AR8200 Bulletin Page

AR8200 stuck slot card

To remove the slot card;

The lever on the side of the set can be very stiff. If this really won't release the slot card, then the case halves will have to be separated.

To do this, remove all the case screws (3 long screws on rear case, 2 long in battery compartment and 2 short on side of set).

Carefully pull the case halves apart making sure that the side switch panel stays with the front case half and that the inter board ribbon cables are not strained.

The slot card fits underneath the power supply PCB, so remove this by releasing the two screws at the front of this board.

Next, simply pull the slot card from the connector.

While inside the set have a look why the slot card wont release. Possibility due to the release lever screw being too tight, slot card forced in reverse (if that's possible).

Re-build the set in the reverse order to the above taking care to ensure that the battery terminals are positioned between the plastic lugs and the contact plates on the board. Also make sure that the slot card door is in position and the slide door on the top of the set hasn't fallen out.

Now make sure that the set still works (especially from the batteries).

AR8200 battery terminals

If having inspected the inside of the AR8200 (Series-1 or Series-2), you then find that the receiver will not operate from internal batteries or change, there may be a poor connection to the battery terminal... this equally applies if the receiver is subjected to a large mechanical shock. Effectively battery operation has been lost although the set works normally from external power. The problem is most probably due to loss of contact between the battery terminals and the power supply PCB.

The top positive and bottom negative terminals form the feed from the battery compartment through to the power supply board.

When the set is assembled, these two terminals are designed to run along two channels on the side of the front case and then be trapped between metal contacts on the power supply PCB and

two plastic saddles on the rear case moulding.

If the rear cover is removed for whatever reason or the battery terminal pulled or pushed quite hard, it is possible to displace one or both of these battery terminals from its seat.

Restoration of normal operation is quite simple.

In short, split the case halves and re-assemble then with the battery terminals correctly positioned.

To do this, remove the case screws (5 x long and 2 x short screws).

Carefully pull the case halves apart. The side keys should stay with the front panel. Take care not to let the two halves fly apart as this will damage the joining ribbon cables.

Before re-assembling, re-position the offending battery terminals back to their correct places.

Push the case halves back together taking care that the battery terminals run along the channels in the top case (these are visible as the case halves are pushed together).

It is just possible to see that the terminals remain seated until the case halves are more or less together.

The only other points to watch are that the slide cover on the top panel and the slot card cover on the bottom remain in their correct positions.

It is possible to hold the earphone rubber cover open with the left hand and accessory rubber cover open with the right hand as the case halves are pushed together to keep them out of the way.

Re-fit the case screws and test the set.

Note; It is possible to solder the battery terminals to the board contacts. This makes a good solution, but does involve a bit of thought and some careful positioning and soldering of the battery terminals. It also involves a small amount of re-shaping of the retaining saddles.

Only try this if you have a steady hand and are used to working on small equipment.

AR8200 charging problems

If you encounter problems charging the AR8200 or the batteries do not appear to last as long as expected (better then 3 to 4 hours AR8200, up to 6 hours use with 1000mAhr cells AR8200-2), the following points may be worth checking.

Note, if you are using Nickel Metal Hydride batteries (NiMH), take a look at the bulletin

relating.

The AR8200 may be suffering from high resistance contacts on the power socket, or the switching function of the socket is faulty - resulting in the series current limit resistor (used for charging) being in circuit all the time.

Measure the resistance between the NEGATIVE battery contact and a suitable earth point of the receiver (such as the outer of the BNC aerial socket). The resistance should me more or less a short circuit, in practical terms this means around 1 OHM. If higher than 1 OHM, there will be reduced battery life. If you measure 6.8 OHMS, this indicates that the battery contacts are open circuit and the resistor is in circuit... replace the DC socket.

Other possibilities include high resistance battery contacts, check them and ensure that they are correctly seated.

If externally charging the batteries from a separate unit and the problem persists, there may be a problem with the charging
circuit of the AR8200, such as a burnt limit resistor. Poor battery contacts (contaminated) or a poor contact between the battery terminal and the PCB can also cause problems... we have experienced battery terminals shorted to the accessory socket in the past. Also check the DC socket for fractured solder joints.

Remember that the power save SWITCHES THE RECEIVE CIRCUIT OFF when in the save cycle!

Signal meter full scale & corrupt system data - STRANGE BEHAVIOUR

It is possible under exceptional conditions (power loss during EEPROM write) that the signal meter of the AR8200 may become full scale even in the absence of a signal. While this does not affect normal operation of the receiver, loss of signal indication is a nuisance and renders the bandscope facility unusable. **This is thought to affect firmware 98xxxx, 99xxxx is not thought to experience s-meter calibration corruption. This information relates to the AR8200 Series-1 only, do not use this information for the AR8200 Series-2.**

It is generally possible to reinstate the signal meter calibration data (which has been blanked) via computer control using Windows HyperTerminal.

2) After setting up HyperTerminal, confirm that you have valid communications. Try a command like 'VA' or 'MA' and make sure that the radio sends data back to you and that it is displayed in HyperTerminal.

3) Connect your external power supply (or suitable charger capable of running the radio) and REMOVE the batteries from the 8200.

4) Power on the radio and start HyperTerminal. In the following lines, ignore the " " quote mark symbols, just type exactly what is contained within them.

5) In HyperTerminal type "AR82" the press [ENTER]

6) Next type "DMEE0F" (0 is zero) then press [ENTER]

7) The ar8200 should respond with a list of data, check the first line which will probably look like this:

EE0F:00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

This s-meter calibration data is wrong (blank), this causes the problem.

8) Next in HyperTerminal type:

"MMEE0F DADAC8BFBAB5B0ABA6A19C97918A8278" then press [ENTER]

9) Re-check the data you just stored by retyping "DMEE0F" then press [ENTER]

The data should now display what you keyed in replacing all the zeros!

10) Remove the power connector so your ar8200 will be switched off. Do NOT use the PWR button of the AR8200 to switch off the radio, this is VERY IMPORTANT.

11) Wait 15 seconds then re-connect power again.

12) Test the radio, the signal meter should now be working again.

End.

Corrupt data AR8200 Series-1 and Series-2 (also applies to AR8600)

If your AR8200 is behaving strangely such as locking up or powering down unexpectedly, it may be suffering from corrupt data (programmable data or system data or both) due to a power glitch (a.c. supply interruption, battery low etc).

The corruption can affect the search bank, memory bank (or channel) or indexes such as pass list of select scan list. Instead of the data reading (for example) **123.450 MHz**, it will attempt to read **123.zv0 MHz**... as the corrupt data
is not recognised, it caused the AR8200 to 'crash' - like a computer program.

- Try deleting & over-writing search banks, pass lists, select scan lists etc.

If the problem persists, it may require the system data to be refreshed using a modified version of the EM8200 external memory card (which allows system data to be written). If you already have an EM8200 card, your supplier may be able to arrange for the EM8200 to be modified and loaded with default data (so the recovery procedure will be just a couple of key presses). ***Please***

contact your supplier if you are unable to progress the matter.

AR8200 Receive Signal Strength Indication (RSSI)

The following tables are taken from various AR8200s and are intended as an indication of levels that can be expected and should not be taken as absolute. The levels will vary for each set.

The first table of figures are for the S meter reading (presented as BLOCKS) relative to RF input signal. The meter is divided into seven stepped blocks each of which divide into two.

The second table of figures are the S meter (AGC) response relative to RF input signal plotted from -120dBm to +10dBm which the set gives when a LM command is given from a PC under Windows Hyper-terminal control. These figures have been taken using an FM (carrier not deviated) at 145MHz.

AR8200 Series-1 (green cabinet) - early production

Signal meter	input signal dBm	equivalent signal in uV
½ block	-117	0.32
1 block	-113	0.50
1½ block	-110	0.71
2 block	-107	1.00
2½ block	-105	1.26
3 block	-102	1.78
3½ block	-100	2.24
4 block	-97	3.16
4½ block	-95	3.98
5 block	-92	5.62
5½ block	-88	8.90
6 block	-84	14.10
6½ block	-80	22.40
7 block	-69	79.3

input signal dBm	equivalent signal in uV	LM response
-120	0.22	115
-115	0.40	126
-110	0.71	140
-105	1.26	151
-100	2.24	162
-95	3.98	171
-90	7.07	179
-80	22.40	191
-70	70.70	200
-60	224.0	205
-50	707.0	210
-40	2.24mV (2240.0)	213
-30	7.07mV	215
-20	22.4mV	217
-10	70.7mV	218
0	224mV	219

input	equivalent	
+10	707mV	219

AR8200 Series-1 (green cabinet) - late production

Signal meter	input signal dBm	equivalent signal in uV
½ block	-105	1.26
1 block	-102	1.78
1½ block	-99	2.52
2 block	-97	3.17
2½ block	-94	4.48
3 block	-93	5.03
3½ block	-91	6.33
4 block	-88	8.94
4½ block	-86	11.30
5 block	-84	14.20
5½ block	-81	20.00
6 block	-78	28.30
6½ block	-74	44.80
7 block	-66	113.00

input signal dBm	equivalent signal in uV	LM response
-120	0.22	113
-115	0.40	113
-110	0.71	113
-105	1.26	121
-100	2.24	138
-95	3.98	151
-90	7.07	164
-80	22.40	184
-70	70.70	197
-60	224.0	206
-50	707.0	212
-40	2.24mV (2240.0)	215
-30	7.07mV	218
-20	22.4mV	220
-10	70.7mV	221
0	224mV	224
+10	707mV	230

AR8200 Series-2 (black cabinet)

Signal meter	input signal dBm	equivalent signal in uV
½ block	-111	0.63

input signal dBm	equivalent signal in uV	LM response
-120	0.22	000
-115	0.40	000
-110	0.71	010

1 block	-109	0.79	-105	1.26	027
1½ block	-108	0.89	-100	2.24	042
2 block	-107	1.00	-95	3.98	055
2½ block	-104	1.41	-90	7.07	068
3 block	-103	1.58	-80	22.40	086
3½ block	-101	1.99	-70	70.70	097
4 block	-100	2.24	-60	224.0	103
4½ block	-98	2.81	-50	707.0	106
5 block	-96	3.54	-40	2.24mV (2240.0)	109
5½ block	-94	4.46	-30	7.07mV	112
6 block	-92	5.61	-20	22.4mV	139
6½ block	-90	7.07	-10	70.7mV	139
7 block	-88	8.90	0	224mV	139
			+10	707mV	139

The AGC voltage is available from the side AUX option socket of the AR8200. The typical swing of AGC voltage is as follows:

No signal	8mV
Minimal detected signal for AGC action, -114dBm	13mV
AGC full on (saturates) above, -24dBm	2.58V

AR8200 illumination when running from external d.c.

The illumination of the LCD and keypad of the AR8200 is automatically switched ON when connected to an external d.c. supply and cannot be switched off when in use. However, it is evident from the circuit, that the supply can be easily interrupted so that the illumination may be switched in the same fashion as when using internal batteries... this suggestion has been physically tested and works fine.

AR8200-2 change of pin-out assignment to side AUX connector - CR8200

It has become apparent that the side AUX connector pin-out assignment has changed with recent production of the AR8200 Series-2 (November'00), this affects the list presented on page 117 of the AR8200 operating manual. In particular the EARTH connections require special attention:

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**

AR8200 ACC earth connections:-

Series-1 (green cabinet) and EARLY Series-2 (black cabinet)
EARTHS ARE ALL LINKED: SHIELD YELLOW BLUE VIOLET

Series-2 later sets (black cabinet) November'00
EARTHS ARE: SHIELD YELLOW **VIOLET IS AGC** (IE. VOLTAGE REDUCES WITH SIGNAL AS OPPOSED TO S

METER
LEVEL ON ACC SOCKET WHICH INCREASES WITH SIGNAL).

BLUE IS 4V SUPPLY - THIS IS THE CONFUSING BIT AS IT DOESN'T APPEAR TO BE THE MAIN 4V SUPPLY - ONLY THE SUPPLY FOR PART OF THE AGC CIRCUIT (WHICH ISN'T SHOWN ON THE CIRCUIT DIAGRAM).

ADDITIONAL INFO:
EVERY BOARD IN THE LATER SERIES 2 IS SLIGHTLY DIFFERENT TO THE EARLIER SETS WITH ADDITIONAL TRACKS AND COMPONENTS .

The AR8200 MK3 has the same pin-out as the later AR8200 MK2.

CR8200 - tape record lead / interface

A problem when using the CR8200 has been reported to us when used in conjunction with the latest AR8200 Series-2 receiver (radio audio muted). The problem is due to a recent reassignment of the AUX connector on the latest AR8200-2 (the AR8200-1 and early AR8200-1 work fine).

The fix is very simple. Pull the cover off the CR8200 (the label is attached to the top cover), its just finger-tight. Gently roll the PCB to expose the wires, **cut the BLUE and PURPLE wire** making sure that the ends don't short against anything... that's it!

In the past, we have encountered one CR8200 where the audio output wire was soldered in backward (centre went to earth and earth to centre)... if used with grounded equipment this would have resulted in no audio - just something to check for.

The above has now been carried through to production stock of CR8200 so no modifications should be necessary.

HP600 AUX lead
It is understood that HP produce a lead which fits the AR8200 AUX connection, otherwise it is similar to the OS8200 leas from AOR. Based on internet information, the lead is called "HP F1258A" and colour / pin-out is as follows:

Pin use as per OS8200 lead / colour HP600 lead

1	+4.2V Red Yellow
2	TXD White Orange

3	RXD Black Red
4	Ground Yellow Blue/brown
5	Ground* Blue* Green
6	Audio Dark Green N/C
7	Squelch Brown White
8	Discriminator Grey Grey
9	AGC Orange N/C
10	Ground* Purple* N/C Frame Ground Shield Shield Black (HP lead only)

The above information has simply been cut & pasted from the internet, AOR UK accepts no responsibility for the accuracy and cannot support queries arising.

AR8200 Series-2 audio output level (measured)

NFM with 1kHz tone deviated by 5kHz, max audio output is:

PSU 13.8V D.C.	200mW
Batteries (fully charged)	130mW

AM with 1kHz tone modulated at 80 percent, max audio output is:

PSU 13.8V D.C.	180mW
Batteries (fully charged)	120mW

AR8200 RS232 commands for tuning (arrow keys)

The following commands can be used via Windows Hyper-Terminal using the ALT key of the PC and the NUMERIC KEYPAD (NOT the number keys above the keyboard letters):

Right arrow	ALT+28 HOLD ALT and type 28

Left arrow	ALT+29 HOLD ALT and type 29
Up arrow	ALT+30 HOLD ALT and type 30
Down arrow	ALT+31 HOLD ALT and type 31

Up/Down Increment **n<CR>** where n is a binary byte value as follows

RIGHT	0x1c
LEFT	0x1d
UP	0x1e
DOWN	0x1f

This would suggest that the command is expressed as a SINGLE HEX VALUE followed by carriage return. Ensure that you have full 8-bit data setup and not limiting it to 7-bit ASCII... otherwise all other commands would be okay but the HEX values would get screwed.

AR8200 RS232 commands for multi-radio operation

It is possible to connect several AR8200 radio receivers together by fabricating a diode buffer (using the optional OS8200 AUX cable) and assign a unique ID to each radio for multi-radio targeted RS232 control, only one RS232 level shift circuit is required.

The English language RS232 protocol listing is slightly incorrect regarding the ID format, it suggests a HEX value to represent the ID of each radio from 01 to 99 (default is ID 00 where no 'RS232 ON' command is required)... however the ID format is simply a two digit decimal ASCII value.

For example, to set an **ID** of '**02**', first use the AR8200 radio CONFIG menu to set ID=02 then load HyperTerminal and use the command:

^A02 <CR-LF>

Hold the **CONTROL** KEY, while holding the CONTROL key press **A** (in upper case, so have the CAPS LOCK ON). Release both keys, now press **0** (zero) then **2** (two) then the **ENTER** key.

When control of the desired radio is achieved (ID=02 in this example), the DOT (RS232 remote) legend appears on the LCD of the AR8200 and it may be controlled via computer in the usual manner. As you pass the different ID addresses via the RS232 port, each AR8200 will display and extinguish the DOT (RS232 remote) legend as RS232 communication is made and severed depending on the ID addresses used.

AR8200 DC and earphone socket replacement

Both the AR8200 Series-1 and Series-2 use a 1.3mm concentric power socket and a 3.5mm surface mount socket for the earphone.

It is unlikely that either of these items will require replacing but we have seen several sets where either the solder joints have failed. On the power socket, this is usually due to some heavy use (quite often accompanied by the centre pin of the socket being visibly bent). The earphone socket can be subject to a lot of leverage when a 3.5mm plug is installed. The solder joints to this can fracture (at worst, pulling the solder pads off the board as well).

Replacement or re-soldering is a delicate task but shouldn't be a problem to anyone used to working on small equipment and is good with a soldering iron. Re-fitting the case halves back together can be quite tricky.

To carry out the work:

Remove battery cover and batteries.

Remove all case screws. (2 in battery compartment, 3 on rear and 2 on side).

A good fitting fine screw-driver is essential here as all but the two side screws are long, coarse threaded self tapping screws and are quite stiff.

Lift the rubber covers out of the earphone, power and option sockets.

Pull the case halves apart. Take care to keep the side key panel with the front panel and do not let the case halves fly apart as this will damage the ribbon cables connecting the two halves.

Once apart, the ribbon cables can be disconnected from the socket by hinging up the darker coloured section. Again, great care must be taken here to avoid damage. Gently Lifting the outer edge of the socket with a fingernail is sufficient to release the cable. Releasing the two ends fastened to the rear of the set is all that is normally required for this job.

Power socket:

Note the position of and remove the insulating piece stuck on the power supply board to expose the power socket.

Fractured joints on this can usually be spotted as obvious rings in the solder joints. Re-solder

these if this is the problem being experienced.

If the socket requires replacing, remove the board by releasing the two screws at the front edge. On some sets, an insulating sheet may be fitted.

Note that on series 2 sets, the feed-through from the +ve battery terminal will have to be de-soldered. If the –ve battery terminal is soldered, simply compress the spring and allow it to pass through the slot in the cover (no need to disturb the solder joint).

Now de-solder the three joints and remove the socket.

Things can get a bit tricky here if the actual tracks are damaged. Solder what ever tracks remain and bridge the fractured one with a piece of tinned copper wire of suitable size. In the worst case, the new socket will have to be glued in the correct position (observe outline markings on board). Super-glue is ideal for this.

Working on the solder side of the board.

Bridge the contact nearest the edge of the board to the earth plane surrounding it. A small amount of resist will have to be scraped away from the board to do this.

Working on the component side.

The centre connector should be bridged to the adjacent resistor, R542 (non earth end).

The end connector (socket pin) should be bridged to the adjacent ends of EM501 and EM502.

Refit the power supply board. Make sure that the battery contacts are trapped between their plastic supports and the board (the board will sit up slightly at the bottom until the case is re-assembled). Remember to re-solder the +ve terminal on series 2 units.

Earphone socket:

If just the joints are fractured, with care, they can be re-soldered without removing the board.

On later sets, the socket is glued in place. This is definitely a good idea and worth considering to add to the robustness of the socket.

The socket can also be replaced without removing the board if none of the tracks are damaged. Great care will have to be taken to avoid melting the case when de-soldering the old socket.

It may also be necessary to remove the metal shield which slightly overlaps the socket (de-solder the PCB end of this rather than the centre joint).

If the tracks are damaged or you want to avoid melting the case, it is a good idea to remove the board completely.

To do this, de-solder the speaker wires. Take care not to damage the ribbon cable – if it is in the way, remove it.

Remove the 4 small self tapping board screws (2 at bottom, 1 on metal shield, 1 on edge of board under fold in top ribbon cable).

Lift the board out complete with side switch panel.

Take great care with the LCD. This may be fixed in some sets but may also hang down by its ribbon cable on others. Either way, it is easily damaged and will probably attract any dust in the area.

Again, it is a good idea to remove the adjacent ribbon cable, although this can be quite tricky due to a strap being soldered across it. Note that the ribbon cables are not interchangeable.

If the solder pads are damaged, remove the old socket and clean up the existing solder pads. Any damaged tracks will have to be bridged with very fine wire. Each solder pad goes to an adjacent small 'plate through hole' on the board. These are visible on both sides of the board once the display frame is released from the board (4 fragile clips on board edge).

Depending on the amount of track damage, remove the resist from both sides of the through plated hole and solder the fine wire though this.

Glue the new socket in place. It will automatically locate correctly on two small lugs. Solder the pads (or new wire) to the socket.

Re-fitting the board is easy enough. Make sure the display locates correctly and remember to solder the speaker wires.

Re-fit the ribbon cables at both ends.

Make sure the accessory door is located correctly.

Now the tricky bit, This is the way I do it;

Offer the two case halves together holding the rear case in the left hand holding the earphone rubber out of the way with the index finger.

Hold the front case with the right hand keeping the power and option socket rubbers out of the way with third and little fingers.

Push the case halves together making sure that the battery contacts slide into their groves in the top case and remain in their seat in the bottom case. This can be seen through the gap between the case halves until they are mated together. At the same time, check that the accessory door hinge has located correctly.

Re-fit all the case screws and test your work.

AR8200 Battery low indicator

A battery low level is detected by the microprocessor by comparing its regulated supply voltage to the voltage provided at pin 77 by the resistors R538 and R539 (33k and 100k).

These resistors are connected directly between battery voltage and ground with the feed to the microprocessor taken from the centre point between them. The comparison battery voltage presented at the microprocessor is therefore about ¾ of true battery voltage. This comparison voltage can therefore fall below the microprocessors regulated supply voltage of 4.5v well before the supply voltage starts to fall. The battery low indication therefore occurs at the same point every time.

This generally gives a battery low voltage indication at between 4.3 and 4.8 volts, varying from set to set slightly depending upon the exact resistor values and type and condition of the batteries being used. With the above in mind, the length of time between battery low indication and the set stopping working altogether may be between a few minutes and half an hour or so.

Tailoring the resistor values will alter the battery low indication point but will not alter the actual usable battery life.

If problems are experienced with only a short time before low battery indication, it is unlikely to be due to a fault in the battery low detection circuit but more than likely is due to a fault at some other point in the battery circuit. Any additional resistance in the battery path will result in such problems.

Possible faulty areas are:-

- Poor contact between the batteries and spring terminals.

- Poor contact between the end battery terminals and the PCB.

- Loss of contact between the switched contacts in the external power socket (the battery negative supply is fed through these).

AR8200 and Nickel Metal Hydride batteries (NiMH)

The charging requirements for NiCad & NiMH batteries are different (constant voltage / constant current). The internal charging circuit of the AR8200-1 / AR8200-2 is designed specifically for NiCad batteries.

While there are many internet comments suggesting that use of NiMH batteries does not cause damage to the AR8200, we have had about three instances where the rear of the receiver has

been badly melted where NiMH have been used.

Here in the UK workshop we have attempted to recreate the failure condition without success, try as we may we cannot cause the batteries to overheat the receiver... so it remains something of a mystery.

For this reason, we cannot endorse the use of NiMH batteries while connected to external DC but there is no reason why they cannot be charged using a separate external specialist charger then inserted into the radio.

AR8200 MK3

The AR8200 MK3 is supplied with 1500mAhr NiMH batteries, this provides longer operation between charges... some geographical areas are also in the process of banning NiCads due to 'green environmental' considerations of recycling the heavy cadmium metal.

The following text has been extracted from the MK3 addendum on the subject of batteries:

The batteries supplied with the AR8200 have been changed. To ensure that a completely full charge is established, please assume the full charge time as follows, this replaces the reference given on page 19 section 1-6-4 of the English language operating manual.

- AR8200 NiCads, 700mAhr 12 hour charge
- Mk2 NiCads, 1000mAhr 14 hour charge
- **Mk3 NiMH, 1500mAhr 22 hour charge**

The AR8200 receiver employs standard 'AA' size batteries, so a range of different types can be used (NiCad, NiMH, alkaline etc). For this reason, the charging circuit cannot be optimised for any one specific type. It is most important that you do not over-charge the batteries and do not keep topping them up without first running them down. If the batteries are flat, do not attempt to 'charge and operate' the radio for the first hour of charging, this would lead to an increase in internal heat generated by the AR8200. Do not connect an external power supply, mobile power lead or charger if dry / alkaline batteries are fitted.

In order to provide the optimum level of charge and life-span from the MiMH batteries (Nickel Metal Hydride) supplied with the Mk3, **use of a specialist dedicated external battery charger is recommended**, they are readily available from electrical suppliers. The AR8200 is not designed to charge rechargeable alkaline batteries.

AR8200 write protect

If you are unable to write data to your AR8200, you may have WRITE PROTECT enabled. There are effectively three ways you may have restricted the writing of data (refer to the manual for details). First check the following:

Global write protect (config menu):
[F] [7] [DOWN-ARROW nine times] use the DIAL or side arrow or PASS key to turn the flag off (black square surrounding the white lettering OFF) press [ENT].

Memory bank write protect (scan menu):
[F] [hold-SCAN] [DOWN-ARROW four times] select bank using side arrow, use the DIAL or side arrow or PASS key to turn the flag off (black square surrounding the white lettering OFF) press [ENT].

Individual memory channel protect (edit menu):
[F] [8] [DOWN-ARROW ten times], select the memory channel, [DOWN-ARROW], use the DIAL or side arrow or PASS key to turn the flag off, press [ENT].

Clear all protect flags in one go (see P99):
[F] [hold-9] [DOWN-ARROW five times] wait for confirmation message 'CH PROTECT' then push [PASS].

It is possible to SOFT RESET the AR8200 by holding [CLEAR] as you switch the unit on, there is no other reset but is may be worth removing external power and batteries for 30 seconds as this will re-boot the CPU. There is no hard reset.

Failing this, it is possible to re-load the system data using a modified EM8200 card 'service tool' which is held in the UK workshop... but use of this is very infrequency, try the above first.

AR8200 text comments

Occasionally we receive queries regarding the text comments of the AR8200 memory banks, search banks and individual memory channels, particularly when the memory has previously been deleted.

For example, the display may read as follows:

```
xx.xxx
MRD AM
D00 xx.xxx
Test AM
```
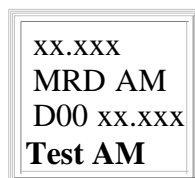
Test AM being a previously stored TEST frequency during manufacture which keep appearing after a memory has been overwritten.

If there has already been something stored in the memory location WITH A TEXT COMMENT, the previous legend is not automatically deleted (even if the delete menu is used). This is to short-cut the requirement for text entry if just the frequency has changed.

The text comment will also automatically be applied to the memory channel if AUTOSTORE has been used to store the memory channel, in that case the SEARCH BANK NAME is used as the memory identifier .

To prevent the previous text name appearing, when you enter a new frequency PUSH THE DOWN ARROW KEY ONCE to move to the text input line then PUSH PASS to delete the previous text. End the sequence with a
PUSH of [ENT] in the normal way.

Digital reception, AR8200 and other receivers

While it is possible to produce receivers capable of receiving certain digital transmissions, there are technical and legal complications.

Technical:
Transmissions such as GSM employ long encryption keys (unless you know what they are set to, it is very difficult to crack the code). DAB employs a bandwidth of about 1.4MHz and DECT phones use ten channels with a bandwidth of about 1MHz (much wider than the final I.F. of a conventional receiver).

Legal:
Some time ago we tentatively approached the UK Radiocommunications Agency regarding reception of certain digital transmissions. They categorically stated that such a move would be fought in the similar way to 'film-net decoders' in the
early days of satellite transmissions. While scanning receivers have legitimate usage, one specifically designed for the decoding of licensed encryption transmissions would not be deemed to have legitimate alternative usage so would be outlawed.

In practical terms, some commercial grade DSP receivers have the capability to decode digital transmissions, but price pushes the products beyond the reach of most hobbyists.

Certainly there appears 'less' to listen to from year to year, for some this is a greater challenge, for others a point of dismay. Even commercially organisations are pursuing very accurate DF techniques with frequency coherent receivers as an alternative to digital decoding (although a few are even reconstructing WAP).

It is very unlikely that the AR8200 (or any other receiver of a similar type) will be adaptable in any way for digital reception.

If you are looking for information on **TRUNKED RADIO**, *take a look at the trunked radio information home page at* http://www.trunkedradio.net

The AR8200 has been designed & manufactured by our associate company in Japan:

AR8200 function button failure

On a few sets we have seen a failure of function button operation. This is mainly on older series 1 units that have seen a lot of use but is equally likely to occur on any series 1 or 2 set. The problem can also be induced by the use of large antennas due to increased flex at the BNC socket.

The problem is due to diode D520 becoming disconnected from its solder pads on the PCB. D520 is a diode in series with the function button switch. It is located on the small side panel board next to the function key.

The failure is due to its close proximity with the antenna socket shielding plates. The diode is almost touching the shield which normally doesn't cause a problem. Any movement can cause the shield to push the diode away from its connection on the board. One or two of the diode connections may be lifted away from the board but it will probably still be more or less in the correct position.

Cure:

Usually no components are damaged and the diode can simply be re-soldered to the board. At worst, the diode legs may have been broken and it will have to be replaced.

Prevention of a repetition of the problem is simple – bend the offending edge of the antenna socket shield a few millimetres inwards. It is usually possible to see a small mark where the diode has rubbed on the shield so it is easy to see which area requires bending. Note that it really does only need a small amount of movement to clear the diode. If the set is a 'well used' example, this is a good opportunity to check that the shield is still soldered to the PCB.

Diode D520 is a dual diode surface mount package (4 legs) - 1SS319.

To carry out the work:

A small cross point screw driver and a fine soldering iron are the only tools necessary although a pair of fine pliers and tweezers may come in handy.

Remove all of the case screws – 5 long self tapping and 2 small threaded screws.

Split the case halves. Take care that the two ribbon cables between the front and back are not damaged – there is only enough length on these for the case halves to be hinged apart.

The side switch panel should remain with the front panel.

The area to be worked on is now exposed although if better access is required, the ribbon cables can be removed. To do this, gently lift the dark brown section of the clip – this hinges around the centre.

The side panel can also be removed if required. The easiest way to do this is by lifting the front control PCB slightly by undoing the 4 screws and de-soldering the speaker wires. The side panel can then be pulled from its connector.

D520 is located on the side panel switch PCB. It is to one closest to the top of the set. It should be quite obvious as it will be broken away from the board slightly.

Re-solder the diode or fit a replacement if necessary. All of the diodes are physically orientated the same was on this board, so just ensure that the writing on the package is the same way as the remaining diodes.

Re-building the set is the reverse of dismantling with two possible areas to watch;

Firstly, hold the two rubber covers out of the way when placing the case halves together. Secondly, Make sure that the battery contacts stay in position as the case halves are brought together. These should be trapped between the small plastic pillar and the PCB contact. They should also run in the groves on the side of the case.

Now power up the set and check the function button operation.

Check that operation is also still possible from the batteries.

with thanks to www.aoruk.com