

THE ELECTRON RX

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The Electron RX system from Slogger is intended to cater for the vast majority of users. The size of the case is such that most add-ons may be incorporated in virtually the same configuration as your existing system. Some add-ons, however, are too tall to fit inside the case, or would perhaps make the case too deep (i.e. units such as the PLUS3). These units have been allowed for in the design and are, or are in the process of, being supported.

The combinations of configurations of an Electron computer system is vast. It is for this reason that the installation instructions should be regarded more as a guide and not taken as verbatim.

The basic kit supplied to upgrade your Electron computer system to the RX is

1. RX unit (lid and base)
2. Buffered keyboard cable
3. Mains cable (approx 6 ft)
4. Mains switch
5. 8 off 10mm metal tapped spacers ...Board supports
6. 20 off M3 x 6mm posidrive screws
7. 1 off 16mm screw -for connecting block
8. Stick-on feet (4 off)
9. "Heat-shrink" tube
10. 26 off P13 nuts
11. 6 off 6mm metal spacers for PLUS1 extra supports
12. 1 off 'P' clip for keyboard cable
13. Earth wire tie
14. 4 off 10mm screws
15. 1 off 2 way terminal block
16. 1 off blue insulating paper
17. 2 off lengths of single core mains cable
18. 1 off strain relief bush

Optional

1. Drive supports and hardware:
 - 2 off upright brackets
 - 1 off horizontal bracket
 - 2 off supports per drive
 - 12 off M3x6mm screws
 - 8 off P13 nuts

THE KEYBOARD CABLE

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The cable supplied to connect the keyboard to the computer board is 25 way flexible colour coded and multi-stranded. Signals returned from the keyboard are very distorted and are of insufficiently low impedance to withstand the new length of cable. For this reason a Buffer Board is used at the keyboard end to 'drive' the four important signals viz. KBO, KBX, KB2 and KB3. This board also has 22 pins which will be used to connect to the existing keyboard connector. The other end of the cable is fitted with a 22 pin connector which will connect to the Electron board. Two grommets will be found attached to the cable. One will be used where the cable emerges from the RX case and the other will be used where the cable emerges from the Electron keyboard case.

The standard cable length supplied is approximately 4 feet but custom lengths are obtainable on request. A cable length of 4 metres was tested satisfactorily, the signals being returned from the Keyboard Buffer Board still being infinitely 'cleaner' than the signals returned on a standard Electron 111

Of the 25 colour coded cables, 22 ways are required for the keyboard itself, 2 are utilised by the Master RAM Board/TURBO Driver and the remaining 1 is used for the Speaker.

The cable is colour coded as follows:

1	Red	13	Red/Blue	25	Orange/Green
2	Blue	14	Green/Red		
3	Green	15	Yellow/Red		
4	Yellow	16	White/Red		
5	White	17	Red/Black		
6	Black	18	Red/Brown		
7	Brown	19	Yellow/Blue		
8	Violet	20	White/Blue		
9	Orange	21	Blue/Black		
10	Pink	22	Orange/Blue		
11	Turquoise	23	Yellow/Green		
12	Grey	24	White/Green		

The signals may be used as follows:

1-22	Keyboard pins 1-22
23,24	Master RAM Board/TURBO Driver
25.	Speaker

WIRING UP THE POWER

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IMPORTANT: TAKE CARE WITH THIS SECTION OF ASSEMBLING YOUR RX UNIT AS CUTTING CORNERS NOW MAY MAKE YOUR UNIT A HAZARD LATER!!

Initially the mains lead has to be fixed to the rear panel utilising the supplied strain relief bush. After stripping the outer insulation from cable by about 50mm refer to figure 2 regarding fitting the strain relief bush. Solder the supplied tag to earth lead (green/yellow), and bolt to the hole provided next to mains switch cut out using M3x6mm bolt and nut.

Fit mains switch into cut out, this item simply 'snaps' into place. The heat shrink tube should be cut into two short lengths and a piece slipped over each (blue & brown) mains wires. Solder mains input to the bottom two tags of switch.

At this point mount the terminal block to rear of case via other 3mm hole adjacent to earth tag. Use the blue insulating paper between the block and chassis to eliminate possibility of future 'shorts'.

Solder the two supplied wires on to top terminals of switch. Feed these through heat shrink tube so that each tube fits over its respective pair of switch terminals. Using a hot air gun (or careful use of soldering iron) apply heat to tube so it shrinks over switch terminals, therefore negating future risk of electric shocks.

Take the two free wires from switch, strip ends, and screw them into terminal block. The other side of terminal block is now used as a mains take off point for transformer, etc.

THE TRANSFORMER

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The transformers used by Electron computers come in one of two different forms. The standard transformer is in a cream plastic case and is integral with the 3 pin mains plug. The other version is the higher power with a separate 3 pin plug.

Standard Transformer (the cream one!)

Undo the four screws holding the case together and then remove the transformer by de-soldering the mains wires which connect to the plug pins. The transformer may then be positioned in the RX adjacent to the mains switch at the rear.

There are no holes in the transformer or obvious means of securing this in the RX so a bracket (obtainable from Slogger) should be used to attach the transformer securely in place. Pre-drilled holes adjacent to the mains switch may be used for this purpose although you may prefer to drill your own holes to offer a little more clearance from the switch.

High power transformer (the black one!)

Unlike the standard transformer, this unit is mounted directly into the RX by four screws in the pre-drilled holes adjacent to the mains switch at the rear.

Fitting

The inputs and outputs of the transformer are purely A.C. and so it does not matter which way the input is connected to the mains connector or which way the output is connected to the PSU board.

The power connection from the transformer to the PSU may then be shortened to suit your needs.

THE ELECTRON MOTHERBOARD

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Before continuing, it would be best to decide where the keyboard cable entry point is to be. If space is not tight to the left hand side of the final RX situation, it is best to take the keyboard cable through the lid, adjacent to the TV modulator. A slot is provided in the lid for this as standard to enable the lid to be fitted neatly over the grommet fitted to the cable.

If it is decided to put the hole in the front panel, it should be drilled now, before installing the motherboard. One end of the Buffered cable will, of course, need to be de-soldered in order to fit the cable through the front panel. Be sure, on re-soldering, that the signals are connected correctly.

Hole Size for the cable & grommet assembly is 12mm and so a pilot hole will need to be drilled first, progressively increasing the drill size to the full size hole.

The first main unit to dismantle and fit into the RX should be the Electron itself with the Power Supply Unit (PSU), this being the circuit board inside the Electron which receives the 18 volts from the transformer.

Undo the 4 screws holding the lid to the base of the Electron (keep these in a safe place as they will be needed again. You will find that the lid is connected still to the Electron board inside via the keyboard cable. This cable should be carefully pulled away from the Electron board where the connector meets the board itself.

Undo the four screws holding the Electron board to the base (three screws probably if you have a Master RAM Board or TURBO Driver) and also the three screws holding the PSU in place. Pull off the connector to the Speaker and then lift both the Electron and PSU board away together (they do not need to be separated). If you have a Master RAM Board or Turbo Driver fitted then unscrew the switch from the Electron case but do not remove the switch yet.

Locate the four holes in the RX base where the Electron board will fit...these will be towards the front and left hand side. To each of these fit a Metal tapped spacer secured by an M3x6mm screw from underneath. Locate the three holes in the RX base where the Electron PSU will fit...these will be to the right of the Electron board. Fit three metal tapped spacers as before.

Locate the Electron board and PSU above the spacer and secure in place with the screws provided, screwing into the tapped spacers. DO NOT OVERTIGHTEN.

Intermediate Test

An intermediate test may be made at this point of re-housing your system. No major operation has taken place at this point but it will give more confidence at later stages. Since you now have power to the mains switch and thence to the transformer which is in turn connected to the PSU which is itself connected to the Electron motherboard then quite simply, all that is necessary is to connect the keyboard to the motherboard in the normal way and connect your TV or monitor and switch on the power (if you have an MRB or Turbo then keep the switch clear of the motherboard to avoid any embarrassing electrical shorts!!!).

If the screen is dead i.e. no pretty patterns or colours or reaction of ANY kind then power is not getting through to the motherboard. Is the PSU connected? Have you switched on at the mains? Check your connections.

If the screen reacts but has pretty patterns or simple colours or whatever but does not sign-on in the usual way then the system is crashed. Is the keyboard connected correctly? This really is the only thing that could be wrong at this stage. If you cannot get past this stage then contact Slogger for advice...DO NOT proceed any further in the hope that things might right themselves...life is NOT like that and neither are computers !!!

If the usual sign-on message comes up then all is well.

CONNECTING THE BUFFERED KEYBOARD CABLE

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The next stage is to fit the Buffered Keyboard cable. This is actually quite simple. Firstly ensure the Computer is switched off. Now locate the 22 pins of the keyboard connector on the motherboard. Locate the connector of the buffered cable (the other end to the buffer board). This connector is not an easy fit but with the Red and Blue and Green cables toward the left side (closest to the TV output etc) and holding the cable toward the front of the unit fit this connector to the 22 pins ensuring a firm fit.

Now connect the Buffer Board end to the Keyboard case but be sure to connect the correct way as follows: hold the Keyboard case the normal way up with the SPACE bar closest to you and the keyboard connector 'dangling' down. Fit the buffered board to this connector with its underside up and the Red, Blue and Green cables to the left.

Intermediate test

Switch on to test that everything is still in order. The Buffer boards are fully tested on leaving Slogger and are very unlikely to be at fault if the system fails to work at this point.

If the system switches on O.K. and the keys work correctly then switch off, pull the Keyboard cable from its connector and then continue.

Now fold the Keyboard cable over such that it is now toward the rear of the unit and then angle it to exit from the left hand side of the RX case to the rear of the TV modulator. A plastic clip is used to secure the cable at the exit point preventing excess movement internally.

MASTER RAM BOARD

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This section concerns the Electron with Master RAM Board. The switch for the Master RAM Board may remain fitted to the keyboard case itself or, alternatively, the switch may be fitted to the front panel of the RX.

MRB switch on front panel

The Master RAM Board switch may be fitted to the front panel of the RX unit by drilling a 1/4 inch hole in the desired position. Although the wires connecting the switch to the board may require extending, the wiring will otherwise be unchanged.

MRB Switch on keyboard

The Master Ram Board (MRB) switch and wire assembly will need to be de-soldered from the MRB pcb and retained in its usual position in the keyboard case.

The Master RAM board has three wires connecting to the three position switch. The centre position is zero volts (0 volts) but since 0 volts is already available from the keyboard connector (pin 3) it is not necessary to channel this signal through the keyboard cable as an individual cable for the Master RAM Board. Only two of the three wires are therefore taken via the keyboard cable.

To reconnect the Master Ram board at the RX end, locate the three pcb pads on the MRB where switch wires were soldered. Solder the yellow/green wire to the north pad and the white/green wire to the south pad (north is toward the rear of the Electron and south toward the front). The centre pad was the original 0 volts and is not now used.

To reconnect the MRB at the Keyboard case end solder the White/Green cable to the bottom terminal of the switch and solder the Yellow/Green cable to the top terminal of the switch. The centre terminal should be connected to 0 volts. The Red cable of the Keyboard cable is 0 volts and so a wire should be connected between the switch and the buffer board accordingly.

Intermediate test

Test that operation of the system is correct at this point.

CONNECTING THE SPEAKER

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Regarding the speaker, the connection on the Electron (the left pin marked “_”) is zero volts and so for the same reason as for the Master RAM Board switch 0 volts, this pin is not used on the Electron board.

Now desolder the pair of wires connected to the speaker, and refit the connector to Electron motherboard in the RX case at the speaker position with the black wire to the left. Connect the red wire to the spare orange/green wire from keyboard cable. The black wire remains unused.

Now refer to the Keyboard case. The Orange/Green wire should be connected to one of the speaker terminals (either terminal will do). If the Orange/Green wire is of insufficient length then it is quite acceptable to lengthen this with another piece of wire. The other speaker should be connected to the 0 volts of the Buffer board in the same manner to the Master RAM Board.

Perform an intermediate test at this point.

FITTING THE PLUS2

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The PLUS2 is fitted next. Fit 4 metal spacers for the cartridge connectors and 1 metal spacer at the left of the PLUS2 to the RX case. The PLUS2 may then be fitted to the rear of the motherboard and secured using 5 of the 4mm screws.

Perform an intermediate test at this point.

FITTING THE PLUS1

Dismantling of the PLUS1 is straightforward. Three screws underneath are firstly removed allowing the lid to be lifted off. The cartridge guides may also be removed. The PLUS1 board is held by 7 screws in all, 2 on retaining each cartridge connector and 3 holding the remainder of the board. Note the positions of these securing points as holes are pre-drilled in the RX case for the tapped metal spacers to

be fixed such that the PLUS1 board is secured to these spacers.

When the PLUSX is fitted securely, perform an intermediate test for the usual confidence check.

FITTING THE ROMBOX PLUS

The ROMBOX PLUS may be fitted to the rear of the PLUS2 remaining in its case. The case may be removed using a Stanley knife or equivalent and patiently scoring around the central join until the glued halves are parted. It is then possible to secure the ROMBOX PLUS board to the RX case but holes are not provided for this but may be drilled accordingly.

THE DISK DRIVE

See next page for original Acorn Plus 3 installation.

This section is concerned with fitting the Disk drive and power supply into the RX. The drive should first be dismantled, the lid normally being secured by either 2 or 4 M3x6mm screws. The drive itself is secured to the metal base by 4 screws. Remove these and then the ribbon lead and also power connector. Do not fit the drive into the RX until later. Next dismantle the power supply. This takes a variety of forms but essentially there are the transformer, which is standard with standard holes, and the regulator board which does vary, but in essence you have the mains input and the regulated 0 volts, 5 volts and 12 volts output.

If you are using a dual disc drive system, only one power supply need be installed. Simply connect the second power connector leads in parallel with existing PSU outputs. Ensure the wires are connected correctly.

Although there is no facility to fit a 3 amp fuse (for the drive) it is recommended that this is included in the items being transferred from your drive unit to your RX. The fitting position for the transformer and PSU are behind and to the right of the Electron board PSU. Four holes are prepared for the transformer and the PSU may be fitted integral with this or alternatively you may, of course, drill your own holes (3mm) to fit the components.

Your disk drive(s) may be fitted into any of the two slots in the RX front panel. If you have 3,1/2 inch drives then the Conversion plate must first be fitted. It is easier to fit the drive support hardware before inserting the drive(s) into the slots but as a precaution, check that your drives will slide completely into the slots. Because of the tolerances involved, it is possible that some drives do not fit easily and so the size of the slot should be adjusted using a file. The drives support hardware takes the form of two short vertical brackets which are bolted to the RX base either side and approximately 150mm to the rear to which in turn is bolted the long horizontal bracket. The two remaining brackets (four if you have two drives) connect between the horizontal bracket and the front panel. Note that these brackets are in pairs and are drilled symmetrically.

Although 5,1/4 inch drives seems to conform to a standard for mounting holes, this is not the case for the 3,1/2 inch drives and so it may be necessary to drill your own holes when fitting these smaller units. Be very careful when lining up the holes as mistakes can be difficult to rectify.

THE ACORN PLUS 3

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If you are not utilising a Plus 2 interface, the Plus 3 main PCB will fit onto the rear Electron connector as usual.

Before installation, de-solder the left hand power connector, as this will foul the RX lid if left in position. Cut the 21v output cable from transformer to required length, and strip ends. Solder onto underside of PCB at point where the power connector was. Self adhesive pillar supports can be used to support PCB, (available from SLOGGER), or alternatively drill holes (3mm) to suit layout, using 10mm spacers and screws, fit to base of RX in a similar manner to Electron motherboard.

Extended drive & power ribbon cables will have to be provided for the new set up, connectors and cable are available from most computer dealers, or we can supply these as options.

The Plus 1 mounting holes will not line up if a Plus 3 is installed, so either 3mm holes will have to be drilled to suit or, again, self adhesive pillar supports.

Refer to the previous section regarding drive support installation.

Disk System testing

Perform some extensive tests on the disk system and monitor for any peculiar disk faults. The reason for this is that it is possible for the PSU situated beneath a disk drive to influence the drive itself. In this case a metal shield should be fitted between the two units to cure this problem.