The Complete

HOME ENTERTAINMENT CENTRE

AMSTRAD
464/664/6128

THE COMPLETE HOME ENTERTAINMENT CENTRE

This package consists of this booklet and either two cassettes or a disk.

CASSETTE SIDE A CHESS, VIDEO CARD ARCADE
                SIDE B PINBALL, DOMINOES
                SIDE C BRIDGE, POOL 200
                SIDE D MAH JONG, BACKGAMMON

LOADING INSTRUCTIONS

All the programs will load using RUN"". There is a small interval between the programs. To ensure you load the correct program you can also type the following loading instructions:-

                SIDE A RUN "CHESS", RUN "ARCADE"
                SIDE B RUN "MAC", RUN "DOMS"
                SIDE C RUN "BRIDGE", RUN "POOL"
                SIDE D RUN "MAHJONG", RUN "BACK"

DISK   SIDE A BACKGAMMON, BRIDGE, CHESS, MAH JONG
                SIDE B DOMINOES, PINBALL, POOL, VIDEO CARD ARCADE

LOADING INSTRUCTIONS

Type RUN "DISK" to display menu and then select game using appropiate number keys.
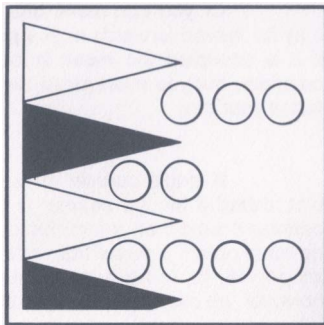
IF YOU HAVE ANY PROBLEMS

If you do not have complete success in running the enclosed software please return it to CDS Software without the packaging. A short note explaining what the difficulties are and the type of equipment you are using will help us to correct any problems quickly and efficiently.

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# CONTENTS

BACKGAMMON

THE GAME

Backgammon is played by one player against the computer. The player uses the fifteen yellow counters and the computer the fifteen white counters. The winner is the first player to get all his counters off the board.

THE BOARD

The board is divided into two identical sides, one for each player, consisting of twelve elongated triangles, called points, divided by a centre strip - the bar.

The two sets of six points divided by the bar are called the inner table and outer table. The points of the inner table are numbered 1 - 6, but the numbers are not marked on the board and must be memorised.

MOVEMENT
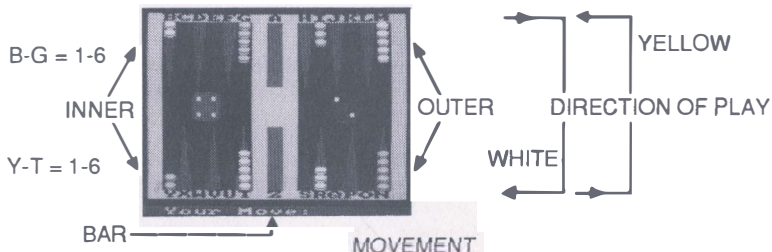
Your counters must move from your opponent's inner table, through his outer table, through your own outer table to your inner table, and then off the board. The first player to get all his counters off the board wins.

The first move is decided by the throw of a dice, the highest throw winning first move. Then two dice are thrown to determine the count for the opening move, and subsequently for alternate moves. Two counters can be moved at a time, in which case one counter moves the number of points on one dice, and the second counter moves the number of points on the other dice.

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Or you can move one counter the total number of points on both dice. A counter may be moved forwards onto a point not occupied by two or more of your opponent's counters; if it is occupied the move is blocked and you must then try to move another counter or counters, but you must move the full number of points thrown by the dice. If you cannot, you forfeit your turn.

HITTING

A single counter on a point is known as a blot, and if you land on your opponent's blot, called a hit, his counter is taken off the board and barred ie. placed on the bar. Your opponent must then return that counter into play before moving any other counters. To do this he must obtain a throw from one or both of the die that corresponds with a point from one to six on your inner table, and that point must not be blocked ie. occupied by your counters. If, however, he moves onto a blot, then your blot is placed on the bar.

BEARING OFF

Removing the counters from the board is called bearing off, and you cannot start to bear off until all fifteen of your counters are in your inner table. You may then bear off counters from points corresponding to the number thrown on the dice, or you can move counters within the table.

You must, if possible, use the full number. For example, if you have a counter on the six-point and you throw six, you can bear off the counter, but if the six-point is not occupied you must take a counter from the next highest point. If a point indicated by the dice is vacant you may only move from a higher point.

If, while bearing off, one of your counters is hit, and therefore barred, you must re-enter it as described. You cannot continue to bear off until your barred counter is back in your inner table.

CONTROLS: GENERAL

When the program has loaded the board is displayed and set up ready for play. The dice are rolled to see who moves first; the left hand die shows the computers score and the right hand die the players'. The highest score moves first.

The computer moves the white counters and the player the yellow counters. If there are more than eight counters on a point, the end counter will display a number which indicates the number occupying that space.

LEVELS: STRENGTH

The program has four levels for strength of play. These are ranked from 1 - 4. Level 1 will play a reasonable strength game quickly, and Level 4 will play a stronger game, but may take several minutes over complicated moves. The levels are selected by pressing the appropriate number key.

MOVEMENT: HOW TO MOVE

A counter is moved by inputting the letter appropriate to the point the counter is on, combined with one of the dice scores.

For example: From the initial set up (see diagram) with a score of 3 and 2, a counter can be moved from N to I, by inputting N3 RETURN followed by K2 RETURN. Before RETURN is pressed a potential move can be cancelled by pressing DELETE.

DOUBLES
When a double is thrown, you are entitled to four moves of the number scored.

BEARING OFF
To "bear off" a counter, input the letter appropriate to the point the counter is on, and one of the dice scores. Which one depends on whether you are "bearing off" or moving within your inner table (Refer to the General section on "bearing off" to see whether you can bear off or have to move).

RETURN FROM THE BAR
When one of your counters has been "hit" by the computer it is brought back onto the board by pressing Z combined with one of the numbers thrown, which corresponds with a free point in your opponents inner table.

If the numbers thrown will not allow you to re-enter via a free point then you will forfeit your turn.

SCORING
Backgammon is also a gambling game, played for a stake, (one point). A losing player who has managed to bear off at least one counter forfeits the stake, but if he has not managed to bear off any of his counters he forfeits double the original stake - this is called a gammon (two points). If the loser also has one or more counters still on the winner's inner table, he forfeits treble the stake - this is called a backgammon (three points).
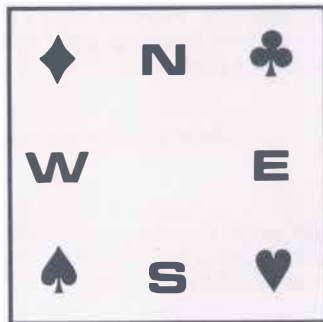
BRIDGE

Table of Bridge Contents

1. Introduction

1a. General

The program allows one player to play a complete game of Bridge with the computer controlling the other three hands. Each hand is bid according to the Acol system. Included are the Blackwood (aces and kings), Stayman, and Baron conventions. The strong 2 club and take-out doubles are also supported.

4

All four hands are displayed at the end of play followed by the score to rubber.

b. Features
* Hands with a specific point count/balanced distribution generated
* Claim trick(s)
* Card autoplay/recommend option
* Hand input facility
* Rebid/replay option
* Game save/load facility
* Demonstration mode
* Bidding/play summary
* On-line instruction menu
* User defined colours
* Cheat option
* Variable speed of play
* Backstep the play
* Skip to the next hand

c. Running the program
A demonstration mode is automatically entered into if no key is pressed for 30 seconds after the program has loaded. Any key press will start the game.

2. Playing a Game
As normal, the player sits South. To follow suit, just enter the card:

A   K   Q   J   T   9   8   7   6   5   4   3   2

To lead or discard press a second key with the first letter of the suit. Please note that if a singleton is held in the suit led, it is automatically played, as is the last trick. At the end of each trick the program waits for a key press.

X	Backstep a trick	Z	Claim some or all of the remaining tricks
P	Peep at the other hands	RETURN	Plays the lowest card held in the suit led
R	Recommend a card	S, H, D or C	Plays the lowest card held in that suit
I	Autoplay the remaining tricks	SPACE	Autoplay a card

3. Global Instructions
E	Abandon the hand	B	Steps through the background colours
L	List the bidding	V	Save/load a hand to or from cassette/disk
F	Toggle the sound	CLR	Restart the program
		TAB	Instruction menu

4. Analysis section
At the end of play the hands are displayed and the following options given:
P	Reset the speed of play	L	List the deal to a printer
R	Start a new rubber	I	Input a hand
W	Display the bidding and play	S	Set the number of points/distribution of the South hand
RETURN	Replay the hand		

5. Opening leads
Partners bid suit, top of three card honour sequence, ace from AK, king from KQ, fourth highest of the longest suit held (no trumps), singleton or high-low from a doubleton. If sensible, partners lead will be returned.

6. Bidding instructions
          SPACE   No bid   D   Double   R   Redouble
Otherwise enter 2 characters, the level 1-7 followed by the first letter of the suit.
Seven other commands are also available throughout the bidding and the play - see section 3.

7. The Bidding System
N.B. HCP's = High card points: Ace = 4, King = 3, Queen = 2, Jack = 1
<=less than >=greater than

a. Opening Bids
1 of a suit ... 12 - 19 HCP's

If two suits of equal length are held, the higher ranking is bid with two exceptions:
i. The suits are spades and clubs. Clubs are bid.
ii. The hand distribution is 4441. Here the suit below the singleton is bid except when the
singleton is clubs when hearts are bid.

1NT ... 12-14 HCP's & a balanced hand (no singletons voids or five card suits).
2 of a suit ... > 19 HCP's (2 clubs = >22) 2NT ... 20-22 HCP's & a balanced hand
3 of a suit . . 4-10 HCP's and at least a seven card holding. Opening bids of 3NT or higher are
not made.

b. Overcalls
Suit ... 11 with a six card suit ... 12 with a five card suit > 13 jump overcall, minimum six card
suit 1NT ... 15-17, a balanced hand and a stop in the called suit
2NT > 17 HCP's a balanced hand and a stop in the called suit
Double ... (for take out)>13 HCP's and a singleton/void in the suit bid (below the three level).
          This distribution is not necessary for hands with >15 HCP's Partner must take out
the double into their best suit. With >8 HCP's they must also jump. It is possible to pass if the
suit doubled is their best (a double of a NT contract is always for penalties).
          Pre-emptive overcalls are not made.

c. Replies to Opening Bids
          To one level bids: <6 HCP's . No bid <10HCP's ... Support partners major with
four cards or more.
          If you have a four card major that can be bid at the one level you must mention it.
Raise partners minor with 4 card support.
Bid your best suit at the one level.
Otherwise make the limit bid of 1NT. Do not bid at the two level.
If two suits of equal length are held, the lower ranking is bid.
10-12 HCP's ..Jump raise partners major with four card support.
Any four card major.
With four card support, jump raise.
Bid your best suit or 2NT's with a balanced hand.
A bid of 2H over 1S required a five card suit due to the bidding space consumed.

>12HCP's ... Change the suit, show support, if held, on the next bid (delayed game raise)
With > 15 jump shift or 3NT.

TO 1 NT: If you have an unbalanced hand, you must either use the Stayman convention or make a takeout bid into your best suit (jump with >12HCP's). The takeout into a suit at the two level is regarded as a sign off.

The Stayman convention is used if you have >10HCP's and a four card major. You bid two clubs. Partners must then bid their best major if they hold more than three cards in either major or a diamond denial.

With a balanced hand, no bid with less than ten points, 2NT with 11 or 12 points otherwise three no trumps.

d. Replies to Overcalls
TO 1NT .   With a balanced hand pass with less than 8 HCP's, 2NT with 8 or 9 HCP's and 3NT with 10 plus.

Unbalanced hands: The Stayman convention may not be used in response to an overcall, 2C being for takeout. With >11 jump in your best suit.

TO SUIT OVERCALL: As the overcall requires a five card suit, support may be given with a three card holding. A single raise is made with 6-11 HCP's, a jump raise with >11.

As game is not likely with a holding of less than 12 points (take-out double is used with strong hands in preference to an overcall), a no trump bid is made to show lack of sympathy for partners suit. A change of suit (requiring>5 cards) is not forcing.
e. Replies to Strong 2 Bids:
With <5HCP's ... 2NT

f. Replies to 2NT
With a balanced hand and >4 HCP's bid 3NT
With an unbalanced hand bid 3 clubs. This is Baron and request partner to bid his lower ranking four card suit except if clubs when 3NT is bid.

g. Replies to 2 Clubs:
This is a conventional bid showing >22 and is no indication of a club holding. Bid 2 diamonds with less than 8 points and 2NT with 8 points. You cannot pass as partner may be able to make game.

h. Replies to Three Level Bids:
With <16 HCP's no bid. With 16 plus either raise partner or bid 3NT.

i. Openers Rebid:
IF PARTNER SUPPORTED then with   <16 HCP's .   no bid   >15 HCP's ... raise

IF PARTNER BID 2NT over 1NT then bid 3NT with anything but a minimum.
IF PARTNER BID A NEW SUIT then you are obliged to keep the bidding open except after 1NT - 2D/2H/2S.

Here you pass the weak take out. 12-15 HCP's ... Support with a four card suit Rebid with a six card suit New suit 15-16 HCP's ... With a balanced hand 1NT may be bid. Used to show a hand suitable for, but too strong to open, 1NT. >15 HCP's ... As above with jump. A 2NT rebid requires>16 HCP's.

Note if partner bid at the two level, then 2NT may be bid with >14 points.
A new suit bid by you at the three level is forcing for one round.

IF PARTNER BID 1NT over your suit and your hand is not unsuitable for trumps then:
<17HCP's ... No bid   17-18 HCP's ... 2NT   19 HCP's ... 3NT
To rebid your opening suit or a new suit at the minimum level is a sign off/preference request. A new suit at the three level is forcing for one round.

8. Blackwood Slam Convention
A check to see if the partnership is missing any aces/kings before moving into a slam. It is generally held that if the bidding indicates that in excess of 32 points are held, the possibilities for a slam must be examined. The convention is only used after a suit has been agreed. A bid of 4 NT by the player will produce the prompt Blackwood? An entry of Y requires North to reply according to the number of aces held:
5C 0 or 4 aces   5D 1 ace   5H 2 aces   5S 3 aces
A bid of 5NT produces a similar sequence re. the number of kings held.
NB: The program will initiate Blackwood.

9.Scoring
The score at Bridge is to rubber. A rubber is complete when one side has won two games. A game is won by amassing 100 or more points 'below the line'.
Points 'below the line' are awarded for making a bid contract. For instance, if two hearts are bid and made by N & S, 60 points (2*30) are earned below the line. The score sheet would then show:

N & S   W & E
60

Additionally, points may be awarded 'above the line'. These are earned by making overtricks, holding honours, bidding and making a slam, making a doubled/redoubled contract or defeating the opponents contracts. For example, had the heart contract above been made with an overtrick, 30 points would also have been awarded above the line:

N & S   W & E
30
60

Whenever one side has a hundred or more points below the line, the first game is complete. A line is then drawn horizontally under the score and the second game commences. Any points which the opponents had below the line are lost. Points earned above the line are unaffected. The calculation for the points awarded below the line is straightforward:

Spades/Hearts	30 per trick	No trumps	40 for the first trick
Diamonds/Clubs	20 per trick		30 for each additional trick

The only circumstances which affect this calculation are a double or re-double of the contract. If doubled, multiply the above by two. If redoubled, multiply by four.

The 'above the line' bonus is not so simple:

i.   50 point bonus is given for making any contract that has been doubled or re-doubled.

ii. If any player holds 4 trump honours   100 points
     If any player holds 5 trump honours   150 points
     If any player holds all four aces at no trumps   150 points

iii. Overtricks: Trick value unless doubled or redoubled.

	non vulnerable	vulnerable
Doubled	100 per trick	200 per trick
Redoubled	200 per trick	400 per trick

iv. A slam bonus is awarded dependant on vulnerability:

	non vulnerable	vulnerable
Small slam	500	750
Grand slam	1000	1500

v. Penalties

	non vulnerable	vulnerable
Undoubled	50 per trick	100 per trick
Doubled	100 for the first	200 for the first
	200 for each additional trick	300 for each subsequen trick
Redoubled	2* the doubled penalty.	

When the rubber is complete, the points above and below the line are totalled and a bonus of 500 or 700 given to the side that completed the rubber.

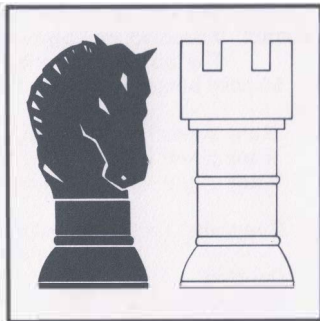N.B. Part game scores 'Lost' when the opponents make game, count in the final score.

CHESS

SECTION 1 - INTRODUCTION

1a - General

This program is the best computer chess program available on any home computer. It is written using the very latest techniques by a computer chess programmer of ten years experience. It has been tested against a wide range of other chess programs and proven stronger than any of the opposition. It has the widest range of true features and sub-features available, including some, never before implemented on any home computer chess program. The program also has a perfect understanding of all the rules of chess, including underpromotions, the fifty move rule and all draws by repetition. It can also handle all the standard mates including King and two Bishops versus King and the very difficult King, Bishop and Knight versus King.

1b - Quick guide

This program has so many features, that at first you may be overwhelmed by the sheer size of the manual. However you do not have to read it from cover to cover but merely sample the relevant sections as your knowledge of the program increases.

The only sections you should need to read to get started (apart from this introduction of course) are "3b - Your Move" and "4a -Cursor Movement". Then the most commonly used commands in section 4c are "Go","New Game" and "Type".

After that, the other sections can be read at your leisure, as you discover the truly amazing features that the program has to offer.

SECTION 2 - DISPLAY

2.a - General

The display uses two screens to provide clear, extensive information as to the state of the game, the programs current thoughts and the past move record. The main screen shows a graphics chess board and various messages and questions as required. The second screen shows the past move record, including the player names and chess clocks and also information on the programs thought processes including lookahead, positions examined, current-line and best-line with evaluation. The display can be toggled between the two screens by pressing the <SPACE> bar.

2.b - The board

The main screen has a graphics board printout showing the current position. Letters and numbers around the board indicate the algebraic notation used for each square.

2.c - Messages and questions

Various messages and questions are displayed around the board as necessary. These are explained in more detail in later sections.

2.d - The move record

The secondary screen shows the last seven moves made by each side in two columns including move numbers. Above the moves are displayed the colours, player names and elapsed-time chess clocks for each side.

2.d.i - The player names

Above each column is displayed the names of the white and black players. The programs name is displayed as 'Colossus' while its opponents name is displayed as 'Opponent'.

2.d.ii - The clocks

Below the player names are displayed the elapsed-time clocks for white and black. The clocks are in the format 'hh:mm:ss' (hh=hours, mm=minutes, ss=seconds). The clocks show the total time used by each side in the game so far.

2.d.iii - The moves

The moves are displayed in algebraic notation with the from-square followed by the to-square. The separator between the from- and to-squares indicates whether the move is a capture or not ('x' signifies a capture, '-' signifies a non-capture). Castling moves are indicated with the from- and to- squares of the moving king. En-passant captures are indicated by the letters 'EP' printed after the move.

Promotions are indicated after the move by a '/', followed by a letter to indicate the promoted piece ('N'=knight, 'B'=bishop, 'R'=rook, 'Q'=queen). Checks are indicated by a '+' being printed after the move.

2.e - Technical information

The bottom of the secondary screen is used to display detailed information of the program thought processes. This information can provide a great insight into how a good chess program works, but only takes a fraction of one percent of the program thinking time to display it.

2.e.i - Lookahead

When the program thinks about its move, it displays the lookahead depth of its search. The depth is printed in 'ply' or 'half-moves'. The program will search most move sequences to at least this depth, with some being searched much deeper.

2.e.ii - Positions examined

The number of positions examined in the tree of move sequences is displayed. This number is updated after each iteration or when a new best-move is found. The program examines on average about 170 positions per second in the middle game.

2.e.iii - Best line

The program displays the best line it has found so far in its search. This can provide you with the usual 'hint' move and also an analysis of the game in the next few moves beyond the 'hint'! (Usually the line will contain a 'null' move. This simply means a passive, non-capturing move has been assumed.) Also displayed is the evaluation of the best-line, as two numbers. The first is the material evaluation (in terms of number of pawns up or down), the second the positional evaluation. A positive number means the program is better, a negative number means the opponent is better. If the best-line is found to lead to a checkmate then the material score will be set to plus or minus 62.

2.e.iv - Current line

The move sequence the program is currently considering is displayed. This can be seen to change as the search progresses. The length of the line shown, can be adjusted as required (for further details see the 'Quantify' command described later).

2.e.v - Assumed move

The program thinks on its opponents time. It assumes the opponent will make a particular move and then continues thinking about its next move. Sometimes the program will not have a move to assume and then will not think ahead. The move assumed is displayed so that you can follow the programs thought processes and to provide a 'hint' move. However, the quality of this move is for you to decide. If you play a different move from the one assumed, the time is wasted, but the program will correctly predict about one third of your moves on average.

SECTION 3 - PLAYING A GAME

3.a - New game

When a new game is started, the pieces are set-up in their initial positions, the clocks are reset to '00:00:00', the move display is cleared and you are given the option of moving first. Typing <SHIFT>'G' will make the program take the white pieces and move first (for further details see the 'Go' command described later).

3.b. - Your move

Whenever it is your turn to move, the program asks 'Your move?' at the bottom of the main screen. You enter moves by the following cursor positioning method (see the later section 'Cursor movement' for further details).

1) Move the cursor to the square of the piece you wish to move, and press the <RETURN> key or the Joystick [FIRE]. This causes the from-square to be displayed. If you accidentally enter the wrong from-square it can be cancelled by pressing the <DELETE> key. (The cursor is shown as an inverse line drawn through the current square).

2) Move the cursor to the square you wish to move to and again press <RETURN>. This causes the 'to-square' to be displayed. If the move is illegal, the message 'Illegal' is displayed and the move entry cleared. You must then return to step-1 above and try again.

3) If the move is a pawn promotion the program then asks 'Promote to?'. You must then specify the piece you want to promote to by typing one of the following: 'N'-knight, 'B'-bishop, 'R'-rook or 'Q'-queen. If you press any other key, the program assumes you promote to a queen.

Note: If you wish to enter a castling move, you should move the king two squares either way. If you wish to enter an en passant capture, you should move the pawn as in a normal capture. The legal move is now indicated on the board, by flashing the cursor on the from-square, then moving the piece and flashing the cursor on the to-square.

3.c - The programs move

When the program computes its move it displays the message 'Let me think...' below the board. The technical information on the secondary screen is updated as the search progresses. When the program has finished its search,

it prints the selected move in the move-record and to the right of the board, and also indicates it on the board(in the same way as your moves are indicated). Pressing the <ESCAPE> key, whilst the program is thinking about its move, will cause it to abort its search, display the message 'Escape' and make the best move it has found so far. If the program has found that its move leads to checkmate, it announces the move with the message 'Mate in N' where N is the number of moves till the mate.

3.d - Game over

When a game is completed, the clocks are stopped and the program displays a message, to the right of the board, to indicate the final state of the game. The messages are:-

'Drawn' - the game has been drawn by 3-fold repetition of position, the 50-move rule or by neither side having enough material to mate the opponent. This occurs in the cases of King, King and Bishop or King and Knight versus a lone King.

'Checkmate' - the side which moved last delivered check-mate.

'Stalemate' - the side to move is in stalemate.

'Time-up' - the side to move lost 'on time'. This occurs only if you are playing an 'All-the-moves' game. (See 'Type' command described later). The program then asks 'What now?' and waits for you to enter one of the program commands.

Type <SHIFT>'N' to start a new game (for further details see the 'New-game' command described later).

SECTION 4 - KEYBOARD ENTRIES

4.a - Cursor movement

The cursor is indicated by an inverse line, drawn through the middle of the current square. It can be moved in three ways.

1) Cursor keys. Four cursor controls, provide single square movement in any direction. The <LEFT-ARROW> and <RIGHT-ARROW> keys give left/right movement, while the <UP-ARROW> and <DOWN-ARROW> keys give up/down movement. If the cursor is moved off one edge of the board, it reappears at the opposite edge.

2) Algebraic keys. The cursor can be moved immediately to any rank, by typing one of the number keys '1' to '8'. It can be moved to any file by typing one of the letters 'a' to 'h'. This allows algebraic notation to be used when entering moves e.g. typing e2<RETURN> e4<RETURN> will enter the common opening move Pe2-e4. Note that if the rank or file of the from - and to - squares is the same, the key sequence can be shortened, i.e. in the above example e2<RETURN> 4<RETURN> would also work.

3) Joystick. The joystick also gives four directional cursor movement.
The initial position of the cursor depends on the current side to move.

If white is to move, the cursor starts on square a1.

If black is to move, the cursor starts on square h8.

4.b - Numeric data - *IMPORTANT* - PLEASE READ

Many of the programs commands require numbers to be entered to set-up new values of parameters etc. The program employs a simple to use, error-proof method for entering numbers. First the current value of the parameter is displayed at the query position.

2) Average mode

This is really an easy usage version of Tournament mode. Instead of entering all four parameters needed for tournament mode, the program simply asks you 'Move time?' The program will then control its search to use on average the time you enter. (Entering 0 seconds for the average move time, selects the programs fastest level.) This effectively provides thousands of 'levels' of play.

Note 1: in fact, this mode sets up tournament parameters of 60 moves to each time control, with 60 times the average move-time being allocated for each control.

Note 2: this is the initial mode, with an average of 10 seconds per move.

3) All-the-moves mode

In chess clubs, most games are played with chess clocks, with each player having say five minutes to complete the game or 'lose on time'. This mode allows you to set the complete game-time and the program will try to play all the moves of the game within the specified time. If either player exceeds the game time, the game will be terminated with the message 'Time up'. By using the 'Elapsed-time clocks' command, you can 'handicap' the program or yourself, by putting some time on one of the clocks before starting the game. This can be very useful for players who are much worse or much better than the program.

4) Equality mode

In this mode, the program will attempt to keep its elapsed time clock closely matched to your elapsed time clock, effectively playing at a similar speed as you are playing. If you make several quick moves, the program will also probably have to play quickly to keep up with the 'pace' you are setting. If however, you think for a long time over some moves, the program will also be able to think longer over its moves. In practice, the programs clock will usually trail yours by a few minutes.

5) Infinite mode

This mode can be used to solve chess puzzles of the form 'find the best move in this position'. It searches all combinations of all moves to ensure that it does not miss a sacrifice. It continues searching, further and further ahead, until you tell it to stop, or it finds a forced checkmate for either side, or it has searched 12 ply ahead (the programs maximum lookahead) or their is only one legal move in the position. This is very useful for postal chess games where you can just leave the program running overnight (or sometimes even longer) to find the best move. When the program starts searching for the move, the clocks are set to 00:00:00:, so that the time taken on the move can be recorded. Also note that the openings book is not searched in this mode. Of course, the program may find the same move in much less time using its normal playing mode, because certain 'obviously bad' moves are ignored

6) Problem mode

This mode is used to solve chess mating problems. When selected the program asks 'Problem Type?'. The program can solve three types of problems:-

1) Normal mates - of the form 'White to move and mate black in X moves'

2) Self mates - of the form 'White to move and force black to mate white in X moves' and

3) Help mates - of the form 'White to move and help black to mate white in X moves'. Of course, the program can find mates for black just as easily. This program is the first home computer chess program ever to be able to solve selfmates and helpmates.

The program then asks 'Mate in?', whereupon you must enter the number of moves till the intended mate. The program can solve mates up to seven moves ahead.

If the position is illegal for any reason, the message 'Illegal' is displayed and 'Alter-position' will not be exited. You must then correct the error before exiting.

Illegal positions occur with any of the following:

either side has no king	either side has more than one king
the side not to move is in check	either side has a pawn on the first or eighth rank
either side has more than eight pawns or promoted pieces	

When you exit 'Alter-position', if you have made any changes, the current game-record is cleared of all previous moves, so that you cannot 'Back-step' through these (now possibly illegal) moves. (Note that changing the side-to-move or the move-number is also considered as a change).

Back-step:- Type <SHIFT>'B' & For-step:- Type <SHIFT>'F'

All the moves in the game are stored in the programs memory. This allows you to step backwards or forwards through the game record, to get to any required position. This can be used for several reasons:-

    e.g. after you accidentally lose a piece, you can recover your error by using Back-step.

    e.g. if you wish to try a different line earlier in the game, you can Back-step to the required position and then carry on playing the different line.

    Stepping through the game record only does one move at a time so you must do an even number of steps if you still want to play for the same side.

Colours:- Type <SHIFT>'C'

The ink, paper and border colours can be set to any of the 2 available colours. The only limitation is that the ink and paper colours cannot be the same, because this would cause the display to 'disappear'. If you try to enter conflicting colours the message 'Illegal' will be displayed and you must re-enter another colour. Note also that you should use a lighter colour for the ink than the paper or the pieces 'colours' will appear inverted i.e. the 'white' pieces will appear darker than the 'black' pieces.

The default colours are: ink = 26 (bright white), paper = 1 (blue), border = 6 (bright red). (See section 4.b for details on how to enter numeric data).

Disk/Tape:- Type <SHIFT>'D'

This allows you to save/load move-records and positions to/from the tape/disk. The program asks 'Load or Save?'. Type 'L' to load a previously saved record, or 'S' if you wish to save the current record. Any other keypress will abort the 'Disk/Tape' command. The program then asks for a file number (from 0 to 255), which is used as part of the filename on the disk/tape. (See section 4.b for details on how to enter numeric data). If any error occurs during loading . the current move-record will be lost. Note that the program parameters, such as playing speed, elapsed time, are not saved and so may need to be reset after loading. The <ESCAPE> key can be used to abort saving and loading early.

Elapsed-time clocks:- Type <SHIFT> 'E'

The elapsed time clocks for both sides can be set from 00:00:00 to 255:59:59. First the program asks for the new value for the white clock and then the new value for the black clock. (See section 4.b for details on how to enter numeric data.)

This can be used to set-up reasonable values for the elapsed time clocks, if you change the playing speed in mid-game.

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The program makes extensive use of the elapsed time clocks to determine how quickly it should play e.g. if you increase the elapsed time on the programs clock it will then play quicker to keep within the average time it is currently set to.

Go:- Type <SHIFT> 'G'

This forces the program to move for the current side to move. This can be used repeatedly to make the program play several moves against itself or to force the program to resume play, for the side to move, after the 'Supervisor' command has been entered (see later). It also allows you to switch sides with the program in mid-game.

After a new game has been initiated, this will make the program play for white. In this case the program automatically clears the clocks and sets the orientation for you to play the black pieces up the board.

This command is ignored if the game is over.

Invisible:- Type <SHIFT> 'I'

This allows you (if you feel confident enough) to play the equivalent of a game of 'blindfold' chess, as sometimes done by strong chess players. The program asks 'Invisibility?', when you must enter a number from 0 to 3. (See section 4.b for details on how to enter numeric data.) The number entered determines which pieces on the board are made invisible.

0 is the default value where both sides pieces are displayed.

    1 will make the white pieces invisible.

    2 will make the black pieces invisible.

    3 will make all the pieces invisible.

The moves are still indicated on the board and displayed in the move record. When 'Invisible' is selected, the word 'Invisible' appears at the top right of the board, to avoid confusion.

Legal moves:- Type <SHIFT> 'L'

All the legal moves by any piece of the side to move can be shown. First position the cursor on the subject piece and type <SHIFT> 'L'. The legal moves will be shown in sequence by flashing the cursor on the target squares. The cursor is then returned to the subject square. If no legal moves exist the cursor will not move. This can be used as a tutorial aid for learners.

New-game:- Type <SHIFT> 'N'

A new game can be started with this command. If you have not used 'Alter-position' since the last 'New-game', then the game record is left intact until the first move of the new game is entered. This allows you to replay through the whole of the last game, by using the 'For-step' or 'Replay' commands.

Orientation:- Type <SHIFT> 'O'

The orientation of the board printout can be reversed, so that you can play the black pieces up the board. The algebraic notation around the board is also reversed. This is most useful when you wish to play black against the program.

Play-self:- Type <SHIFT>'P'

This makes the program play a game against itself, but moving for both sides. When a game is completed, the program pauses for a few seconds, to allow you to study the final position, and then starts a new game automatically. This command is ignored if the program is in 'problem' or 'infinite' mode (see later), or the game is over. Pressing the <ESCAPE> key, whilst the program is thinking about its move (but not while it is indicating its move on the board) or after the game is over, will stop the program playing against itself and allow you to resume play for the current side to move.

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When playing itself, both player names are displayed as 'Colossus'.

Quantify parameters:- Type <SHIFT> 'Q'

This allows you to adjust some of the programs internal parameters to make it function in different ways. (See section 4.b for details on how to enter numeric data.) The program first asks 'Book?'. The parameter value can be 0 or 1. If it is set to 0 the program will not search its 'openings book' for moves (effectively making the openings easier for you). If it is set to 1 the program will use its book in the normal manner. The program then asks 'Prediction?'. The parameter value can be 0 or 1. If it is set to 0 the program will not predict your move or think ahead on your time (effectively making the whole game easier for you). If it is set to 1 the program will predict your move in the normal manner. The program then asks 'Line depth?'. The number of moves in the "current-line" display can be set from 1 to 15 ply. The default is 1, i.e. the moves at the first ply of the tree are displayed. The program then asks 'Dimensions?'. The parameter value can be 2 or 3. If it is set to 2 the graphics board printout is the two-dimensional (2D) representation as used in chess literature. If it is set to 3 (the default) the board is displayed as three dimensional (3D) as though you are looking at a real board and pieces. The program then asks 'Draw score?'. The "material" part can be set from -9 to +9 and the "positional" part from -60 to +60. The lower the draw score is set the more the program will keep trying to win. The higher the draw score is set the more the program will be happy to allow a draw (effectively making it easier for you to achieve a draw by repetition of position).

Replay:- Type <SHIFT> 'R'

The whole game-record can be replayed from the start to the final position to demonstrate the game-so-far to a spectator. The program pauses between moves to allow you to follow the game. The pause time can be set from 0 to 20 seconds. (See section 4.b for details on how to enter numeric data). You can interrupt the replay by pressing the <ESCAPE> key during one of the pauses. When an action replay is in progress, the message '*Replaying*' is displayed below the board.

Supervisor:- Type <SHIFT>'S'

This stops the program making any moves, and allows you to play moves for both sides. This allows you to set-up a required position by playing through a sequence of moves, or to play a friend using the programs board display. All moves entered are still checked for legality. When supervising, both player names are displayed as 'Opponent'.

Type of playing mode:- Type <SHIFT> 'T'

The program has six modes of play, to allow different speed and style games to be selected. The more time you give the program to think about its move, the better it will play. The program asks 'Type?', to allow you to select one of the following:- (See section 4.b for details on how to enter numeric data.)

1)Tournament mode

Full tournament parameters can be set-up.

First, the program asks for the move number of the first time control.

Second, the program asks for the number of moves to secondary time controls.

Third, the program asks for the time of the first time control.

Fourth, the program asks for the time to the secondary time controls.

The program is not strict about your time control and will not claim a win 'on time', if you exceed any time control. The program will usually never exceed its own time control.

To increment the displayed value, use the <UP-ARROW> key. If the new value is above the upper limit for that parameter then it is reset to its lower limit. To decrement the displayed value, use the <DOWN-ARROW> key. If the new value is below the lower limit for that parameter then it is reset to its upper limit. To enter the new value into the program, press <RETURN>. (If you do not wish to change the current value, then just press <RETURN>, instead of using the "increment" or "decrement" keys.)

4.c - Commands

The following commands can be entered, when it is your turn to move or when the game is over. To enter a command, just type its first letter (shown in capitals in the descriptions below) with the <SHIFT> key also pressed. The commands are ordered alphabetically and are designed to be easy and logical to use and to greatly increase your enjoyment of the game of chess.

Note 1: If the selected command requires numeric input, and you are viewing the secondary text screen, then the program will automatically switch back to the primary graphics screen.

Note 2: If the command is entered, then any 'thinking on the opponents time' will be aborted.

Alter position:- Type <SHIFT>'A'

Any legal chess position can be set-up with this command. When selected, the program displays the message:-

'Alter position: SSSSS: Command?' (where SSSSS is the side to move). When in 'Alter-position' mode, a further subset of commands allow you to adjust the board thus:-

Get initial data:- Type 'G'

If after changing part of the position, you decide you've made a mistake, the initial position can be retrieved with this command.

Move-number:- Type 'M'

The program asks 'Move number?', thus allowing you to enter the new move number required. (See section 4.b for details on how to enter numeric data.)

Side-to-move:- Type 'S'

This toggles the side to move between white and black. When pieces are added to the board, their colour is determined by the current side to move.

Clear, Pawn, Knight, Bishop, Rook, Queen, King:- Type 'C', 'P', 'N', 'B', 'R', 'Q' or 'K'.

To change a particular square, place the cursor over it and enter one of the above, to determine the new status of that square. (Note that algebraic control of the cursor is not available in 'Alter-position'.) When a square is changed the cursor will move one square to the right to make the setting up of complete rows of pieces very easy.

Wipe:- Type 'W'

This removes all pieces from the board, thus allowing positions with very few pieces, to be set-up more quickly.

New-game:- Type<SHIFT>'N'

The 'New-game' command is still available when in 'Alter-position' mode. (See full description later.)

Exit:- Type 'E'

This allows you to exit from 'Alter-position', when the required position has been achieved. (Remember to set the correct side-to-move before exiting).

When the program starts searching for the mate, the clocks are set to 00:00:00, so that the time to find the mate can be recorded. If the program finds a mating move, it prints the mating line below the move record, stops the clocks, and asks 'Continue?'. If you are satisfied with the discovered move, then pressing 'N' will cause the program to make this move immediately. If however you wish the program to continue searching for any alternative mate, press 'Y' and the program will restart the clocks and continue searching for another mate. This process is repeated until no more mating moves are found, in which case the program will then make the last mating move found, on the board. If the program does not find any mate, the message 'No mate' is displayed and the program automatically enters 'Alter-position' to allow you to select another position or correct the current one. This program is one of the fastest problem solving chess programs in the world!

Use next best:- Type<SHIFT> 'U'

After the program has made a move, you can instruct it to choose a different move from those remaining. You can use this repeatedly until all the moves have been used up. When no more moves are available, it prints the message "*NO MORE MOVES*' and starts again choosing from the whole move list. If the program is still using its openings book, it will choose the next book alternative (selected at random). This can be used to examine the programs book choices to select the line you prefer. (No non-book moves are considered!) If the program is out of book, it will choose the move it considers to be its next best choice from the remaining moves.

Volume:- Type<SHIFT> 'V'

The volume of the programs 'beeps' can be adjusted from 0 (silent) to 7 (loudest). (See section 4.b for details on how to enter numeric data).

SECTION 5 - PROGRAM INFORMATION

5.a - Statistics

|	
Author: Mr. M.P. Bryant	Language: Z80 assembly
Publisher: CDS Software Ltd., CDS House,	Code size: 36K
Beckett Road, Doncaster, England.	Data size: 5K
Positions examined per second: 170 (average)	Estimated Rating: 1850+ELO (156+BCF)

5.b - Openings book

The program has an openings 'book' of about 3000 positions, which it uses to play the first few moves of the game quickly and accurately. Lines vary from 2 ply to 17 ply deep. When there is a choice of book moves at any position, the program will choose between them at random, with a slight bias towards the moves which the program itself considers best.

DOMINOES
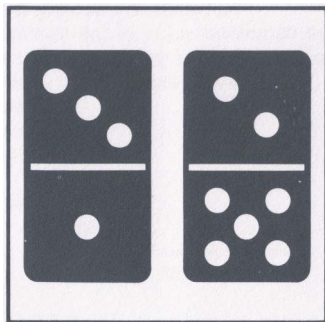
There are twenty eight dominoes in a set, and each is divided in half by a line. Within each half, the surface is either blank or marked by dots, ranging in number from one to six. Seven of the dominoes are doubles, with the same values on either side of the line, ranging from double blank to double six. The rest have different combinations of values, for example, 6-5; 4-1; 3-0.

Of the many variations on the game, all share the same central objective; to get rid of all your hand of dominoes before your opponents can get rid of theirs.

This program contains two of the most popular versions of the game; DOMINO OUT and FIVES AND THREES.

DOMINO OUT

The computer will shuffle the dominoes and draw seven for itself and seven for you. The leading player places any domino from his hand face up in the centre of the table. The other player then has to follow suit, butting the half of a matching domino against the appropriate half of the lead player's domino, and so on. The dominoes are laid end to end.

If a player cannot follow suit it is called 'knocking' and allows his opponent to take another turn - until he can follow suit. Play ends when one player has used all his dominoes.

The loser counts the dots on the dominoes he still holds, and the total number is passed to the winner as his score for that hand.

Where both players cannot follow suit each counts the dots in their hands, the winner being the one with the fewest. He scores the points difference between the two hands. A points total of 61 is set as the winning total. After each hand all the dominoes are shuffled again, and each player takes turns to start.

FIVES AND THREES

The object of the game is the same as in Domino Out i.e. to clear your hand of dominoes using the normal rules.

However, the scoring is done on a move by move basis. When any piece is placed, the combined value of the dominoes at each end is divided by five or three (or both). This value is added to your score. For example points scored are calculated as follows:-

Combined value	Points scored
10	Divide by 5 = 2
9	Divide by 3 = 3
8	Not divisible by 5 or 3 = 0
15	Divide by 5 = 3
and	Divide by 3 = 5

Total scored   = 8

A bonus point is scored by the first player to get rid of all seven dominoes.

KEYS
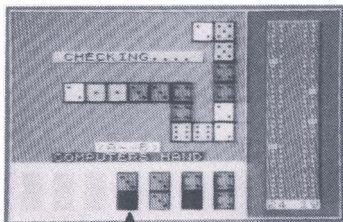
1 2 3 4 5 6 7

Press 4 to play this domino.

1 - 7   Play respective domino
SPACE   Knocking
S   Start

If the domino can be played at either end the computer will ask which end you prefer. This is selected by pressing A or B.

MAH JONG
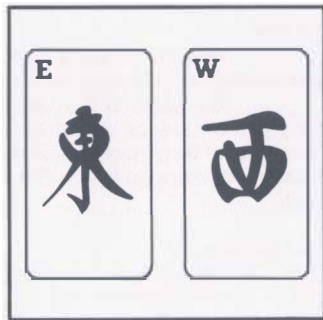
1. Introduction

1.1 General.

MAH JONG is the computer version of the popular game of Mah Jong which enables you to enjoy a challenging game against three other opponents played by the computer.

The game of Mah Jong, first played in the Far East, was introduced into this country early this century as an exciting alternative to chess and bridge. Since then the game has been refined by generations of players until reaching its present form. The rules employed are those recommended by the British Mah Jong Association (BMJA) and widely regarded as the best.

1.2 Features.

1	Adjustable speed of play.	2	Automatically scores,
3	Demonstration mode.		doubles and settles up hands.
4	Discards face up or down.	5	Hints on play.
6	Joystick control.	7	Nine levels of play.
8	Optional 19 special hands.	9	Optional tournament mode.
10	Peep at other players hands.	11	Replay, new hand or new game.
12	Take back last discard.	13	3D graphics.

2. Running the program.

2.1 Demonstration mode.

On starting, the program will enter a demonstration mode. You can stop the demonstration by holding down the escape key (ESC) while the tiles are being drawn in the bottom half of the screen.

After the last tile has been drawn the computer will beep, indicating that the demonstration has been stopped. You should then release the key immediately, otherwise the demonstration will restart.

2.2 Program controls.

All tile discards are made using the cursor. This is shown by a 'diamond' symbol which will appear on the left of the screen above the lower set of tiles. The following controls will enable you to move the cursor and discard/claim tiles as you choose.

Z	left	SPACE	claim
X	right		
	up	}	select tile
	down		to discard

The joystick also gives you full directional cursor movement.

2.3 Feature controls.

You can access a number of special features when it is your turn to discard a tile. Instead of using the cursor controls the following keys will invoke the relevant feature:-

D: Dead tiles - switches on/off the dead tile display enabling 'face up' or 'face down' play.

E: Expert - switches on/off the expert mode. This mode removes the flower and season tiles from play and activates the dead wall (14 tiles) rule. This becomes effective in the next deal. To bring it into immediate operation press 'R' to replay the current hand. (Note that if any flower or season tiles were dealt at the start of the current hand then the hands will not be the same when replayed).

H: Hint - indicates the tile which the computer thinks is the best discard from your hand.

K: Kong - form either a concealed or exposed kong from the tile(s) in your hand.

L: Level - displays the current level of play. Using left or right cursor controls will step through the alternative levels until released. Using the up or down cursor controls will select the new level. Levels vary from 1-9, where 1 is easy and 9 is difficult.

N: New hand - starts a new hand in the current game without changing the wind of the round or the players winds.

P: Peep - displays your opponents hands.

Q: Quit - quits the present game and starts a new game.

R: Replay - replays the current hand in the current game without changing the wind of the round or the player winds.

S: Special - switches on/off special hand play.

T: Take-back - resets the game to the position before the last tile you discarded enabling you to retake a go.

W: Wait - displays the current wait period that a discarded tile is displayed for. The wait period can be adjusted from 1 - 60 seconds using the cursor controls.

ESC: Escape - interrupts/restarts the demonstration mode using the current feature settings.

3. Brief explanation on how to play.

Mah Jong is played by four players called the East, South, West and North winds respectively, who compete to go Mah Jong by collecting four sets and a pair. A set being either:

	a pung	three identical tiles.
	or a kong	four identical tiles.
	or a chow	run of three tiles in the same suit.

Only one chow is allowed per hand. Each player starts with thirteen tiles, except East who has one extra to start the game by making the first discard. Apart from the flower/season tiles there are four of each kind of tile in the Mah Jong set.

Each player takes a tile from the 'wall' and then discards a tile in turn until someone goes Mah Jong, or until all tiles are used up. This is termed a 'washout'.

Any player may claim the latest discard if and only if he can make a pung or kong with it, or go Mah Jong. The player whose turn it is next may also claim it if he can make a chow, otherwise the discard becomes a 'dead tile'. When claiming a tile a player who goes Mah Jong has priority over a player claiming a pung or kong who in turn has priority over a player claiming a chow. When a discard is claimed the player who takes it must immediately 'expose' the set he makes then discard, play continues with the player next to him.

Sets made entirely from wall tiles are termed 'concealed' and score more points than 'exposed' sets. Also sets of 'minor' tiles (suit tiles numbered 2-8) score less than 'major' tiles. Exposed sets may only contain one discard and thus an exposed pung can only be made into an exposed kong with a wall tile.

Extra bonuses can be made by picking up a players flower or season tile. Flowers and seasons are connected to the winds as follows:-

Wind	Flower	Season
East	Plum blossom	Spring
South	Orchid	Summer
West	Chrysanthemum	Autumn
North	Bamboo	Winter

To maintain a balanced hand whenever a kong is made an extra tile is taken from the wall. If the kong is concealed then it is declared just like an exposed kong but one of the set is kept face down to indicate the higher score. An extra tile is also taken if a 'bonus' (i.e. flower or season) tile is picked up from the wall which must be exposed immediately as bonus tiles do not count towards a Mah Jong hand (except in scoring).

When a player is only one tile from Mah Jong he is 'fishing' and must say so to warn other players. Now you should be ready to load and start MAH JONG. Watch in demonstration mode for a few hands until you feel ready to read the remaining instructions and play a game. To begin with to give yourself more of a chance, increase the 'Wait' period and reduce the 'Level'.

4. Playing the game.

4.1 Preliminaries.

As soon as the game has loaded the computer will begin the first hand and you will start by playing East wind. The tiles are washed, the wall built and the hands dealt. All hands are then checked for flower and season tiles which are immediately exposed and the hand replenished from the wall. Your hand is then drawn in front of you as if you were playing the real game. The wall is simulated on the screen to indicate the progress of the game. Each tile shown in the wall represents two tiles.

4.2 Discarding a tile.

As East wind always starts it will be up to you to discard the first tile. To discard a tile move the cursor left or right (initially above the leftmost tile in your hand) to indicate which tile you wish to discard. Then choose either the upper or the lower tile by using either the up or down cursor controls respectively.

4.3 Claiming a discard.

Each of the computer players will in turn take a tile and make a discard. The tiles discarded by your opponents are shown inside the wall. While a tile is in view it may be claimed to make a chow, pung or kong or to go Mah Jong. The computer will verify that you have a legitimate claim to the tile before giving it to you. If you have made an incorrect call, or one of your opponents makes a call that takes precedence, then your claim is ignored. The time that your opponents discards remain in view is set by the 'Wait' feature.

If you make a successful claim for a discard the tile will be exposed on the table along with the tiles from your hand comprising the appropriate combination (chow, pung or exposed kong). Should there be more than one possible combination, the alternatives will be displayed. Again by using the cursor controls the intended combination can be selected from the menu.

4.4 Claiming a kong from a wall tile.

The alternative method of completing a kong is when you take a wall tile. To accomplish this, select the 'Kong' feature when it is your turn to discard. If more than one kong is possible the alternatives will be displayed.

As before, using the cursor controls, the desired kong can be selected from the menu. Otherwise the fourth tile will be treated as any other and can be discarded or used to make a chow. Four tiles left in a hand at the end of a game will not be scored as a kong.

When a concealed kong is declared, one of the tiles will be shown face down to distinguish it from an exposed kong.

4.5 Your opponents exposed tiles.

When one of your opponents claims a discarded tile, the combination is declared and exposed using a notation consisting of an icon to represent the 'suit' and letters/numbers to indicate the denomination. The notations used are shown below:-

🎋	bamboo	
⅃L	character	numbers from 1 - 9
⊕	circle	
⋺◀	wind	E,S,W,N
✖	dragon	G,R,W
⛰	flower	Pl, Or, Cr, Ba
🍂	season	Sp, Su, Au, Wi
◼	face down tile	

In the case of a pung three numbers follow the icon and for a kong four numbers (i.e. one for each tile). If a kong is concealed then one of the four numbers will be replaced by the icon representing a face down tile.

4.6 Dead tiles

If a discarded tile is not claimed then it becomes dead and is added to the dead tiles inside the wall. The convention used is shown at the start of a game before there are any dead tiles.

4.7 Fishing.

When a player requires only one tile to go Mah Jong that player is fishing and the fish icon will be displayed next to the players wind marker. In certain circumstances a player may cease to be fishing but the fish icon will remain. This is consistent with the real game where a player cannot retract his declaration once made.

4.8 A complete game.

As play progresses, the wall will diminish until either there are no tiles left (a washout) or a player goes Mah Jong.
In the case of a washout a new hand is dealt and the winds rotate one place anti-clockwise. Otherwise, when a player goes Mah Jong the hands are scored, settled and the scoreboard updated before starting a new hand.

After scoring each hand the computer will wait for you to press the space bar (or fire button) before scoring the next. After all the hands are scored the computer will again wait for you to press the space bar (or fire button) before proceeding.

Normally the winds are rotated one place anti-clockwise after a Mah Jong hand, but if East wind goes Mah Jong then the winds do not rotate. When each of the players have had their turn at being East wind, the wind of the round changes. The current wind of the round is indicated by a letter and an icon in the top left corner of the display. After every player has been East wind four times the game is finished and the winner is the player with the highest score.

Note that in declaring the winner at the end of the game the wind of the winning player is that with which the player started the game (also the wind with which the player will start the next game). For example, as you will always start the game as East wind and finish a game as North wind, should you win you will be declared as East.

4.9 A short game.

To play a complete game of Mah Jong can take a long time, but there is no reason why a game cannot be concluded after any number of whole rounds, when all the players have held East wind an equal number of times.

4.10 Large hands.

In theory it is possible to collect a hand with up to twenty-six tiles in it. The maximum that can be displayed in your hand is twenty, therefore if you have more than twenty tiles some flowers or seasons will not be displayed. However, they will be included in the score at the end of the hand.

The probability of this occurring is very small and cannot arise if the flowers and seasons are removed from play (i.e. the maximum hand is then eighteen).

5. Scoring and settling hands.

5.1 General

When a player goes Mah Jong all of the hands are displayed and scored in turn starting with the player who went Mah Jong. There is a limit of 1000 points per hand. The hand scores are then settled between the players and the cumulative game score displayed on the scoreboard.

All of the basic scores, bonus points and doubles recommended by the BMJA are recognized by the program with the exception of two (see Section 7).

Theoretically a game of Mah Jong could be infinitely long if East wins repeatedly and hence the game scores are also potentially infinite. The maximum game score that can be recorded by a player is approximately +/- 32,000 points.

5.2 Table of scores.

Each basic hand is scored as follows:-

Going Mah Jong	20	Going Mah Jong with a wall tile	2
Going Mah Jong with only possible tile	2		
Pair of tiles	0	A chow	0
Exposed pung of minor tiles	2	Exposed pung of major tiles	4
Concealed pung of minor tiles	4	Concealed pung of major tiles	8
Exposed kong of minor tiles	8	Exposed kong of major tiles	16
Concealed kong of minor tiles	16	Concealed kong of major tiles	32
Pair of players own wind tiles	2	Pair of wind of the round tiles	2
Pair of any dragon tiles	2	Each flower or season tile	4

The basic hand may then receive a number of 'doubles' according to the following conditions:-

Having players own flower or season	x 2	Having all flowers or seasons	x 4
Pung or kong of any dragon	x 2	Pung or kong of players wind	x 2
Pung or kong of wind of the round	x 2	Fishing from dealt hand	x 2

And for the player who goes Mah Jong the following extra doubles are available:-

A pure hand (one suit and winds/dragons)	x 2	No chows	x 2
A hand with no minor tiles	x 2		
A completely concealed hand of different suits/winds/dragons			x 2
Going Mah Jong from a dealt hand	x 2	Going Mah Jong with the last wall tile	x 2
Going Mah Jong with the last discarded tile	x 2	Going Mah Jong with a loose tile	x 2

5.3 Settling of hands.

When all four of the hands have been scored the players settle up. Firstly the winner receives his score from each of the other players.

Then the other three players compare their scores with each other and pay the difference to the player with the higher score. The player who is East wind always receives and pays twice his score or difference.

Example: Suppose North has gone Mah Jong and the four hands are scored as follows:-

North	144	East	36
South	4	West	64

North receives 144 from both South and West and receives 288 from East. East receives 64 from South and pays West 56. South pays West 60.

So at the end of the game the scores are adjusted as follows:-

North	+144	+144	+288	+576
East	-288	+ 64	- 56	-280
South	-144	- 64	- 60	-268
West	-144	+ 56	+ 60	- 28

6. Advanced play.

6.1 General.

To ensure that you are continuously presented with a challenge as you learn and progress, the program contains many advanced features.

6.2 Special hands.

By selecting the 'Special' feature any one of the special hands recognised by the BMJA can be collected.

NB. Certain special hands may be collected by your opponents which may not be instantly obvious to you, eg. 'plucking the moon from the bottom of the sea' and 'gathering the plum blossom from the roof'.

6.3 Playing with the dead tiles face down.

This program undoubtedly presents you with more of a challenge if the dead tiles are laid face down during play. This can be simulated by selecting the 'Dead tile' feature.

6.4 Tournament rules.

By selecting the 'Expert' feature you can remove the flowers and seasons from play, thus reducing the element of luck in the game to a minimum. The dead wall of 14 tiles is also activated giving players less time to complete a Mah Jong hand. However, the number of washouts may increase, especially at the lower levels of play.

6.5 Fast play.

Mah Jong is essentially a fast game; but because the ability of players will vary greatly the program can be adjusted to play as quickly or as slowly as desired. However, the maximum challenge to the expert player can be achieved by reducing the 'Wait' period to the minimum of one second and switching off the dead tile display and special hands.

7. Departures from the BMJA rules.
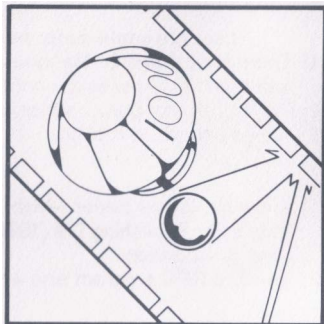
There are some minor respects in which this program departs from the BMJA rules:-
1) There is no goulash, the tournament rule is used instead (after a washout the winds rotate and play continues normally).
2) Players are not punished for letting off a cannon.
3) Kongs cannot be robbed.

8. Acknowledgements.

PINBALL

THE GAME

Pinball is not only a superb simulation, but also allows you to modify every element of the table design, and even create your own table layouts from scratch. It gives you all the features you would expect from a real pinball table right down to nudge and tilt (both of which you can adjust of course!)

INSTRUCTIONS

Once the game has loaded a menu will appear as follows:-

P	Play game	R	Redefine keys
M	Modify layout	C	Create a new layout
L	Load a layout	S	Save a layout

PLAY GAME

After pressing P from the main menu, press C to put a coin into the machine. Each coin will give one player five balls (For four players insert four coins). Press the N key once for each new player. The score of the current player is highlighted. Holding down both flipper keys will pull the launcher back, and releasing the keys will eject the ball.

REDEFINE KEYS

Press R to redefine the default keys which are as follows:-

/	Right hand flippers	X	Left hand flippers
\	Jolt right side	Z	Jolt left side
R	Release blocked ball	C	Insert coin
N	Start/select number of players	ESC	Quit game/return to menu

MODIFY LAYOUT

Pressing M will allow you to change the scoring speed etc. Move the cursor around the screen using the cursor keys, input a different value, and press RETURN to confirm it.

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Pressing ESC at this stage takes you back to the menu. Y takes you into the layout modification screen where you can move, add, and delete components. The instructions for this stage are explained by the text at the bottom of the screen.

CREATE A NEW LAYOUT

Press C from the main menu and you will be presented with a blank table where you can let your artistic skills run riot. Once again the instructions are shown via the text at the bottom of the screen.
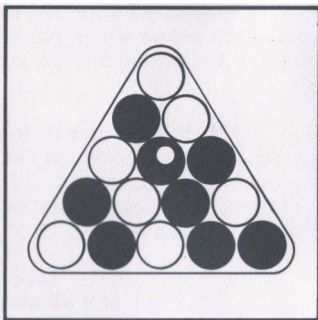
N. B. When creating a new layout you will erase the existing table layout, and will have to reload to get back to it.

LOADING/SAVING A TABLE DESIGN
Pressing L or S will allow you to LOAD or SAVE your designs.

Macadam Bumper ⓒ Infogrames.

POOL

THE GAME
The screen prompts you to choose either the 8 or 15 ball game. The cursor is first of all prompted by using the keys enter/return.

Then play resumes by prompting the cursor to the ball you wish to play, and then deciding the amount of power and spin you wish to use. Players scores are highlighted at the top of the screen.

PLAYING THE GAME
.KEYS

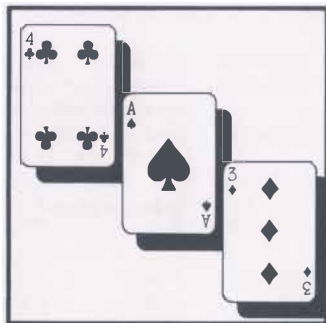|			
O	Left	P	Right
Q	Up	A	Down
O	Decrease power	P	Increase power
O	Left spin	P	Right spin
Q	Top spin	A	Bottom spin

ENTER/RETURN   Executes shot

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VIDEO CARD ARCADE

HIGH LOW: THE GAME

The computer will deal five cards of which the first one is revealed. You are given the option of changing this first card. Once you have decided to keep it you have to decide whether the subsequent cards are higher or lower than the preceeding card. You start with twenty credits, and bonus credits are awarded when you score over 200 points.

The hands score as follows:-

300 points	Four of a kind
200 points	Full house
150 points	Flush
100 points	Straight
80 points	Three of a kind
40 points	Two pairs
20 points	Any other

Aces can be high or low but not both. Should you get two cards of the same value following each other, then to decide which is higher or lower foilow the ranking of suits; Hearts (high), Spades, Diamonds, Clubs (low).

KEYS

H	Higher	TAB	Return to menu
L	Lower	RETURN	Deal cards
C	Change Card		

POKER ROYAL: THE GAME

The computer will display five cards dealt at random. You then have to decide which cards to hold, before the remainder are redealt. The aim of the game is to accumulate as many points as possible in the bank. You start with twenty credits, and bonus credits are awarded when you score over 200 points.

The hands score as follows:-

300 points	Royal flush - ace, king, queen, jack and ten of the same suit.
200 points	Straight flush - five numerically consecutive cards of the same suit, the highest being that led by a king and so on down the rank.
150 points	Four of a kind - any four cards of the same value, the highest being four aces. The fifth card in the hand does not count.
100 points	Full house - three cards of one value, together with two of another, the highest being three aces and two kings.
80 points	Flush - any five cards of the same suit, the value of the flush depending on the value of the highest card.
60 points	Straight - five numerically consecutive cards of any mixture of suits, the value depending on the highest card.
40 points	Three of a kind - any three cards of the same value, ranking from three aces downwards. The other two cards in the hand do not count.
20 points	Two pairs - two cards of the same value and of any suit, and two of another. The higher fifth card in the hands decides the winner between two pairs of equal value.

KEYS
1 - 5   Hold/Keep respective cards   RETURN Deal cards
SPACE   Cancel last choice   TAB   Return to menu

PONTOON (TWENTY ONE): THE GAME

The computer will deal the player two cards and itself two cards, of which one is hidden. You then have to decide whether to twist (take another card) or stick (settle for the cards you have) and hope the computer goes bust (scores over twenty one). The Ace can score as either one or eleven. You start with twenty credits and bonus credits are awarded when you score over 200 points. The aim of the game is to get a score as close to twenty one as possible without going bust yourself. There are various special hands you can get which whilst all scoring twenty one or under count for more points.

The hands score as follows:-

300 points	7,7,7.
200 points	6 card trick
150 points	6,7,8 (Any order)
100 points	5 card trick
60 points	2 card 21
20 points	21 and unde

KEYS
T Twist   S Stick   RETURN Deal cards   TAB Return to menu

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