AOR® RS232 protocol listing for the AR8200 (accompanies the CC8200) Documentation release V1.3

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(1) General

The AR8200 is designed to be connected to a computer using the optional CC8200 lead with built-in level shift conversion, this will enable computer control via the RS232 serial port of a computer. An additional piece of software will usually be required in order to address the computer's serial port with the correct set of parameters. If using an IBM-PC or clone (with 80386 processor or higher) *Microsoft Hyper Terminal* (or WINDOWS TERMINAL on Windows 3.1x) may be used to address the computer's serial port.

In order to gain the greatest flexibility, a specialist software package is desirable. For this reason a Windows based PC package is supplied FREE on the CD-ROM accompanying the CC8200 (this may also be made available from the AOR web site **WWW.AORJA.COM**).

For those wishing to compile their own software (for computers other than the PC etc) or for basic terminal control, please refer to the following command protocol.

(2) Supplied Accessories

Please check that the following items are included in the package:

CC8200 lead with built-in level shift (9-pin D type connector)	One
CD-ROM containing protocol listing and PC software	One

(3) Connection for RS232 operation

The option socket is mounted on the right hand side of the cabinet underneath the 12V d.c. input socket. The socket is protected from dust by a grey rubberised case stopper which is hinged toward the front of the cabinet. Gently lift the stopper from the rear edge to reveal the D-shaped metallic socket. Be careful to keep dust and dirt from this socket and to prevent liquid entering the AR8200 via this socket. Ensure that no conductive material is allowed to short circuit the socket which may damage the receiver.

Notes: Switching the receiver On, setting of volume and adjustment of squelch cannot be achieved via the RS232 port. Computers "always" generate RF noise which may interfere with the AR8200 reception if the standard helical rubber aerial is used. To reduce the effects of noise, use of a remote aerial is highly recommended with good quality 50 OHM coaxial cable employed.

The following signals are available via the option socket including detector output, mute and AGC. This pin-out assumes connection using the AOR optional **OS8200** or **CC8200** leads (refer to page 117 of the English language operating manual):-

RED	+4.2V
BLACK	RXD
BLUE	GROUND
BROWN	MUTE
ORANGE	AGC
SHIELD	GROUND
WHITE	TXD
YELLOW	GROUND
GREEN	AUDIO OUT
GREY	DETECTOR OUT
PURPLE	GROUND

Note: TXD + RXD (levels to drive a level shift converter) The voltage output level to drive external RS232 is deliberately below 'H' level. If connecting to an external I.C., you must be aware of latch status. Connect the optional CC8200 computer control lead to the option socket and connect to a computer.

The RS232 parameters may be defined using the CONFIG menu. Baud rates (transfer speed) may be set to 4800, 9600 or 19200bps. It is also possible to set an 'address' to facilitate connection of up to 99 AR8200 to a single port for custom operation, the addresses may be set between the limits of 01 to 99 with 00 representing single radio operation.



When operating from external RS232, the legend ⊙ will be displayed on the LCD. Please refer to **page 109 section 14-6** of the English language operating manual for information on the CONFIG menu settings.

If your computer has a 9-pin 'D' type connector then simply connect to the computer's serial port, if however the computer input is 25 way, either a 9-pin male - 25-way female adaptor (ensure all pins are connected through) or patch lead will be required. If a lead is used, the following connections are suggested:-

CC8200 9-pin male	PC 25 way female
2	3
3	2
5	7 GND
7	4
8	5

The following RS232 parameters are employed:-

Interface	Built in level shift within the CC8200 lead
Connections used	TXD, RXD, GND
Flow control	Software X flow
Baud rate	19200, 9600, 4800 (selectable)
Data	8 bit, 2 stop bits
Parity	None
RS232 command set	ASCII text, <cr> or <cr><lf> delimeter</lf></cr></cr>

Both the computer and AR8200 must use the same parameters for correct operation. If data is regularly lost or corrupted, try using a slower speed such as 4800 baud. Use of a slower baud rate should not greatly reduce overall communications transfer rate since the processing time within the receiver as PLL lock-time ultimately restricts the whole process.

Dote: When changing BAUD rate, switch the AR8200 Off/On to ensure the new speed is selected.

(4) Use of Microsoft WINDOWS 'Terminal' and 'HyperTerminal'

Windows 3.1x uses TERMINAL in a similar way using TERMINAL in the program Manager group. If the terminal program has not been configured an error message will appear (depending upon the serial port / mouse configuration). Click on [OK] to continue. TERMINAL will open and appear on the screen. You may re-size or maximise the screen at this point. Click on the **S**ettings heading toward the top of the screen so that the communications and terminal parameters may be configured. Click on "TERMINAL EMULATION" then select "ANSI" then click on [OK]. Click on the **S**ettings heading toward the top of the screen so that the communications and terminal parameters may be configured. Click on "TERMINAL PREFERENCES" then select the required options. Finally click on [OK]. Click on the **S**ettings heading toward the top of the screen so that the communications and terminal parameters may be re-configured. Click on "COMMUNICATIONS" then select the options as required. The choice of COM port (COM1, COM2 etc) will depend upon your computer serial port and mouse configuration. Finally click on [OK]. Click on the **S**etter so that the parameters will not require future re-configuration (.TRM being the default extension). The file is saved in the main WINDOWS sub directory. For further information regarding WINDOWS TERMINAL and configuration, please refer to the operating manual supplied with Microsoft software and the computer. Click on "COMMUNICATIONS" then select the required options. The choice of COM port (COM1, COM2 etc) will depend upon your computer serial port and mouse configuration regarding WINDOWS terminal parameters will not require future re-configuration (.TRM being the default extension). The file is saved in the main WINDOWS sub directory. For further information regarding WINDOWS terminal port and configuration, please refer to the operating manual supplied with Microsoft software and the computer. Click on "COMMUNICATIONS" then select the required options. The choice of COM port (COM1, COM2 etc) will depend upon

Assuming you have **Windows98** loaded on an IBM-PC compatible computer (**Windows95** setup is virtually identical) click on the START button:

Start Next scroll up through PROGRAMS, ACCESSORIES, COMMUNICATIONS and onto HYPER TERMINAL (click):

🔚 Accessories 🔹 🕨	🛱 Communications 🔸	🖻 Dial-Up Networking
🛱 Adobe 🔸	🖶 Entertainment 💿 🕨	🗄 Direct Cable Connection
🛱 Adobe Acrobat 🔹 🕨	🖶 Games 🔹 🕨 🕨	🚞 HyperTerminal
🛱 Corel Graphics 🔹 🕨	👼 Internet Tools 🔷 🕨	🐯 Phone Dialer

The following screen will be displayed:



Double **click** the **HYPERTRM.EXE** icon, the following screen will be displayed (this may take quite a few seconds as Windows checks your hardware:

Connect	ion Des	criptic	on					? ×
N	New Co	innectio	on					
Enter a	name ar	id choo)se an i	con for t	the con	nection:		
Name:								
<u>l</u> con:								
2	3	Solution	MC	1		8	Ú3	
•]			•
					OK		Ca	ncel

Enter an identifying name, such as AR8200 then click on OK. The CONNECT TO screen will be displayed:

Net to		
Enter details for	he phone number that you want to diat	
Gountry code:	Detect Kingdom (44)	¥
Avge.code:	11771	
Phone number:	ſ	
Cognectusing	Directio Comi	
	OK Cance	

Select the required communications port (serial port). By default, Com1 is selected, this is correct for most lap-top computers but **Com2** is more usual for a desktop computer (especially when a serial mouse is used on Com1). Click on **OK**.

COM	2 Properties	? ×
Po	rt Settings	
	<u>B</u> its per second:	9600
	<u>D</u> ata bits:	8
	<u>P</u> arity:	None
	<u>S</u> top bits:	2
	Elow control:	Xon / Xoff
	Advanced	<u>R</u> estore Defaults
	0	K Cancel Apply

Input the required communication parameters as shown above (this example shown 9600 baud but you can select 4800 or 19200), whichever has been configured on in the AR8200 receiver... they MUST be the same. Click on **OK**.

🍓 ari	3200 -	Hyper	Termi	nal		
<u>F</u> ile	<u>E</u> dit	⊻iew	<u>C</u> all	Transfer	<u>H</u> elp	
	Ĩ	2	<u> </u>		ľ	
F						

Select the 'PROPERTIES' icon (finger pointing at a written page), select 'SETTINGS' then click on 'ACSII Setup'.

ASCII Setup	×
C ASCII Sending	1
Send line ends with line feeds	
Echo typed characters locally	
Line delay: 0 milliseconds.	
Character delay: 0 milliseconds.	
ASCII Receiving ✓ Append line feeds to incoming line ends 「 Eorce incoming data to 7-bit ASCII ✓ Wrap lines that exceed terminal width	
OK Cancel	



Click on the fields indicated to add carriage returns to outgoing and incoming text. Echo displays your keyboard strokes input on to the computer screen. If incoming text is double-spaced, remove the tick box for 'ASCII Receiving'. Click **OK**.

Refer to the command listings later in this section... to try out the link, ensure that the AR8200 is in 2VFO mode (if not type **VA [ENTER]**) then type the command **RX [ENTER]** via the computer keyboard. The AR8200 should respond with the current frequency displayed on the AR8200. To change frequency type **RF123 [ENTER]**, the AR8200 should change to 123.000 MHz.

(5) How to send a command

Each command comprises of two upper case letters (header) along with options as required. All commands use ASCII code which MUST BE IN UPPER CASE (except for the û ↓ ⇔⇒ arrow keys and remote ID command (^A) which are non-printable and use the control codes of ASCII).

A multiple command entry is only valid where specified. Where a multiple command entry is allowed, each command MUST be separated with a space "h20" (HEX DECIMAL). Each command is completed with a [CR] or [CR] [LF]. Although there is no local echo, either [CR] or specified response should come back from the receiver after confirming the correct command.

If no response has been gained after a short while, the receiver has failed to receive the command properly. Send a [CR] then re-send the command. Should problems persist, check your connections and try reducing the RS232 baud rate.

AR8200 remote indication

When the AR8200 has received a command via the RS232C port the receiver's LCD will display the o symbol. The AR8200 will appear frozen while RS232 operation is in progress. To return operation to the radio keyboard, PUSH (ENT) on the AR8200.

(6) Command index

- ^Α Remote ID
- Automatic Frequency Control AF
- AM Bandscope analyser
- AP Auto power off
- Search auto store AS
- AT Attenuator
- AU Auto mode
- ΒM Scan bank linking
- BΡ Search bank protect
- BS Search bank linking
- CF Bandscope centre frequency
- CN CTCSS operation
- DA Dial (VFO) audio squelch
- DB Dial (VFO) level squelch
- DC Bandscope date centre frequency
- DD Dial (VFO) delay
- DP Dial (VFO) pause
- DS Bandscope ****
- DT Display frequency (on/off)
- EX Exit RS232
- GA Select scan
- GD Release select scan channels
- GM Scan parameter selection
- GR Select scan recall
- GS Search parameter selection
- GV VFO status list
- LB LCD contrast
- LC Frequency & level status
- LM Signal meter reading
- LS Tone eliminator frequency (requires optional TE8200 slot card)
- MA List a block of memory channels
- MC Monitor control (forced squelch)
- Receive mode MD
- MF Bandscope set marker frequency
- MP Set memory channel pass
- MQ Delete memory channel or bank
- MR Memory recall
- MS Scan mode
- MW Memory bank resizing
- MX Memory write
- NL Noise limiter
- OF Frequency offset
- OL Set and list frequency offset
- OM Opening message
- PA Power save
- Protect memory channel PC
- PD Delete pass frequency
- PH Bandscope peak hold
- Ы Power save interval

- PP Priority channel
- PQ Wait time for LC2
- PR List pass frequencies
- PW Write search pass frequency
- QM Quick memory
- QP Power off
- QS Delete search bank
- RF Set receive frequency
- RX Respond with current data
- SA Search audio squelch
- SB Search level squelch
- SC Voice invertor frequency
- (requires the optional VI8200 slot card)
- Search hold / delay time SD
- SE Set search data SH Set offset step
- SI
- Voice invertor on/off (requires the optional VI8200 slot card)
- SL Lower search frequency limit
- SM Start select scan
- SP Search pause time
- SR Recall search parameters
- SS Start search
- ST Tuning step size
- SU Upper search frequency limit
- SW Bandscope span width
- TB Set text description for bank
- Set priority interval TΙ
- ТМ Memory text
- TS Text search
- TΤ Search bank text
- VA Set VFO A
- VB Set VFO B
- VF Select 1-VFO mode
- VL Beep volume
- VR Firmware version
- VS VFO search
- VT VFO auto-store
- VV VFO scan
- WM Write protect bank
- WP Write protect enable
- XA Scan audio squelch
- XB Scan level squelch

Tuning arrows

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- XD Memory scan delay time
- XM Mode scan XP Scan pause setting

UP/DOWN

(7) Detailed command listing for the AR8200

^A	Remote ID	Hex value 0x01 Accepts a value <i>nn</i> in the range 01-99
AF	AFC	To set: AF <i>n</i> <cr> <i>n</i>=0 (off), <i>n</i>=1 (on) To read: AF<cr> Response is AF<i>n</i> Note: Not valid in WFM, USB, LSB or CW</cr></cr>
AM	Bandscope Analyser Mode	AM <cr> starts bandscope mode AM<cr> repeated when in bandscope mode generates a report in the following format: AM PH0 CF0091000000 MF0091000000 SW1</cr></cr>
AP	Auto Power off	AP <i>nn</i> <cr> <i>nn</i>=00 (off) <i>nn</i>=05-95 (sets 0.5 - 9.5 hours to power off following last active transmission) To read: AP<cr> Responds with AP<i>n.n</i> (where <i>n.n</i> is the delay time in hours or 0.0 = off) Note: <i>nn</i> must be in multiples of 0.5 hours</cr></cr>
AS	Search auto-store on/off	To set: $ASn < CR >$ n=0 (off), n=1 (on - write frequency into bank J), n=2 (on - same as 1 but erase previous channels to create space for new entries), To read: $AS < CR >$ Response is either $n=0$ (off) or $n=1$ (on) Note: Stores into the search group nominated by GS
ΑΤ	Attenuator	To set: AT <i>n</i> <cr> <i>n</i>=0 (off), <i>n</i>=1 (on) To read: AT<cr> Response is AT<i>n</i>, where <i>n</i>=0 (off) or 1 (on)</cr></cr>
AU	Auto mode	To set: AU <i>n</i> <cr> <i>n</i>=0 (off), <i>n</i>=1 (on) To read: AU<cr> Response is AU<i>n</i> MD<i>m</i></cr></cr>
ВМ	Scan bank link setting	To read: BM <cr> Responds with: BM <i>nnnnnnnnnnnnnnnn</i>, where <i>n</i> = character corresponding to linked bank (A - J or a - j), or - (not linked) Example: BM-BCD indicates that banks B, C & D are linked To set: BM <i>nnnnnnnnnnnn</i>CR> Where <i>n</i> is a character which specifies a bank which will have its link status toggled (A - J or a - j). There is no need to enter a "-" to avoid changing a bank link BM%%<cr> clears all link settings BM%% <i>nnnnnnnnnnnnnn</i>CR> clears all links except those specified Examples: BM abc toggles the link status for banks a, b & c BM%% bc clears the link status for all banks except b & c <i>Note: As defined by GM</i>.</cr></cr>
BP	Search Bank Protect	To set: BP <i>n</i> <i>n</i> =0 (off), <i>n</i> =1 (on) To read: BP <cr> Response is BN<i>n</i></cr>
BS	Bank link search	To read: BS <cr> Responds with: BS <i>nnnn</i>, where <i>n</i> = character corresponding to linked bank, or - (not linked). The search bank indicators range from A - T and a - t (40 search banks in all) Example: BS-BCF-HIJRaeh-jnost Indicates that the banks shown are linked.</cr>

					To se Whe BS% BS%	et: BS <i>nnn</i> re <i>n</i> is a bar % <cr> cle %<i>nnnn</i><c< th=""><th>.<i>n</i><cr> nk indicate ars all linl CR> clears</cr></th><th>or in the range A settings all link settings</th><th>-T or a-t except those lis</th><th>sted</th></c<></cr>	. <i>n</i> <cr> nk indicate ars all linl CR> clears</cr>	or in the range A settings all link settings	-T or a-t except those lis	sted
					Exar BSA BS% <i>Note</i>	nples: BRabcmp<0 % BFT <cr e: As defined</cr 	CR> toggl > clears a d by GS.	es the link state Ill links except fo	for the banks sh or the banks B, F	nown ⁻ & T
CF		Bandscope centre frequency			To read: CF <cr> Responds with CF<i>nnnnnnnn</i> To set: CF<i>nnnnnnnn</i> CR> or CF<i>nn.nnn</i> Set the bandscope centre frequency to the specified frequency (expressed in Hz or MHz depending on format) Note: Maximum resolution is 10kHz for spans 10MHz - 500kHz; maximum resolution is 2kHz for spans 200kHz-100kHz. Frequencies below 2kHz are not accepted.</br></cr>					
CN		CTCSS operation		Requ To re Resp (a fre	Requires CT8200 option To read: CN <cr> Responds with CN<i>nn nn</i>=0 (off), <i>nn</i>=01 (auto), <i>nn</i>=06-37 (a frequency from the following table)</cr>					
	nn	freq	nn	freq	nn	freq	nn	freq		
	00	off	10	136.5	20	241.8	30	177.3		
	01	auto	11	141.3	21 22	250.3	31	183.5		
			12	146.2 151.4	22	67.0 71.9	32	196.6		
			14	156.7	24	74.4	34	199.5		
	06	Q/ 8	15 16	162.2 167.9	25 26	77.0 79.7	35 36	206.5		
	07	100.0	17	173.8	27	82.5	37	254.1		
	08	103.5	18	179.9	28	85.4				
	09 04	107.2 110 9	19 1 Δ	186.2 192.8	29 24	88.5 91 5				
	0B	114.8	1B	203.5	2B	97.4				
	0C	118.8	1C	210.7	2C	69.4				
	0D 0E	123.0	1D 1E	218.1 225.7	2D 2E	165.5				
	0F	131.8	1F	233.6	2F	171.3				
					To se	et: CN <i>nn</i> <c< th=""><th>R>, where</th><th>e <i>nn</i> is a two dig</th><th>it value from the</th><th>table</th></c<>	R>, where	e <i>nn</i> is a two dig	it value from the	table
DA		Dial (VFO) audio squelch		To se <i>nnn</i> = To re Resp	et: DA <i>nnn<</i> (:000 - 255 (ead: DA <cr ponds with E</cr 	CR> where 000 <> DA <i>nnn</i> or)=audio squelch DA+ <i>nnn</i> (+ = cu	off) Irrent audio sque	elch level >= <i>nnn</i>)	
DB		Dial (VFO) level squelch		To se <i>nnn</i> = To re Resp	et: DB <i>nnn<</i> 0 :000 - 255 (ead: DB <cr ponds with D</cr 	CR> where 000 > 0B <i>nnn</i> or)=level squelch DB+ <i>nnn</i> (+ = cu	off) ırrent level >= <i>nı</i>	nn)	
DC	Data centre Frequency		To re Resp Exar Note Note	ead: DC <cr oonds with E nple: DC00 e: Valid only e: Refer to th</cr 	R> DC nnn D0 when bai ne LM cor	ndscope is on nmand				
DD		Dial (VFO) delay			To set: DD <i>nn</i> <cr> Where <i>nn</i> = 00 - 99 or FF (indicating 0.0 - 99 seconds or FF=hold) To read: DD<cr> Responds with DD<i>n.n</i></cr></cr>					
DP		Dial (VFO)	pause		To so Whe To re Resp	et: DP <i>nn</i> <c re <i>nn</i> = 00 c ead: DP<cr ponds with E</cr </c 	R> or 01 - 60 S> DD <i>nn</i>	(indicating 1 - 60) seconds or off)

DS<CR>

Responds with wave form data from the bandscope. This is valid only when the bandscope is functioning. Data is output on completion of each sweep over the span, data is not continuous so response will not be instantaneous. Each datum is assigned a number totalling 1024 with 16HEX.

The minimum value of each datum is [2] and maximum [F] by 16HEX.

[0] = not measuring, out of span (not 10MHz or 200kHz span).

[1] = out of specification of receive frequency.

Note: When the span has been narrowed while measuring takes place, only the newly selected span range will be renewed with fresh data. Care must be taken when the marker frequency is replaced with the centre frequency. **Example** of data analysis response:

DS<CR>

DS

Note: Data is always sent 32 lines at a time.								
DS0031	:	23345F	96542	22222	33343	334332	22222	22
DS0063	:	2238B9	63222	55222	22333	322233	32233	32
DS0095	:	C86222	25522	24652	22222	235422	22222	22
~ ~		~	~	~	~	~	~	~
DS0863	:	222222	22333	43222	22224	142222	23332	22
DS0895	:	223222	24565	22222	2389 <i>1</i>	464223	33443	22
DS0927	:	222222	22248	A9632	22222	222498	35322	22
DS0959	:	2223AF	в7222	23322	22223	354222	22222	33
DS0991	:	222334	44332	22222	22333	322334	44322	33
DST023	:	222222	222222	22222	22222	222222	22222	22

Frequency is obtained from the data of the centre frequency. Even if the span is selected as 5MHz, 500kHz or 100kHz, the response is always based on 10MHz or 20kHz.

When the marker is moved, the data between the centre frequency and the new marker frequency will be renewed.

Frequency data is still obtainable from the centre frequency.

Note: When a centre frequency is entered, all figures (numbers) except the sweep range (upper and lower frequencies) will be void.

↓ centre frequency DS1023 : 2222222222483 224535AD83332142 ↑ centre frequency

There are 1000 pieces of data over a 10MHz span in 10kHz steps, plus 24 pieces in reserve.

Note: Data is sent continuously, either buffer memory is required or high speed processing is required in order not to miss data.

DS0543 : 345354339AFD9633 59564323433379AD DS0511 : 8634345443369642 2532423333458423 ↓ -10MHz DS0031 : 233459A65422222 3334334332222222

All figures are data number (marker frequency = centre frequency)

in inguiere and adda					
Span	10MHz	5MHz	2MHz	1MHz	50kHz
Upper frequency	1023	800	620	572	545
Centre frequency	512	512	512	512	512
Lower frequency	12	260	410	442	482
Each one represents	s 10kHz				

Span	200kHz	100kHz
Upper frequency	118	92
Centre frequency	64	64
Lower frequency	00	29
Each one represents	s 2kHz	

DT Display frequency text

To set: DT*n n*=0 (off), *n*=1 (on) *Note: Frequency display is blank when n*=1 To read: DT<CR> Response is DT*n*

EX Exit RS-232

EX<CR>

Terminates remote operation via the RS-232 and restores normal operation from the radio's front panel.

GA	Select Scan on/off	To set: GA <i>n</i> <cr> <i>n</i>=0 (off), <i>n</i>=1 (on)</cr>
GD	Release select scan channel	To set: GD <i>nn</i> <cr> <i>nn</i> = channel (00-49) To clear all memory select scan settings, use GD%%<cr> To read: GD<cr> Response is GD<i>nn</i> <i>Note:</i> A select scan channel number will be incremented each time select scan channel has been released. Confirmation is via the GR command</cr></cr></cr>
GM	Scan parameter selection/status	To set: GM <i>n</i> <cr> Tags the current memory with label <i>n</i> = 0 (fixed presets only) - 9 (user definable) To read: GM<cr> Example: GM GM0 XD2.0 XB 000 XA 000 XP00 XMF BM <i>Note: Refer to individual commands for details of each field.</i></cr></cr>
GR	Recall tagged channels for select scan	GR <cr> Lists selected channels from those available for select scan. Response is of the form: GR<i>nn</i> MX<i>mnn</i> RF<i>nnnnnnnnnn</i> ST<i>nnnnn</i> AU<i>n</i> MD<i>n</i> AT<i>n</i> TM<i>xxxxxxxxx</i> Note: Refer to individual commands for details of each field.</cr>
GS	Search parameter selection/status	To set: GS <i>n</i> <cr> Where <i>n</i>=0 (fixed presets only) - 9 (user definable) To read: GS<cr> Example: GS GS0 SD2.0 SB 000 SA 000 SP00 AS0 BS <i>Note: Refer to individual commands for details of each field.</i></cr></cr>
GV	VFO set list	To read: GV <cr> Reads current status of the VFO as a list of parameters Example: GV GV DD0.0 DB 000 DA 000 DP00 VT0 Note: Refer to individual commands for details of each field.</cr>
LB	LCD contrast	To set: LB <i>nn</i> <cr> <i>nn</i>=00 - 31 To read: LB<cr> Responds with LB<i>nn</i></cr></cr>
LC	Respond with frequency and level when squelch opens	To set: LCn <cr> n=0 (off), n=1 (on), n=2 (special mode) To read: LC<cr> Responds with LCn When active, data in the following format is returned when the squelch opens: LCnnn Vx RFnnnn or LCnnn SRx RFnnnn or LCnnn Mnxx RFnnnn When inactive, the radio returns LC data indicating the end of the transmission as follows: LC%nnn Vx or LC%nnn Vx or LC%nnn Vx I. Receive frequency and S-meter level are output when squelch opens (range of nnn reported by LC is 120-220 approx but varies from set to set)</cr></cr>

2. Response is made automatically every time squelch opens or closes and is

			affected by s 3. Special m output when pre-defined resolution sp 4. Signal lev AGC voltage Note: Refer	squelch parameters such as level and voice scan node (LC2) enables a continuous stream of frequency data to be squelch is open. This allows shift to next frequency after a delay specified by PQ in search/scan. This also allows for high pectrum analysis. vel values may be specified 000-255, but only 100-255 is used. The e is processed in 256 steps internally. to individual commands for details of each field.
LM	Respond wit reading	h S-meter	To read: LM Responds w where <i>nnn</i> =	<cr> ith a 256-level s-meter sample in hexadecimal, LM<i>mnnn,</i> : 128-256 and <i>m</i> is either " " (squelch open) or "%" (squelch closed)</cr>
LS	Tone elimina	ate frequency	Requires TE To set: LS <i>nr</i> The following	8200 option <i>nn</i> (000-255) (000=off) g mapping is used between <i>nnn</i> and tone frequency:
	Tone Freq	nnn	Tone Freq	nnn
	0.4 (kHz) 0.6 1.0 1.4 1.8 2.2	0-60 70-110 160-170 190-200 210-220 220-230	2.6 (kHz) 3.0 3.4 3.8 4.2 To read: LS- Responds w	230-235 237-240 240-245 245-248 248-250 <cr> ith LS <i>nnn</i> or LS+<i>nnn</i> (for mute on)</cr>
MA	List a block of channels	of ten memory	To read: MA Example: MA MXA00 MP0 MXA01 MP0 MXA02 MP0 MXA03 MP0 MXA04 MP0 MXA05 MP0 MXA06 MP0 MXA06 MP0 MXA08 MP0 MXA09 MP0 MXA09 MP0 Note: Refer	<cr> or MA<i>n</i><cr> (n= bank A-J or a-j) 0 RF0101100000 ST100000 AU0 MD0 AT0 TM 0 RF0460900000 ST010000 AU0 MD1 AT0 TMTest 2 0 RF0085900000 ST100000 AU0 MD0 AT0 TMTest 3 0 RF0085900000 ST020000 AU0 MD1 AT0 TMTest 4 0 RF0085900000 ST020000 AU0 MD6 AT0 TMTest 5 0 RF0085900000 ST020000 AU0 MD7 AT0 TMTest 6 0 RF0085900000 ST020000 AU0 MD2 AT0 TMTest 7 0 RF0085900000 ST010000 AU0 MD8 AT0 TMTest 8 0 RF0085900000 ST000050 AU0 MD4 AT0 TMTest 9 0 RF0085900000 ST000050 AU0 MD3 AT0 TMTest 10 to individual commands for details of each field.</cr></cr>
MC	Monitor Con	trol	To set: MC <i>n</i> 0 1 2	<cr> normal squelch operation squelch forced closed squelch forced open</cr>
MD	Receive mod	de	To set: MD <i>n</i> 0 1 2 3 4 5 6 7 8 To read: MD Responds w	<cr> WFM NFM AM USB LSB CW SFM WAM NAM V<cr> ith mode value as above</cr></cr>
MF	Set Marker F	Frequency	To read: MF Responds w To set: MF <i>n</i> . Set the band (expressed i Note: Maxim resolution is	<cr> with MF<i>nnnnnnnnnnnnnnnnnnnnnnnnnnnnnnnnn</i> dscope marker frequency to the specified frequency n Hz or MHz depending on format) num resolution is 10kHz for spans 10MHz - 500kHz; maximum 2kHz for spans 200kHz-100kHz</cr>

MP	Set memory channel as pass	To set: MP <i>n</i> <cr> <i>n</i> = 0 (pass off), <i>n</i> = 1 (pass on)</cr>
		To read: MP <cr> (when in memory read mode) <i>Note:</i> Setting pass on a memory channel excludes it from scans <i>Note:</i> "?" is returned when not in M.RD mode</cr>
MQ	Delete bank or memory channel	MQ <cr> Deletes the current memory channel (when in memory recall mode) MQ<i>nn</i><cr> Deletes memory channel <i>nn</i> MQ<i>x</i>%%<cr> Deletes all memory channels from bank <i>x</i>. Note: Responds with "?" when a memory channel is protected. Refer to PC, WM and WP commands</cr></cr></cr>
MR	Recall memory channel	MR <i>xnn</i> <cr> recalls memory channel <i>nn</i> from bank <i>x</i> (A-J or a-j) To read the current memory channel: MR<cr> Note: Responds with "?" if the channel is blank</cr></cr>
MS	Scan mode	MS <cr> Starts scan using the current memory bank MS<i>x</i><cr> Starts scan using memory bank <i>x</i> (A-J or a-j) <i>Note:</i> to scan and report active frequencies, see LC command <i>Note:</i> Responds with "?" if the channel is blank</cr></cr>
MW	Memory Bank resizing	MW <i>xnn</i> <cr> Sets number of channels in bank <i>x</i> to <i>nn</i> (where <i>nn</i>=10-90) MW<i>x</i><cr> Responds with the current allocation for bank <i>x</i>: MW <i>x:nn y:mm</i> Example: MWA MW A:50 a:50 MW%%<cr> or MW<cr> Responds with a list of 10 allocations Example: MW%% MW A:50 TBAAOR Test MW%% MW a:50 TBAAOR Test MW b:50 TBBAOR Test MW b:50 TBbaer band MW C:50 TBCham call MW c:50 TBCham call MW c:50 TBDrepeater MW d:50 TBDrepeater MW d:50 TBAARINEch MW c:50 TBEMARINEch</cr></cr></cr></cr>
		 Notes: This feature allows the size of memory banks to be changed in size from 10 to 90 channels. Note, the total number of channels allocated to each bank pair (upper and lower case) remains 100 channels (ie size of A + size of a = 100). It takes a significant amount of time to execute this command. Do not attempt to send another command until the radio responds with a <cr>.</cr> When the size of a bank is changed, any channels that are allocated from the smaller bank to the larger are erased (ie setting bank B to 80 channels and b to 20 channels, then resetting B to 30 channels will cause the last 50 channels of B to be erased)
MX	Write data to memory	MXxnn RFnnnnnnnn AUn STnnnnn MDn ATn TMxxxxxx <cr> Writes data of the format shown into memory channel <i>nn</i> in bank <i>x</i> Fields are separated by a space. TM permits a 12-character alphanumeric ASCII comment Automode will be selected if any fields are skipped <i>but</i> MX, RF & TM cannot be skipped. (MX cannot be sent on its own). <i>Note:</i> Refer to the individual commands for further details <i>Note:</i> Do not use while scanning or searching.</cr>

NL	Noise Limiter	To set: NL n <cr> n = 0 (off), $n = 1$ (on) To read: NL<cr> Response is NLn</cr></cr>
OF	Select offset frequency	 OF<i>nnx</i><cr></cr> Selects offset frequency at index <i>nn</i> (00-47, 00=off) and defines offset to be <i>x</i> (+/-) OF<cr></cr> Returns with the current offset frequency data as follows: OF <i>mmx</i> RF <i>Onnnnnn00</i> (where <i>mm</i> is the offset index value and <i>x</i> is + or -) <i>Notes:</i> 1. OF can be used on its own or with MX and SE 2. Allows access to a table of offset frequencies defined by OL 3. Automode operation is switched off when an offset frequency is entered 4. The offset frequency range is 0.1 -999.99 MHz 5. Index 00 specifies offset operation off 6. Indexes 20-47 are reserved for automode and cannot be altered
OL	Set and list offset frequencies	OL <cr> Lists ten offset frequencies from the table OL<i>mm</i><cr> Lists ten offset frequencies starting from index <i>mm</i> (00-47) Format of listing is: OL<i>mm</i> RF0nnnnnn00<cr> OL<i>mm</i> 0nnnnnn00<cr> Specifies the stated offset frequency for offset mm Note: See notes for OF</cr></cr></cr></cr>
ОМ	Opening message	To set: OM <i>n</i> <cr> Where: <i>n</i>=0 display the standard default message <i>n</i>=1 display no opening message <i>n</i>=2 display a custom 48-character message defined as follows: OM2 <i>xxxx</i></cr>
ΡΑ	Set delay for power save mode	To set: PA <i>nn</i> <cr> Sets the power save delay time in seconds (<i>nn</i> = 01-99, 00=off) To read: PA<cr> Responds with PA<i>nn</i> (<i>nn</i> = current value in seconds) Note: used on conjunction with PI command</cr></cr>
PC	Protect memory channel	To set: $PCn < CR >$ n = 0 (off), $n = 1$ (on) PC% < CR > Turns off protection on all channels in the current bank. To read: $PC < CR >$ Response is PCn Note: Use WM command to protect a bank
PD	Delete pass frequency	PD <i>xnn</i> <cr> Deletes pass frequency <i>nn</i> (00-49) in search bank <i>x</i> (A-T or a-t) PD<i>x</i>%%<cr> Deletes all pass channels in bank <i>x</i> (A-T or a-t) Note: The list of pass frequencies is shifted down each time a channel is deleted</cr></cr>
PH	Bandscope Peak Hold	To set: PH n <cr> n = 0 (off), $n = 1$ (on) To read: PH<cr> Response is PHn</cr></cr>
PI	Set interval time for power save mode	To set: PI <i>nm</i> <cr> Sets interval time in seconds (<i>n</i>=1-9, <i>m</i>=0/5) Example: PI<i>15</i><cr> Sets power save interval to 1.5 seconds To read: PI<cr> Responds with PI<i>n.n</i> (<i>n.n</i>= current interval value in seconds) <i>Note:</i> used on conjunction with PA command</cr></cr></cr>

PP	Set priority channel	To set: PP <i>xnn</i> <cr> Selects channel <i>xnn</i> as the priority channel, where x is a bank A-J or a-j and nn is a channel number To read: PP<cr> Responds with PP<i>xnn</i></cr></cr>
PQ	Wait time for LC2	To set: PQnn <cr> Sets time nn (00-99 corresponding to 000-990 mS in steps of 10 mS) To read: PQ<cr> Responds with PQnnn (000-999 mS) <i>Note: This wait time is used as a buffer.</i></cr></cr>
PR	List pass frequencies	PR <i>xnn</i> <cr> Lists the pass frequency stored in pass channel nn of bank <i>x</i> (A-T, a-t or V) PR<i>x</i><cr> Lists all pass frequencies for bank <i>x</i> (A-T, or a-t, V = VFO) PR<cr> Lists all pass frequencies in the current bank (or the VFO)??? Responds with: PR<i>xnn</i> fffffffff Where <i>x</i> = bank, <i>nn</i> = channel, ffffffffff = frequency (in Hz) Example: PR PRV00 0147455000 PRV01</cr></cr></cr>
PW	Write search pass frequency	PW <cr> Write the current frequency to the next available pass channel PW<i>x</i><cr> Write the current frequency to the next available channel in bank <i>x</i> (A-T, a-t or V=VFO) PW<i>nnnnnnnn</i><cr> or PS<i>nnnn.nn</i><cr> Adds the frequency <i>nnnnnnnnn</i> (in Hz) or <i>nnnn.nn</i> (in MHz) to the next available pass channel PW<i>xnnnnnnnnn</i><cr> or PS<i>xnnnn.nn</i><cr> Adds the frequency <i>nnnnnnnnn</i> (in Hz) or <i>nnnn.nn</i> (in MHz) to the next available pass channel</cr></cr></cr></cr></cr></cr>
QM	Quick Memo	To Read: QM <cr> Responds with ten quick memory frequencies stored within the radio in for the format: QM QM0 RF0086450000 QM1 RF0087310000 QM2 RF0087310000 QM3 RF000950000 QM3 RF000950000 QM4 RF000750000 QM5 RF0087320000 QM6 RF0087320000 QM7 RF0087320000 QM8 RF0087320000 QM9 RF0087320000 Mote: This command is read only</cr>
QP	Power Off	QP <cr> Turns off power to the AR-8200 <i>Note: there is no way to turn it on again via RS-232</i></cr>
QS	Delete search bank	QSx <cr> Delete search bank x=A-T or a-t</cr>
RF	Set frequency	RF <i>nnnnnnm0</i> <cr> Tune to the specified frequency (expressed in Hz) RF<i>nnn.nnnm</i><cr> Tune to the specified frequency (expressed in MHz) <i>m</i> must either be '5' (for 50Hz) or '0'. Any other digit is ignored. Note: Frequencies below 3.0MHz are specified in kHz</cr></cr>

RX	Respo	nd with curren	t data		RX <cr> Recalls current operating parameters in the following formats</cr>
					VFO mode VF RF <i>nnnnnnnn</i> ST <i>nnnnn</i> AU <i>n</i> MD <i>n</i> AT <i>n</i>
					2-VFO mode V <i>x</i> RF <i>nnnnnnnn</i> ST <i>nnnnn</i> AU <i>n</i> MD <i>n</i> AT <i>n</i>
					VFO search mode VS V <i>x</i> RF <i>nnnnnnnn</i> ST <i>nnnnnn</i> AU <i>n</i> MD <i>n</i> AT <i>n</i>
					VFO scan mode VV V <i>x</i> RF <i>nnnnnnnnn</i> ST <i>nnnnnn</i> AU <i>n</i> MD <i>n</i> AT <i>n</i>
					Memory manual mode MR MX <i>xnn</i> MPn RF <i>nnnnnnnnn</i> ST <i>nnnnnn</i> AU <i>n</i> MD <i>n</i> AT <i>n</i> TM <i>xxxx</i>
					Scan mode MS MX <i>xnn</i> MP <i>n</i> RF <i>nnnnnnnnn</i> ST <i>nnnnnn</i> AU <i>n</i> MD <i>n</i> AT <i>n</i> TM <i>xxxx</i>
					Select scan mode SM MX <i>xnn</i> MP <i>n</i> RF <i>nnnnnnnnn</i> ST <i>nnnnnn</i> AU <i>n</i> MD <i>n</i> AT <i>n</i> TM <i>xxxx</i>
					Search mode SR <i>x</i> RF <i>nnnnnnn</i> ST <i>nnnnn</i> AU <i>n</i> MD <i>n</i> AT <i>n</i> TT <i>xxxx</i> Note: Refer to individual commands for details of each field.
SA	Search Audio				To set: SA <i>nnn</i> <cr> <i>nnn</i> = 0 (audio search off), <i>nnn</i> = 001-255 (level value) To read: SA<cr> Responds with SA <i>nnn</i> or SA+<i>nnn</i> (current voice level >= <i>nnn</i>) <i>Note:</i> Applies to search group specified by GS <i>Note:</i> Search will resume when signal strength drops below pre-set level and delay time set by SD has elapsed.</cr></cr>
SB	Search level squelch				To set: SB <i>nnn</i> <cr> <i>nnn</i> = 0 (level search off), <i>nnn</i> = 001-255 (audio search value) To read: SB<cr> Responds with SB <i>nnn</i> or SB+<i>nnn</i> (current level >= <i>nnn</i>)</cr></cr>
SC	Change voice invertor frequency			iency	Note: Requires VI8200 To Set: SC <i>nnn</i> <cr> Where <i>nnn</i> (000-156) defines the voice inversion frequency from the following conversion table:</cr>
	nnn 0 86 128 154	Freq 2.4k 3.6k 4.8k 6.0k	nnn 37 102 138 156	Freq 2.8k 4.0k 5.2k 6.15k	nnn Freq 64 3.2k 116 4.4k 146 5.6k To Read: SC <cr> Responds with: SCnnn</cr>
SD	Set hold/delay time in search mode				To set: SD <i>nn</i> <cr> where 01-99 Delay in 1/10ths of a second FF hold 00 delay off To read: SD<cr> Responds with SD<i>n.n</i>, as above Note: Writes to the search group as specified by 'GS', you cannot write to search group 0.</cr></cr>
SE	Set search data				SEx SLnnnnnnnn SUnnnnnnnn AUn STnnnnn MDn ATn TTxxxx Sets search parameters for search bank x=A-T or a-t TT permits a 12-character alphanumeric ASCII comment to be specified Parameters ST, MD, AT, TT are all optional and need only be specifies if required. Note: Refer to the individual commands for further details

SH	Set offset step	To set: SH <i>nnnm0</i> <cr> Set the tuning step size in Hz To set: SH<i>nnn.nm</i><cr> Set the tuning step size in kHz SH+<i>nnnm0</i>, SH+<i>nnn.nm</i> or SH+ turns on step adjust <i>m</i> is either 0 or 5 To read: SH<cr> Responds with value, format: SH<i>nnnm0x</i> (<i>x</i>=+ step adjust on)</cr></cr></cr>
SI	Voice Invertor on/off	Note: Requires VI8200 To Set: SI <i>n</i> <cr> <i>n</i>=0 (off), <i>n</i>=1 (on) To read: SI<cr> Responds with SI<i>n</i> SC<i>nnn</i> Example: <i>SI1w SC051</i> when the invertor value is 051 Note: Refer to individual commands for details of each field.</cr></cr>
SL	Lower search frequency limit	See RF command for format of frequency
SM	Start select scan	SM <cr> Starts select scan using the parameters selected Note: Up to 100 select scan channels</cr>
SP	Search pause time setting	To set: SP <i>nn</i> <cr> where, $nn = 01 - 99$ seconds free search time, $nn = 00$ pause off To read: SP<cr> Returns with SP<i>nn</i> (as above) Note: Applies to the search group set by 'GS'.</cr></cr>
SR	Recall search parameters	SR <cr> Recalls the currently selected search bank SR<i>x</i><cr> where <i>x</i> = A-T or a-t Recalls search bank <i>x</i> SR%%<cr> Responds with a listing of all search banks A-J Responds with: SR<i>x</i> SL<i>nnnnnnnnn</i> SU<i>nnnnnnnn</i> ST<i>nnnnnn</i> AU<i>n</i> MD<i>n</i> TT<i>xxxx</i> or SRR for a blank bank Note: Refer to the individual commands for further details</cr></cr></cr>
SS	Start search	SS <cr> Start searching using the current search bank SS<i>x</i><cr> Start searching using the parameters stored in search bank <i>x</i> (A-T or a-t)</cr></cr>
ST	Tuning step size	To set: ST <i>nnnnm</i> 0 <cr> Set the tuning step size in Hz To set: ST<i>nnn.nm</i><cr> Set the tuning step size in kHz ST+<i>nnnm</i>0, ST+<i>nnn.nm</i> or ST+ turns on step adjust To read: ST<cr> Responds with value, format: ST<i>nnnnm</i>0x (<i>x</i>=+ step adjust on)</cr></cr></cr>
SU	Upper search frequency limit	See RF command for format of frequency
sw	Bandscope Span Width	To set: SW n <cr> Where $n = 1 - 7$ as follows: 1 10.0MHz 2 5.0MHz 3 2.0MHz 4 1.0MHz 5 500kHz 6 200kHz 7 100kHz To read: SW<cr> Responds with SWn (where n has a value as above)</cr></cr>

ТВ	Set Text Description for Bank	To set: TB <i>nxxxxxx</i> <cr> Sets the text for bank <i>n</i> (A-J or a-j) to be the 8-character ASCII comment specified TB<cr> or TB%%<cr> Responds with a complete listing of the comments for each bank in the following form:</cr></cr></cr>
		TB MW A:50 TBAAOR Test MW a:50 TBa MW B:50 TBBAOR
		MW b:50 TBb
		MW C:10 TBCAOR Test
		MW 0.50 TBDAOR Test
		MW d:50 TBd
		MW E:50 TBE
		MW e:50 TBe
		IBX <cr> Responds with the text for bank x in the following format:</cr>
		TBA
		TBAAOR Test
ті	Set priority interval	To set: TInn <cr></cr>
		Sets priority interval <i>nn</i> (01-19) in seconds
		To read: TI <cr></cr>
		Responds with 1 Dnn (nn is current priority interval value expressed in seconds)
ТМ	Memory Text	To write: TM <i>xxxx</i> <cr></cr>
		Where xxxx is a 12-character ASCII text comment Note: See TT command.
тѕ	Text Search	TS <i>xxxx</i> <cr></cr>
		Searches for the specified text in a memory channel
		Where <i>xxxx</i> is a minimum of 2 characters and a maximum of 11 characters of
		Note: The more characters specified the faster the search
		Note: When the text search has completed, <cr> is returned</cr>
		<i>Note:</i> When the RX <cr> command is issued with TS, the relative bank and</cr>
		channel number will be shown
тт	Search Bank Text	To set: TT <i>xxxx</i> <cr></cr>
		Where xxxx is a 12-character ASCII text comment
		Note: See SE command
VA/VB	Set VFO A - B	To set: V <i>xnnnnnnnm0</i> <cr> (in Hz) or V<i>xnnnn.nnnnm</i><cr> (in MHz)</cr></cr>
		Where: <i>x</i> is A or B for VFO A or B, frequency data is expressed in the format
		used by the RF command
		Selects VFO x (A or B), there is no data returned from the radio
VE	Select 1-1/EO mode	
VF	Select I-VFO mode	
VL	Beep volume level	To set: $VLn < CR >$
		where, $h = 0 - 9$ (0=01) To read: VI <cr></cr>
		Responds with VLn as above
VR	Firmware Version	To read: VR <cr></cr>
		Responds with data of the form:
		VR
		VR0101
VS		VFO search
		VS <cr></cr>
		Starts a VEO based search with limits defined by the frequencies in VFO A & B

VT	VFO auto-store	To set: VT <i>n</i> <cr> Where <i>n</i> is defined as follows: 0 Off 1 On, Auto-store to bank J</cr>
		2 On, erase bank J To read: VT <cr></cr>
		Responds with VTn as above
		Note: VT2 response is equivalent to VT1
vv	VFO Scan	To set: VV <i>n</i> <cr> Where <i>n</i>=0 (2-VFO mode) or <i>n</i>=1 (VFO scan mode)</cr>
WM	Write Protect Bank	To set: WM <i>xn</i> <cr> Where <i>x</i> is bank (A-J or a-j) and <i>n</i>=0 (protect off), <i>n</i>=1 (protect on) To read: WM<cr> or WM%%<cr> Responds with a listing of 10 banks starting from the last queried bank. Example: WM WM F0 WM F0 WM f0 WM f0 WM g0 WM H0 WM h0 WM h0 WM I0 WM I0 WM I0</cr></cr></cr>
		WM jo
WP	Write protect enable	To set: WP <i>n</i> <cr> Where <i>n</i>=0 (disabled) or n=1 (enabled) To read: WP<cr> Responds with WP<i>n</i> as above</cr></cr>
ХА	Audio scan setting	To set: XA <i>nnn</i> <cr> Where, <i>nnn</i> = 000 (audio scan off), <i>nnn</i> = 001-255 (audio scan value) To read: XA<cr> Responds with XA <i>nnn</i> or XA+<i>nnn</i> (if current voice level >= <i>nnn</i>) <i>Note:</i> Applies to the scan group set by 'GM'.</cr></cr>
ХВ	Level scan setting	To set: XB <i>nnn</i> <cr> Where, <i>nnn</i> = 0 (level scan off), <i>nnn</i> = 001-255 (level scan value) To read: XB<cr> Responds with XB <i>nnn</i> or XB+<i>nnn</i> (if current level >= <i>nnn</i>) <i>Note:</i> Applies to the scan group set by 'GM'.</cr></cr>
XD	Memory scan delay time	To set: XD <i>nn</i> <cr> <i>nn</i>=00 (off) or <i>nn</i> = 01 - 99 representing 100ms increments (0.1 - 9.9s) To read: XD<cr> Responds with XD<i>n.n</i> as above</cr></cr>
ХМ	Mode scan	To set: XMn <cr></cr>
		0 WFM 1 NFM 2 AM 3 USB 4 LSB 5 CW 6 SFM 7 WFM 8 NAM F All mode
		I o read: XM <cr> Responds with XM<i>n</i> as above</cr>
ХР	Free scap pause setting	To set: XPan-CR>
АГ	i iee soari pause selling	00 pause off 01-99 pause time in seconds
		or-oo pause line in seconds
		To read: XP <cr> Responds with XP<i>nn</i> as above</cr>

Up/Down	Increment
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n < CR >where *n* is a binary byte value as follows $\Rightarrow 0x1c$

0x1d

 \Diamond

企

- 0x1e
- ↓ 0x1f

(8) AOR PC Windows control software & bandplan editing

A dedicated *PC Windows* package is supplied on CD-ROM with the CC8200 lead, it is also available as a FREE download from the AOR web site **WWW.AORJA.COM**

It is recommended that the AOR software be used should you wish to **edit the automode bandplan data**. The protocol information for bandplan has not been included in the CC8200 command listing as errors written to the Flash-ROM could potentially cause operational problems.

IMPORTANT: When editing the bandplan, the following points must be observed:

(CC8200 Essential tips you should know before editing the auto-mode)

• Every offset frequency within the auto-mode data is allocated with the specific offset table number. These numbers are used for editing the auto-mode data. Therefore you are required to obtain the offset table data prior to commencing the edit. (Get from AR8200)

After starting the program, select {File} {New} {Auto Mode File}, select {Edit} {Add Item} or {Modify Item}, and click {Edit offset table}. Click {Get} followed by {X} to exit. Then select {Get from RX} to download the offset table data.

The offset table must be renewed by pressing the {Send} in the {Edit offset table} each time the offset frequency has been deleted/added.

• The auto-mode data is an important ingredient which is vital to the CPU brain work of the AR8200! Any incorrect data which may have been introduced in the course of editing will affect the operation of the receiver.

1. Always allocate the change-over frequencies from lower to higher in order. A change-over frequency will work as cut-off frequency to separate the different receive mode, step size, etc used from one segment of auto-mode to another. Therefore if the change-over frequencies have been written high and low at random the AR8200's CPU is unable to find the change-over frequency required. Unless this condition is met you are unable to edit the auto-mode data correctly.

2. A change-over frequency must be divisible by the step size of both ends (must be an even number without decimal point). If not divisible, the change-over frequency will be forced to move (migrate) in an unstable manner every time the receiver is tuned over the change-over frequency up and down.

Ignore the step-adjust frequency when the step-adjust is applied.

Where non-divisible change-over frequency is unavoidable use a stop gap method as shown below:-

Frequency	Step size	Description
459.500	25	Lower change-over frequency
462.475	5	Adjusted change-over frequency
462.480	240	Desired change-over frequency and step size
464.880	20	Adjusted change-over frequency
464.900	12.5	Desired change-over frequency and step size

Such adjusted change-over frequencies may be found within the factory auto-mode data.

3. Make sure you reset the CPU.

Unplug the external power and remove a battery cell to allow the CPU to reset. This is required to force the flag within the CPU and the contents of the flash ROM to become consistent/identical. Without the CPU reset some malfunctions may be encountered.

4. Rewriting the memory

Old memory channel data such as frequency, receive mode, step size (prior to editing) may still be found valid in some memory channels. This will cause conflict between new auto-mode data and old memory channel data. Rewrite the memory channels using the new auto-mode to resolve such conflict.

Installing the software

To install the AOR software run the INSTALL.EXE program from the CD-ROM (*x*:\English\CC8200\cont-soft\install.exe where 'x' is your CD-ROM drive letter). If installing from a web download, expand the ZIP file into a temporary directory on your hard drive then run the INSTALL.EXE

A directory will be created on your hard drive along with a program group from the START/PROGRAMS button of the desktop.

This software package will also provide additional facilities such as memory channel & search bank editing, spectrum display and a record-to-disk sound utility.

(9) Acknowledgements

This manual has been compiled by AOR UK LTD using materials supplied by AOR Japan. The original compilation was by Simon Collings G4SGI whom we wish to thank.

The software package was created for AOR LTD by Simon Collings G4SGI.

Thanks to AOR LTD, AOR UK LTD, Javiation and Simon Collings for final beta-testing of the software.

All trade marks acknowledged (such as Microsoft, Windows, IBM etc).

Please refer to the AOR web site for updates on this file and the AR8200 Windows PC software.

(10) Contact details

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CC8200 - AR8200 REMOTE CONTROL

Thank you for purchasing the CC8200.

This CD-ROM is supplied with the CC8200 and contains the following data in both Japanese and English languages. Should you wish to use English language, please select the files under <ENGLISH>, should you wish to use Japanese language, please select the files under <JAPANESE>.



Regarding the AR8200 control software

Please ensure prior to operating the control software that you understand and accept the following conditions:-

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