# BLIND ALLEYS

Blind alleys require additional strategy not outlined in Shannons notes.

Must disable the comparor circuit $D_1 = D'$ when

A: 3 Barriers are hit

or B: Same barrier is hit twice, or $D_n = D'$ twice.

or C: Mouse has made 4 changes of direction

Most elegant method: when 3rd barrier is hit, turn to direction in which $D_n = D'$. Record this direction and move out.

Simple? method: when $D_n = D'$ for second time, move out of square in $D'$ direction.

A. When $D_n = D'$ first time, pull up relay $X_1$. When next barrier is hit or change in direction made pull up $X_2$ thru $X_1$ disabling $D_n = D'$ circuit so that next time $D_n = D'$ no additional 90° turn will be made past $D'$.

# EXPLORING PROGRAM

On center of sq X.

Previously registered direction entered square $(-180°)\, D_2' D_1'$

Read out direction left square last time $D_2 D_1$

Compute new direction $90°$ counter clock from $D_2 D_1 = D_2{-}1, D_1{-}$

Compare new direction $D_2{-}1, D_1{-}1$ with $D_2' D_1'$; clear $D_2 D_1$

    If different:    $Y = 0$

        Turn motor on in direction $D_2{-}1, D_1{-}1$

        Transfer $D_2{-}1, D_1{-}1$ into $D_2 D_1$ reg.

        If barrier hit:

            Reverse motor direction, return to center of sq.

            Record barrier hit.

            Clear $D_2{-}1, D_1{-}1$ after motor stops

        If no barrier:

            Continue to center of next square

            Clear barrier hit pulse counter

            Clear $D_2' D_1'$ register

            Transfer $D_2{-}1, D_1{-}1 \; -180°$ into $D_2' D_1'$ reg.    $D_2 D_1 \; reg \to D_2' D_1'$

            Clear $D_2{-}1, D_1{-}1$ after motor stops

    If same:    $Y = 1$

        Block motor action    (but give off vibration?)

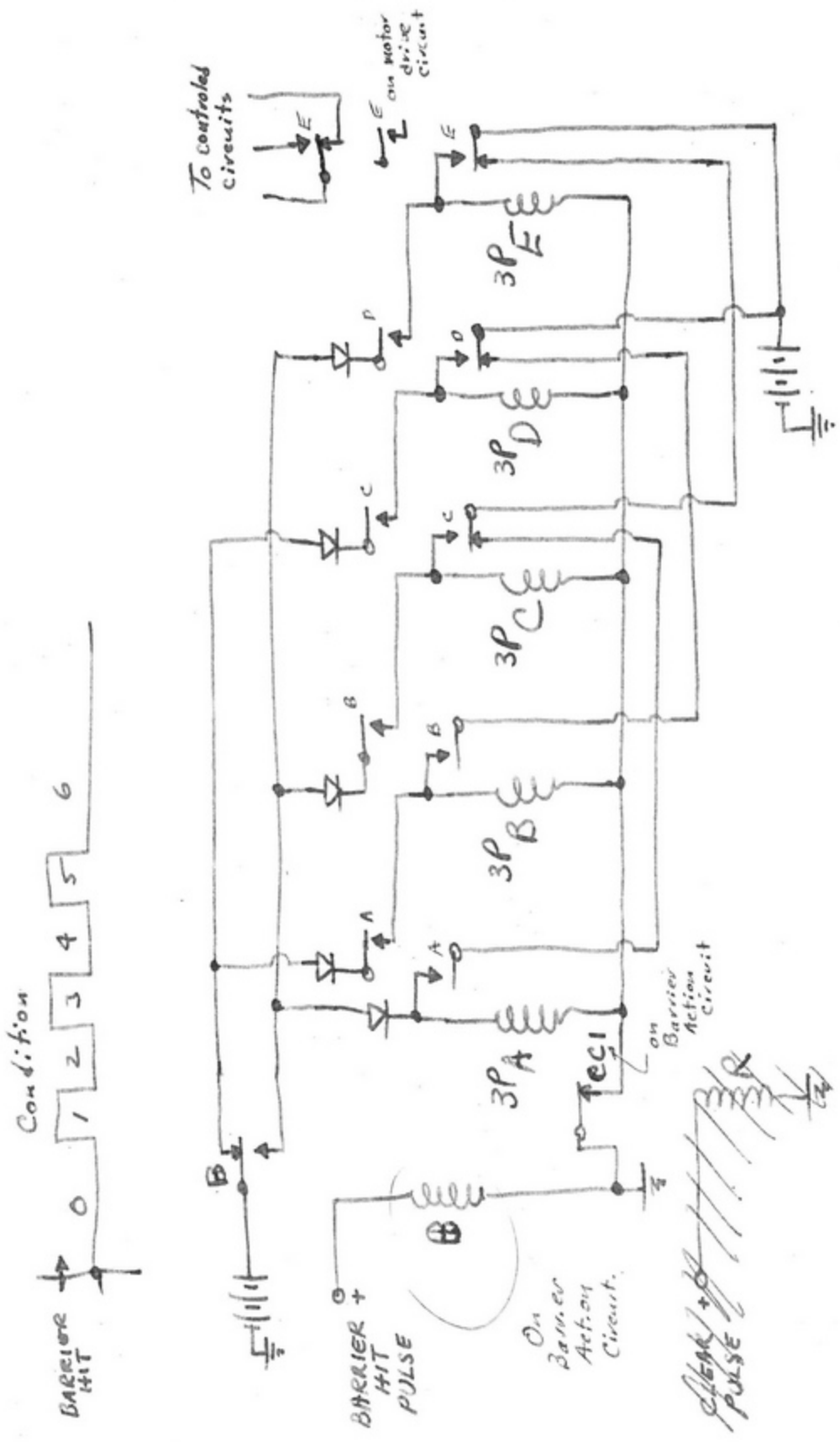        Transfer $D_2{-}1, D_1{-}1$ into $D_2 D_1$ reg

XIII: Routine to avoid circles:

III

# 3 PULSE COUNTER

1/4/52

## Using no special relays or contacts!

To controled circuits

E on motor drive circuit

3P E

3P D

3P C

3P B

3P A

CC1

On Barrier Action Circuit

Condition

0 1 2 3 4 5 6

BARRIER HIT

B

BARRIER + HIT PULSE

On Barrier Action Circuit.

CLEAR + PULSE

L is energised when 3rd barrier is hit

CC1 is opened when center of adjacent square is reached

| Condition | Relays Energised | Relays Dropped |
|---|---|---|
| 0 | — | — |
| 1 | A | — |
| 2 | A,B | — |
| 3 | B,C | A |
| 4 | C,D | B |
| 5 | D,E | C |
| 6 | | — |

On center of square X.

Previously registered direction entered square ($-180$) $D_2' D_1'$

Read out direction left square last time $D_2 D_1$

Compute new direction $90°$ counterclock from $D_2 D_1 = D_2 - 1, D_1 - 1$

Compare new direction $D_2 - 1, D_1 - 1$ with $D_2' D_1'$;  clear $D_2 D_1$

 If different:  $Y = 0$

  Transfer $D_2 - 1, D_1 - 1$ into $D_2 D_1$ register

  Turn motor on in direction $D_2 - 1, D_1 - 1$

 If barrier hit:

  Reverse motor direction, return to center of square

  Record barrier hit

  Clear $D_2 - 1, D_1 - 1$ after motor stops

 If no barrier:

  Continue to center of next square

  Clear barrier hit pulse counter

  Clear $D_2' D_1'$ register

  Transfer $D_2 - 1, D_1 - 1$ $-180°$ into $D_2' D_1'$ reg. (actually $D_2 D_1 - 180$ register $\Rightarrow$ $D_2' D_1'$ register

  Clear $D_2 - 1, D_1 - 1$ after motor stops

 If same:  $Y = 1$

  Block motor action  (but give off center sig ?)

  Transfer $D_2 - 1, D_1 - 1$ into $D_2 D_1$ register


XTRA: Routine to avoid circles:

Dear Ed,

 Here are the plans which we have made to date. I hope they meet with your approval. We are coming pretty well on Franken and have really made progress. The box for the machine is made, and the brain section is now being wired. Not all the parts have been mounted in the brain because we don't have them all yet. Ivan and I are always arguing about some small detail, but we seem to get the job done. We got a very large stepping switch from Philadelphia with 7 poles and 102 positions. It will be driven in sequence with the motions of the mouse and will make the necessary connections for each square. This switch does not have a stepping coil, but must be driven by gears.

 The machine is fairly large, 24" x 41½" x 18" . The box is built in three sections; the bottom one holds the relay boxes and has some storage space for cables and the like, the next section is the brain with all the wiring and the big stepping switch which will be driven by a selsyn, the top section will contain the machinery for moving the mouse and the mating selsyn to drive the stepping switch in sequence with the mouse movements. The three layers are fastened together with removable-pin hinges and luggage catches, and all connections will be made with cables and plugs so that the layers can be completely separated.
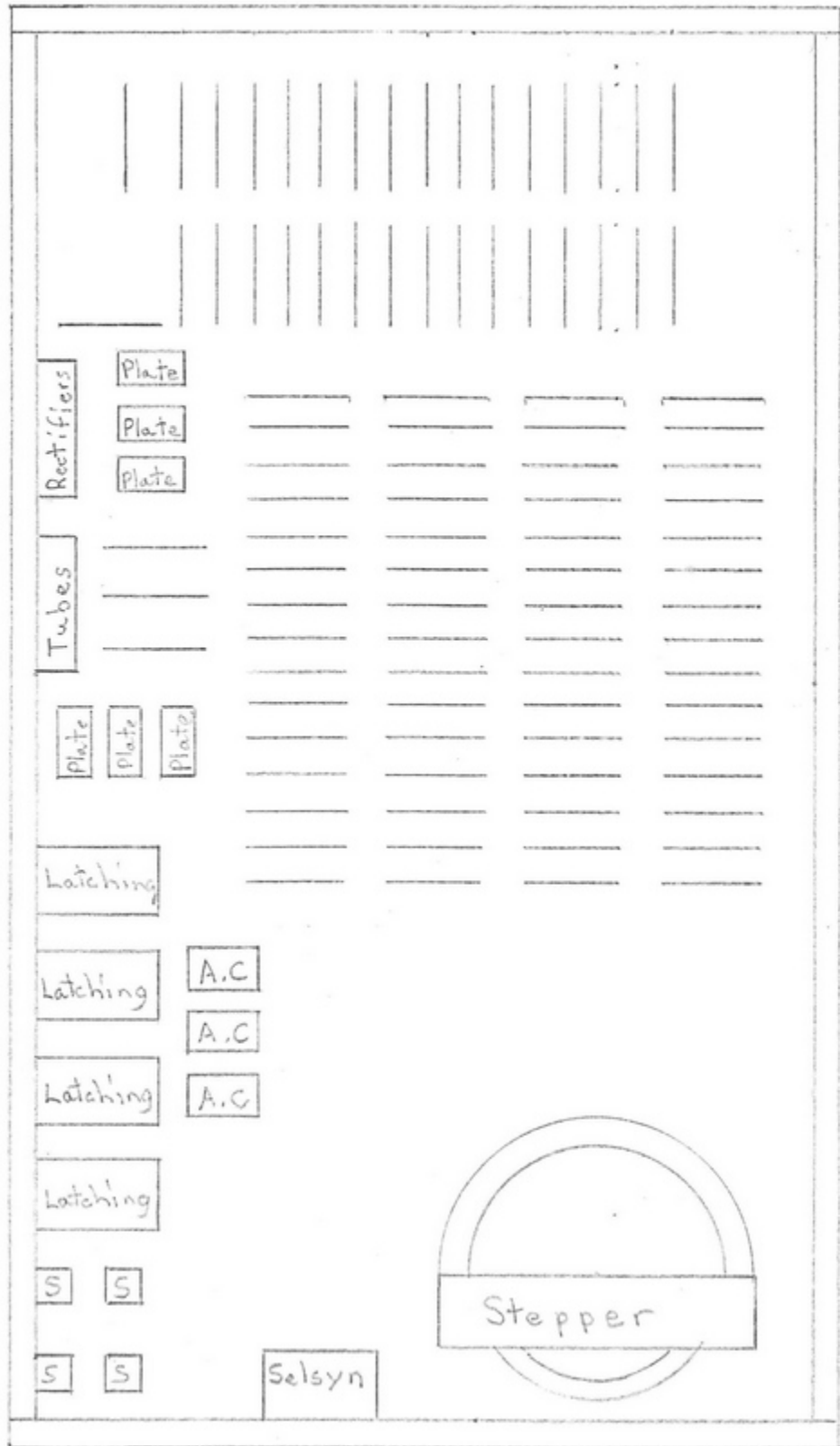
       That's all for now.
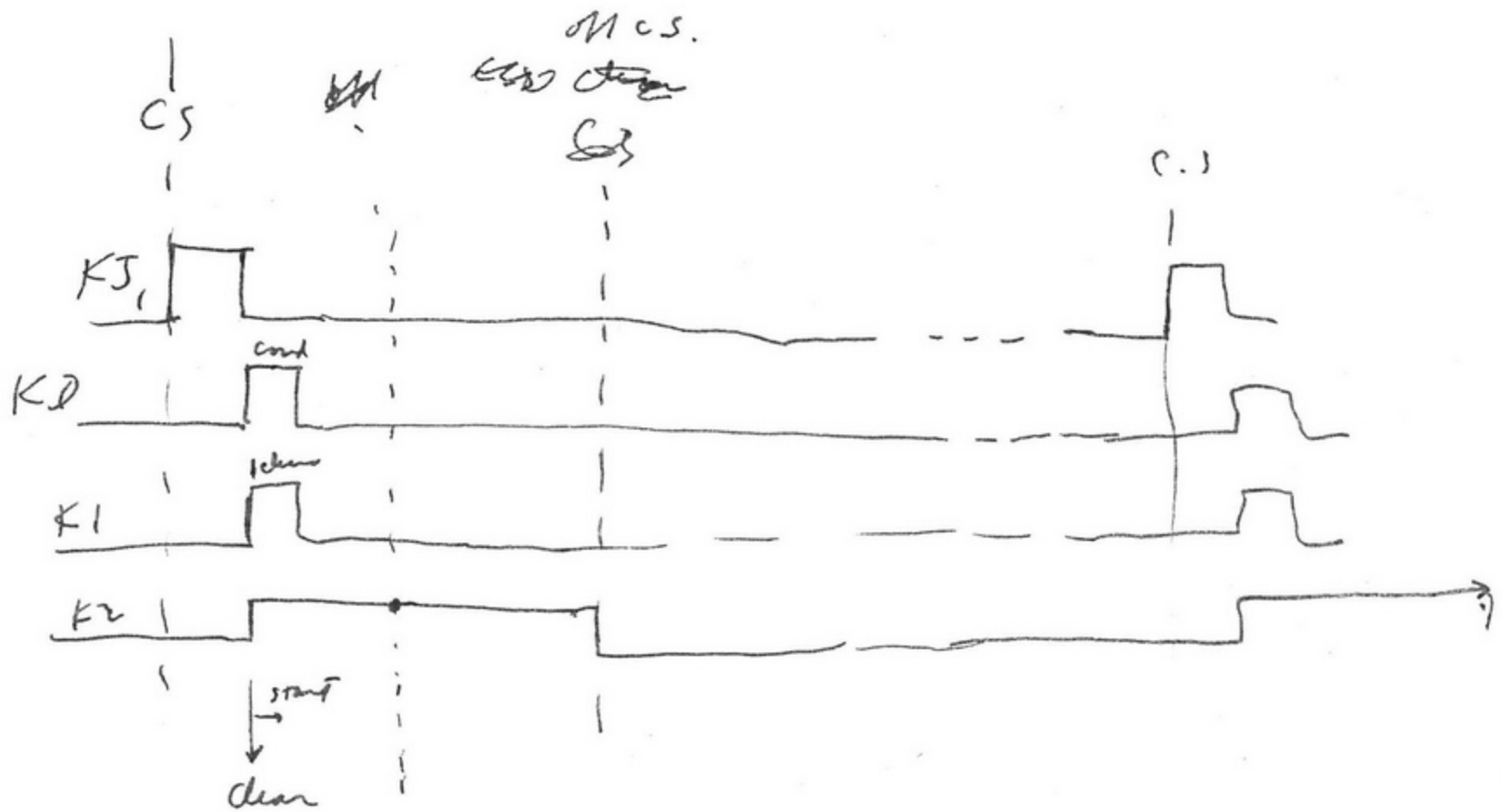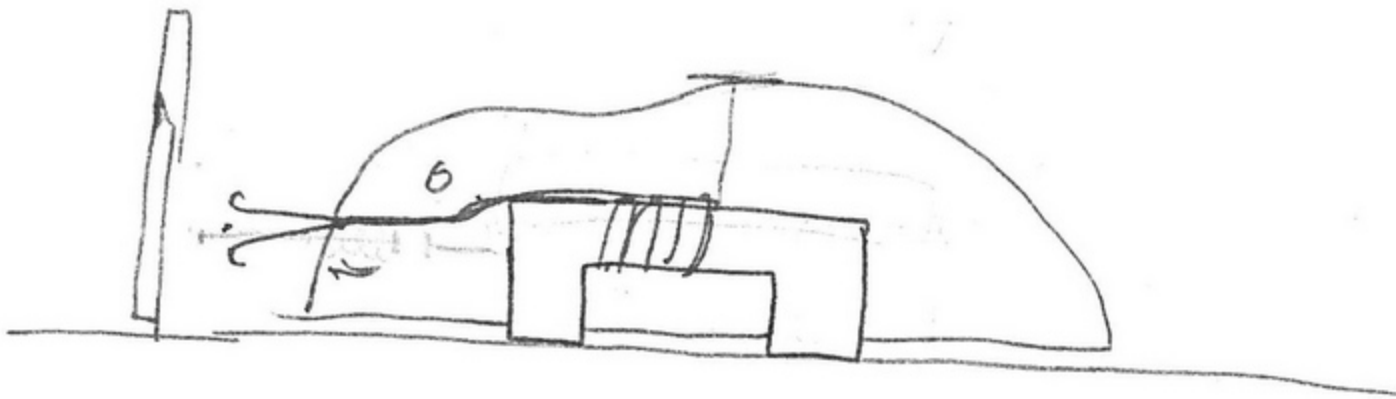
            Bert

Parts Mounting in Brain.

W



Rectifiers | Tubes

Plate
Plate
Plate

Plate Plate Plate

Latching

Latching    A.C

Latching    A.C

Latching    A.C

S   S

S   S    Selsyn

Stepper

S

N

All lines are terminal strips. The S relays are slow acting relays

W

Dear Ed,

    If you have now received the set of plans which we sent you, would you please number the drawings in order as they arrived. The diagram of the squares should be first and the one with the tubes on it should be sixth. This will help in making changes as we have already thought of some.
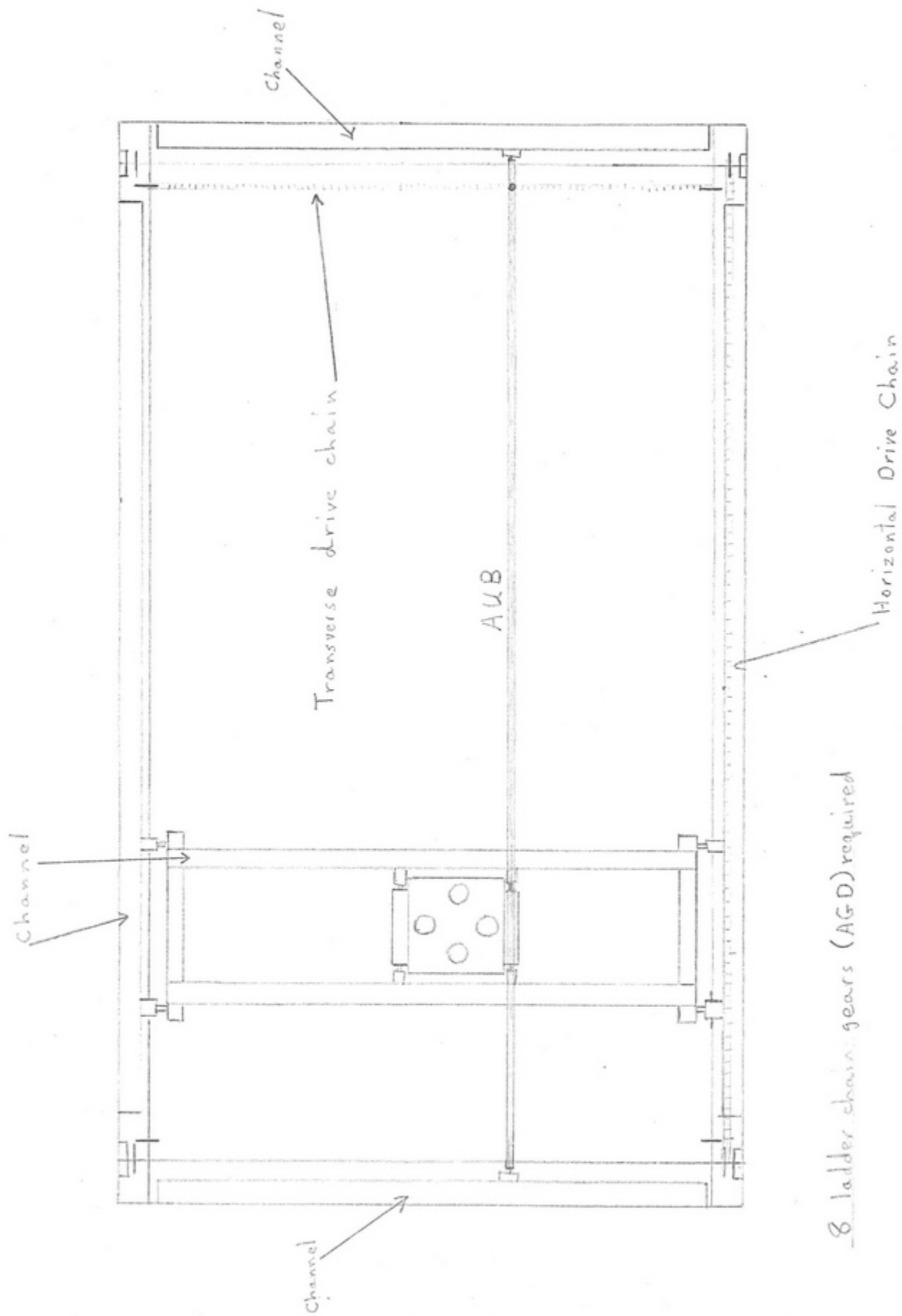
                              Yours truly,

                              Bart

    P.S.  Don't count the parts list in the plans, keep it separate please. Thanks

Channel

Transverse drive chain

A u B

Channel

Channel

Horizontal Drive Chain

8 ladder chain gears (AGD) required