00307eb0-0

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Contents

Chapter 1

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1.1   Main

```
                        More Amiga Projects
                  --------------------
                     Issue #1 Apr95

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    ~
     Atari TrackBall Hacks




    ~
     Microsoft Ergo Keyboards




    ~
     Extrenal A1200 Keyboards




    ~
     A500 Fan Hack




    ~
     Sega Joypad Hack
```

~
HardWare Copier

~
ParNet Adapter

~
External Floppy Interface

~
Credits

1.2 Atari-Intro

                         Atari Trackball to Amiga Conversion

                          By John H. Lee
                     (jhlee@hac2arpa.hc.com)

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This fil documents how to convert Atari model
               CX22
                and
               CX80
                trackballs
(originally manufactured for the Atari Video Computer System(TM) and Atari
home computers) for use on Commodore Amiga computers.

I've encountered at least two different Atari trackballs: the model CX22 and
model CX80. The model CX22 has a beige trackball and two round buttons. The
model CX80 has a black trackball and twp triangular buttons. The CX22 appears
to be the original model while the CX80 is the newer cost-reduced model. They
are fnctionally identical with somewhat similar circuit designs. Their
construction differ considerably, but both can be converted into Amiga

trackballs while preserving their switchable trackball and joystick modes.

1.3 CX22

                    Atari CX22 Trackball Conversion (Round Buttons & Beige Trackball)

Theory of Conversion:

        The CX22 trackball generates quadrature signals from vertical and
        horizontal optical interrupters just like an Amiga mous. A LM339C
        quad op-amp IC is used as a quad comparator to clean up the signals
        from the optical pickups. A 4538 (dual D-flip-flop) and a 4011
        (quad 2-input NAND) IC take the quadrature signals and generate
        four direction ignals: left, right, up, and down. The four
        direction signals, the vertical pulse signal, and horizontal pulse
        signals are fed into a 4019 (quad AND/OR selector) IC that selects
        between the joystick signals and the Atari mouse veocity &
        direction signals.

        The conversion works by replacing the Atari mouse signals at the
        4019 selector IC with the quadrature signals from the comparator.
        The Atari joystick signals are the same as the Amiga's. If
        desired, the right trackball button is separated from the left
        button and turned into Mouse Button 3 (the right mouse button).
        Some games also recognize it as a second joystick button.

                ~
                 Parts

                ~
                 Tools

                ~
                 The Hack

1.4 CX80

                    Atari CX80 Trackball Conversion (Triangular Buttons & Black ←˒
                        Trackball)

Theory of Conversion:

The CX80 trackball generates quadrature signals from vertical
and horizontal optical interrupters just like the Amiga mouse.
Two-thirds of 40106 (hex Schmitt-trigger inverter) IC is used
as a quad comparator to clean up the signals from the optical
sensors. A 4098 (dual precision retriggerable monostable
multivibrator), 4013 (dual D-flip-flop), and remaining one-thid
of the 40106 IC take the quadrature signals and generate four
direction signals, left, right, up, and down. The four direction
signals, the vertical pulse, and horizontal pulse signals are fed
into a 4019 (quad AND/OR seector) IC that selects between the
joystick signals and the Atari mouse velocity & direction signals.

The conversion works by replacing the Atari mouse signals at the
4019 selector IC with the quadrature signals from the 40106 hex
inverter. The Atari joystick signals are the same as the Amiga's.
If desired, the right trackball button is separated from the left
button and turned into Mouse Button 3 (the right mouse button).
Some games also recognize i as a second joystick button.

~
 Parts

~
 Tools

~
 The Hack

1.5 cx22Parts

Parts Needed:
  9-pin cable with female DB9 onnector (if a right-mouse button is desired)
  Parts to connect the 9-pin cable (heatshrink tubing for insulating
  splices or 6 crimp terminals for a .100"-center Molex-type housing)
  Hookup wire

1.6 cx22tools

Tools Needed:
        #2 Phillips screwdriver
        Anti-static wriststrap
        IC puller
        Needle nose pliers
        Ohmmeter
        Soldering iron

```
     Solder
```

1.7 cx22hack

1. Remove the four screws from the corners on the underside of the case..
Carefully pry apart the two halves of the shell, which are held together
    by two pressure-fit posts. They might be tight, so be patient. You
    might want to try pushing on the post with a screwdriver through what
    look like two screw holes inthe bottom shell. Be careful not to drop
    the freed trackball on your foot.

3. Remove the two interrupter shafts and bearings.

4. Remove the two screws that hold down the printed circuit board and
    carefully disengage the plastic hook that hold down the corner.

5. Lift up the PCB and unplug the cable connector J1.

6. Remove the PCB from the shell.

7. Take anti-static precautions and locate the 16-pin IC marked "A5" on
    the PCB (a 4019) on the left side of the PCB. Carefully remove IC 5
    from its socket, noting the orientation of the IC (look for the dot
    at pin 1 or the notch at one end.)

8. Carefully straighten pins 1, 3, 5, and 7 so that they stick straight
    out to the side of the IC.

```
     Dual In-Line Package IC Pin umbering
     (looking from COMPONENT side at a 16-pin IC):
     ------------------------------------------
       Dot---\  v------Notch
             +-U-+
         1 |o  | 16
         2 |   | 15
         3|   | 14
         4 |   | 13
         5 |   | 12
         6 |   | 11
         7 |   | 10
         8 |   |  9
           +---+
```

9. Reinsert IC A5 into its socket, making sure it's oriented correctly.

. Solder the following jumper wires directly to IC A5 from the test points
    marked "TPx" placed along the bottom of the PCB. Be careful to avoid
    overheating the IC.

IC A5 Pin	Test Point	Which Is Connected To (for reference)
1	TP3	IC A1 pin 13
3	TP2	IC A1 pin 1
5	TP4	IC A1 pin 14
7	TP1	IC A1 pin 2

11. Unfortunately, the original cable does not connect pin 9, so it cannot
    support a right mouse button. If you don't want the right mouse
    button, you can leave the original cable and skip to step 16.

12. Repace the original cable with the new 9-pin cable. Connect the
    following pins from the female DB9 cable to connector J1. I reused
    the J1 connector shell from the original cable and installed new
    crimp-on terminals purchased from an electronicsstore. You may find
    it easier to cut the wires, leaving about 2" to splice the connector
    onto the new cable (don't cut the black ground wire to the buttons!)
    I highly recommend heat-shrink tubing to seal the splices; electrical
    tape *will come apart, permitting shorts to occur.

```
        DB9 Pin     J1 Pin           Used For
        -------     ------           --------
           1           4             Mouse Vertical / Forward
           2           3             Mouse Horizontal / Back
           3           6             Vertical Quadrature / Left
           4           5             Horiz. Quadrature / Right
           5       (not connected)   Mouse Button 2 (Middle) / Horiz. Pot
           6       (Left Button)     Mouse Button 1 (Left) / ire
           7           2             +5
           8           1             Ground
           9       (Right Button)    Mouse Button 3 (Right) / Vertical Pot
```

    DB9 Pin Numbering (looking at the end of the female DB9):

```
            +----------+
            | 5 4 3 2 1 |
             \         /
              \9 8 7 6/
               +-----+
```
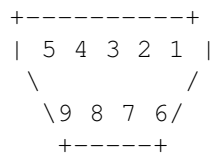
13. Cut the red wire that runs between the two buttons. Cut it as close
    as possible to the connector at the left button.

14. Spice the left button red wire to the DB9 pin 6.

15. Splice the right button red wire to the DB9 pin 9.

16. At this point, all wiring has been completed. Double check your work
    and make sure there are no shorts.

17. Plug connector J1 back onto the PB.

18. Snap the PCB back into the bottom shell, but do not install the screws
    yet. Replace the two interrupter shafts and bearings, and place the
    trackball on the shafts.

19. Test the trackball while it's still disassembled. Set the mode selec
    switch on the trackball to "Trackball" and plug the trackball into the
    mouse port of your Amiga.

20. Turn your Amiga on and verify that the mouse cursor moves and the
    buttons work as expected.

21. Run your favorite joystick game, move the tackball to the second
    mouse port if needed, switch the trackball to joystick mode, and
    verify the that trackball now acts like a joystick.

22. Turn your Amiga off and unplug the trackball.

23. Install the two screws that hold down the PCB. Makesure that the
    interrupters spin without touching the optical sensors.

24. Reassemble the shell and install the four screws in the corners.

25. Enjoy your new trackball!

1.8 cx80parts

Parts Needed:
 9-pin cable with female DB9 connector (if a right-mouse button is desired)
        Heatshrink tubing (for insulating splices)
        Hookup wire

1.9 cx80tools

Tools Needed:
        Anti-static wristtrap
        #1 Phillips screwdriver
        Needle-nose pliers
        Soldering iron
        Solder
        X-acto knife

1.10 cx80hack

1. Peel off the four stick-on rubber feet on the underside of the case.

2. Remove the four screws hidden by the feet.

3. Openthe shell. Be careful not to drop the loose trackball on your foot.

4. Take anti-static precautions. The main printed circuit board is
    attached to two small circuit boards by ribbon cable. These small PCBs
    hold the optical sensors for the verical and horizontal interrupters.
    They are slid into place and held by friction. Carefully pry up and
    loosen them.

5. Carefully lift the PCB assembly from the bottom shell. Do not
    disconnect the cable yet.

6. There are four IC's on the PB. Looking at the component side of the
    PCB with the connectors to the cable at top, locate the 4019 (16 pin)
    and 4013 (14 pin) IC's on the right side of the PCB.

7. Turn the PCB over and on the solder side locate the solder pads for the
    403 and 4019 IC's.

8. Using a sharp Xacto knife, cut the traces to the 4019 IC at pins 4, 6,
    and 15. Be sure to cut only the traces to those pins. Pin 1 is marked
    with a small "1". Remember that the left and right sides are reversed
    when yo're looking at the solder side. My favorite technique is to
    make two cuts close to each other and then lift (or scrape) the copper
    sliver between the cuts away from the PCB.

```
        Dual In-Line Package IC Pin Numbering
        (looking from COMONENT side at a 16-pin IC):
        --------------------------------------------
            Dot---\  v------Notch
                  +-U-+
                1 |o  | 16
                2 |   | 15
                3 |   | 14
                4 |   |13
                5 |   | 12
                6 |   | 11
                7 |   | 10
                8 |   |  9
                  +---+
```

9. Verify with a ohmmeter that the traces have been cut.

10. Solder the following jumpers from the pads of he 4013 IC to the pads
    of the 4019 IC. Use short pieces of hookup wire; 30-gauge wire-wrap
    wire works pretty well. Be careful not to overhead the IC's.

```
            4013 IC Pin     4019 IC Pin
            -----------     -----------
                3               6
                9               15
                11               4
```

11. Unfortunately, the original cable does not connect pin 9, so it cannot
    support a right mouse button. If you don't want the right mous
    button, you can leave the original cable and skip to step 15.

12. Locate the contact area for the right button on the PCB. There is a
    trace that goes to the "BLUE" connector via a solder pad for a jumper
    to the left button. Cut this trace etween the right button contact
    area and the first solder pad, near the solder pad. The wire to pin 9
    of the DB9 cable will be soldered directly to the trace leading to the
    contact area.

13. Replace the original cable with the new 9-pin cabl. Connect the
    following pins from the female DB9 cable to the connector pads along
    the top edge of the PCB. You'll probably want to solder the new
    cable directly to the pads. Optionally, you can cut off the spade
    connectors from the oriinal cable and splice them to the new cable.
    (I couldn't find substitute spade connectors.) I highly recommend
    heat-shrink tubing to seal the splices; electrical tape *will* come
    apart, possibly permitting shorts to occur.

```
        DB9 Pin     PCB Pad            Used For
        -------     ------             --------
           1        Brown              Mouse Vertical/Forward
           2        Red                Mouse Horizontal/Back
           3        Orange             Vertical Quadrature/Left
           4      Yellow             Horiz. Quadrature/Right
           5        (not connected) Mouse Button 2 (Middle)/Horiz. Pot
           6        Blue               Mouse Button 1 (Left)/Fire
           7        Purple             +5
           8        Gray             Ground
           9        (Right Button)  Mouse Button 3 (Right)/Vertical Pot


        DB9 Pin Numbering (looking at the end the female DB9):

              +-----------+
              | 5 4 3 2 1 |
               \         /
               \9 8 7 6/
                +-----+
```

14. Scrape the oxidation off the trace to the right button and solder the wire to the DB9 pin 9 directly to the PCB trace leading to the right button.

15. At this point, all wiring has been completed. Double check your work and make sure there are no shorts.

16. Reinsert the optical sensor PCB's back into their slots. Make sure they're fully inserted and that the interrupters spin without touching the optical sensors.

17. Position the PC back into the bottom shell and place the trackball on the interrupter shafts.

18. Fit the top shell back on and install only two screws, in diagonally opposite corners.

19. Test the trackball while it's still partially disassembled. Set the mode select switch on the trackball to "TB" and plug the trackball into the mouse port of your Amiga.

20. Turn your Amiga on and verify that the mouse cursor moves and the buttons work as expected.

21. Run your favorite joystick game, move the rackball to the second mouse port if needed, switch the trackball to "JS" mode, and verify the that trackball now acts like a joystick.

22. Turn your Amiga off and unplug the trackball.

23. Install the remaining two screws into the shell.

24. Sick the four rubber feet back over the screw holes.

25. Enjoy your new trackball!

1.11   MicrosoftKB

- Area: Amiga Tech

  Attr: Read   Date: 01 Apr 95
  17:48:00
  From: Dale Currie
    To: Randolph Murdock Iii   Mark:
  Subj: Re: Microsoft Ergo keyboard
-- -
-- In a message dated 30 Mar 95 15:52:53, Randolph Murdock Iii wrote:

 RMI>   Does anyone know whether you can hook up a Microsoft ergonomic
 RMI> keyboard to an A3000?

   You can purchase an IBM PC-AT keyboard adapter from Dana_Peters@Mitel.COM,
which especially supports the Microsoft Natural keyboard. Contact him for
more details. It allows screen-swapping via a single key, uses the "Windows"
keys on the MS keyboard, allows the numeric keypad to become your mouse, etc.
Works great for the Amiga and for NetBSD.

1.12   A1200KB

 New KeyBoard Hack

 By: JON GUIDRY

Here's some info about putting an external keyboard on an A1200.. USE AT YOUR
OWN RISK!.. I haven't tried it yet. :)

-Jon

I've noticed a number of people asking about putting an external keyboard on
their 1200's. Unfortunately, the only replies they got said it couldn't be
done, or that it would be very difficult. Neither of these is true.
Electronically, the keyboard interface is pretty much the same as it always
has been. The only real obstacles are physical; Thus I decided to make an
attempt, and recently managed to pull it off. What follows is an account of
what I did along with a few suggestions. Be sure to read it through all the
way before breaking out the tools...

 It's been working well so far (I'm typing this on my good old A1000 keyboard
hooked up to my 1200 right now.) The result is that I can have both an
internal and external keyboard hooked up simultaneously without interference.
In fact, they complement one another. You can actually press shift on one
keyboard and 's' on the other and get a capital 'S'! Those old 6570 keyboard
controllers are quite robust, seemingly in contrast to the on board one in the
1200.

Needless to say, doing this modification required some very delicate work.
The internal keyboard micro has to be physically taken off-line in order to
connect an external keyboard or keyboards. This isn't like the 500 where all
you had to do to hook up an external was to patch into the KCLK and KDAT
lines, tap +5 and Ground from somewhere and you were done. The 6570's took
care of all the handshaking automatically. Unfortunately, the 1200's keyboard
micro doesn't work that way. Hooking up another keyboard in parallel with
it's clock + data lines just hangs both of them. (My guess is that the output
isn't open-collector like it is on the externals, (there's no reason for it to
be) so when you have an external hooked up, the internal can't drive its 0's
low enough.) Anyway, I just decided to do away with the internal controller
altogether.

 Um...let me just say this... I'm not really writing this post in the form of
a full blown hardware hack. This is more of a "Here's what I did. If you'd
like to give it a shot, here's what you need to know." sort of thing. I'm not
going to go into disassembly instructions or anything like that. I will make
the standard disclaimer, though: If you try this and you blow up your machine,
don't come crying to me. There are some quite tiny spots that have to be
soldered and/or desoldered, so patience, a steady hand, and a reasonably
sharp soldering iron are a definite necessity. If there's enough support for
turning this into a full article I'll throw something together. (My brother
suggested submitting it to AC, but it may be a bit hardcore for them.
Schematically, it's quite simple, but the tiny joints do make it a little more
difficult. Maybe Aminet...

 Okay, with that out of the way here are the gooey details. The two chips
we'll be dealing with are U13 (The keyboard micro) and U7 (The
keyboard/parallel 8520). Try to keep your soldering iron and any other
potentially destructive tools away from the other chips. ;^) The KBClk and
KBDat pins on the keyboard micro need to be heated and bent up away from the
motherboard. I touched the top of the pin with the iron, let it heat for a
second and then, with a razor-knife wedged behind the pin, twisted, lifting
the pin away from the board. There's not much solder holding these down, so it
shouldn't take too much force. Once the pin was free, I straight ened it up
with a pair of needle-nose pliers and went on to the next one. Fortunately,
both pins are right next to each other and the keyboard micro (and the 8520)
are surface-mounted PLCC's and not true SMD's. These are the only two pins
that need to be desoldered. The rest of this hack just involves soldering
wires in. ***NOTE: I've heard from at least two people that their internal
micros did not need to be taken offline for the external to work. All I know
is that on mine it had to be disconnected. Your Mileage May Vary, however, so
you may want to try skipping this step, do the rest, and see if it works.***

 Get your hands on the smallest insulated wire you can find (>24 awg), and
solder wires to the KBClk, KBDat and _KBReset lines as shown in the diagram
below. The number of pins on the chips should be accurate. they are 44 pin
PLCC's, with 11 pins on each side. The ^ denotes the pin 1 dot on the chips.

                         |||||||||||
                     -+-----------+-
                     -| |-
                     -| |-

```
                                    -|   8520PL  |-
                                    -|           |-
                                    -|    U7     |-
                                    -|           |-
                                    -|           |-
                                    -|           |-
                                    -|     ^     |-
                                    -+----------+-
                                      ||||||||||||
                                          ||
                                          | \KBDat (Solder wire here)
       ||||||||||||                       |
          -+----------+-                  \KBClk (Solder wire here)
          -|          |-
          -|          |-
          -| Keyboard |---KBClk (Desolder + bend up) Floppy
          -|  Micro.  |---KBDat (Desolder + bend up) Power
          -|          |-
          -|    U13   |- ....
          -|          |-                 To                               ||
          -|          |-                 Front                            ||
      /---|     ^     |-                 of                          +5v/|
      |  -+----------+-                  Machine                     /    |
      |    ||||||||||||                  ||          (Tap +5 and Gnd. from    |
      |                                  ||             these wires.)-------Gnd /
      \_KBReset (Solder wire here)       ||
                                         ||
                              \/
```

 As you can see, power is easily tapped from the floppy cable. You should use
somewhat larger wires for this. Thus, when you're done you should have five
wires coming out of your machine: KBClk, KBDat, _KBReset, +5, and Gnd. You
will also have a non-functional internal key board. If you want, however, you
can take these wires (except _KBReset) and hook them up to a 5 pin DIN and
attach a 2000/3000 keyboard, or a phone plug and connect a 1000 keyboard.
There is a catch, however. You will not be able to reset from the external
keyboard. 1000s, 2000s, 3000s, and 4000s have internal circuitry which
interprets 500 milliseconds of KBClk low as a "reset" pulse, and pulls the
_KBReset line internally (This is according to the Hardware Manual). So
unless you fabricate a circuit that does this (see below), you'll need to
reset from the native keyboard. (This function should still work. Actually, If
you're going to do it this way, there's no need to solder the extra wire for
_KBReset.)

 Now, the A500 keyboard is slightly different. It has no case but it will
generate a _KBReset signal. Remember how I said you could have two kbd's
simultaneously? Well, all you have to do is hook up your external as described
above, and string your wires along (Including _KBReset) to the 500 keyboard.
What's more, the 500 keyboard is a near-exact fit replace ment for the 1200
one (and with full sized Left-Shift and Return keys!). In order to do this I
had to desolder the LEDs on the 500 kbd altogether and then remove the ones
from the 1200's "LED board", hot glue them individually to their positions,
bend the leads down flat, and wire them up again. Also, the support on the top
part of the wedge-shaped floppy bracket has to be sawed off to make room for

the encoder board. It works, though, and theoretically I should even be able
to fit the RF shield back on.

 Okay, so you may not like the beige-colored keys of the 500 keyboard sticking
out of your shiny white 1200 case. The simple solution is to swap the 500
keyboard's beige keycaps for your defunct 1200 keyboard's white ones. They
should be the same in every respect except color. There is, however, another
alternative. Your original 1200 keyboard may be compatible with the 500

keyboard's encoder board. Encoder boards that are compatible have a slot for
one large ribbon cable to fit in. Incompatible encoder boards have slots for
two small ribbon cables. If compatible, all you have to do is unplug the
ribbon from the 500 keyboard itself, unscrew the little circuit board in the
upper-right corner (the encoder board) and remove it along with its plastic
bottom-shield. You can then plug the ribbon from your 1200 kbd into the
socket, and wire the encoder board up as you would with the true 500 keyboard.
This is the setup I had originally. Now, since the ribbon comes out of the
middle-back of the 1200 keyboard, you have to put the controller board in
that same vicinity. It's up to you how to mount it, but what I did was to
first off trash the RF shield. (REAL hackers don' need no steenkin' RF shield
8^)) Then I hot-glued the plastic shield to the bottom of the encoder board,
and hot-glued this by the lower left corner to the top of the hard drive. The
other end rests on the floppy cable, and tension from the keyboard ribbon
folded under the keyboard keeps the whole thing steady.

Here's a quick recap:

       -Desolder the clock and data pins coming from the onboard A1200
keyboard microcontroller. (This is probably the hardest part of this
whole thing.)

       -Solder the KBClk, KBDat, _KBReset, +5, and Gnd. lines to the
locations described in the diagram. (A magnifier lamp is useful for
this.)

       -Hook the KBDat, KBClk, +5, and Gnd. lines up to some sort of
external keyboard connector, and use the dead internal to reset, OR

Hook the KBDat, KBClk, +5, and Gnd. lines up to some sort of
external keyboard connector and run the wires along to their
corresponding locations on a 500 keyboard INCLUDING _KBReset, OR

Hook the KBDat, KBClk, +5, and Gnd. lines up to some sort of
external keyboard connector and run the wires along to their
corresponding locations on a 500 keyboard's encoder board INCLUDING
_KBReset and then plug your 1200 keyboard's ribbon cable into the
encoder board.

       -Seal up, fasten down, make sure there are no solder bridges, shorts,
etc.

       -Power up and enjoy! -------

Below are the pinouts for various types of Amiga keyboards.

```
A500:                                    Ribbon out (usually rainbow)
                                        Black=1...Purple=8
                                        ||||||||
                  +------------------------------------+
                  |        Pin 1->........<-Pin 8       |
                  |               |||| |                XX<--Shield Gnd.
                  | A500          |||| \Gnd             |
                  | Keyboard      ||||\+5v              [===]<--Power LED
                  | Encoder       ||\_KBReset           |
                  |               |\KBClk               [===]<--Drive LED
                  | +----------+ \KBDat                 |
 Ribbon Socket---->|...........|                        |
                  +------------------------------------+
                     |||||||||||
                     ||||||||||| <---To A500 or A1200 Keyboard.

A1000: (Connector on back of keyboard itself)

  (Female)                  +------+
                            | |||| |         1=Gnd
                            | 1234 |         2=KBClk
                            |      |         3=KBDat
                            +-+  +-+         4=+5v
                              +  +
                               ++


A2000/3000: (This is from the Hardware book. Not firsthand information.)

  (Female)                   -v-
                            /   \
                           |3   1|         1=KBClk
                           | 5 4 |         2=KBDat
                           |  2  |         3=NC
                            \___/          4=Gnd.
                                           5=+5v
-----------------------------------------------------------------------
```

That's pretty much it. As I said, this isn't a full tutorial, so I'm leaving
the mechanical considerations up to the reader. If you have any other
suggestions for improvement let me know, or feel free to add them in yourself.
Start a credits list if you so desire.

Some final thoughts:

 -I wouldn't worry too much about power supply overloading. I've
  got 2 floppys, 2 keyboards, a hard drive, a DataFlyer SCSI+
  SCSI controller, and a MicroBotics 50Mhz 1230XA with '881 and 8
  megs and my stock supply hasn't complained yet.

 -You could also use a DPDT switch to switch between internal and
  external keyboards. One side goes to KBClk and KBDat on the internal
  micro, the other side goes to the same lines from the external, and
  the middle goes to the pins on the 8520. The keyboards should be
  able to deal with being switched in or out in midstream.
  (I have not actually tried this one, but don't see why it wouldn't
  work, as it's effectively the same thing as unplugging one keyboard

   and plugging in another one.) The Hardware Manual says the keyboards
   were designed to handle hot connects/disconnects.

 -No, IBM keyboards are electrically totally different. You would
  need a microprocessor driven interface to make the translation.
  There is a (fairly involved) hack on Aminet in /hard/hack to do this.

 -If you hook everything up and get a pulsing stream of '''s, you've
  got the clock and data lines backwards. Switch them around.

 -If you're installing your 1200 in a tower and your tower has a
  Reset button on it, you can hook the _KBReset line and Ground up
  to the button and reset that way.

 -As a couple people have asked, I don't have A1200 schematics. The
  data herein is the result of some poking around with a logic probe,
  a little deductive reasoning, some extrapolation from the A500
  schematics, and a lot of trial and error. However, if someone out
  there HAS A1200 schematics, I'll gladly reimburse you for your time
  at a photocopier! 8^)
   Enjoy... ...Sean Curtin. (smc8516@ultb.isc.rit.edu)
           ^^New address!

The following is an optional modification to the above hack which allows the
ability to reset the computer from the external keyboard, posted by Dana
Peters. It looks good, although as of this time I have not yet tried it
myself.

16152.3.26294.1 A1200 external keyboard reset hack 7/5/94 06:16 89/4737
ai745@FreeNet.Carleton.CA (Dana Peters) Lines 1 to 89 of 89 (100%) -----

Got an A1200? What do you think of the keyboard? If you're a touch typist
you probably figured out pretty fast that the A1200 keyboard has a problem
with rollover. Try rolling over between two keys on the same row, and you're
just as likely to get them in the reverse order as the forward order.
Commodore botched this one, IMHO.

Anyway, I decided to try to "fix" my machine, and found two different hacks to
put another model Amiga keyboard on the A1200; one by Hans Luijten
(j.a.w.m.luijten@kub.nl) and another by Sean Curtin (squirrel@cup.portal.com).
Using the info from these plans I decided to add a connector to my A1200 for
an A2000/3000 keyboard. Although the plans called for two pins to be cut or
desoldered to disable the internal keyboard, on my machine I tried leaving the
connections intact, and found that both the internal and external keyboards
were able to co-exist without problems. Your mileage may vary, however.

The other change I made to the plans was to create a circuit to allow the
external keyboard to reset the A1200 the way god intended... with the three
finger salute. This avoids having to use the internal keyboard to reset or
having to wire up a separate button to perform reset. KBReset.iff is an IFF
picture of the external keyboard reset circuit.

... On a clear disk you can seek forever

1.13   a500Fan

A500 Fan Project

BY: Wizard

 WARNING: This project could damage your Amiga if done improperly. Use
          at your own risk!

 If your A500 has the old heavy 35w power supply instead of the newer and
lighter 60w one, I wouldn't even bother with this project. The A500 power
supply can barely supply enough juice for the computer and an external floppy
drive let along anything else. I would hope that you have already added a
BigFoot or made one from a PC power supply.

 NOTE: Before starting ensure you have discharged any static electricity
       by touching a well grounded surface or by wearing a wrist strap.

1. Unplug all cables, and using a Torx-10 screwdriver remove the cover from
   your A500. After removing the cover, take off the keyboard & the RF
   Sheild.

2. It is best to hook the fan to the power connector and not the motherboard
   itself. There are four metal posts sticking out of the back of the
   connector. The top two will be the ones used in this project. The top
   left is the +12V source and the top right is the ground.

3. Cut 2, 8 inch pieces of wire. Gauge is not extrememly important. Solder a
   male quick disconnect to one end of each wire.

4. Solder your resistor to the top left post of the power connector.

5. Solder your wires, one to the resistor and the other to the top right
   post as shown in the wiring~diagram.

6. Solder a female quick disconnect each wire on your fan.

7. Glue the fan, using modeling glue, hot glue gun or something similar to
   the lid of your A500. Position the fan so it is over the air vents (see
   fig#2) and that the air will be blow out
   of your A500. I would place the fan so that it is above your CPU, but the

   actual position is entirely up to you.

8. Plug the quick disconnects together making sure the black wire from the

    fan is connected to the top right post and thered wire from the fan is
    connected to the resistor which is connected to the top left post.

9. Double check all your wiring, then plug in your power supply and turn it
   on.

10. If the fan came on and worked as advertised. Turn the power off, unplug
    the power supply and reassemble your A500.

 NOTE: For maximum air flow leave your RF sheild off when reassebling your
       A500. If this bothers you, or you're paranoid the FCC with come take

       away your beloved Amiga. Try drilling a few holes in the shield
       before reassemble the computer to aid in the air flow.

1.14   Sega

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Sega Joypaad Project
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By: Wizard
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 WARNING: This project could cause damage to your Amiga if done incorrectly.
          Use at your own risk!

 As you may have already figured out, Sega joypads can used on the Amiga. More
and more games, like Deluxe Galaga, Leander ect.. are starting to support the
extra buttons. I have been using my sons Sega controller "as-is". But as of
lately I have heard rumors this could blow your CIA chips. So I dug through my
old Euro mags and came up with this wiring diagram. It swaps pins 5 & 7 from
the Amiga to the Sega. I don't know what these pins represent on the Sega but
on the Amiga pin 5 is middle mouse button and pin 7 is +5V. This is what I
heard caused the smoking of the CIA chips was the +5V being tied to one of the
buttons. If you have WB3.0, the lowlevel.library I believe has the support for
the Sega Control Pads. This is according to the docs for Deluxe Galaga. I
believe you must have this library installed to use the extra buttons with
Deluxe Galaga. As for Leander. I have no Idea.

 Wiring~Diagram

1.15   copier

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Hardware Disk Copier
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By: Wizard
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      WARNING: If done incorrectly this project could cause damage to your
              Amiga. Use at your own risk!

   This project will show you how to make a basic Hardware Disk Copier. This is
very similar to a commercial product released by Cachet Software. There is a
PD program that this will work with, but I can't think of it's name off the
top of my head, as I was foolish enough to buy the commercial one.

   The hardware works by swapping the read/write lines between DF0: and the
external disk drive (DF1: or DF2:). Just plug this thing into your external
floppy port then plug your disk drive into the adapter, power up your Amiga,
run your copy program and you will get a mirror copy of the original.

   The only source of 23 pin connectors I know of is a place called I.C. Supply
in Honolulu, HI. You'll have to get the phone # from directory assistance,
since I tossed all my HI. phone books when I moved back to the mainland.

      Wiring~Diagram

1.16   parnet

 ParNet Adapter

 This project will show you how to make a ParNet Adapter for your Amiga. Use
this information at your own risk! It worked on my A2000 & my friends A4000,
but I don't guarantee it will work on your setup. For more information
download the entire Parnet Archive.

 You must first obtain 2 unwired male to female RS-232 type breakout adapters
(Radio Shack PN# 276-1403) and a fully wired DB-25 male to male cable. Cable
length is usually not a problem as long as it is kept under 15 ft.

      ~Wiring~Diagram

 You should leave pins 1, 14, 15, 16, 17, 23, 24, and 25 unconnected as shown
in the wiring diagram. Also, it is very important that you build 2 adapters
and NOT just bridge pins 10 & 13 on a single adapter.

1.17   Floppy

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Disk Drive Interface
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Design By: Moose

Docs by: Wizard
```

   This project will show you how to build a external floppy drive interface
for your Amiga. Now you have a use for all those extra internal drives you
have laying around. It should work for both 3.5 & 5.25 floppies, although I
have only used it for 3.5's. If you use a little imagination and some creative
engineering you could make a multidrive interface and put 2 external floppies
in one case! Note: if you use this on an A500 and don't get a beefed up power
supply don't cry on my shoulder when your machine starts crashing for NO
reason. That wimpy little power supply can barely supply enough juice for the
A500 itself, let alone a couple of extra floppies.

 Use This at your own risk! If this project is not done correctly it will
cause severe damage to your Amiga! Like blowing open your 5V lines on your
motherboard.

   Wiring~Diagram

1.18 credits

```
Credits
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```

 I would like to thank the following people for their contributions to this
project.


```
Ed Dumbill        Author of Heddley. Awsome AmigaGuide Editor.

Chas Wyndham      Author of the freeware pic veiwer P-View.

John Lee          For posting the Atari Trackball info on FidoNet.

John Guidry       For posting the A1200 Keyboard info on FidoNet.

Moose             For Sharing his Top Secret External Floppy interface.

Wizard            For providing most of the Hacks in this project.
```


 If you have some Amiga hardware hacks you would like included in MAP's Issue

#2, send them to me at:

E-Mail: wizard@galstar.com

 MAP's (More Amiga Projects) is Freeware do what you want with it, But if you
make a million bucks off of it you have to split it with me. ;-)