREES data (**ddd**) is in the form of 3 characters in the range 000 to 180.

The LONGITUDE MINUTES data (**ee.ee**) is in the form of 5 characters, including decimal point, in the range 00.00 to 59.99.

The LONGITUDE HEMISPHERE data (**f**) is in the form of 1 character, where 'E' represents East Longitude, and 'W' represents West Longitude.

If the command length is incorrect, or if the specified LOG MEMORY is out of range, then the command is ignored, and the ERROR response is returned. See the examples shown above.

LOG MEMORY FREQUENCY

Format:

COMMAND	RESPONSE
LFmmmm?<CR>	LFfff.ffff<CR>

Examples:

COMMAND	RESPONSE
Read Frequency from Log Memory 37 LF00037?<CR>	162.475 MHz LF0162.475000<CR>
Read Frequency from Log Memory 1918 LF01918?<CR>	445.8125 MHz LF0445.812500<CR>
Read Frequency from Invalid Log Memory LF02561?<CR>	Command Error ERROR<CR>

Description:

This command reads the FREQUENCY stored in the specified LOG MEMORY location.

The specified LOG MEMORY data (**mmmm**) is in the form of 5 characters. The specified LOG MEMORY must be in the range 00000 to 01918.

The FREQUENCY data (**fff.ffff**) is in the form of 11 characters, including decimal point, and represents the frequency in megahertz. The specified FREQUENCY must be in the range 30 MHz to 3 GHz.

If the command length is incorrect, or if the specified LOG MEMORY is out of range, then the command is ignored, and the ERROR response is returned. See the examples shown above.

LOG MEMORY

Format:

COMMAND	RESPONSE
LM?<CR>	LMmmmmm<CR>
LMmmmmm<CR>	OK<CR>

Examples:

COMMAND	RESPONSE
Read Log Memory LM?<CR>	Memory 8 LM00008<CR>
Read Log Memory LM?<CR>	Memory 837 LM00837<CR>
Select Log Memory 1862 LM01862<CR>	Command Accepted OK<CR>
Select Invalid Memory LM01919<CR>	Command Error ERROR<CR>

Description:

This command either reads or selects the LOG MEMORY location.

The specified LOG MEMORY data (**mmmmm**) is in the form of 5 characters in the range 00000 to 01918, or to the highest non-empty log memory location, whichever is less.

If the command length is incorrect, or if the specified LOG MEMORY is out of range, then the command is ignored, and the ERROR response is returned. See the examples shown above.

LOCKOUT

Format:

COMMAND	RESPONSE
LO<CR>	OK<CR>

Examples:

COMMAND	RESPONSE
Initiate LOCKOUT function (SWEEP, SCAN, or MEMORY mode) LO<CR>	Command Accepted OK<CR>
Invalid LOCKOUT function (other mode) LO<CR>	Command Error ERROR<CR>

Description:

This command initiates the LOCKOUT function. *This command is only valid in SWEEP, SCAN, or MEMORY mode.*

In SWEEP mode, a LOCKOUT locks out the active frequency, clears the HOLD function, and resumes sweeping. In SCAN mode, a LOCKOUT locks out the active frequency, and resumes scanning. In MEMORY mode, a LOCKOUT toggles the LOCKOUT status of the currently selected MEMORY in the currently selected BANK.

If the command length is incorrect, or if SWEEP, SCAN, or MEMORY mode is not selected, then the command is ignored, and the ERROR response is returned. See the examples shown above.

LOG MEMORY SIGNAL STRENGTH

Format:

COMMAND	RESPONSE
LSmmmmm?<CR>	LSss<CR>

Examples:

COMMAND	RESPONSE
Read Signal Strength from Log Memory 185 LS00185?<CR>	38 Bargraph Segments LS38<CR>
Read Signal Strength from Log Memory 614 LS00614?<CR>	43 Bargraph Segments LS43<CR>
Read Signal Strength from Invalid Log Memory LS95637?<CR>	Command Error ERROR<CR>

Description:

This command reads the SIGNAL STRENGTH stored in the specified LOG MEMORY location.

The specified LOG MEMORY data (**mmmmm**) is in the form of 5 characters. The specified LOG MEMORY must be in the range 00000 to 01918.

The SIGNAL STRENGTH data (**ss**) is in the form of 2 characters in the range 00 to 50, and represents the number of bargraph segments displayed.

If the command length is incorrect, or if the specified LOG MEMORY is out of range, then the command is ignored, and the ERROR response is returned. See the examples shown above.

LOG MEMORY TIME / DATE

Format:

COMMAND	RESPONSE
LTmmmmmm?<CR>	LThh:mm:ss,w,nn-dd-yyyy<CR>

Examples:

COMMAND	RESPONSE
Read Time/Date from Log Memory 16 LT00016?<CR>	16:50:14, Thursday ,June 26, 2003 LT16:50:14,4,06-26-2003<CR>
Read Time/Date from Log Memory 1506 LT01506?<CR>	8:13:58, Sunday ,May 4, 2003 LT08:13:58,0,05-04-2003<CR>
Read Time/Date from Invalid Log Memory LT32589?<CR>	Command Error ERROR<CR>

Description:

This command reads the TIME/DATE stored in the specified LOG MEMORY location.

The specified LOG MEMORY data (**mmmmmm**) is in the form of 5 characters. The specified LOG MEMORY must be in the range 00000 to 01918.

The HOURS data (**hh**) is in the form of 2 characters in 24-hour time format in the range 00 to 23.

The MINUTES data (**mm**) is in the form of 2 characters in the range 00 to 59.

The SECONDS data (**ss**) is in the form of 2 characters in the range 00 to 59.

The WEEKDAY data (**w**) is in the form of 1 character in the range 0 to 6, where 0 represents Sunday.

The MONTH data (**nn**) is in the form of 2 characters in the range 01 to 12.

The DAY data (**dd**) is in the form of 2 characters in the range 01 to 31.

The YEAR data (**yyyy**) is in the form of 4 characters in the range 2000 to 2099.

If the command length is incorrect, or if the specified LOG MEMORY is out of range, then the command is ignored, and the ERROR response is returned. See the examples shown above.

MEMORY COORDINATES

Format:

COMMAND	RESPONSE
MC bbmmm ?<CR>	MC aa:bb.bbc,ddd:ee.eef <CR>

Examples:

COMMAND	RESPONSE
Read Coordinates from Bank 0, Memory 0 MC 00000 ?<CR>	27 Deg., 48.92 Min. N., 86 Deg., 12.45 Min., W. MC 27:48.92N,086:12.45W <CR>
Read Coordinates from Bank 9, Memory 78 MC 09078 ?<CR>	10 Deg., 31.05 Min. S., 143 Deg., 58.22 Min., E. MC 10:31.05S,143:58.22E <CR>
Read Coordinates from Invalid Bank MC 31085 ?<CR>	Command Error ERROR <CR>

Description:

This command reads the COORDINATES stored in the specified BANK and MEMORY.

The specified BANK data (**bb**) is in the form of 2 characters. The specified BANK must be in the range 00 to 09.

The specified MEMORY data (**mmm**) is in the form of 3 characters. The specified MEMORY must be in the range 000 to 099.

The LATITUDE DEGREES data (**aa**) is in the form of 2 characters in the range 00 to 90.

The LATITUDE MINUTES data (**bb.bb**) is in the form of 5 characters, including decimal point, in the range 00.00 to 59.99.

The LATITUDE HEMISPHERE data (**c**) is in the form of 1 character, where 'N' represents North Latitude, and 'S' represents South Latitude.

The LONGITUDE DEGREES data (**ddd**) is in the form of 3 characters in the range 000 to 180.

The LONGITUDE MINUTES data (**ee.ee**) is in the form of 5 characters, including decimal point, in the range 00.00 to 59.99.

The LONGITUDE HEMISPHERE data (**f**) is in the form of 1 character, where 'E' represents East Longitude, and 'W' represents West Longitude.

If the command length is incorrect, or if the specified BANK is out of range, or if the specified MEMORY is out of range, then the command is ignored, and the ERROR response is returned. See the examples shown above.

MODE

Format:

COMMAND	RESPONSE
MD?<CR>	MDm<CR>
MDm<CR>	OK<CR>

Examples:

COMMAND	RESPONSE
Read Mode MD?<CR>	SWEEP Mode MD0<CR>
Read Mode MD?<CR>	MEMORY Mode MD2<CR>
Select VFO Mode MD3<CR>	Command Accepted OK<CR>
Select Invalid Mode MD7<CR>	Command Error ERROR<CR>

Description:

This command either reads or selects the MODE.

The MODE data (**m**) is in the form of 1 character in the range 0 to 6. The MODE values are as follows:

- 0** = SWEEP Mode
- 1** = SCAN Mode
- 2** = MEMORY Mode
- 3** = VFO Mode
- 4** = GPS Mode
- 5** = LOG MEMORY Mode
- 6** = SETUP Mode

If the command length is incorrect, or if the specified MODE is out of range, then the command is ignored, and the ERROR response is returned. See the examples shown above.

MEMORY FREQUENCY

Format:

COMMAND	RESPONSE
MF bbmmm ?<CR>	MF fff.fffff <CR>
MF bbfff.fffff <CR>	OK<CR>

Examples:

COMMAND	RESPONSE
Read Frequency from Bank 2, Memory 37 MF 02037 ?<CR>	162.475 MHz MF 0162.475000 <CR>
Read Frequency from Invalid Bank MF 23076 ?<CR>	Command Error ERROR<CR>
Write Frequency 442.6875 MHz to Bank 8 MF 080442.687500 <CR>	Command Accepted OK<CR>
Write Invalid Frequency 26.450 MHz to Bank 5 MF 050026.450000 <CR>	Command Error ERROR<CR>

Description:

This command either reads the FREQUENCY stored in the specified BANK and MEMORY, or writes the specified FREQUENCY to the next available MEMORY in the specified BANK.

The specified BANK data (**bb**) is in the form of 2 characters. The specified BANK must be in the range 00 to 09.

The specified MEMORY data (**mmm**) is in the form of 3 characters. The specified MEMORY must be in the range 000 to 099.

The FREQUENCY data (**fff.fffff**) is in the form of 11 characters, including decimal point, and represents the frequency in megahertz. The specified FREQUENCY must be in the range 30 MHz to 3 GHz.

If the command length is incorrect, or if the specified BANK is out of range, or if the specified MEMORY is out of range, or if the specified FREQUENCY is out of range, or if the specified BANK is full, then the command is ignored, and the ERROR response is returned. See the examples shown above.

MEMORY HITS

Format:

COMMAND	RESPONSE
MH bb mmm? <CR>	MH hhhhh <CR>

Examples:

COMMAND	RESPONSE
Read Hits from Bank 6, Memory 42 MH 06042 ? <CR>	6,158 Hits MH 06158 <CR>
Read Hits from Invalid Bank MH 26081 ? <CR>	Command Error ERROR <CR>

Description:

This command reads the HITS stored in the specified BANK and MEMORY.

The specified BANK data (**bb**) is in the form of 2 characters. The specified BANK must be in the range 00 to 09.

The specified MEMORY data (**mmm**) is in the form of 3 characters. The specified MEMORY must be in the range 000 to 099.

The HITS data (**hhhhh**) is in the form of 5 characters, and represents the number of HITS in the range 0 to 65,535.

If the command length is incorrect, or if the specified BANK is out of range, or if the specified MEMORY is out of range, then the command is ignored, and the ERROR response is returned. See the examples shown above.

MEMORY LOCKOUT STATUS

Format:

COMMAND	RESPONSE
ML bb mmm?<CR>	MLs<CR>

Examples:

COMMAND	RESPONSE
Read Lockout Status from Bank 4, Memory 0 ML 04000 ?<CR>	Not Locked Out ML 0 <CR>
Read Lockout Status from Bank 7, Memory 99 ML 07099 ?<CR>	Locked Out ML 1 <CR>
Read Lockout Status from Invalid Bank ML 21032 ?<CR>	Command Error ERROR <CR>

Description:

This command reads the LOCKOUT STATUS stored in the specified BANK and MEMORY.

The specified BANK data (**bb**) is in the form of 2 characters. The specified BANK must be in the range 00 to 09.

The specified MEMORY data (**mmm**) is in the form of 3 characters. The specified MEMORY must be in the range 000 to 099.

The LOCKOUT STATUS data (**s**) is in the form of 1 character, where '0' indicates that the associated frequency is not locked out, and '1' indicates that the associated frequency is locked out.

If the command length is incorrect, or if the specified BANK is out of range, or if the specified MEMORY is out of range, then the command is ignored, and the ERROR response is returned. See the examples shown above.

MEMORY SIGNAL STRENGTH

Format:

COMMAND	RESPONSE
MS bb mmm ?<CR>	MS ss <CR>

Examples:

COMMAND	RESPONSE
Read Signal Strength from Bank 1, Memory 5 MS 01005 ?<CR>	38 Bargraph Segments MS 38 <CR>
Read Signal Strength from Invalid Bank MS 20013 ?<CR>	Command Error ERROR<CR>

Description:

This command reads the SIGNAL STRENGTH stored in the specified BANK and MEMORY.

The specified BANK data (**bb**) is in the form of 2 characters. The specified BANK must be in the range 00 to 09.

The specified MEMORY data (**mmm**) is in the form of 3 characters. The specified MEMORY must be in the range 000 to 099.

The SIGNAL STRENGTH data (**ss**) is in the form of 2 characters in the range 00 to 50, and represents the number of bargraph segments displayed.

If the command length is incorrect, or if the specified BANK is out of range, or if the specified MEMORY is out of range, then the command is ignored, and the ERROR response is returned. See the examples shown above.

MEMORY TIME / DATE

Format:

COMMAND	RESPONSE
MT bb mmm?<CR>	M Thh :mm:ss,w, nn -dd-yyyy<CR>

Examples:

COMMAND	RESPONSE
Read Time/Date from Bank 2, Memory 6 MT 02006 ?<CR>	16:50:14, Thursday ,June 26, 2003 MT 16:50:14,4,06-26-2003 <CR>
Read Time/Date from Bank 9, Memory 30 MT 09030 ?<CR>	8:13:58, Sunday ,May 4, 2003 MT 08:13:58,0,05-04-2003 <CR>
Read Time/Date from Invalid Bank MT 25001 ?<CR>	Command Error ERROR <CR>

Description:

This command reads the TIME/DATE stored in the specified BANK and MEMORY.

The specified BANK data (**bb**) is in the form of 2 characters. The specified BANK must be in the range 00 to 09.

The specified MEMORY data (**mmm**) is in the form of 3 characters. The specified MEMORY must be in the range 000 to 099.

The HOURS data (**hh**) is in the form of 2 characters in 24-hour time format in the range 00 to 23.

The MINUTES data (**mm**) is in the form of 2 characters in the range 00 to 59.

The SECONDS data (**ss**) is in the form of 2 characters in the range 00 to 59.

The WEEKDAY data (**w**) is in the form of 1 character in the range 0 to 6, where 0 represents Sunday.

The MONTH data (**nn**) is in the form of 2 characters in the range 01 to 12.

The DAY data (**dd**) is in the form of 2 characters in the range 01 to 31.

The YEAR data (**yyyy**) is in the form of 4 characters in the range 2000 to 2099.

If the command length is incorrect, or if the specified BANK is out of range, or if the specified MEMORY is out of range, then the command is ignored, and the ERROR response is returned. See the examples shown above.

MEMORY

Format:

COMMAND	RESPONSE
MY?<CR>	MYmmm<CR>
MYmmm<CR>	OK<CR>

Examples:

COMMAND	RESPONSE
Read Memory MY?<CR>	Memory 8 MY008<CR>
Read Memory MY?<CR>	Memory 37 MY037<CR>
Select Memory 62 MY062<CR>	Command Accepted OK<CR>
Select Invalid Memory MY09B<CR>	Command Error ERROR<CR>

Description:

This command either reads or selects the MEMORY.

The specified MEMORY data (**mmm**) is in the form of 3 characters in the range 000 to 099.

If the command length is incorrect, or if the specified MEMORY is out of range, then the command is ignored, and the ERROR response is returned. See the examples shown above.

SIGNAL STRENGTH

Format:

COMMAND	RESPONSE
SG?<CR>	SGss<CR>

Examples:

COMMAND	RESPONSE
Read Signal Strength SG?<CR>	8 Bargraph Segments SG08<CR>
Read Signal Strength SG?<CR>	37 Bargraph Segments SG37<CR>

Description:

This command reads the current SIGNAL STRENGTH.

The SIGNAL STRENGTH data (ss) is in the form of 2 characters in the range 00 to 50, and represents the number of bargraph segments displayed.

If the command length is incorrect, then the command is ignored, and the ERROR response is returned. See the examples shown above.

SIGNAL / HITS DISPLAY

Format:

COMMAND	RESPONSE
SH?<CR>	SHs<CR>
SHs<CR>	OK<CR>

Examples:

COMMAND	RESPONSE
Read Signal/Hits Display SH?<CR>	Signal Display SH0<CR>
Select Signal Display SH0<CR>	Command Accepted OK<CR>
Select Hits Display SH1<CR>	Command Accepted OK<CR>
Select Invalid Signal / Hits Display SH2<CR>	Command Error ERROR<CR>

Description:

This command either reads or selects the SIGNAL / HITS DISPLAY.

The SIGNAL / HITS DISPLAY data (s) is in the form of 1 character in the range 0 to 1. The SIGNAL / HITS DISPLAY values are as follows:

0 = Signal Display

1 = Hits Display

If the command length is incorrect, or if the specified SIGNAL / HITS DISPLAY value is out of range, then the command is ignored, and the ERROR response is returned. See the examples shown above.

SKIP

Format:

COMMAND	RESPONSE
SK<CR>	OK<CR>

Examples:

COMMAND	RESPONSE
Initiate SKIP function (SWEEP or SCAN mode) SK<CR>	Command Accepted OK<CR>
Invalid SKIP function (other mode) SK<CR>	Command Error ERROR<CR>

Description:

This command initiates the SKIP function. *This command is only valid in either SWEEP or SCAN mode.*

In SWEEP mode, a SKIP clears the HOLD function and resumes sweeping. In SCAN mode, a SKIP jumps to the next captured frequency.

If the command length is incorrect, or if neither SWEEP nor SCAN mode is selected, then the command is ignored, and the ERROR response is returned. See the examples shown above.

SETUP PARAMETER

Format:

COMMAND	RESPONSE
SP?<CR>	SPss<CR>
SPss<CR>	OK<CR>

Examples:

COMMAND	RESPONSE
Read Setup Parameter SP?<CR>	DISPLAY CONTRAST Setup SP00<CR>
Read Setup Parameter SP?<CR>	RECEIVER TYPE Setup SP08<CR>
Select PCR1000 SQUELCH Setup SP10<CR>	Command Accepted OK<CR>
Select Invalid Setup SP14<CR>	Command Error ERROR<CR>

Description:

This command either reads or selects the SETUP PARAMETER.

The SETUP PARAMETER data (ss) is in the form of 2 characters in the range 00 to 13. The SETUP PARAMETER values are as follows:

- 00 = DISPLAY CONTRAST Setup
- 01 = DISPLAY POLARITY Setup
- 02 = DISPLAY BACKLIGHT Setup
- 03 = TIME/DATE Setup
- 04 = FREQUENCY DISPLAY Setup
- 05 = SWEEP AUTO-SKIP Setup
- 06 = SWEEP AUTO-HOLD Setup
- 07 = INTERFACE TYPE Setup
- 08 = RECEIVER TYPE Setup
- 09 = PCR1000 VOLUME Setup
- 10 = PCR1000 SQUELCH Setup
- 11 = GPS SELECT Setup
- 12 = LOG MODE Setup
- 13 = LOG TYPE Setup

If the command length is incorrect, or if the specified SETUP PARAMETER is out of range, then the command is ignored, and the ERROR response is returned. See the examples shown above.

SQUELCH STATUS

Format:

COMMAND	RESPONSE
SQ?<CR>	SQs<CR>

Examples:

COMMAND	RESPONSE
Read Squelch Status SQ?<CR>	Squelch Closed SQ0<CR>
Read Squelch Status SQ?<CR>	Squelch Open SQ1<CR>

Description:

This command reads the current SQUELCH STATUS.

The SQUELCH STATUS data (s) is in the form of 1 character in the range 0 to 1. The SQUELCH STATUS values are as follows:

0 = Squelch Closed

1 = Squelch Open

If the command length is incorrect, then the command is ignored, and the ERROR response is returned. See the examples shown above.

TIME / DATE

Format:

COMMAND	RESPONSE
TD?<CR>	TDhh:mm:ss,w,nn-dd-yyyy<CR>
TDhh:mm:ss,w,nn-dd-yyyy<CR>	OK<CR>

Examples:

COMMAND	RESPONSE
Read Time/Date TD?<CR>	8:13:58, Sunday ,May 4, 2003 TD08:13:58,0,05-04-2003<CR>
Set Time/Date 16:50:14, Thursday ,June 26, 2003 TD16:50:14,4,06-26-2003<CR>	Command Accepted OK<CR>
Set Invalid Time/Date TD25:62:14,8,06-26-2215<CR>	Command Error ERROR<CR>

Description:

This command either reads or sets the TIME and DATE.

The HOURS data (**hh**) is in the form of 2 characters in 24-hour time format in the range 00 to 23.

The MINUTES data (**mm**) is in the form of 2 characters in the range 00 to 59.

The SECONDS data (**ss**) is in the form of 2 characters in the range 00 to 59.

The WEEKDAY data (**w**) is in the form of 1 character in the range 0 to 6, where 0 represents Sunday.

The MONTH data (**nn**) is in the form of 2 characters in the range 01 to 12.

The DAY data (**dd**) is in the form of 2 characters in the range 01 to 31.

The YEAR data (**yyyy**) is in the form of 4 characters in the range 2000 to 2099.

If the command length is incorrect, then the command is ignored, and the ERROR response is returned. See the examples shown above.

VFO FREQUENCY

Format:

COMMAND	RESPONSE
VF?<CR>	VFffff.fffff<CR>
VFffff.fffff<CR>	OK<CR>

Examples:

COMMAND	RESPONSE
Read VFO Frequency VF?<CR>	162.475 MHz VF0162.475000<CR>
Write VFO Frequency 442.6875 MHz VF0442.687500<CR>	Command Accepted OK<CR>
Write Invalid VFO Frequency 26.450 MHz VF0026.450000<CR>	Command Error ERROR<CR>

Description:

This command either reads or selects the VFO FREQUENCY.

The VFO FREQUENCY data (**fff.fffff**) is in the form of 11 characters, including decimal point, and represents the frequency in megahertz. The specified VFO FREQUENCY must be in the range 30 MHz to 3 GHz.

If the command length is incorrect, or if the specified VFO FREQUENCY is out of range, then the command is ignored, and the ERROR response is returned. See the examples shown above.

OPTOELECTRONICS, INC.
5821 N.E. 14th Avenue
Fort Lauderdale, FL 33334
Phone: (954) 771-2050
FAX: (954) 771-2052
www.optoelectronics.com